UNIT 6

Geometry and Algebraic Reasoning

Essential Questions

- How can you classify shapes using their attributes and properties?
- How can you use the coordinate grid to represent and interpret mathematical and real-world problems?

Explore: Sorting Objects
Students build curiosity from the beginning of the unit by engaging in a mathematical task that elicits multiple strategies and allows them to apply their own knowledge.

Unit Story: Hanan Pacha
In this story, Mia visits her grandfather in Chile and learns about the heritage of her ancestors and the beauty of "looking up" once in a while.

Focus on the TEKS

TEKS

Addressing

5.4.C, 5.4.D, 5.5.A, 5.8.A, 5.8.B, 5.8.C, 5.9.B

Math Process Standards:

5.1.A, 5.1.B, 5.1.C, 5.1.D, 5.1.E, 5.1.F, 5.1.G

ELPS:

1.A, 1.B, 1.C, 1.E, 1.F, 2.B, 2.C, 2.D, 2.E, 2.F, 3.C, 3.D, 3.E, 3.F, 3.G, 3.H, 4.C, 4.D, 4.F

Students use defining attributes, such as side lengths, angle measures, and parallel sides, to classify quadrilaterals and triangles into graphic organizers. They recognize and use the hierarchical relationship between different types of quadrilaterals and triangles to relate and distinguish pairs of shapes.

Students use the structure of the **coordinate grid** to explain how to plot points along the ***x*-axis** and ***y*-axis** in the first quadrant. They apply their understanding of the structure of the coordinate grid to identify and graph **ordered pairs**. Students use a given rule in the form of an equation to generate, identify, and graph numerical patterns on the coordinate grid. They graph and interpret real-world information presented on graphs.

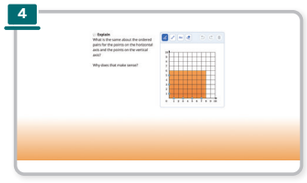
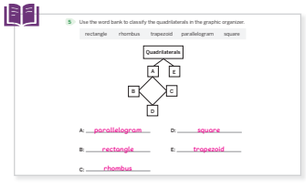


Kevin Key/Shuttestock.com

Connections and Coherence

Spotlight on Connecting the Content and Process Standards

Students engage in these Mathematical Process Standards as they . . .

TEKS 5.1.A	Apply their understanding of graphing ordered pairs on a coordinate grid to represent data from real-world scenarios on a scatterplot. **(Lesson 12, Activity 1)** **TEKS 5.8.C, 5.9.B**
TEKS 5.1.B	Analyze given information about a point on a coordinate grid, formulate a strategy to determine the relationship between the *x*- and *y*- coordinates, and evaluate the process for determining if a pattern is additive or multiplicative. **(Lesson 10, Activity 2)** **TEKS 5.8.A, 5.8.B, 5.8.C**
TEKS 5.1.C	Select tools, such as rulers, to measure triangle side lengths. **(Lesson 2, Activity 2)** **TEKS 5.5.A**
TEKS 5.1.D	Communicate mathematical ideas using points on a coordinate grid. **(Lesson 8, Activity 1)** **TEKS 5.8.C** 
TEKS 5.1.E	Use graphic organizers to classify quadrilaterals. **(Lesson 5, Activity 2)** **TEKS 5.5.A** 
TEKS 5.1.F	Analyze equations to identify additive and multiplicative patterns. **(Lesson 10, Activity 2)** **TEKS 5.4.D**
TEKS 5.1.G	Use precise mathematical language to explain how quadrilaterals can be classified. **(Lesson 3, Activity 1)** **TEKS 5.5.A**

Coherence

Prior Learning

- Students identified points, lines, line segments, rays, angles and parallel and perpendicular lines. **(Grade 4)** **TEKS 4.6.A**
- Students classified two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specific size. **(Grade 4)** **TEKS 4.6.D**
- Students used a rule to generate input-output tables to show the relationship between values. **(Grade 4)** **TEKS 4.5.B**

Future Learning

- Students will compare, identify, and represent additive and multiplicative rules using verbal descriptions, tables, and graphs. **(Grade 6)** **TEKS 6.4.A, 6.6.C**
- Students will extend their knowledge of the properties of triangles to include the sum of angles, the relationship between angle size and side lengths, and when 3 lengths form a triangle. **(Grade 6)** **TEKS 6.8.A**
- Students will represent a given mathematical situation in all 4 quadrants of a graph. **(Grade 6)** **TEKS 6.11.A**

See the Connections to Future Learning page for more information, including explanations and examples.

Unit at a Glance

Explore

Sorting Objects: Launch the unit with a non-routine task to investigate the question, "How can you show categories?"

Assess and Respond



A Pre-Unit Check

Learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

TEKS 4.6.C, 4.6.D, 3.6.B

Sub-Unit 1



1 Explore: Sorting Objects

How can you show categories?

Sort a set of classroom objects and justify categories and subcategories.

TEKS Building Toward 5.5.A
TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.E



2 Classifying Triangles

Using a Hierarchy to Classify Triangles

Sort, identify, and describe equilateral, isosceles, and scalene triangles using attributes, such as side lengths and angle measurements.

TEKS 5.5.A
TEKS 5.1.C, 5.1.F, 5.1.G



3 Classifying Quadrilaterals

Using a Hierarchy to Classify Quadrilaterals

Sort and describe quadrilaterals using attributes, such as parallel lines, angle measurements, and side lengths.

TEKS 5.5.A
TEKS 5.1.E, 5.1.F, 5.1.G



7 Bullseye!

Points on the Coordinate Grid

Use ordered pairs to identify the location of points on the coordinate grid.

TEKS 5.8.C
TEKS 5.1.F, 5.1.G

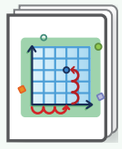


8 Coordinating Satellite Repairs

Graphing Points on Lines

Identify and graph ordered pairs on the coordinate grid, including on horizontal and vertical lines and the axes.

TEKS 5.8.C
TEKS 5.1.B, 5.1.D, 5.1.F



9 Follow My Lead

Describing the Process for Graphing Ordered Pairs

Describe the process for graphing points along the *x*- and *y*-axes using whole-number and decimal ordered pairs.

TEKS 5.8.A, 5.8.B, 5.8.C
TEKS 5.1.D, 5.1.G

Assess and Respond



A Quiz: Sub-Unit 2

Learn about your students' understanding of the concepts and skills so far in this unit.

TEKS 5.8.C, 5.8.B

All lessons can be taught using the Student Edition while the teacher projects Presentation Screens.

We recommend students use devices to interact with some lessons, as indicated with .

Pacing: 16 days | **Short on time?** See pacing considerations below.

Pre-Unit Check: 20 min

12 Lessons: 60 min each

Sub-Unit Quizzes: 20 min each

End-of-Unit Assessment: 45 min

Sub-Unit 2



4 A Question of Shape

Identifying the Most Specific Name of a Quadrilateral

Use the attributes of quadrilaterals and the relationships between them to identify a mystery shape in a game.

TEKS Building Toward 5.5.A
TEKS 5.1.F, 5.1.G



5 Classifying Shapes in Graphic Organizers

Using Graphic Organizers to Classify Triangles and Quadrilaterals

Use graphic organizers to classify quadrilaterals and triangles into categories and subcategories.

TEKS 5.5.A
TEKS 5.1.E, 5.1.F, 5.1.G

Assess and Respond

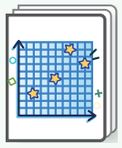


A Quiz: Sub-Unit 1

Learn about your students' understanding of the concepts and skills so far in this unit.

TEKS 5.5.A

Sub-Unit 2



6 Creating a Coordinate System

Using the Coordinate Grid to Locate Points

Use the structure of the coordinate grid to precisely describe the location of points.

TEKS Building Toward 5.8.A
TEKS 5.1.D, 5.1.E

Sub-Unit 3

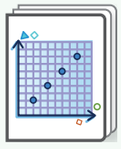


10 Patterns in Tables and Graphs

Recognizing Additive and Multiplicative Relationships

Analyze data in input-output tables and on graphs to determine whether the pattern represented is additive or multiplicative.

TEKS 5.4.D
TEKS 5.1.B, 5.1.D, 5.1.E, 5.1.F, 5.1.G



11 Graphing Patterns

Graphing Multiplicative and Additive Patterns

Generate and graph numerical patterns using given rules in the form of additive and multiplicative equations.

TEKS 5.4.C, 5.4.D
TEKS 5.1.D, 5.1.E



12 Graphing Real-World Problems

Graphing Ordered Pairs Generated from Real-World Problems

Graph ordered pairs from real-world scenarios on graphs and scatterplots.

TEKS 5.8.C, 5.9.B
TEKS 5.1.A, 5.1.D, 5.1.E, 5.1.F

Assess and Respond



A End-of-Unit Assessment

Learn about your students' understanding of the concepts and skills in the unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

TEKS 5.4.C, 5.5.A, 5.8.A, 5.8.B, 5.9.B
TEKS 5.1.D, 5.1.E, 5.1.G

Pacing Considerations

End-of-Unit Assessment: This assessment can be given on the same day as the Pre-Unit Check for the next unit.

Lesson 1: This lesson can be omitted. It is an exploration that helps students engage in the unit, but is not essential for meeting required standards. If omitted, read and discuss the Unit Story prior to Lesson 2.

Lesson 4: This lesson can be omitted. It is an opportunity for students to have additional practice using attributes and properties to identify quadrilaterals, but is not essential for meeting required standards.

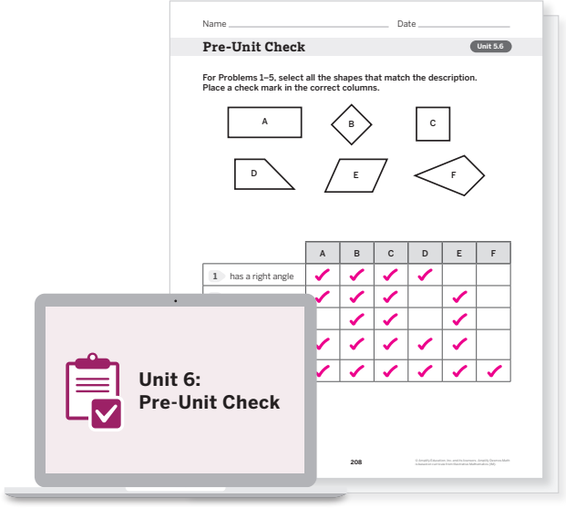
Assessments

Every unit includes a variety of formative and summative assessments designed to highlight students' understanding of a variety of concepts and skills.

Pre-Unit Check

Assign the **Pre-Unit Check** to learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

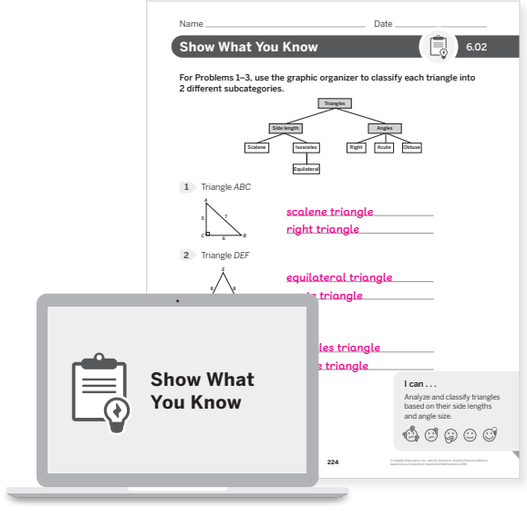
TEKS: 3.6.B, 4.6.C, 4.6.D



Lesson | Show What You Know

Use the **Show What You Know** for each lesson to learn more about your students' progress toward the lesson goal(s). Here is one example from this unit. **(Lesson 2)**

TEKS: 5.5.A

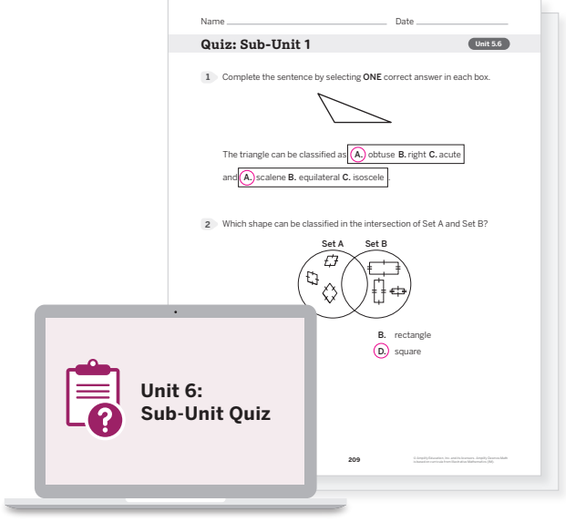


Sub-Unit Quizzes

Assign each **Sub-Unit Quiz** to learn about your students' understanding of the concepts and skills so far in this unit.

TEKS assessed on:

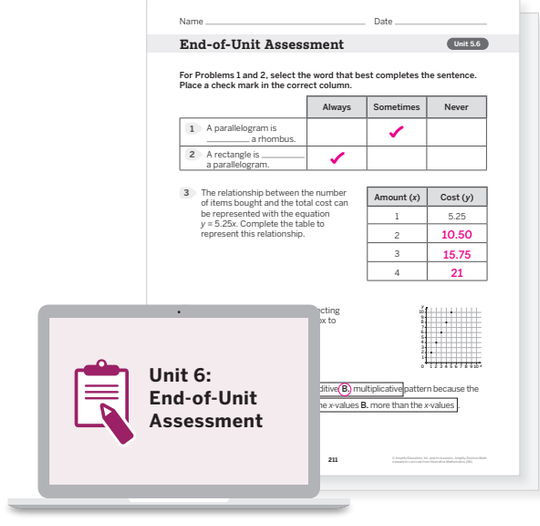
- **Sub-Unit Quiz 1:** 5.5.A
- **Sub-Unit Quiz 2:** 5.8.C, 5.8.B



End-of-Unit Assessment

Assign the **End-of-Unit Assessment** to learn about your students' understanding of the concepts and skills in this unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

TEKS: 5.1.D, 5.1.E, 5.1.G, 5.4.C, 5.5.A, 5.8.A, 5.8.B, 5.9.B



Differentiation

Every unit includes additional resources to support, strengthen, and stretch student learning. You can also assign digital resources that adjust to each student's current level of skill and understanding:

• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

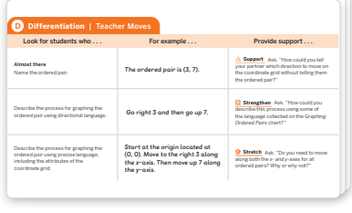
Differentiation Across the Unit

	Support	Strengthen	Stretch
	Mini-Lessons	**Centers**	**Extensions**
Sub-Unit 1 (Lessons 1–5)	• **ML 6.02**: Classifying Triangles Based on Their Side Lengths • **ML 6.03**: Classifying Quadrilaterals • **ML 6.04**: Identifying Names of Quadrilaterals • **ML 6.05**: Using a Hierarchy to Classify Quadrilaterals	• ***How Are They the Same?:*** *Grade 4 Shapes, Grade 5 Shapes* • ***Mystery Shape:*** *Grade 4 Shapes* • ***Can You Draw It?:*** *Grade 5 Shapes*	• **Sub-Unit 1 Extension Activities**
Sub-Unit 2 (Lessons 6–9)	• **ML 6.06**: Creating a Coordinate System • **ML 6.07**: Using the Coordinate Grid to Locate Points • **ML 6.08**: Plotting Points on the Coordinate Grid • **ML 6.09**: Describing How to Graph an Ordered Pair	• ***Can You Draw It?:*** *Grade 5 Shapes* • ***How Are They the Same?:*** *Grade 5 Shapes* • ***Mystery Shape:*** *Grade 5 Shapes*	• **Sub-Unit 2 Extension Activities**
Sub-Unit 3 (Lessons 10–12)	• **ML 6.10**: Identifying Additive and Multiplicative Patterns • **ML 6.11**: Graphing Ordered Pairs Generated From Number Patterns • **ML 6.12**: Introducing Scatterplots	• ***Mystery Shape:*** *Shapes on the Coordinate Plane*	• **Sub-Unit 3 Extension Activities**

Differentiation Within the Lesson

Each Teacher Edition includes point-of-use differentiation suggestions to modify or adjust instruction during the lesson to accommodate the needs of all learners.

Here is one example from **Lesson 9**, where students use the attributes of the coordinate grid to describe the location of a point.



Vocabulary of the Unit

Every lesson includes opportunities for all students to access mathematical and non-mathematical vocabulary and actively participate in their own vocabulary development.

Vocabulary

New Vocabulary	Lesson
axis (axes) **coordinates** **coordinate grid** **origin**	6
equilateral triangle **isosceles triangle** **scalene triangle**	2
ordered pair ***x*-coordinate** ***y*-coordinate**	7
scatterplot	12
***x*-axis** ***y*-axis**	9

Review Vocabulary
attribute
acute triangle
input-output table
intersecting lines
obtuse triangle
parallel lines
parallelogram
perpendicular lines
quadrilateral
rectangle
rhombus
right angle
right triangle
square
trapezoid

Contextual Vocabulary	Lesson
classify	2
points score	7
rule	11
subcategories	1
trend	12

Spotlight on Vocabulary

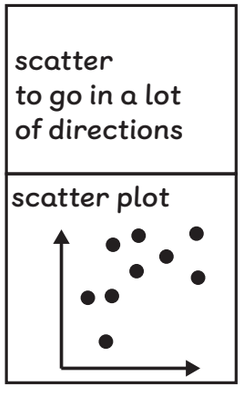
Vocabulary Strategy

In this unit, the term **scatterplot** refers to a display that shows a set of disconnected data points plotted on a coordinate plane. Students may be familiar with the first part of the term, *scatter*. As a verb, *to scatter* means to separate and go in different directions. Consider using the following vocabulary routine to support students' vocabulary development.

Word Structure: Prior Knowledge
Invite students to fold a piece of paper in half horizontally.

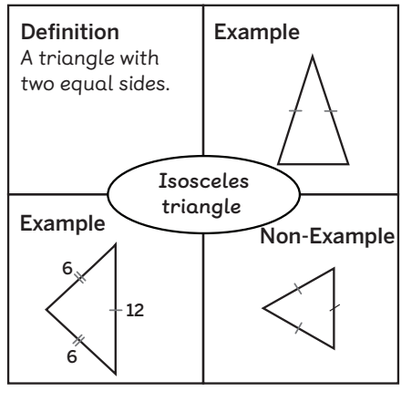
- Display or read aloud the following sentence, "The noise made the dogs scatter quickly."
- Ask, "What does it mean to scatter? Draw or write an example on the top half of the paper."
- Display a scatterplot.
- Ask, "How does thinking about what it means to scatter help you remember what a scatter plot looks like?"
- Invite students to draw their own example of a scatterplot on the bottom half of the paper.

ELPS 3.E



Frayer Models

Lesson 2 Invite students to create a Frayer Model graphic organizer that shows the definition, example, and non-example of the term *isosceles triangle*.





Additional Vocabulary Strategies and Frayer Model templates can be found in the ***Math Language Development Resources.***

Language Development

Every lesson includes embedded opportunities for all students, including those building English proficiency, to develop their mathematical language skills and engage in meaningful language interactions.

Math Language Routines

Math Language Routine	Lesson
MLR2: Collect and Display	3, 9, 10
MLR3: Critique, Correct and Clarify	5
MLR7: Compare and Connect	12
MLR8: Discussion Supports	1, 2, 4, 6, 8, 11

Spotlight on MLR3: Critique, Correct and Clarify

In **Lesson 5, Activity 2**, students use graphic organizers to classify quadrilaterals into categories and subcategories and use precise mathematical language to name shapes.
ELPS 2.B, 2.D, 2.E, 3.E, 3.G

MLR **MLR3: Critique, Correct and Clarify** Display the following incorrect statement for Problem 7, "A square has the same defining attributes as all quadrilaterals." Use the Think-Pair-Share routine. Ask:

- Critique: "What might this person be trying to say? How do you know?"
- Correct: "What could you add or change to make their statement true?"
- Clarify: "What could you add or change to make their statement easier to understand?"

Spotlight on Meaningful Language Interactions

Listening

In **Lesson 7, Activity 1**, students share strategies for identifying the ordered pairs of a point on the coordinate grid.

EB **Emergent Bilinguals** When discussing the horizontal and vertical axes, use gestures to highlight the difference between the axes. **ELPS 3.D, 3.F**

Speaking

In **Lesson 9, Activity 1**, students use the attributes of the coordinate grid to describe the location of a point.

EB **Emergent Bilinguals** Encourage students to use the sentence frames from Problem 2 in the Student Edition as well as the words collected on the Graphing Ordered Pairs chart to support them with the discussion.
ELPS 1.E, 2.C, 2.E

Reading

In **Lesson 2, Activity 2**, students reference a class display created during the lesson to classify triangles into categories and subcategories.

EB **Emergent Bilinguals** Encourage students to use the *Triangle Classification* chart to support them with classifying each triangle. **ELPS 3.E, 3.F**

Writing

In **Lesson 2, Activity 1**, students sort triangles based on their attributes such as side length and angle size.

EB **Emergent Bilinguals** Encourage students to annotate the attributes of each type of triangle using words or phrases.
ELPS 1.C, 4.D

Materials and Prep

Here are materials and resources used in this unit and where to find them.

Materials

Manipulative Kit

- protractors **(Lesson 2)** (optional)
- rulers **(Lesson 2)**

Hands-on

Classroom materials

- chart paper **(Lessons 1–3, 9)**
- markers **(Lessons 1–3, 9)**
- sets of 10 classroom objects **(Lesson 1)**
- sticky notes **(Lesson 3)**

Additional Printable Resources

Lesson

- Activity PDFs* **(Lessons 1–4, 6, 10)**

  *Refer to each lesson overview to see the Activity PDFs needed for the lesson.
- Work Mats, Cards, and Grids

PDF
Presentation Screens
Digital

Centers

- Center PDFs*

  *Refer to the Centers page to see the Center PDFs needed or suggested for the unit.
- Work Mats, Cards, and Grids



PDF

Assessment

- Pre-Unit Check
- Quiz: Sub-Unit 1
- Quiz: Sub-Unit 2
- End-of-Unit Assessment, Forms A and B
- End-of-Unit Assessment Rubrics
- Show What You Know



PDF
Digital

Intervention and Extension Resources

- Mini-Lessons
- Extensions



PDF
Digital

Caregiver Support

These resources can be shared with students' caregivers. They provide background on the mathematics in this unit, as well as suggestions for supporting students at home.

Caregiver Hub

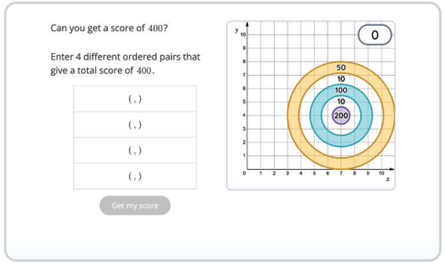
Caregiver Letter

Centers

Technology

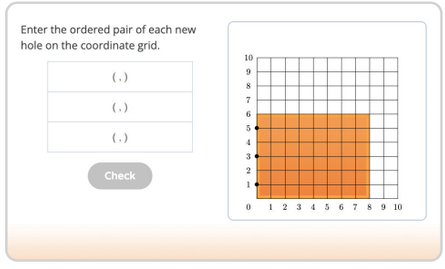
Dynamic, digital interactions are integral to Amplify Desmos Math. Powerful digital tools, such as the teacher dashboard, enable teachers to effectively facilitate rich math discussions.

A Powerful Digital Experience



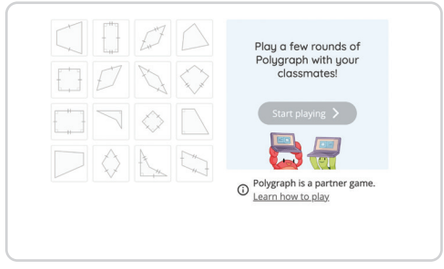
Visualize the Mathematics
(Lesson 7)

Students use multiple representations of mathematical concepts and skills in order to make connections, understand structure, and find patterns.



Receive Responsive Feedback
(Lesson 8)

Students are free to explore mathematics in interactive ways. When they try new ideas, they receive real-time responsive feedback so they can refine their thinking and move learning forward.



Collaborate With Classmates
(Lesson 4)

Students have opportunities to view, appreciate, and respond to the mathematical thinking of their classmates and work together in problem solving.

Lessons With Digital Student Screens

Digital Lessons are recommended to be taught with students on devices for a dynamic learning experience. Aligned Student Edition pages are also available for notetaking and off-device learning when needed.

Lesson	Why digital?
4 A Question of Shape	Students ask and answer questions about shapes and revise their thinking as they go.
7 Bullseye!	Students enter ordered pairs to graph points on the coordinate grid and receive interpretive feedback in real time.
8 Coordinating Satellite Repairs	Students explore graphing and identifying points that form lines on coordinate grids and revise their thinking as they go.

A Accessibility

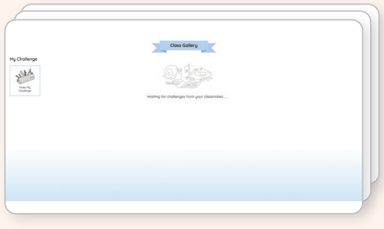
Every lesson is designed using the principles of Universal Design for Learning. Every lesson also includes support suggestions that build on students' strengths.

Universal Design for Learning

Here is one example from a lesson designed to support Engagement.

Spotlight on Spotlight on Sustaining Effort and Persistence . . .

Lesson 7, Activity 2: Students receive Responsive Feedback prior to submitting their own challenge to the class gallery. Students then solve each other's challenges, which fosters a sense of community.

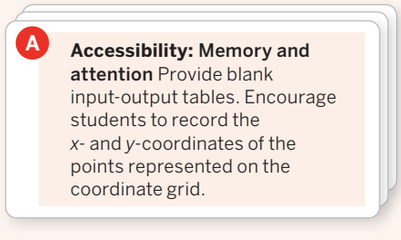


Just-In-Time Accommodations and Supports

Each Teacher Edition includes suggested supports that are based on the areas of cognitive function recognized by the Education Development Center (EDC).

Spotlight on Memory and Attention . . .

Lesson 10, Activity 2: This Accessibility support is provided during the Launch.



Centers

Every unit includes Centers, which are fun and engaging ways for students to practice math skills. This table shows the Center stages introduced during Lessons as an Activity, used in Center Choice Time, and suggested for Beyond the Lesson or Assess and Respond Differentiation. More information can be found in the Center Resources book.

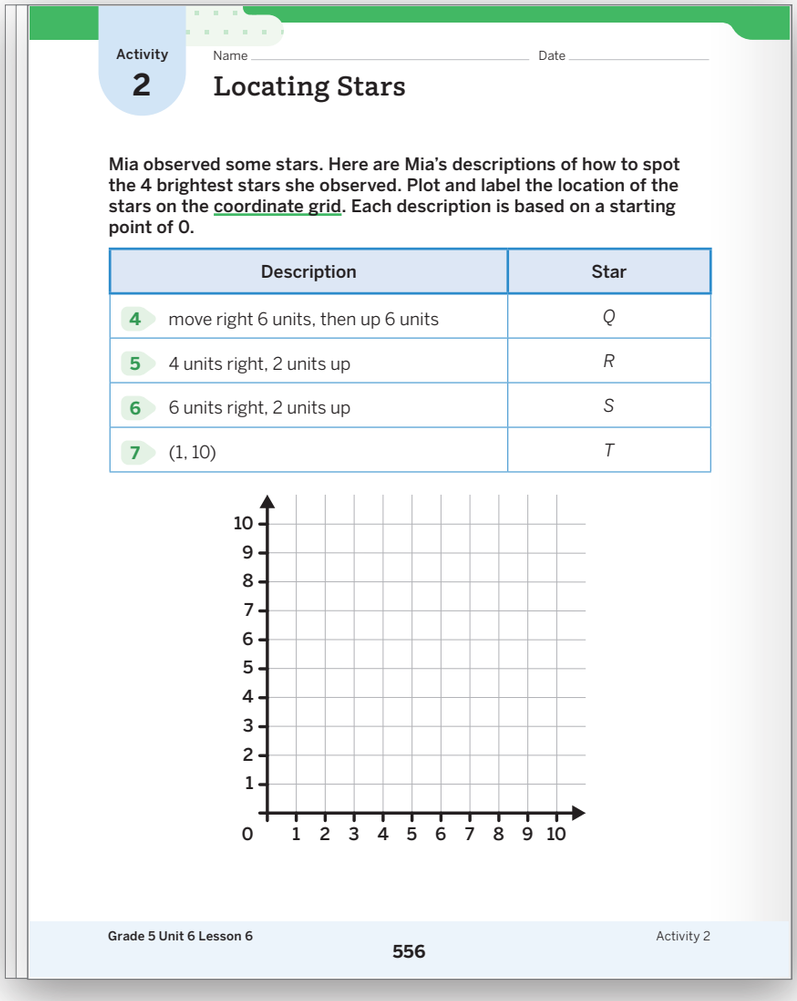
		Introduced in Activity in	Suggested for Differentiation in	TEKS
Can You Draw It?	Grade 5 Shapes	Grade 5	Lessons 5–9	Building Toward 5.5.A
How Are They the Same?	Grade 4 Shapes	Grade 4	Lessons 2–5	4.6.C, 4.6.D
	Grade 5 Shapes	Grade 5	Lessons 2–9	Building Toward 5.5.A
Mystery Shape	Grade 4 Shapes	Grade 4	Lessons 2–5	4.6.C, 4.6.D
	Grade 5 Shapes	Grade 5	Lessons 6–9	5.5.A
	Shapes on the Coordinate Plane	Grade 5	Lessons 10–12	Building Toward 5.8.C

Professional Learning

Here is an opportunity to deepen your understanding of the math in this unit and how to teach it.

Spotlight on Structure Recognition

Lesson 6, Activity 2



Activity 2

Name _____ Date _____

Locating Stars

Mia observed some stars. Here are Mia's descriptions of how to spot the 4 brightest stars she observed. Plot and label the location of the stars on the coordinate grid. Each description is based on a starting point of 0.

	Description	Star
4	move right 6 units, then up 6 units	*Q*
5	4 units right, 2 units up	*R*
6	6 units right, 2 units up	*S*
7	(1, 10)	*T*

Grade 5 Unit 6 Lesson 6 556 Activity 2

Try This

Put on your student hat and complete Problems 4–7.

Questions for reflection

- This is the first time students are asked to plot points on a coordinate grid.
  - » What do students need to recognize about the structure of the coordinate grid to accurately plot points?
- New language is intentionally spread across Lessons 6 and 7.
  - » How will students build an understanding of the terms *coordinate grid*, *axes*, *origin*, and *coordinates* in Lesson 6?
  - » How will you support students' use of these vocabulary terms in this lesson and beyond?

Other lessons that attend to structure recognition:

- **Lesson 7:** Students graph ordered pairs and recognize the importance that order plays when identifying coordinates.
- **Lesson 8:** Students identify and plot points on axes and horizontal and vertical lines. They observe patterns when points are on lines.

Mathematical Background

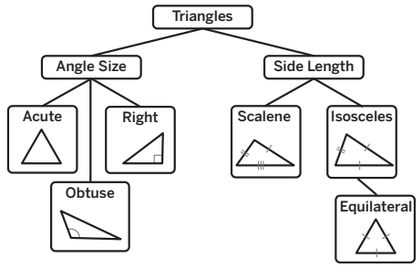
Here is an overview of the content your students will learn in this unit.

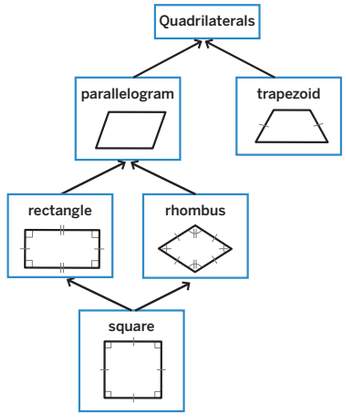
Geometry and Algebraic Reasoning

Classify two-dimensional shapes into categories and subcategories using graphic organizers

TEKS 5.5.A

- Triangles can be classified based on angle size and side length.
  - » Triangles can be classified as acute, right, and obtuse triangles based on their angle sizes.
  - » Triangles can be classified as **scalene**, **isosceles**, or **equilateral** based on their side lengths.
- Quadrilaterals can be classified based on the presence or absence of parallel sides, side lengths, or angle measurements.
  - » Some quadrilaterals share the same attributes, but each has their own distinct attribute making them their own subcategory.

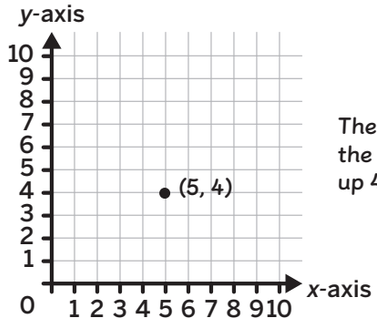




Graph ordered pairs in the first quadrant of a coordinate grid

TEKS 5.8.B, 5.8.C

- **Ordered pairs** describe the location of points on a **coordinate grid**.
- The process for graphing ordered pairs can be described as movements along the ***x*-axis** and ***y*-axis**.
  - » The first number in an ordered pair indicates how to move along the *x*-axis. The second number in an ordered pair indicates how to move along the *y*-axis.



The point on the graph is located 5 units to the right of the origin along the x-axis and up 4 units along the y-axis.

Recognize the difference between additive and multiplicative numerical patterns in a table or graph

TEKS 5.4.D

- Graphs and tables can represent data that is generated by an additive or multiplicative numerical pattern when given a rule.
  - » Additive numerical patterns can be shown by $y = x + a$.
  - » Multiplicative numerical patterns can be shown by $y = ax$.

Table A

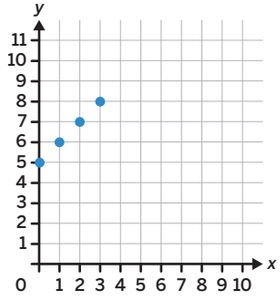
x	*y*
0 × 5	0
1 × 5	5
2 × 5	10
3 × 5	15

Multiplicative

Table B

x	*y*
0 + 5	5
1 + 5	6
2 + 5	7
3 + 5	8

Additive



This is an additive relationship. It represents the relationship in Table B.

Connections to Future Learning

Here is how the content in this unit connects to where your students are headed in their math journeys.

Equations as Rules

In this unit, students recognized the difference between additive and multiplicative numerical patterns in tables and graphs. They generated numerical patterns when given a rule in the form $y = ax$ or $y = x + a$.

In Grade 6, they will continue to compare additive and multiplicative patterns generated from rules in the form of equations and tables.

TEKS: 6.4.A

Example:

How can you describe the relationship between x and y in these two equations?

$y = 5x$ $\quad$ $y = x + 5$

In $y = 5x$ the value of y is 5 times more the value of x, and in $y = 5 + x$ the value of y is 5 more than the value of x.

Example:

How can you describe the relationship between x and y in each data set?

Set 1		Set 2	
x	y	x	y
1	2	1	3
2	4	2	4
3	6	3	5

In set 1 the value of y is 2 times the value of x. In set 2 the value of y is 2 more than the value of x.

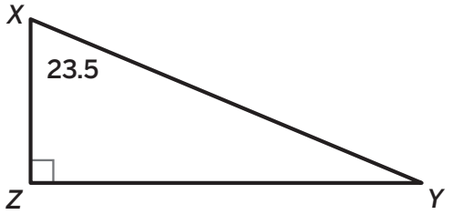
Attributes and Properties of Triangles

In this unit, students classified triangles into categories and subcategories using graphic organizers based on attributes such as side length and angle size. **In Grade 6,** students will use their understanding of the properties of triangles to determine sums of angles, the relationship between the length of the side and the size of the angle, and when three lengths form a triangle.

TEKS: 6.8.A

Example:

Determine the size of angle Z.



90 + 23.5 = 113.5

180 − 113.5 = 66.5

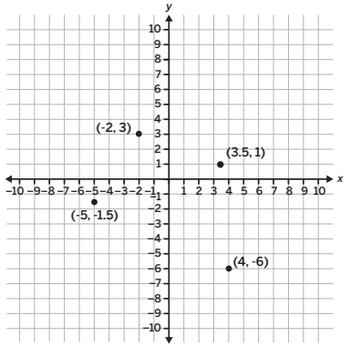
Graphing

In this unit, students graphed ordered pairs, including those generated from numerical patterns or found in an input-output table, in the first quadrant of the coordinate grid. **In Grade 6,** students will locate and graph points using ordered pairs in all four quadrants of the coordinate grid.

TEKS: 6.11.A

Example:

Graph the ordered pairs: (−2, 3), (−5, −1.5), (3.75, 1), (4, −6).



Unit Story

Every unit has a Unit Story to engage students and help them make connections between math and authentic contexts.



About the Story

Students hear a story about Mia's visit to Chile, where she learns about her ancestors' deep understanding of the relationship between the constellations and agriculture.

Unit Story Read-Aloud

For the **Warm-Up of Lesson 1,** read aloud the Unit Story. Use the **Presentation Screens** for Lesson 1 to display the story images to introduce students to the characters.

The Math in the Story

Classifying Shapes and the Coordinate Grid

During her visit to Chile, Mia identifies and describes the shapes of constellations using her understanding of quadrilaterals. She uses a coordinate grid to describe the stars' location and analyzes a graph about rectangular stones.

Throughout the unit . . .

- Students classify shapes into hierarchies and examine constellations for attributes of different shapes.
- Students use the coordinate grid to describe the location of points.

Math Connections

Students will connect the math of the unit to the Unit Story in these activities:

- **Lesson 1, Activity 1**
- **Lesson 2, Activity 2**
- **Lesson 3, Activity 1**
- **Lesson 10, Activity 1**
- **Lesson 6, Activity 2**
- **Lesson 12, Activities 1 and 2**

Math Identity and Community

The Unit Story provides an opportunity for students to reflect on their math identity and share their experiences of being a part of a math community. Throughout the unit, you may wish to support students in their mathematical journey by asking them to reflect on the Math Identity and Community questions provided at the start of each lesson.

I can be all of me in math class.



Just as Mia learned from others, how can you learn from others today? **(Lesson 4)**



Mia discovered a love of the stars. What have you discovered about yourself this year? **(Lesson 11)**

Story Moments

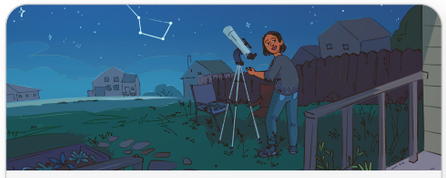


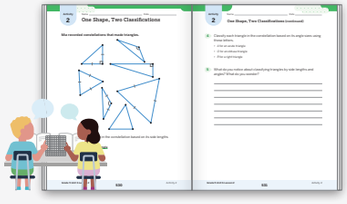


Lesson 1 Activity 1

Math Connection

Students listen to the unit story, *Hanan Pacha*. They notice and wonder about mathematical situations in the story.





Lesson 2 Activity 2

Math Connection

Students sort, compare, and classify triangle constellations that Mia recorded based on their attributes.



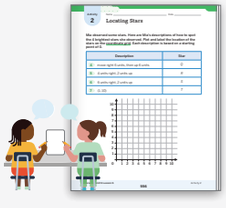


Lesson 3 Activity 1

Math Connection

Students sort quadrilaterals drawn by Mia into categories based on their attributes. They use their understanding of the attributes of quadrilaterals to identify shapes by their most specific names.



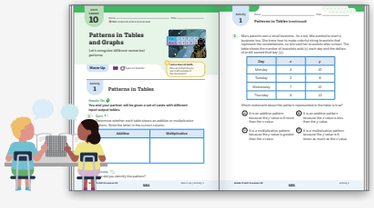


Lesson 6 Activity 2

Math Community Connection

Students use a coordinate grid to plot the location of four of the brightest stars Mia had observed.



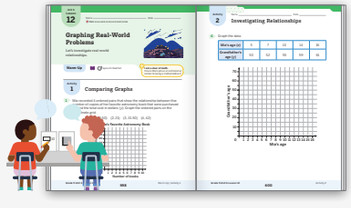


Lesson 10 Activity 1

Math Community Connection

Students identify the numerical relationship between x- and y-values in a table showing bracelets sold by Mia and identify patterns in input-output tables.





Lesson 12 Activities 1 and 2

Math Identity Connection

Students apply their understanding of graphing ordered pairs to graph sets of data Mia collected.They notice that scatterplots can be used to investigate trends between 2 sets of data collected from real-world scenarios.

Read this aloud during the **Warm-Up of Lesson 1**, using the lesson's **Presentation Screens.**

Read-Aloud Hanan Pacha

2



People ask me, "Mia, why did you become an astronomer? After all, what do stars and planets have to do with the way we live here on Earth?"

Studying the sky helps us with a lot of things. In fact, a lot of the technology we have today like computers, cell phones, and GPS exist thanks to the work of my fellow astronomers.

But that's actually not why I first got into astronomy. For me, my love of the night sky came from my grandfather—my Apucha.

Ask: *"What do you notice? What do you wonder?"*

3



When I was a kid, I used to stay with my Apucha during the summers in Pozo Almonte in Chile. He lived in a farmhouse out in the desert. For him, and the other campesinos—or farmers—their way of life depended on the night sky.

4



They called it Hanan Pacha—"the world above". The most important part of the world above was Mayu.

5



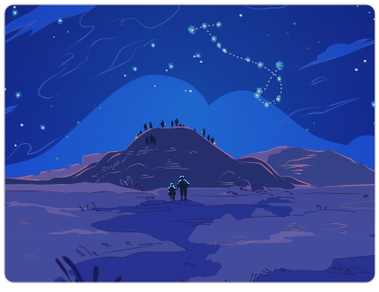
Most astronomers today call it the Milky Way, but for thousands of years, people like my grandfather called it Mayu—the River in the Sky. As the seasons change, Mayu moves across Hanan Pacha. Depending on the time of year, different shapes would appear inside the River. Those shapes tell the farmers when to plant, and when the weather might change. All this, just by looking up!

6



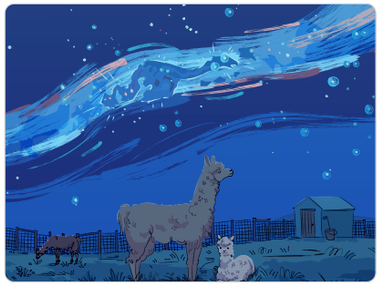
Apucha taught me how to read them all. There is Mach'acuay, the serpent who pokes their head in August to signal the beginning of the rainy season.

7



Then there is the constellation of stars that make up an *arado*, or plow. Spotting it in the sky meant that it would be an excellent crop year.

8



But the most important shape of all is Yana Llama, the black llama.

For the campesinos of the Atacama desert, the llama is a very special animal. The farmers depend on them for their wool, and they help carry heavy loads around the farm.

In December, you can see Yana Llama in the night sky. Two shining eyes appear right where the llama's head is. Those two stars are seen as a sign from Hanan Pacha that it's time for the farmers' llamas to have babies.

Ask: *"What do you notice? What do you wonder?"*

9



As an adult, I see the sky a little differently than I did when I was a kid.

I know now that stars are bright burning balls of gas; and the dark clouds that make up Yana Llama and Mach'acuay are bands of dust and gas.

But even so, when I'm studying these objects, tracking their movements using sophisticated pieces of equipment like satellites and high-powered telescopes, there's a part of me that goes back to my Apucha's house in the desert.

He showed me how big and mysterious and wonderful the night sky was.

Ask: *"What do you notice? What do you wonder?"*

10



I think of the other scientists. I think of the campesinos. I think of my Apucha—all of us, looking up, together.

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Pre-Unit Check

Independent | 20 min

Facilitation: Assign the Pre-Unit Check to learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis

Problems	Concept or skill	Preparation for	DOK	TEKS
1–5	Identifying and classifying shapes by angles and parallel sides	Lesson 2	2	4.6.C *(S)*, 4.6.D *(R)*, 3.6.B *(S)*

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources include:
- Mini-Lessons • Extensions

Centers Resources includes:
- Centers

PDF *Assessment Resource PDF*

Digital

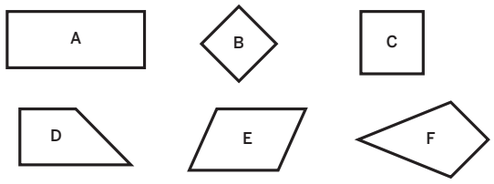
Unit 6
Pre-Unit Check

Name _____ Date _____

Pre-Unit Check

Unit 5.6

For Problems 1–5, select all the shapes that match the description. Place a check mark in the correct columns.



	A	B	C	D	E	F
1 has a right angle	✓	✓	✓	✓		
2 is a parallelogram	✓	✓	✓		✓	
3 is a rhombus		✓	✓		✓	
4 has at least 1 pair of parallel sides	✓	✓	✓	✓	✓	
5 is a quadrilateral	✓	✓	✓	✓	✓	✓

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D Differentiation (Pre-Unit Check)

To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Unit.

Sub-Unit Goal	Problems	Respond to Student Thinking

Preparation for Sub-Unit 1: Classify quadrilaterals and triangles in a hierarchy using graphic organizers based on attributes and properties.	1–5	**Support**
		• **Centers:**
		  • *How Are They the Same?, Grade 4 Shapes*
		  • *Mystery Shape, Grade 4 Shapes*
		• **Teacher Move:** Plan to spend more time classifying quadrilaterals in Lesson 3.

Watch Your Knowledge Grow (Optional)

Purpose: Students rate their understanding of the concepts that they will explore in this unit, prior to beginning the unit. Return to this page at the end of the unit and invite them to rate their understanding again to see how their knowledge has grown.

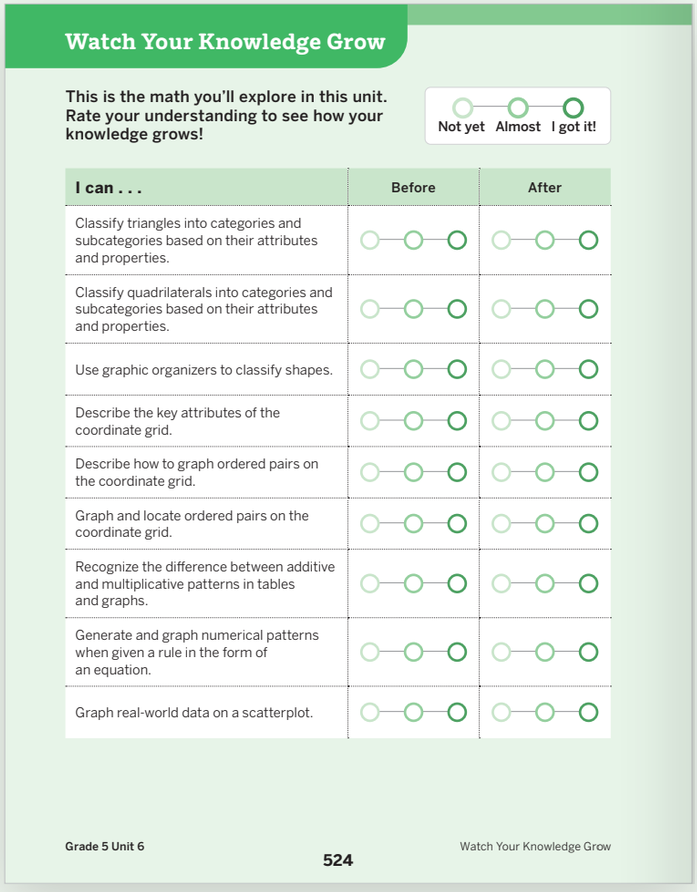
Read aloud the instructions. Let students know they are about to explore these math concepts in the upcoming unit.

Invite students to rate their understanding of each concept prior to beginning the unit. Let them know that they will return to this page at the end of the unit to rate their understanding again. They will be able to see how their knowledge has grown! Consider asking:

- "How have you classified or categorized shapes before?"
- "Have you heard of, or seen, a coordinate grid? If so, what did the term mean or what did it look like? What do you think a coordinate grid shows?"

EB **Emergent Bilinguals** Consider pairing students with partners who speak the same primary language and inviting them to respond to your questions first in their primary language or using a mixture of their primary language and English. **ELPS 1.C, 1.E, 2.C, 2.F**

Math Identity and Community Celebrate student thinking as they respond to your questions, including students who shared their thinking even though they may not have been sure yet. Invite students to share their "first draft thinking" with the class, such as "I think I've heard of a coordinate grid before when playing battle ship." or "I wonder what attribute means when talking about shapes?"



Watch Your Knowledge Grow

This is the math you'll explore in this unit. Rate your understanding to see how your knowledge grows!

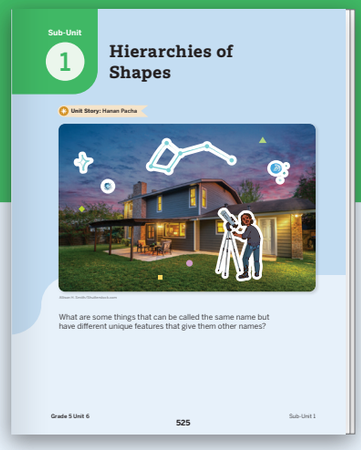
Not yet Almost I got it!

I can . . .	Before	After
Classify triangles into categories and subcategories based on their attributes and properties.		
Classify quadrilaterals into categories and subcategories based on their attributes and properties.		
Use graphic organizers to classify shapes.		
Describe the key attributes of the coordinate grid.		
Describe how to graph ordered pairs on the coordinate grid.		
Graph and locate ordered pairs on the coordinate grid.		
Recognize the difference between additive and multiplicative patterns in tables and graphs.		
Generate and graph numerical patterns when given a rule in the form of an equation.		
Graph real-world data on a scatterplot.		

Grade 5 Unit 6 524 Watch Your Knowledge Grow

Sub-Unit 1

Hierarchies of Shapes



Sub-Unit 1 Goal

- Classify quadrilaterals and triangles in a hierarchy using graphic organizers based on attributes and properties.

Progression of TEKS in Sub-Unit 1

- **Lesson 2:** Students sort and classify triangles based on their attributes and properties into categories and subcategories using graphic organizers.
- **Lessons 3–4:** Students sort and classify quadrilaterals based on their attributes and properties into categories and subcategories using graphic organizers.
- **Lesson 5:** Students classify triangles and quadrilaterals into categories and subcategories.

Sub-Unit 1 Progression	Lesson 1*	Lesson 2	Lesson 3	Lesson 4*	Lesson 5
Geometry and Measurement					
TEKS 5.5.A	●	●	●	●	●

*This lesson builds toward the standard shown.

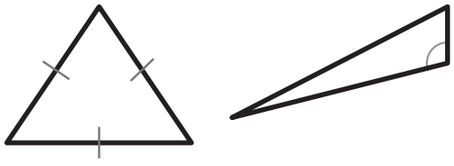
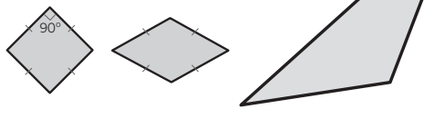
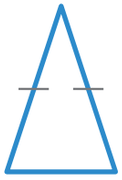
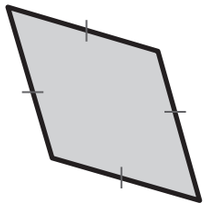
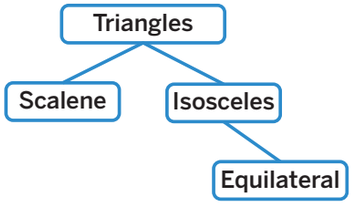
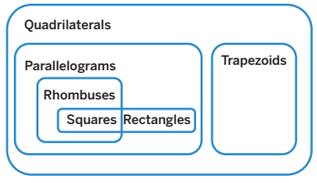
Coming up Next

- **Sub-Unit 2, Lessons 6–9:**
  - Geometry and Measurement: **TEKS 5.8.A, 5.8.B, 5.8.C**
- **Sub-Unit 3, Lessons 10–12:**
  - Algebraic Reasoning: **TEKS 5.4.C, 5.4.D**
  - Geometry and Measurement: **TEKS 5.8.C**
  - Data Analysis: **TEKS 5.9.B**

Math That Matters Most

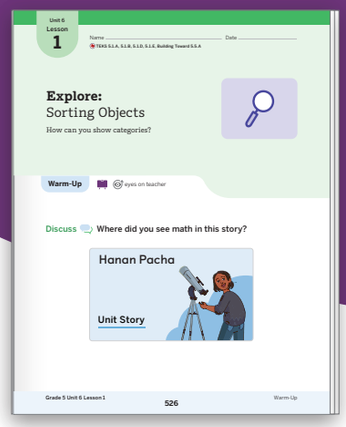
Sub-Unit 1: Classify quadrilaterals and triangles into categories and subcategories using graphic organizers based on attributes and properties.

Progression of Strategies, Skills, or Language

Progression	For example . . .	
Describing and sorting quadrilaterals and triangles by their attributes using precise geometric language.	Triangles • 3 equal sides • 3 acute angles • no equal sides • obtuse angle 	Quadrilaterals • 4 sides that are equal in length • 2 sets of parallel sides • unequal sides • no sets of parallel sides 
Using attributes to identify and name triangles and quadrilaterals.	Triangles  This triangle is an Isosceles triangle because it has 2 equal side lengths.	Quadrilaterals  This quadrilateral is a rhombus because it has 2 sets of parallel sides and four equal side lengths.
Classifying quadrilaterals and triangles by their attributes and properties using graphic organizers.	Triangles  • An equilateral triangle can be classified as an isosceles triangle because they share the attribute of having two equal sides, however an equilateral triangle is its own category because it has 3 equal sides.	Quadrilaterals  • A rectangle is always a parallelogram because every rectangle always has 2 sets of parallel sides. • A rectangle is sometimes a square. A rectangle is a square if all 4 sides are equal. • A rectangle is never a triangle because a triangle must have 3 sides, and a rectangle has 4.

Unit 6
Lesson
1

Student Edition pages and Presentation Screens support learning in this lesson.



Explore:
Sorting Objects

How can you show categories?

Key Concepts

- **Today's Goals**
  1. **Goal:** Represent categories and subcategories using any strategy.
  2. **Language Goal:** Describe the rationale for sorting a set of objects. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

To build curiosity and interest from the start of the unit, students engage in a non-routine task that elicits multiple strategies and solutions. They apply their own knowledge and language to a new mathematical task. Giving students a non-routine task with multiple answers and solution paths allows them to truly engage in the math process standards and invites all students to see themselves as mathematicians. **(TEKS 5.1.A)**

In this Exploration, students grapple with categories and subcategories of classroom objects in order to look closely at attributes, develop the conceptual idea of subcategories, and most importantly, encounter the need for standard representations of categorization — the hierarchy of shapes — which they will see in this sub-unit. **(TEKS 5.1.B, 5.1.D, 5.1.E)**

In Grade 4, students applied their understanding of angles to identify right, obtuse, and acute triangles. In Grade 6, students will use the properties and attributes of triangles to determine the sum of angles. Students will also model the areas of triangles, parallelograms, and trapezoids by decomposing and rearranging attributes of these shapes. This Exploration provides an opportunity to see students' skills and conceptual understanding of groups and subgroups, as well as their visualization.

Caregiver Connection

At home, invite students to sort objects in the kitchen or another living space into categories and subcategories by different attributes.

Vocabulary

Review Vocabulary

attribute

TEKS

Building Toward

5.5.A

Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.

Math Process Standards: 5.1.A, 5.1.B, 5.1.D, 5.1.E

ELPS: 1.E, 2.B, 2.C, 2.E, 2.F, 3.E, 3.F

Building On

4.6.D

Lesson at a Glance 60 min

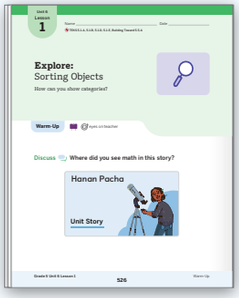
TEKS: 5.1.A, 5.1.B, 5.1.D, 5.1.E, Building Toward 5.5.A

Warm-Up

Whole Class | 15 min

Students are introduced to the **Notice and Wonder** routine after hearing the Unit Story read aloud. Because there is no single correct response, this invitational routine allows all students to share their mathematical curiosity about the unit narrative to which they will return throughout the unit.

Materials: Unit Story, *Hanan Pacha*



Activity

Small Groups | 45 min

Students sort classroom objects into categories and subcategories using any strategy. They participate in a **Gallery Tour** to compare representations and consider what makes a representation clear and useful as they sort new objects.

Note: The Student Edition is not required for this activity.
Materials: *Explore Organizer* PDF (optional), chart paper, markers, sets of 10 classroom objects
Additional Prep Prepare: sets of 10 of the same classroom objects, 1 set per 4 students



Opportunities for Extension (optional)

Students can sort another set of objects into categories and subcategories, such as art supplies or sports equipment.

Math Language Development

Emergent Bilinguals

Consider using the ***Math Language Development Resources*** with the **Activity, Connect** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames
- ✓ Visuals

ELPS 1.E, 2.C, 2.D, 2.E, 2.F



Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

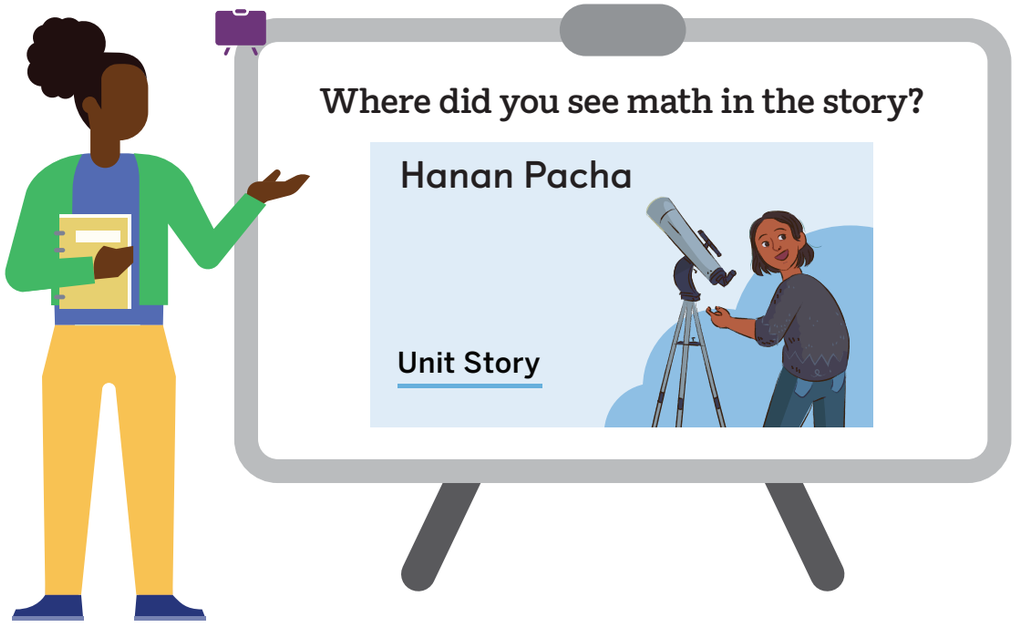
Whole Class | 15 min

Presentation Screens



Warm-Up Notice and Wonder

Purpose: Students hear a read aloud of *Hanan Pacha*. They notice and wonder about mathematical situations in the story.



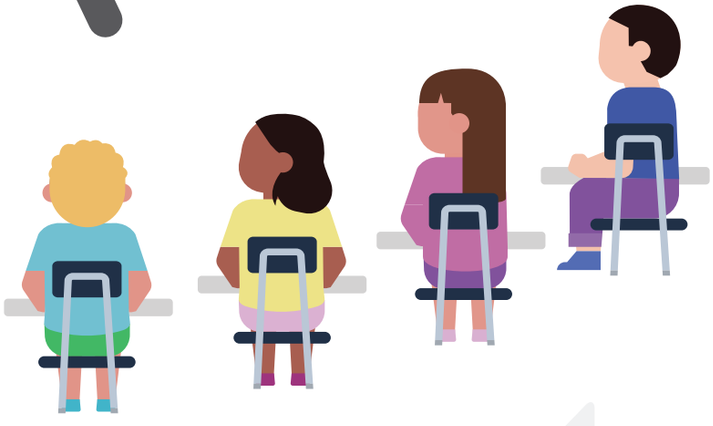
1 Launch

Display the cover of the Unit Story, *Hanan Pacha*.

Use the Think-Pair-Share routine. Activate students' background and prior experiences by asking, "What do you know about stars in the sky?"

Read aloud the Unit Story from this Teacher Edition while displaying the illustrations on Screens 2–10. ELPS 1.E

Pause on Screens 2, 8, and 9. Ask, "What do you notice? What do you wonder?"



2 Connect

Use the Think-Pair-Share routine. Ask, "Where did you see math in the story? What do you wonder about constellations in the sky?"

Record students' responses as they share.

Say, "In this unit, you are going to identify different shapes, just like Mia identified shapes in the constellations in the story. You'll see Mia and her Apucha again in this unit. Today, you're going to start by sorting classroom objects into categories."

Students might say . . . ELPS 2.B

I notice that Mia has a telescope and there are stars arranged in a shape in the sky.

I notice that Mia is using the computer to research more about the stars in the sky.

I wonder if Mia can see lots of different shapes with her telescope.

I wonder if scientists have discovered all the constellations.

Small Groups | 45 min

Activity How can you show categories?

Purpose: Students sort classroom objects into categories and subcategories to heighten their awareness of attributes and create a need for a systemic representation of the hierarchy of objects.

Presentation Screens



Materials

Lesson Resources:

- Provide students with access to the *Exploration Organizer* PDF (optional).

Classroom materials:

- Distribute one set of the same 10 classroom objects to each group.
- Distribute chart paper and markers to each group.

Make It Your Own!

You can use any set of classroom objects for this Investigation. Make sure you give each group a set of the same 10 objects.

1 Launch



Arrange students in groups of 3 to 4.

Say, "Today, your task is to organize these 10 objects into categories. You will also organize categories within your categories — called *subcategories*. You can use any strategy to determine and name the categories."

EB **Emergent Bilinguals** Invite students to share what they know about *subcategories* and provide examples of categories and subcategories they've seen to increase access to the task. ELPS 3.E, 3.F

Read aloud the directions.

A **Accessibility: Visual-spatial processing** Guide visualization of *categories* and *subcategories* by drawing a diagram.

2 Monitor



As students complete the activity, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Have students choose 1 object, and ask, "How might you describe this object? Do any other objects share that same description?"
- Ask, "Within this category, how could you sort again into a category within the category?"

3 Connect



Use the Gallery Tour routine. Say, "As you tour, consider how the representations created by your classmates are similar and how they are different."

MLR **MLR8: Discussion Supports – Sentence Frames** ELPS 1.E, 2.C, 2.E

During the Gallery Tour, display these sentence frames for students to use as they discuss.

- "These representations are similar because . . ."
- "These representations are different because . . ."

Ask, "Which representations were easiest to understand? What was helpful about the representations?"

Invite students to share their reflections. Provide the *Exploration Organizer* PDF to those students who wish to write or draw their reflections.

Key Takeaway: Say, "Today, we saw that there are many ways to sort objects into categories and subcategories, and it can be tricky to represent it in a way that is easily understood by others. In this unit, you will have the opportunity to learn the representations mathematicians use to show the relationship between different shapes based on their attributes."

Student Edition

Activity

Name _____ Date _____

With your group, decide how to organize the objects in your set.

- Move the objects around to show categories and categories within the categories.
- On chart paper, show how you organized the objects.

Ways to be a mathematician

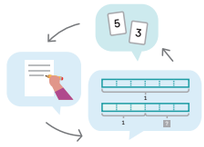
1. I can take my time to think about a challenging problem and come up with a plan before trying to solve it.

Not yet Almost I got it!



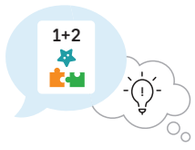
2. I can create representations to share and organize my mathematical ideas.

Not yet Almost I got it!



3. I can share my mathematical ideas clearly and in more than one way.

Not yet Almost I got it!



Grade 5 Unit 6 Lesson 1 527 Activity

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Sort objects into categories and discover categories overlap.	*We made a group of writing and math tools, but the sticky notes could be in both groups.*	**Support** Ask, "How else could you name these categories so that someone not in your group would know exactly where to place a new object?"
Almost there Sort objects based on ambiguous or subjective attributes.	*We sorted based on small and large objects.*	
Sort objects based on 1 attribute.	*We made 2 piles — 1 for plastic objects and 1 for everything else.*	**Strengthen** Ask, "What do you see within the categories you made that could help you make a subcategory?"
Sort objects by using attributes to make categories and subcategories.	*We sorted into plastic and paper objects. Then we sorted the plastics into objects we use and don't use in math class.*	**Stretch** Ask, "Can you think of any other ways to sort the objects?"

Activity Sample Student Work

Students will likely represent their answer to the Explore question in different ways. Because this is the beginning of the unit, there is no expectation for students to sort or represent categories in a specific way.

How can you show categories?

Sample student responses:

Sample response 1

We made lists to show the categories.

Paper AND reading tools
paper
book

Paper AND writing tools
sticky note
pencil

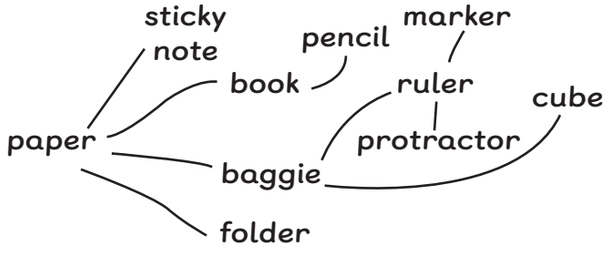
Plastic, Drawing
marker

Plastic AND measuring tools
cube
ruler
protractor

Plastic containers
baggie
folder

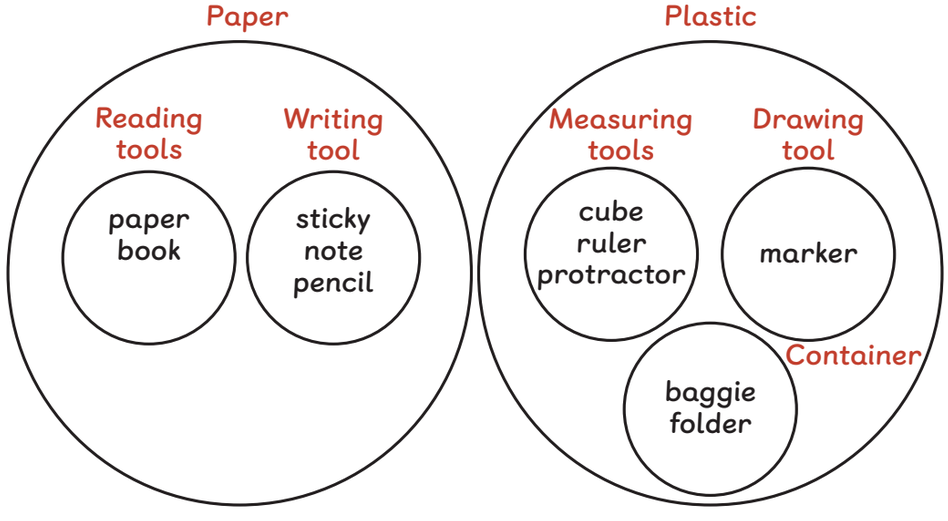
Sample response 2

We drew lines to show which objects go together.



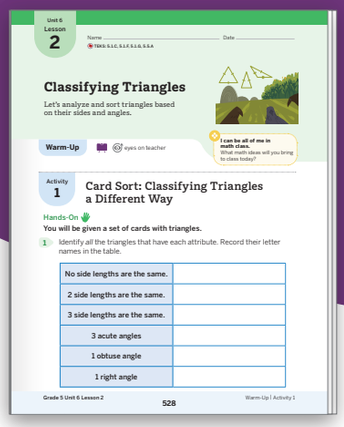
Sample response 3

We made circles to show the categories and then circles inside the circles to show the subcategories.



Unit 6
Lesson
2

Student Edition pages and Presentation Screens support learning in this lesson.


Unit 6 Lesson 2

Classifying Triangles

Let's analyze and sort triangles based on their sides and angles.

Warm-Up

Activity 1 Card Sort: Classifying Triangles a Different Way

Hands-On

You will be given a set of cards with triangles.

1 Identify all the triangles that have each attribute. Record their letter names in the table.

No side lengths are the same.	
2 side lengths are the same.	
3 side lengths are the same.	
3 acute angles	
1 obtuse angle	
1 right angle	

Grade 5 Unit 6 Lesson 2 528 Warm-Up | Activity 1

Classifying Triangles

Using a Hierarchy to Classify Triangles

Let's analyze and sort triangles based on their sides and angles.

Key Concepts

Today's Goals

1. **Goal:** Analyze and classify triangles based on their side lengths and angle size.
2. **Goal:** Identify equilateral, isosceles, and scalene triangles.
3. **Language Goal:** Justify classifications of triangles based on their side lengths and angle size. **(Listening, Speaking, and Writing)** ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F

Connections and Coherence

Students sort and classify triangles using a graphic organizer based on relationships between the side lengths of each triangle and the size of angles, allowing them to recognize that some triangles have 2 or 3 sides that are the same length. This leads them to draw conclusions about the defining attributes of 3 possible types of triangles when classified by their side lengths. Students then apply their understanding of the defining attributes of side length and angle size to classify triangles. **(TEKS 5.1.C, 5.1.F, 5.1.G)**

Prior Learning

In Grade 4, students identified triangles based on the size of their angles.

Future Learning

In Lesson 3, students will identify and sort quadrilaterals based on their attributes, such as angles and whether their sides are parallel or perpendicular.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of how to classify triangles based on their attributes, such as side length and angle size.
- Students **apply their** understanding of the attributes of triangles to name triangles based on their properties.

Vocabulary

New Vocabulary

equilateral triangle

isosceles triangle

scalene triangle

Review Vocabulary

acute triangle

obtuse triangle

right triangle

TEKS

Addressing

5.5.A

Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.

Math Process Standards: 5.1.C, 5.1.F, 5.1.G

ELPS: 1.B, 1.C, 1.E, 2.B, 2.C, 2.D, 2.E, 3.C, 3.E, 3.F, 4.C, 4.D, 4.F

Building On	Building Toward
4.6.D	6.8.A

Building Math Identity

I can be all of me in math class.
What math ideas will you bring to class today?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

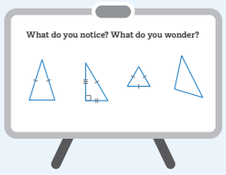
60 min

TEKS: 5.1.C, 5.1.F, 5.1.G, 5.5.A

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about a set of triangles. Students have an opportunity to share their mathematical curiosity while you observe the language they use.



Activity 1

Pairs | 15 min

Students sort and classify a set of triangles based on the number of side lengths that are equal in measure and the size of the angle. The terms **equilateral triangle**, **isosceles triangle**, and **scalene triangle** are introduced in the Connect.

Manipulative Kit: rulers
Materials: chart paper, markers, *Triangle Classifications* chart (teacher made), *Activity 1* PDF
Additional Prep Cut out: *Activity 1* PDF, Prepare: *Triangle Classifications* chart

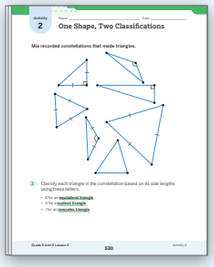


Activity 2

Pairs | 20 min

Students classify triangles as equilateral, isosceles, and scalene in a constellation. They then classify the triangles based on angle size.

Manipulative Kit: protractors, rulers (optional)
Materials: *Triangle Classification* chart (Activity 1)



Synthesis

Whole Class | 10 min

Students review and reflect on the relationship between attributes and properties of equilateral triangles and isosceles triangles.

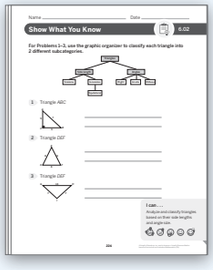


Show What You Know

Independent | 5 min

Students demonstrate their understanding of classifying triangles based on side lengths and angle sizes to name a given triangle as scalene, equilateral, or isosceles and right, acute, or obtuse.

Materials: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.



✓ Cognates
✓ Visuals
✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F, 4.C, 4.D, 4.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** and **write** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** and **write** using a variety of sentence types.	Students **listen** to spoken English and **speak** and **write** using longer sentences. Exemplar responses are provided.

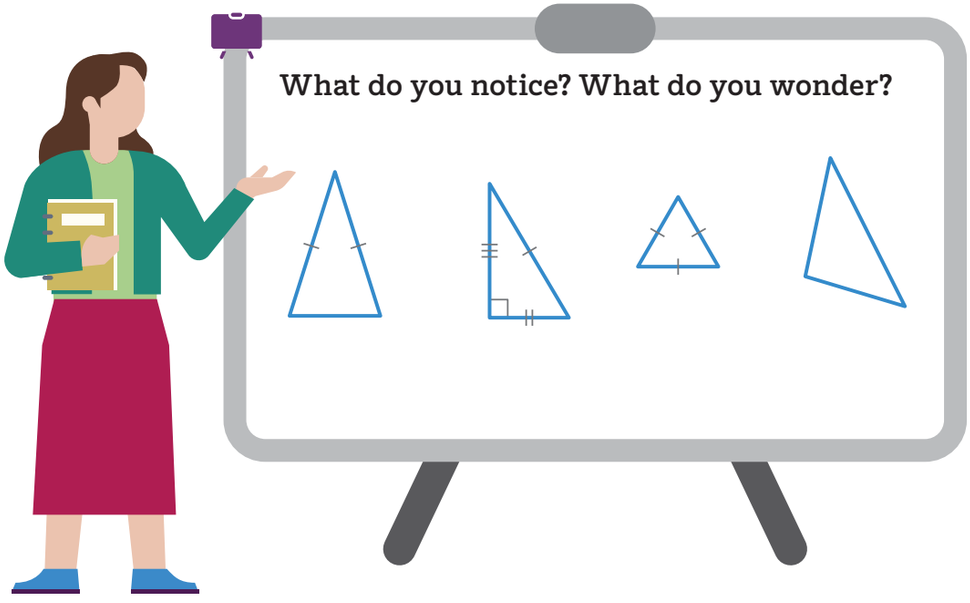
Whole Class | 10 min

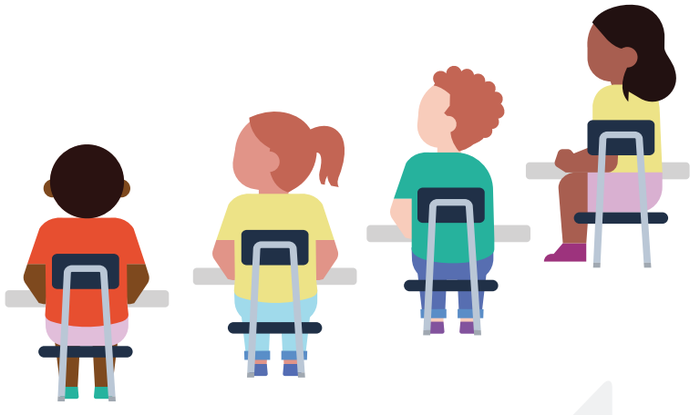
Presentation Screen



Warm-Up Notice and Wonder

Purpose: Students examine a set of triangles with tick marks representing equivalent side lengths to prepare for sorting and classifying triangles by side lengths.





1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Say, "In fourth grade, you classified triangles by their angles. Today, you will explore a new way to categorize triangles. based on their side lengths. The tick marks help to show which sides in the shape are equal. When side lengths have the same amount of tick marks, that means they are equal. When side lengths have a different amount of tick marks or no tick marks, this means the side lengths are unequal."

Students might say . . . ELPS 2.B

I notice that all of the triangles have some acute angles.

I notice that the middle triangle looks like a right triangle.

I wonder why some of the triangles have extra lines on them.

I wonder if we will measure triangles.

Pairs | 15 min

Activity 1 Card Sort: Classifying Triangles a Different Way

Purpose: Students sort triangles based on the length of their sides to help them identify the defining characteristics of equilateral, isosceles, and scalene triangles.

Presentation Screens



Materials

Manipulative Kit:

- Distribute one ruler to each pair.

Lesson Resources:

- Distribute one set of cards from the *Activity 1* PDF to each pair during the Launch.

Classroom Materials:

- Display chart paper *Triangle Classifications*. Record students' responses throughout the Connect.

1 Launch



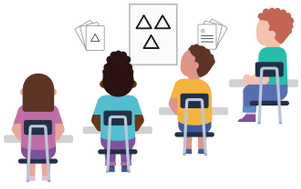
Read aloud the introduction and Problem 1. ELPS 1.E

EB **Emergent Bilinguals** Invite students to share what they know about the term *classify* and examples of different classifications to increase access to the task. ELPS 3.E, 3.F

Say, "You will complete Problem 1 with your partner and meet with another pair to complete Problem 2. Use a ruler to get precise measurements of the sides of the triangle. You can use tick mark notation to record the equal and unequal sides on each triangle."

A **Accessibility: Executive functioning** Invite students to make a plan with their partner on how they will determine which category each triangle gets placed in. Listen for and clarify any questions students have as they make sense of their plan.

2 Monitor



After students have completed **Problem 1**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What are you asked to do for this problem?"
- Ask, "How could you use your ruler to help you?"

3 Connect



Display the completed table from Problem 1.

Use the Think-Pair-Share routine. Ask:

- "What measurable attributes did you use to classify triangles into categories?"
- "What subcategories can you add under these classifications?"

Record informal student language on the *Triangle Classifications* chart. Consider organizing the language into categories that align with the table in Problem 1.

Key Takeaway: Say, "Triangles can be named and classified using attributes, such as side length or angle size. **Equilateral triangles** have 3 equal-length sides, **isosceles triangles** have at least 2 equal-length sides, and **scalene triangles** have 0 equal-length sides."

Record and label a drawing of each type of triangle on the chart. Use tick marks to show equal and unequal side lengths.

EB **Emergent Bilinguals** Encourage students to annotate the attributes of each type of triangle using words or phrases. ELPS 1.C, 4.D

Unit 6 Lesson 2

Name _____ Date _____

TEKS: 5.1.C, 5.1.F, 5.1.G, 5.5.A

Classifying Triangles

Let's analyze and sort triangles based on their sides and angles.



Warm-Up eyes on teacher

I can be all of me in math class.
What math ideas will you bring to class today?

Activity 1 Card Sort: Classifying Triangles a Different Way

Hands-On

You will be given a set of cards with triangles.

1 Identify *all* the triangles that have each attribute. Record their letter names in the table.

No side lengths are the same.	C, F, G, H, K
2 side lengths are the same.	B, D, E, J
3 side lengths are the same.	A, I, L
3 acute angles	A, B, I, K, L
1 obtuse angle	C, F, J
1 right angle	D, E, G, H

Name _____ Date _____

Card Sort: Classifying Triangles a Different Way (continued)

2 **Discuss**

- Join another pair and compare how you classified the triangles based on their side lengths and angle sizes.
- If you disagree on any triangle classifications, explain your rationale for how you classified them. Make any adjustments to your table that you feel are necessary.
- What do you notice about your classifications? What do you wonder?

Oral activity: No writing expected. Sample response shown.

We sorted the same way.
We notice that some triangles are in multiple categories. We wonder if any triangle can be classified in more than 1 way.



D Differentiation | Teacher Moves

Presentation Screens

Look for students who . . .	For example . . .	Provide support . . .
Almost there Classify triangles by side length appearance without the use of a tool, such as a ruler, to measure.	No side lengths are the same. — K 2 side lengths are the same. — B, C, D, F, G, H, J 3 side lengths are the same. — A, E, I, L 3 acute angles. — A, B, I, K, L 1 obtuse angle. — C, F, J 1 right angle. — D, E, G, H	**Support** Ask, "How could you be certain that the sides are a specific measurement? Why is it helpful to know the specific measurement of each side length?"
Classify triangles by the number of equal side lengths and list each triangle in 1 category based on the exact number of equal-length sides.	No side lengths are the same. — C, F, G, H, K 2 side lengths are the same. — B, D, E, J 3 side lengths are the same. — A, I, L 3 acute angles. — A, B, I, K, L 1 obtuse angle. — C, F, J 1 right angle. — D, E, G, H	**Stretch** Ask, "What do you notice about the angles for each group of triangles you sorted? Are there any patterns?"

Pairs | 20 min

Activity 2 One Shape, Two Classifications

Purpose: Students apply their understanding of the defining attributes of different types of triangles, such as side length and angle size, to identify and classify examples of equilateral, scalene, and isosceles triangles.

Presentation Screens



Materials

Manipulative Kit:

- Provide students with access to rulers and protractors (optional).

Classroom materials:

- Display the *Triangle Classification* chart.

Short on time? Consider completing Problems 3 and 4 as a whole class.

1 Launch



Read aloud Problems 3 and 4. Let students know other materials are available if they think using those would be helpful.

A **Accessibility: Memory and attention** Chunk this task into smaller, more manageable parts by ensuring students have correctly labeled all the equilateral triangles before they label the scalene and isosceles triangles.

EB **Emergent Bilinguals** Encourage students to use the *Triangle Classification* chart to support them with classifying each triangle. **ELPS 3.E, 3.F**

2 Monitor



After students have completed **Problem 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What is the problem asking you to do?"
- Ask, "Which triangle do you want to label first? How could you determine what type of triangle it is?"

3 Connect



Invite students to share their responses to Problems 3 and 4.

Use the Think-Pair-Share routine. Ask:

- "What do you notice about equilateral triangles and their angle sizes?"
- "What do you notice about isosceles and scalene triangles and their angle sizes?"
- "How can we use this information to update our classification chart?"

Key Takeaway: Say, "You can classify triangles, creating categories and subcategories based on shared attributes. For example, scalene and isosceles triangles can have any size angles, but equilateral triangles will always have acute angles."

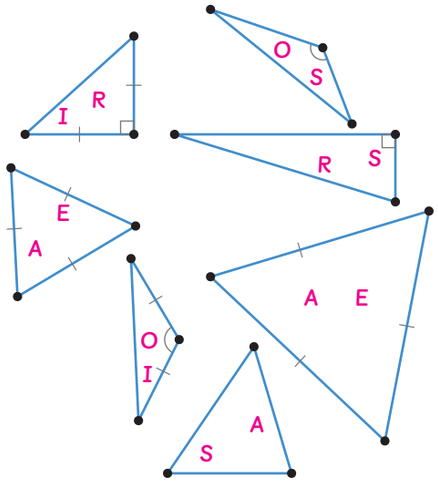
Record subcategories based on angle sizes on the *Triangle Classifications* chart. Use symbols to denote obtuse and right angles.

Activity 2

Name _____ Date _____

One Shape, Two Classifications

Mia recorded constellations that made triangles.



3 Classify each triangle in the constellation based on its side lengths using these letters.

- *E* for an **equilateral triangle**
- *S* for a **scalene triangle**
- *I* for an **isosceles triangle**

Activity 2

Name _____ Date _____

One Shape, Two Classifications (continued)

4 Classify each triangle in the constellation based on its angle sizes using these letters.

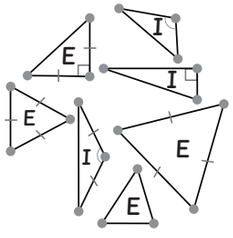
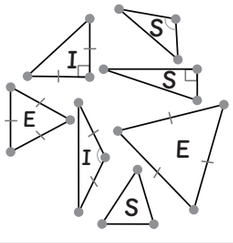
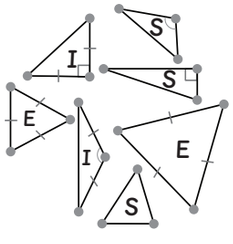
- *A* for an acute triangle
- *O* for an obtuse triangle
- *R* for a right triangle

5 What do you notice about classifying triangles by side lengths and angles? What do you wonder? **Sample response shown.**

I notice that the acute triangles can also be equilateral. I also notice that scalene triangles can be acute, obtuse and right triangles. The isosceles triangle is an obtuse triangle. I wonder if equilateral, scalene, and isosceles triangles can be classified with any angle sizes or if they can only be classified as specific angle sizes.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Identify all the triangles by how they appear.		**Support** Ask, "How did you classify the triangles in the diagram? How could you check your classifications are correct?"
Use a ruler to determine the side lengths to classify triangles.		**Strengthen** Ask, "How can you identify the length of each side without measuring?"
Use markings to determine the side lengths to classify the triangles.		**Stretch** Ask, "What other attributes does each named triangle have? What patterns do you notice?"

Whole Class | 10 min

Presentation Screens



Synthesis

Lesson Takeaway: Triangles can be classified according to their side lengths or angle sizes. **Equilateral triangles** have 3 equal sides, **isosceles triangles** have 2 equal sides, and **scalene triangles** have no equal sides.



Display the Venn Diagram.

MLR **MLR8: Discussion Supports — Make a Conjecture**
ELPS 2.B, 2.C, 2.D, 2.E

- Ask students to make a conjecture about the connection between equilateral triangles and isosceles triangles. Have them share their conjectures with a partner and discuss the following questions:
- "How do you know whether your conjecture is always true?" "Are there any counterexamples that show this conjecture is false?"

Say, "Triangles can be classified by their side lengths or angle sizes. Equilateral triangles can also be classified as isosceles because they have at least 2 equal sides. However, *equilateral* is their most precise name because they have the unique attribute of always having 3 equal sides."

Formalize vocabulary: equilateral triangle, **isosceles triangle**, **scalene triangle**

(optional) **Consider using the Word Structure: Word History routine** with one or more of the new vocabulary words. Ask, "*Equilateral* comes from the Latin *aequi-* + *later-*, which means *equal sides*. How can you use this to remember what *equilateral* means? ELPS 3.C, 3.F

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

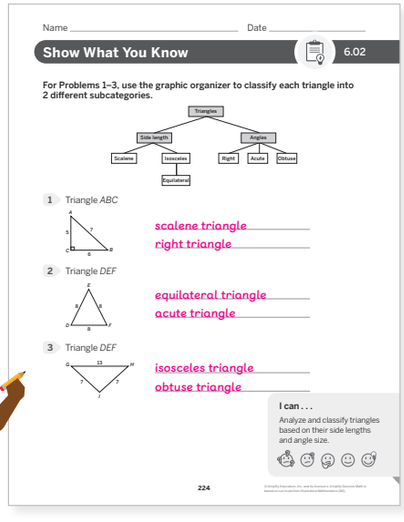
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.02

For Problems 1–3, use the graphic organizer to classify each triangle into 2 different subcategories.

Triangles; Side length: Scalene, Isosceles, Equilateral; Angles: Right, Acute, Obtuse

1 Triangle *ABC*
scalene triangle
right triangle

2 Triangle *DEF*
equilateral triangle
acute triangle

3 Triangle *DEF*
isosceles triangle
obtuse triangle

I can . . .
Analyze and classify triangles based on their side lengths and angle size.

224

Today's Goals

1. **Goal:** Analyze and classify triangles based on their side lengths and angle size.
   - In the *Show What You Know*, students classified triangles based on their side lengths and angles.
2. **Goal:** Identify equilateral, isosceles, and scalene triangles.
   - In the *Show What You Know*, students identified triangles as equilateral, isosceles or scalene.
3. **Language Goal:** Justify classifications of triangles based on their side lengths and angle size. **(Listening, Speaking and Writing)** ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

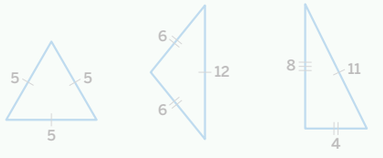
Lesson 2
Practice

Students using digital

Students using print

Summary 6.02

You can sort, compare, and classify triangles based on their side lengths and angle sizes. Equilateral triangles have 3 equal sides, isosceles triangles have at least 2 equal sides, and scalene triangles have no equal sides.

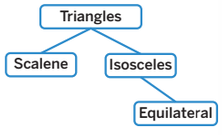


equilateral triangle | isosceles triangle | scalene triangle

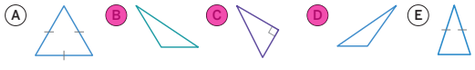
equilateral triangle A triangle with 3 equal-length sides.
isosceles triangle A triangle with at least 2 equal-length sides.
scalene triangle A triangle with no sides that are equal.

Practice 6.02

Use the graphic organizer for Problems 1–8.



1 Which triangles could be classified as *scalene*? Select **THREE** correct answers.



Grade 5 Unit 6 Lesson 2 532 Summary | Practice

Practice 6.02

Name _____ Date _____

2 How do you know which triangles from Problem 1 can be classified as scalene? Sample response shown.

I know that the triangles are scalene because each side is a different length.

For Problems 3–6, identify the subcategory of the triangle based on its side lengths.

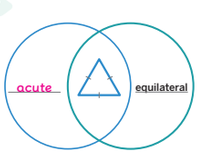
3  *isosceles*

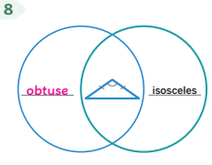
4  *scalene*

5  *equilateral*

6  *isosceles*

For Problems 7 and 8, classify the angle of the triangle.

7 

8 

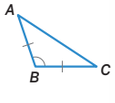
Grade 5 Unit 6 Lesson 2 533 Practice

Practice 6.02

Name _____ Date _____

9 Mia charted 3 stars that formed triangle *ABC*. Use the chart to classify triangle *ABC*.

Triangles					
Angle size			Side length		
Acute	Right	Obtuse	Isosceles	Equilateral	Scalene
		×	×		



Spiral Review

10 Simplify the expression.

3[48 ÷ (3 +5) – 2]

Show your thinking.

Sample work shown.

$3[48 \div (3 + 5) - 2]$

$3[48 \div 8 - 2]$

$3[6 - 2]$

$3[4] = 12$

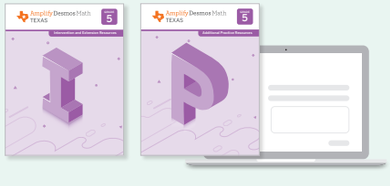
answer: 12

Grade 5 Unit 6 Lesson 2 534 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1	1	5.5.A
	2–9	1	5.5.A
Spiral Review			
Fluency	10	1	5.4.F

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 2

Lesson Goal: Analyze and classify triangles based on their side lengths and angles.

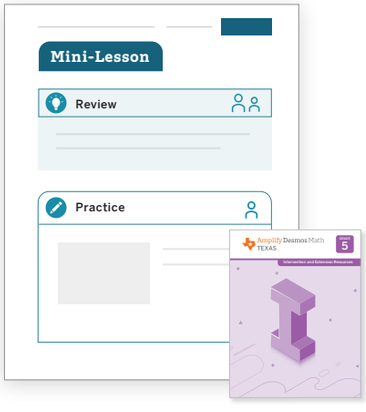
Support

Provide targeted intervention for students by using these resources.

If students classify 0 or 1 triangles correctly:

Respond:

- Assign the *Classifying Triangles Based on their Side Lengths.* **Mini-Lesson. |** 15 min
- Review the definitions and how to identify equilateral, isosceles, scalene, acute, obtuse, and right triangles.



Strengthen

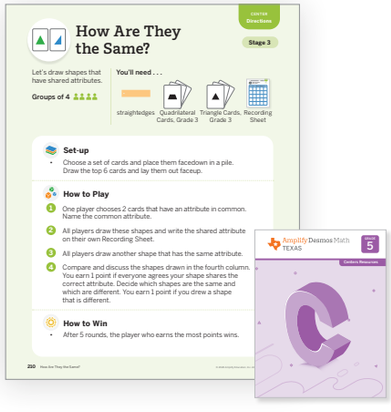
Reinforce students' understanding of the concepts assessed by using these resources.

If students classify 2 triangles correctly:

Respond:

- Invite students to play these **Centers. |** 15 min
  How Are They the Same?:
  - *Grade 4 Shapes*
  - ***Grade 5 Shapes***

  Mystery Shape: Grade 4 Shapes
- Have students complete **Lesson 2 Practice. |** 15 min
- **Item Bank**



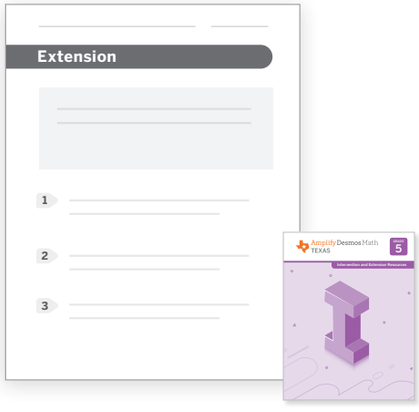
Stretch

Challenge students and extend their learning with these resources.

If students classify 3 triangles correctly:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.

• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., **scalene triangle** / **triángulo escaleno**
- Frayer Model templates
- Vocabulary routines



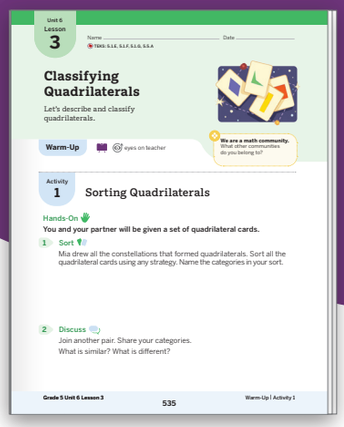


Professional Learning

In this lesson, students learned a new way to classify and name triangles. What was challenging for students about learning a new way that focused on a different attribute? Where did you see students making connections to what they had learned about classifying triangles by side length?

Unit 6
Lesson
3

Student Edition pages and Presentation Screens support learning in this lesson.



Classifying Quadrilaterals

Using a Hierarchy to Classify Quadrilaterals

Let's describe and classify quadrilaterals.

Key Concepts

Today's Goal

1. **Goal:** Classify quadrilaterals based on their attributes and properties.
2. **Language Goal:** Justify classifications of quadrilaterals based on their attributes and properties. **(Listening and Speaking)** **ELPS 1.E, 2.E, 2.F**

Connections and Coherence

Students analyze connections between various quadrilaterals by sorting into categories with shared attributes. Students practice using attributes, such as side length, angle measurement, and the presence or absence of parallel sides, to describe different quadrilaterals. They recognize that they can classify quadrilaterals using shared attributes. **(TEKS 5.1.E, 5.1.F, 5.1.G)**

Prior Learning

In Lesson 2, students used attributes such as side length and angle measurement to identify and classify triangles.

Future Learning

In Lesson 4, students will use the hierarchy of quadrilaterals and the attributes of quadrilaterals to identify a specific shape.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of how to use attributes related to sides and angles to describe, identify, and distinguish between quadrilaterals.

Vocabulary

Review Vocabulary

attribute
parallel lines
perpendicular lines
quadrilateral
right angle

TEKS

Addressing

5.5.A

Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.

Math Process Standards: 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.C, 2.D, 2.E, 2.F, 3.C, 3.D, 3.E, 3.F

Building On	Building Toward
4.6.D	6.8.B

Building Math Identity

We are a math community.
What other communities do you belong to?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.E, 5.1.F, 5.1.G, 5.5.A

Warm-Up

Whole Class | 10 min

Students use the **What Do You Know About ____?** routine, which provides an opportunity to hear the knowledge they already have about quadrilaterals and allows all students to contribute to the discussion.



Activity 1

Pairs | 20 min

Students sort Quadrilateral Cards based on shared attributes using any strategy. They notice that not all quadrilaterals share the same attributes.

Materials: Activity 1 PDF, chart paper, markers, *Classifying Quadrilaterals* chart (teacher made), sticky notes

Additional Prep Cut out: Activity 1 PDF; Prepare: blank chart titled *Classifying Quadrilaterals*



Activity 2

Pairs | 15 min

Students apply their understanding of the attributes and properties of quadrilaterals to complete Venn diagrams. They discover that quadrilaterals are specifically named based on the properties that are not shared with other quadrilaterals.

Materials: *Classifying Quadrilaterals* chart (from Activity 1)



Synthesis

Whole Class | 10 min

Students review and reflect on how to classify quadrilaterals into a hierarchy based on their attributes and properties.

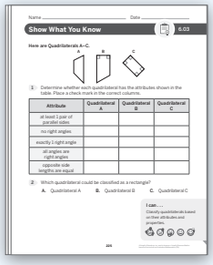


Show What You Know

Independent | 5 min

Students demonstrate their understanding by classifying quadrilaterals based on their attributes and properties.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

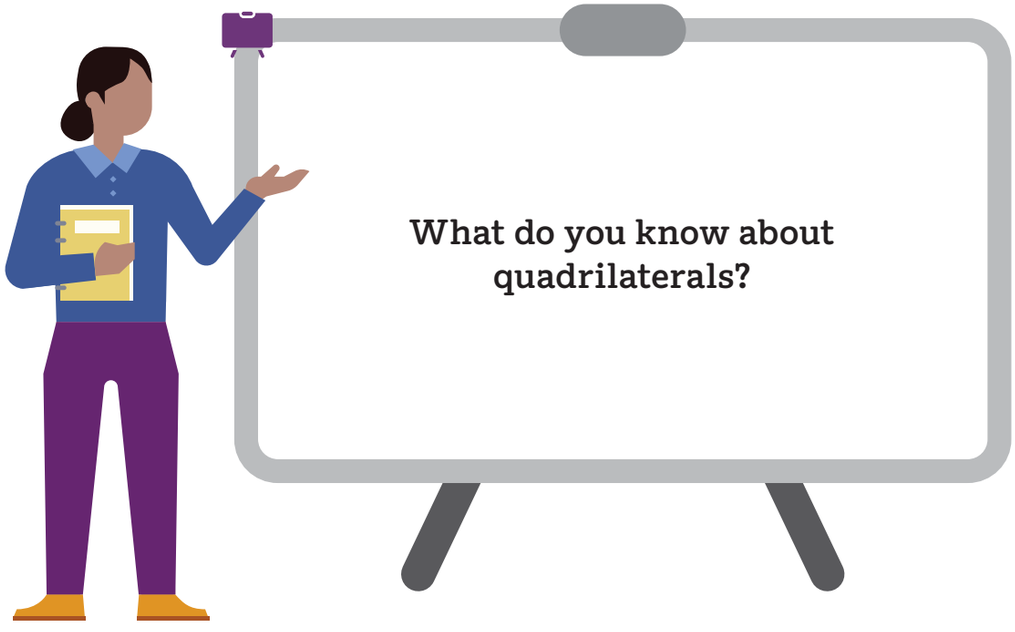
Whole Class | 10 min

Presentation Screen



Warm-Up What Do You Know About __?

Purpose: Students share ideas about quadrilaterals to prepare to use attributes to describe and classify quadrilaterals.





1 Launch

Display the question.

Use the What Do You Know About ___? routine.

Ask, "What do you know about quadrilaterals?"

Invite students to share their responses.

2 Connect

Record students' responses as they share.

Say, "Today, you will use what you know about quadrilaterals to describe and sort them."

Students might say . . . ELPS 1.E, 2.C, 2.D, 2.F

Quadrilaterals must have 4 sides and 4 angles.

Quadrilaterals might have no parallel sides, 1 set of parallel sides, or 2 sets of parallel sides.

Quadrilaterals can have no sides equal in length or all 4 sides equal in length.

Quadrilaterals might have right angles or no right angles.

Rectangles, squares, and parallelograms are quadrilaterals.

Pairs | 20 min

Activity 1 Sorting Quadrilaterals

Purpose: Students sort quadrilaterals based on shared attributes. They see that sorting based on shared attributes is one way to classify shapes.

Presentation Screens



Materials

Lesson Resources:

- Distribute the pre-cut cards from the Activity 1 PDF to each pair.

Classroom materials:

- Use sticky notes, chart paper, and markers to prepare the *Classifying Quadrilaterals* chart before the lesson. Add to the sticky notes during the Monitor and Connect.

1 Launch



MLR This activity is structured using the *MLR2: Collect and Display* routine. ELPS 3.C, 3.D, 3.E, 3.F

Read aloud the introduction and Problem 1.

Say, "Complete Problem 1 with your partner. Then join another pair to complete Problem 2."

A **Accessibility: Memory and attention** Invite pairs to brainstorm some categories before they start sorting.

EB **Emergent Bilinguals** If possible, pair students with different levels of English language proficiency together. This will provide a structured opportunity for multilingual learners to interact with and receive feedback from their peers with varied backgrounds. ELPS 1.E, 2.C, 2.D

2 Monitor



While students complete Problem 1, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "Choose 2 cards that have something in common. What do they have in common?"
- Ask, "What shared attribute could you use to name a category for those cards? Do any other cards belong in that category? Why?"

Record the informal and formal math language students use to describe quadrilaterals on sticky notes to create the *Classifying Quadrilaterals* chart. Consider organizing language into categories, such as sides and angles. Student language might include *wide, open, big, small, obtuse, acute angle, right angle, intersect, parallel, tilted, flat, square,* and *rectangle.*

3 Connect



Display the *Classifying Quadrilaterals* chart. Keep the chart displayed for Activity 2 and display the chart for students' reference in upcoming lessons.

Invite students to share their categories and their reasoning for those categories from Problem 1.

Use the Think-Pair-Share routine. Ask:

- "What is the most precise mathematical language that could be used to most specifically describe attributes in this category?"
- "How would that change the way you classified the shapes?"

Add the most precise language to describe an attribute to the *Classifying Quadrilaterals* chart using markers. Place any informal language from the sticky notes under the corresponding precise language.

Key Takeaway: Say, "You can classify and describe quadrilaterals based on multiple shared attributes, such as angle measurements, side lengths, and whether there are parallel or perpendicular sides."

Student Edition

Unit 6
Lesson
3

Name _____ Date _____

TEKS: 5.1.E, 5.1.F, 5.1.G, 5.5.A

Classifying Quadrilaterals

Let's describe and classify quadrilaterals.



Warm-Up eyes on teacher

We are a math community. What other communities do you belong to?

Activity
1

Sorting Quadrilaterals

Hands-On

You and your partner will be given a set of quadrilateral cards.

1 Sort

Mia drew all the constellations that formed quadrilaterals. Sort all the quadrilateral cards using any strategy. Name the categories in your sort.

Sample categories shown.

4 right angles
4 equal-length sides
2 sets of parallel sides
2 sets of perpendicular sides

4 sides
1 set of parallel sides

2 Discuss

Join another pair. Share your categories.
What is similar? What is different?

Oral activity: No writing expected. Sample response shown.

We both made a category to sort by right angles.
We made a category for parallel sides, but the other pair did not.

Grade 5 Unit 6 Lesson 3 535 Warm-Up | Activity 1

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Create 1 category.	4 sides	**Support** Ask, "What other attributes does this shape have? Do other shapes have this attribute? What other ways can you classify these shapes into smaller groups?"
Use 1 attribute to create categories.	2 sets of parallel sides No parallel sides	**Stretch** Say, "Draw another figure that belongs in one of your categories."
Use more than 1 attribute to create categories or subcategories.	2 sets of parallel sides with 4 right angles 2 sets of parallel sides with 0 right angles	

Pairs | 15 min

Activity 2 What's in a Name?

Purpose: Students apply their understanding of the attributes of quadrilaterals to identify the specific properties to complete Venn diagrams.

Presentation Screens



Materials

Classroom materials:

- Display the *Classifying Quadrilaterals* chart (from Activity 1) throughout the activity.

Short on time? Consider completing Problems 4 and 5 as a whole class.

1 Launch



Read aloud Problems 3–5.

Say, "Complete Problems 3–5 with your partner. Use the *Classifying Quadrilaterals* chart to help you identify the attributes of each shape."

2 Monitor



After students have completed **Problem 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What are some attributes you can use from Activity 1 to describe the shape?"
- Ask, "How would you describe this shape?"

3 Connect



Display a completed version of Problem 3.

Use the Think-Pair-Share routine. Ask:

- "What attributes do quadrilaterals have in common?"
- "What differentiates one quadrilateral from another quadrilateral?"

A **Accessibility: Visual-spatial processing** Have students highlight the same attributes in one color, using different colors for each attribute to see connections and separations.

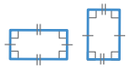
Key Takeaway: Say, "Quadrilaterals can be classified and named based on their attributes and properties. Some quadrilaterals can share the same attributes and properties, but they each have a specific name based on the attributes that define them."

Activity 2

Name _____ Date _____

What's in a Name?

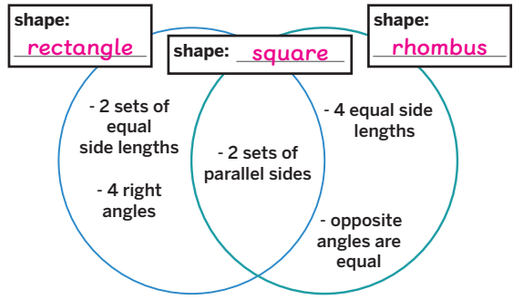
3 List *all* the attributes of the quadrilaterals.

Quadrilateral	Parallelogram
 4 sides 4 angles	 2 sets of parallel sides 4 angles
Rectangle	**Square**
 2 sets of parallel sides 4 right angles opposite sides equal	 2 sets of parallel sides 4 right angles 4 equal side lengths
Rhombus	**Trapezoid**
 2 sets of parallel sides 4 equal side lengths opposite angles equal	 1 set of parallel sides

What's in a Name? (continued)

Write the name of the shapes being classified in the Venn diagram based on the attributes listed. Sample responses shown.

4



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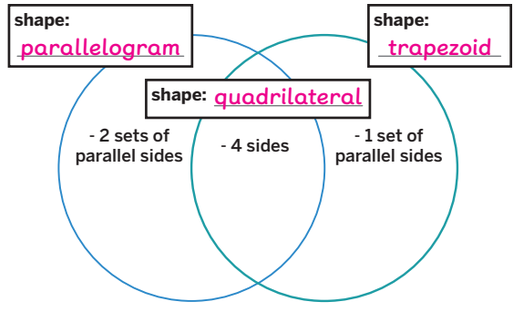


Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Use imprecise or ambiguous language.	All sides are the same.	**Support** Ask, "What do you mean by the same? How could you rephrase your attribute to be more descriptive so others know exactly what you mean?"
Use informal language.	tilted sides	**Strengthen** Ask, "What do you mean by tilted? Is there a mathematical term you could use to describe the same attribute more precisely?"
Use precise language to describe attributes.	2 sets of parallel sides or 2 sets of equal side lengths or all right angles	**Stretch** Ask, "Based on the attributes listed, do any shapes share attributes? Could this quadrilateral be classified as another quadrilateral because of their shared attributes? Why or why not?"

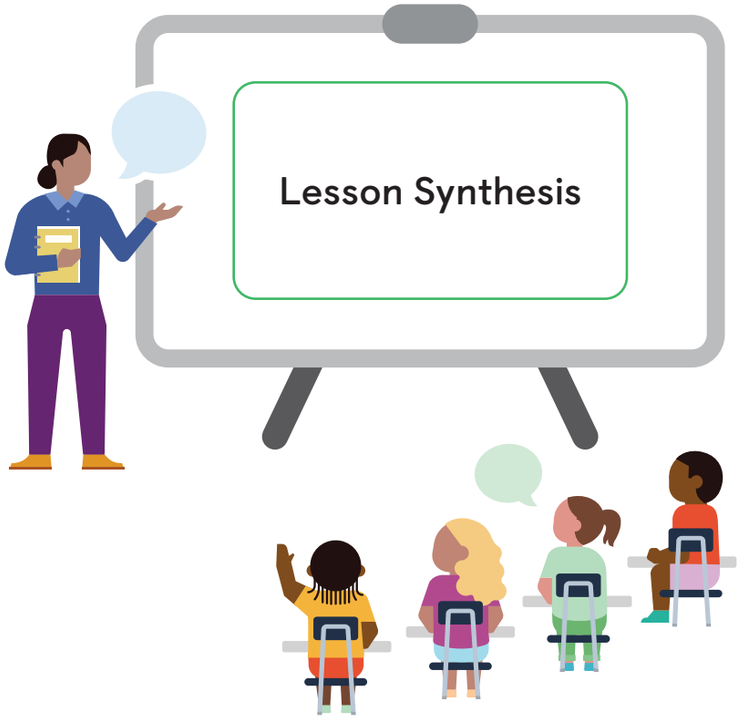
Whole Class | 10 min

Presentation Screen



Synthesis

Lesson Takeaway: A quadrilateral can be described, identified, and classified using its attributes, such as side lengths, angle measurements, and whether the sides are parallel or perpendicular.



Say, "Shapes can be classified using graphic organizers to show how they are connected."

Use the Think-Pair-Share routine. Ask, "What do you notice about how the quadrilaterals are classified? Why does this make sense?"

Say, "Quadrilaterals can be classified by their attributes and properties. Some quadrilaterals share the same attributes, but each has their own distinct attribute making them their own subcategory."

Invite students to refer to the **Summary** during Practice or anytime during the year.

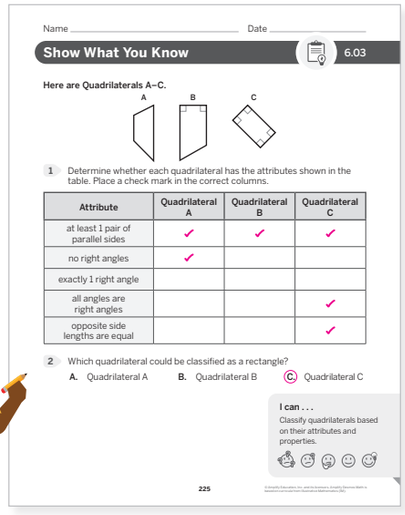
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.03

Here are Quadrilaterals A–C.

A B C

1 Determine whether each quadrilateral has the attributes shown in the table. Place a check mark in the correct columns.

Attribute	Quadrilateral A	Quadrilateral B	Quadrilateral C
at least 1 pair of parallel sides	✓	✓	✓
no right angles	✓		
exactly 1 right angle			
all angles are right angles			✓
opposite side lengths are equal			✓

2 Which quadrilateral could be classified as a rectangle?

A. Quadrilateral A B. Quadrilateral B C. Quadrilateral C

I can . . .
Classify quadrilaterals based on their attributes and properties.

225

Today's Goals

1. **Goal:** Classify quadrilaterals based on their attributes and properties.
   - In the *Show What You Know*, students classified quadrilaterals based on their attributes and properties.
2. **Language Goal:** Justify classifications of quadrilaterals based on their attributes and properties. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 3
Practice

Students using digital

Students using print

Summary 6.03

There are many different types of quadrilaterals. They can be sorted, classified, and named based on their defining attributes.

Parallelogram	Trapezoid
2 sets of parallel sides 4 angles	1 set of parallel sides
Rectangle	**Rhombus**	**Square**
2 sets of parallel sides 4 right angles opposite sides equal	2 sets of parallel sides 4 equal side lengths opposite angles equal	2 sets of parallel sides 4 right angles 4 equal side lengths

Practice 6.03

For Problems 1 and 2, select *all* the quadrilaterals that fit the clue.

1 I have 2 sets of parallel sides.

(A) square (B) rhombus
(C) parallelogram (D) rectangle

2 *All* my sides are equal in length.

(A) parallelogram (B) rhombus
(C) square (D) rectangle

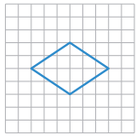
Practice 6.03

Name _____ Date _____

3 Which figures are quadrilaterals? Select **TWO** correct answers.

(A) (B) (C) (D) (E)

Consider the figure for Problems 4–7. Determine whether each statement is *true* or *false*. Explain your thinking.
Sample explanations shown.



4 The figure is a rectangle.

False. The angles are not right angles, so it is not a rectangle.

5 The figure is a square.

False. The angles are not right angles, so it is not a square.

6 The figure is a rhombus.

True. The sides are equal lengths, and there are 2 acute and 2 obtuse angles.

7 The figure is *not* a parallelogram.

False. A rhombus is a parallelogram, and there are 2 sets of parallel and equal-length sides.

Practice 6.03

Name _____ Date _____

Spiral Review

The table shows the distance that 4 stars are from the Sun in light years. Use the table for Problems 8 and 9. Sample work shown.

Star	Distance (light years)
Wolf 1061	14.04
Gliese 1061	11.98
Struve 2398 A	11.49
α Centauri B	4.37

Show your thinking.

8 Determine the distance between Struve 2398 A and α Centauri B.

$$\begin{array}{r} {\scriptstyle 011} \\ 11.49 \\ -\ 4.37 \\ \hline 7.12 \end{array}$$

answer: 7.12 light years

9 Determine the distance between Wolf 1061 and Gliese 1061.

$$\begin{array}{r} {\scriptstyle 9} \\ 3\ 1014 \\ 14.04 \\ -\ 11.98 \\ \hline 2.06 \end{array}$$

answer: 2.06 light years

For Problems 10 and 11, evaluate the expression.

10 $(20 - 5) \times 3$

45

11 $[88 + 2(18 \div 6)]$

94

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 2	2	5.5.A
Test Practice	3	1	5.5.A
	4–7	2	5.5.A
Spiral Review			
	8, 9	2	5.3.K
Fluency	10, 11	1	5.4.F

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 3

Lesson Goal: Classify quadrilaterals based on their attributes and properties.

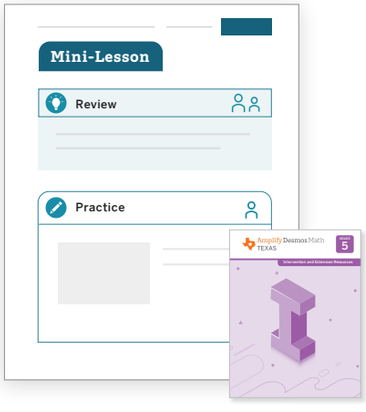
Support

Provide targeted intervention for students by using these resources.

If students identify 0–1 correct attribute:

Respond:

- Assign the *Classifying Quadrilaterals* **Mini-Lesson. |** 15 min
- Review attributes and quadrilaterals learned in previous grades.



Strengthen

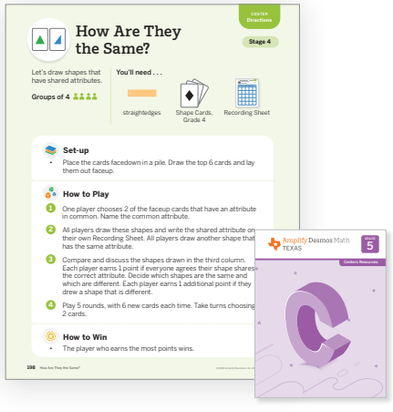
Reinforce students' understanding of the concepts assessed by using these resources.

If students identify 2–5 correct attributes:

Respond:

- Invite students to play these **Centers. |** 15 min
  How Are They the Same?:
  - *Grade 4 Shapes*
  - ***Grade 5 Shapes***

  Mystery Shape: Grade 4 Shapes
- Have students complete **Lesson 3 Practice. |** 15 min
- **Item Bank**



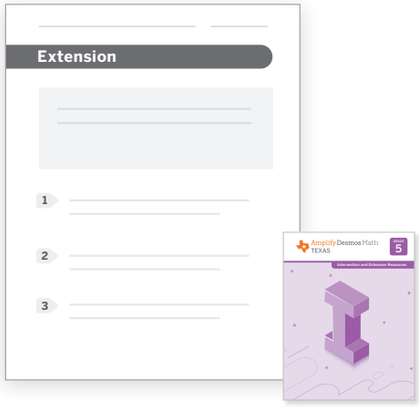
Stretch

Challenge students and extend their learning with these resources.

If students identify all 6 correct attributes:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.

• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., *attribute/atributo*
- Frayer Model templates
- Vocabulary routines





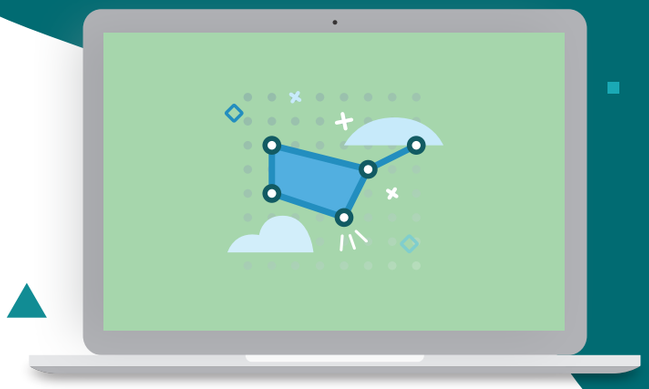
Professional Learning

What did you learn about students' understanding of quadrilaterals during the lesson? How can you use what you learned to support students in the next lesson?

Unit 6
Lesson
4

Student devices recommended

We recommend students use devices for this lesson. Student Edition pages are also available.



A Question of Shape

Identifying the Most Specific Name of a Quadrilateral

Let's play a game to identify different quadrilaterals.

Key Concepts

Today's Goals

1. **Goal:** Name quadrilaterals using their attributes.
2. **Language Goal:** Describe quadrilaterals using their most specific names. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use what they know about the properties and attributes of different quadrilaterals to ask their partners questions to identify secret shapes. Students discover that they can ask fewer questions to identify the quadrilaterals when their questions include specific shape names. **(TEKS 5.1.F, 5.1.G)**

Prior Learning

In Lesson 3, students identified and classified shapes based on their attributes and properties.

Future Learning

In Lesson 5, students will use graphic organizers to name and classify quadrilaterals and triangles into hierarchies based on their attributes and properties.

Depth and Rigor of Student Thinking

- Students **apply** their understanding of the hierarchy of quadrilaterals to ask questions to identify a quadrilateral.

Vocabulary

Review Vocabulary

parallelogram	*rhombus*
quadrilateral	*square*
rectangle	*trapezoid*

TEKS

Building Toward

5.5.A

Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.

Math Process Standards: 5.1.F, 5.1.G

ELPS: 1.E, 2.C, 2.D, 2.E, 2.F

Building On

4.6.D

Building Math Identity

We are a math community.
Just as Mia learned from others, how can you learn from others today?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.F, 5.1.G Building Toward 5.5.A



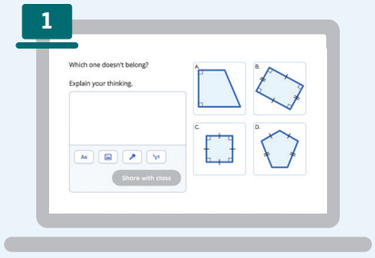
Why digital?

Students ask and answer questions about shapes and revise their thinking as they go.

Warm-Up

Whole Class | 10 min

Students use the **Which One Doesn't Belong?** routine to analyze 4 quadrilaterals. They should be encouraged to use precise language and the names of shapes as they give their reasons for the one they chose.



Activity 1

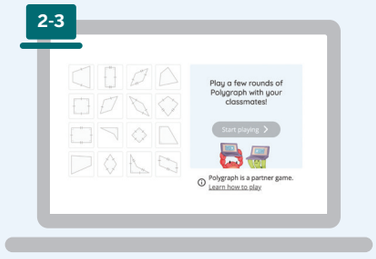
Pairs | 35 min

Students play a guessing game in which they ask and answer yes-and-no questions using the names of shapes. They apply their understanding of the attributes of shapes and the hierarchy of quadrilaterals.

Note: The Student Edition is not required for this activity.

Materials: *Classifying Quadrilaterals* chart (from Lesson 3)

Students using print: Activity 1 PDF

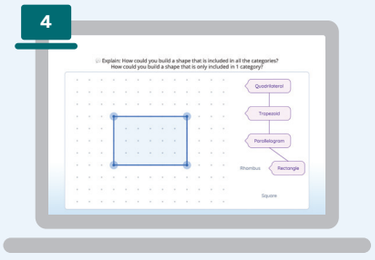


Synthesis

Whole Class | 10 min

Students review and reflect on how to precisely name quadrilaterals.

Note: The Student Edition is not required for this activity.

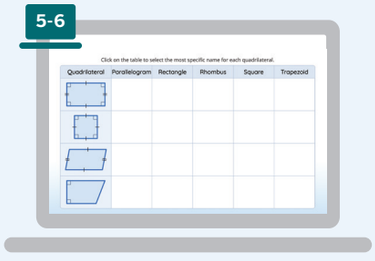


Show What You Know

Independent | 5 min

Students demonstrate their understanding by identifying quadrilaterals using their most specific name.

Students using print: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

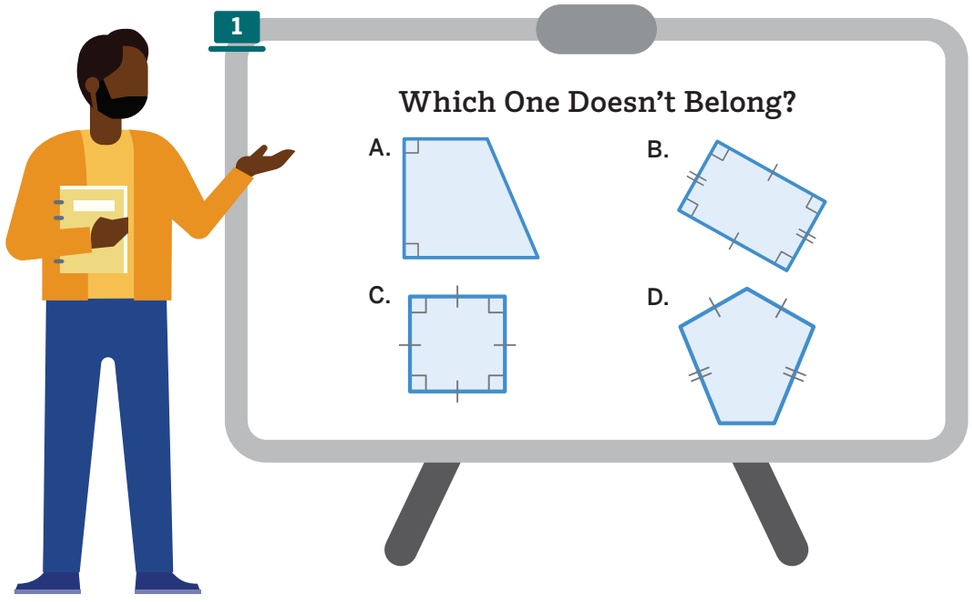
Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Which One Doesn't Belong?

Purpose: Students analyze and compare 4 shapes to prepare for asking and answering questions about shapes in Activity 1.

Students using print







1 Launch

1 **Display** the 4 shapes.

Use the Which One Doesn't Belong? routine.

Say, "Choose one that doesn't belong. Be ready to share your reasoning."

2 Connect

1 **Record** students' responses as they share.

Ask, "What is a name for each shape? Do any other shapes share that name? How do you know?"

Students might say . . . ELPS 2.C, 2.D, 2.E

A: *It is the only quadrilateral with no equal-length sides.*

B: *It is the only quadrilateral with only 2 equal-length sides.*

C: *It is the only quadrilateral with all equal-length sides.*

D: *It is the only shape that is not a quadrilateral.*

Pairs | 35 min | Suggested Pacing: Screens 2-3

Activity 1 Mystery Shape

Purpose: Students ask and answer questions about shapes using attributes of quadrilaterals and the relationships between them to identify a mystery shape.

Students using print



Additional Print Materials

Lesson Resources:

- Distribute the Activity 1 PDF to each student.

Classroom materials:

- Display the *Classifying Quadrilaterals* chart (from Lesson 3).

You may choose to lead the Launch and demonstrate Activities by using the some *Instructional Routines*.

1 Launch



2 **Say**, "In this activity, you and your partner will play a guessing game that includes 2 different roles. One partner will choose a mystery shape without telling the other partner. The other partner will ask *yes* or *no* questions including a shape name. For example, 'Is your shape a rhombus?'"

Say, "As you play the game, use the *Classifying Quadrilaterals* chart if it helps your thinking."

Note: The digital version of the Polygraph has a trial round that is not represented in print.

A **Accessibility: Conceptual processing** Prompt students to use the language from the *Classifying Quadrilaterals* chart.

2 Monitor



After students have completed **Screen 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

2-3 **If students need help getting started . . .**

- Ask, "What is a question you could ask that could help you eliminate some shapes?"
- Ask, "What do you notice about the shapes that are remaining on the gameboard? What question could you ask next?"

EB **Emergent Bilinguals** Provide sentence stems to help students ask and answer questions about the mystery shape. **ELPS 1.E, 2.C, 2.E**

3 Connect



2 **Display** examples of students' questions using the dashboard's Teacher View.

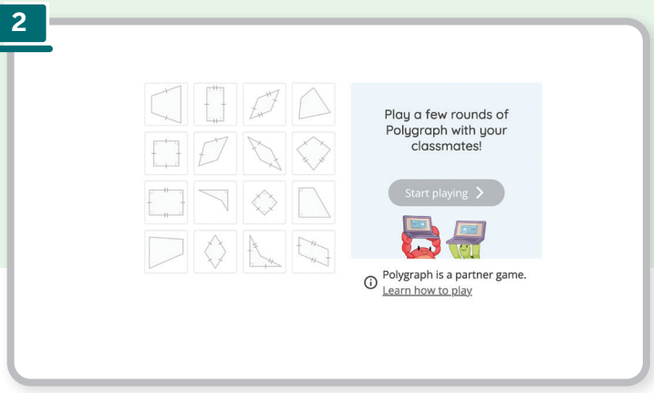
Use the Think-Pair-Share routine. Ask, "What did you notice about the questions that were asked during the game?"

3 **Have students share** their questions for Screen 3.

Key Takeaway: Say, "Using the attributes and properties of shapes can be helpful when identifying a quadrilateral using its most specific name."

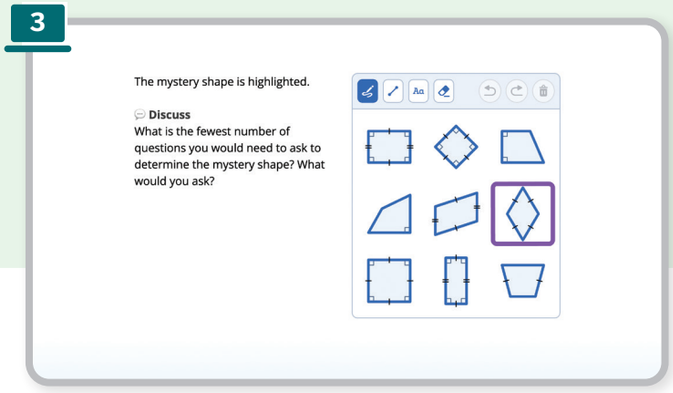
Students using digital

2



Students ask and answer questions to determine their partner's mystery shape.

3



Students discuss questions to identify a mystery quadrilateral.

Students using print **will arrive at similar answers.**

D Differentiation | Teacher Moves

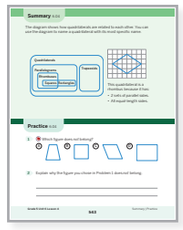
Look for students who . . .	For example . . .	Provide support . . .
Almost there Ask questions using attributes.	Does your mystery shape have 4 sides? or Does your mystery shape have equal sides?	**Support** Ask, "What are the names of the 2 shapes? How could you revise your question using those names?"
Ask questions using the hierarchy of quadrilaterals.	Is your mystery shape a parallelogram? Is your mystery shape a square? Is your mystery shape a rhombus?	**Strengthen** Ask, "Which of your questions helped you identify the mystery shape? Did you need to ask all of your questions? Why or why not?"
Ask a question using the most specific quadrilateral name.	Is your mystery shape a rhombus but not a square?	**Stretch** Ask, "If you changed 1 attribute of the mystery shape, how would that change the name of the quadrilateral?"

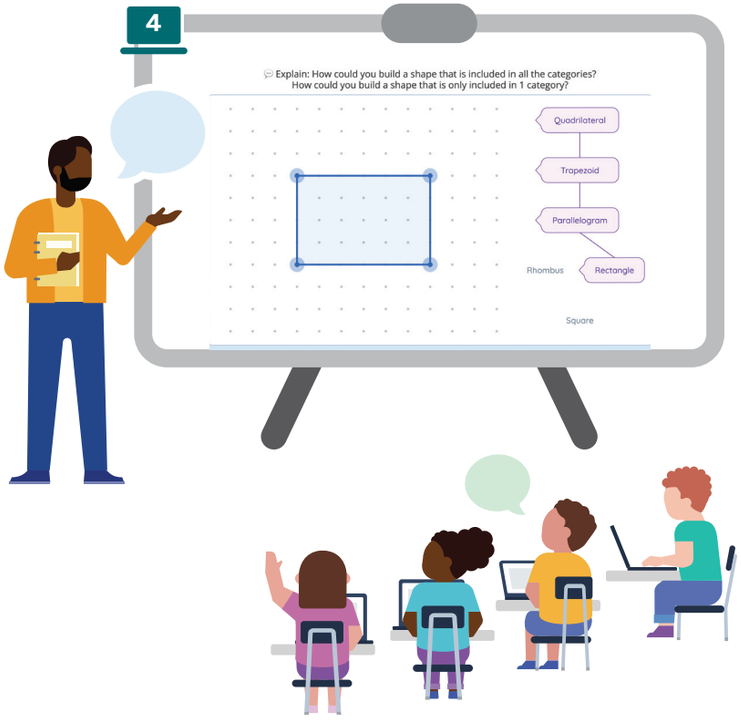
Whole Class | 10 min | Suggested Pacing: Screen 4

Synthesis

Lesson Takeaway: The hierarchy of quadrilaterals shows how attributes can be used to distinguish between shapes or group shapes together.

Students using print





4 **Invite** students to create different quadrilaterals.

Use the Think-Pair-Share routine. Ask:

- "How could you build a shape that is included in all of the categories?"
- "How could you build a shape that is only included in 1 classification?"

MLR **MLR8: Discussion Supports — Active Listening**
ELPS 1.E, 2.C, 2.D, 2.F
- Invite students to begin partner interactions by restating their partner's description, in their own words, before adding their own ideas to the discussion.

Say, "Attributes and properties of quadrilaterals can be used to distinguish between shapes or classify shapes."

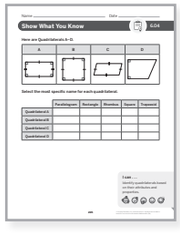
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

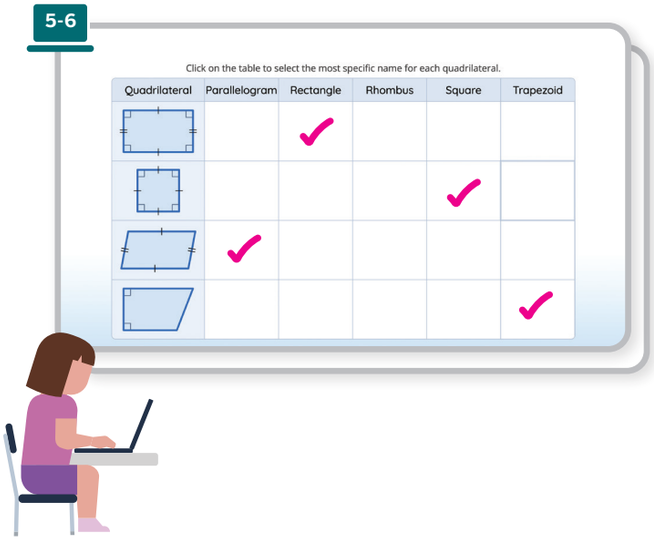
Independent | 5 min |
Suggested Pacing: Screens 5–6

Students using print

(Show What You Know PDF)



Students using digital



Today's Goals

1. **Goal:** Name quadrilaterals using their attributes.
   - In the *Show What You Know*, students named quadrilaterals based on their attributes.
2. **Language Goal:** Describe quadrilaterals using their most specific names. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

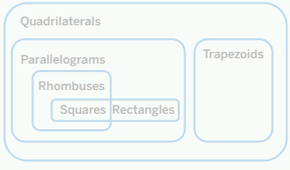
Lesson 4
Practice

Students using digital

Students using print

Summary 6.04

The diagram shows how quadrilaterals are related to each other. You can use the diagram to name a quadrilateral with its most specific name.



This quadrilateral is a rhombus because it has:

- 2 sets of parallel sides.
- All equal-length sides.

Practice 6.04

1 Which figure does *not* belong?

A 
B 
C 
D 

2 Explain why the figure you chose in Problem 1 does *not* belong.
Sample response shown.

The trapezoid does not belong because the other figures have 2 pairs of parallel sides.

Practice 6.04

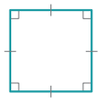
Name _____ Date _____

3 Name the figure with its most specific name.



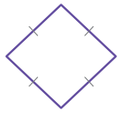
(A) rhombus (B) rectangle
(C) quadrilateral (D) square
(E) trapezoid (F) parallelogram

4 Name the figure with its most specific name.



(A) rhombus (B) rectangle
(C) quadrilateral (D) square
(E) trapezoid (F) parallelogram

5 Name the figure with its most specific name.



(A) rhombus (B) rectangle
(C) quadrilateral (D) square
(E) trapezoid (F) parallelogram

6 Choose 1 figure from Problems 3–5. Explain how you chose its most specific name using the hierarchy of quadrilaterals.
Sample response shown.

Problem: 5

Rhombus because it is a parallelogram with 2 pairs of parallel sides and 4 equal side lengths.

Practice 6.04

Name _____ Date _____

Spiral Review

For Problems 7–9, evaluate the expression. Sample work shown.

Show your thinking.

7 $\frac{9}{10} - \frac{3}{4}$

$\frac{9}{10} - \frac{3}{4} = \frac{18}{20} - \frac{15}{20} = \frac{3}{20}$

answer: $\frac{3}{20}$ or equivalent

8 3,097 ÷ 19

$$\begin{array}{r} 163 \\ 19\overline{)3097} \\ -19 \\ \hline 119 \\ -114 \\ \hline 57 \\ -57 \\ \hline 0 \end{array}$$

answer: 163

9 18 × 245

$$\begin{array}{r} 34 \\ 245 \\ \times \quad 18 \\ \hline 1,960 \\ +\ 2,450 \\ \hline 4,410 \end{array}$$

answer: 4,410

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1	1	5.5.A*
	2, 6	2	5.5.A*
	3–5	1	5.5.A*
Spiral Review			
	7	1	5.3.H
Fluency	8	1	5.3.C
Fluency	9	1	5.3.B

*These problems build toward the standard shown.

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 4

Lesson Goal: Name quadrilaterals using their attributes.

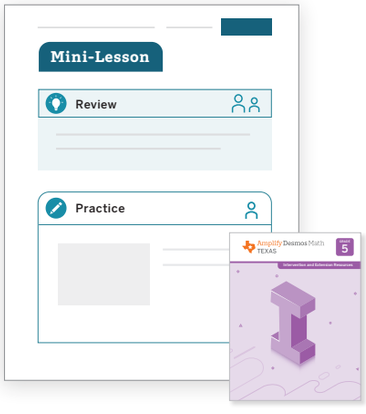
Support

Provide targeted intervention for students by using these resources.

If students identify the most specific name for 0–2 of the quadrilaterals:

Respond:

- Assign the *Identifying Names of Quadrilaterals* **Mini-Lesson. |** 15 min
- Revisit Lesson 3.



Strengthen

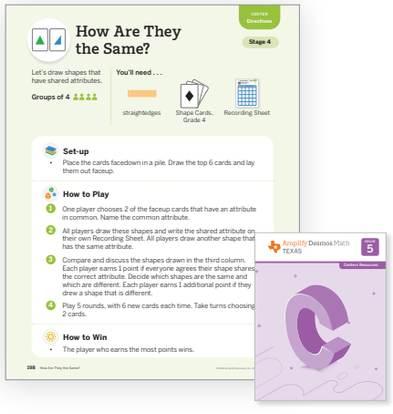
Reinforce students' understanding of the concepts assessed by using these resources.

If students identify the most specific name for 3 of the quadrilaterals:

Respond:

- Invite students to play these **Centers. |** 15 min
  How Are They the Same?:
  - *Grade 4 Shapes*
  - ***Grade 5 Shapes***

  Mystery Shape: Grade 4 Shapes
- Have students complete **Lesson 4 Practice. |** 15 min
- **Item Bank**



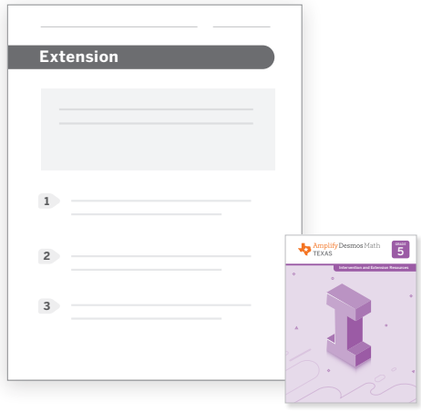
Stretch

Challenge students and extend their learning with these resources.

If students identify the most specific name for all 4 of the quadrilaterals:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., *parallelogram/paralelogramo*
- Frayer model templates
- Vocabulary routines



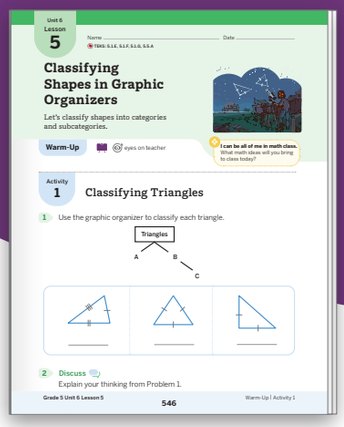


Professional Learning

What surprised you about students' thinking in today's activity?

Unit 6
Lesson
5

Student Edition pages and Presentation Screens support learning in this lesson.



Classifying Shapes in Graphic Organizers

Using Graphic Organizers to Classify Triangles and Quadrilaterals

Let's classify shapes into categories and subcategories.

Key Concepts

Today's Goals

1. **Goal:** Classify triangles and quadrilaterals using graphic organizers based on their attributes and properties.
2. **Language Goal:** Justify classifications of quadrilaterals and triangles based on their attributes and properties. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students continue to classify triangles and quadrilaterals into categories and subcategories using graphic organizers by analyzing the relationships between shapes' attributes and properties. They use a variety of graphic organizers to justify how shapes are classified and connected across categories and subcategories using precise language for their attributes and properties. Students deepen their understanding that shapes are classified in the same way each time due to the specific attributes and properties of shapes. **(TEKS 5.1.E, 5.1.F, 5.1.G)**

Prior Learning

In Lesson 4, students identified quadrilaterals based on their attributes and properties by asking and answering questions.

Future Learning

In Grade 6, students will extend their knowledge of classifying triangles to include the sum of angles and the relationship between the lengths of sides and the measures of angles.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of how shapes can be classified into graphic organizers.
- Students **apply** their knowledge of quadrilaterals' and triangles' attributes and properties to classify them.

Vocabulary

Review Vocabulary

acute triangle	*rectangle*
equilateral triangle	*rhombus*
isosceles triangle	*right angle*
obtuse triangle	*scalene triangle*
parallelogram	*square*
quadrilateral	*trapezoid*

TEKS

Addressing

5.5.A

Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.

Math Process Standards: 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.E, 3.G

Building On	Building Toward
4.6.D	**6.8.A**
	6.8.B

Building Math Identity

I can be all of me in math class.
What math ideas will you bring to class today?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance 60 min

TEKS: 5.1.E, 5.1.F, 5.1.G, 5.5.A

Warm-Up

Whole Class | 10 min

Students use the **Which One Doesn't Belong?** routine to identify shared and unshared attributes and properties of street signs. They should be encouraged to use precise language as they give their reasons for the one they chose.

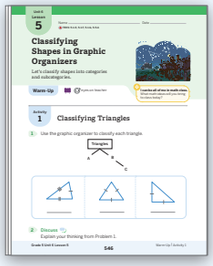


Activity 1

Pairs | 15 min

Students use graphic organizers to classify triangles into categories and subcategories based on their attributes and properties. They determine that triangles can have shared and individual attributes and properties.

Materials: *Triangle Classification* chart (from previous lessons)

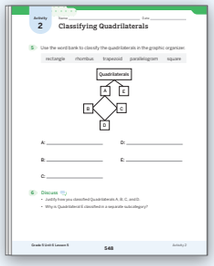


Activity 2

Pairs | 20 min

Students use graphic organizers to classify quadrilaterals into categories and subcategories based on their attributes and properties. They determine that quadrilaterals can have shared and individual attributes and properties.

Materials: *Classifying Quadrilaterals* chart (from previous lessons)



Synthesis

Whole Class | 10 min

Students review and reflect on how to classify shapes using various graphic organizers.

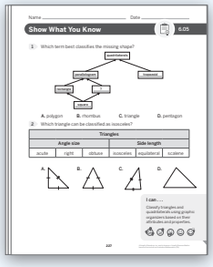


Show What You Know

Independent | 5 min

Students demonstrate their understanding by using graphic organizers to classify quadrilaterals and triangles.

Materials: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

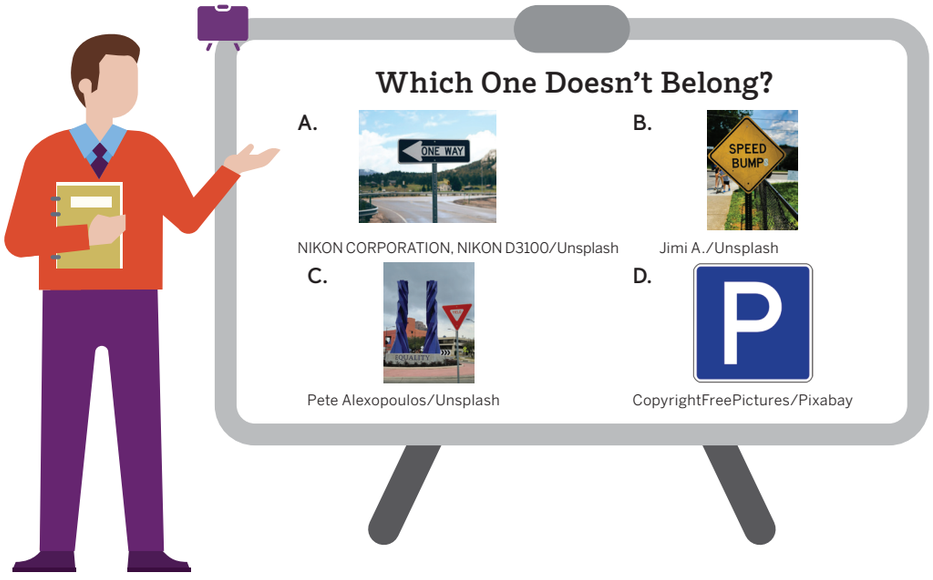
Whole Class | 10 min

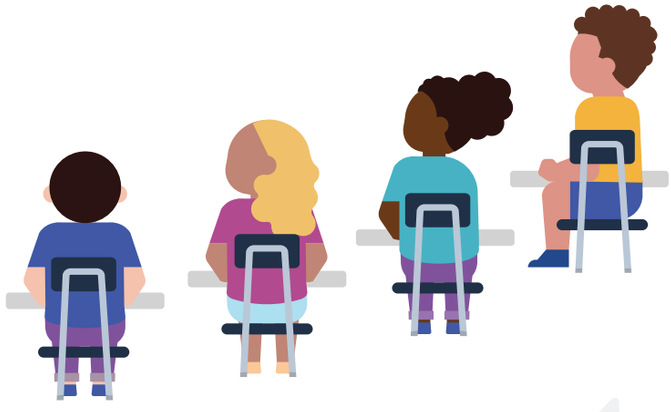
Presentation Screen



Warm-Up Which One Doesn't Belong?

Purpose: Students analyze and compare quadrilaterals and triangles in real-world contexts to build precision with identifying similarities between the attributes and properties of two-dimensional figures.





1 Launch

Display the 4 signs.

Use the Which One Doesn't Belong? routine.

Say, "Look at the shapes of these 4 signs. Choose one that doesn't belong. Be ready to share your reasoning."

2 Connect

Record students' responses as they share.

Use the Think-Pair-Share routine. Ask, "How are Signs A and B similar? How are they different?"

Say, "Shapes can be classified by identifying their similarities using shared attributes and properties. Even triangles and quadrilaterals can be classified together."

Students might say . . . ELPS 2.C, 2.D, 2.E

A: It is the only sign whose sides are not all equal.

B: It is the only sign that has obtuse angles.

C: It is the only sign that is not a quadrilateral.

D: It is the only sign that has 4 right angles and 4 equal side lengths.

Pairs | 15 min

Activity 1 Classifying Triangles

Purpose: Students use graphic organizers to classify triangles into categories to notice that some triangles can be classified into subcategories based on their properties.

Presentation Screens



Materials

Classroom Materials:

- Display the *Triangle Classification* chart (from previous lessons) during the Launch.

1 Launch



Review the *Triangle Classification* chart (from previous lessons).

Say, "Work with your partner to complete Problems 1–4."

A **Accessibility: Memory and attention** Chunk Problem 4 into smaller, more manageable parts by having students first classify by angle size and then classify by side lengths.

2 Monitor



While students complete **Problem 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What do the markings on the triangles tell you?"
- Ask, "What do you notice about the side lengths?"

3 Connect



Display a completed organizer from Problem 1 with triangle labels.

Use the Think-Pair-Share routine. Ask, "Why is the equilateral triangle a subcategory of an isosceles triangle?"

Display another graphic organizer and triangle.

Use the Think-Pair-Share routine. Ask, "How can you classify this triangle?"

Key Takeaway: Say, "You can use a graphic organizer to classify triangles in different ways based on their attributes and properties. Some triangles can be classified into subcategories because their attributes can be described by both the category and subcategory. For example, every equilateral triangle is also an isosceles triangle, but *equilateral triangle* is its most specific name."

Unit 6 Lesson 5

Name _____ Date _____

TEKS: 5.1.E, 5.1.F, 5.1.G, 5.5.A

Classifying Shapes in Graphic Organizers

Let's classify shapes into categories and subcategories.

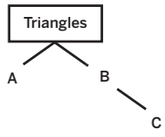


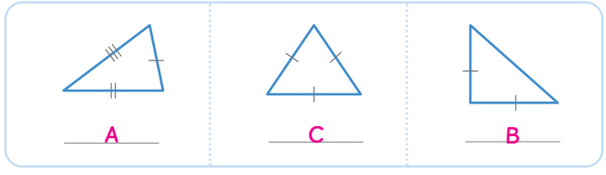
Warm-Up eyes on teacher

I can be all of me in math class. What math ideas will you bring to class today?

Activity 1 Classifying Triangles

1 Use the graphic organizer to classify each triangle.





2 Discuss Oral activity: No writing expected.
Explain your thinking from Problem 1.

Activity 1

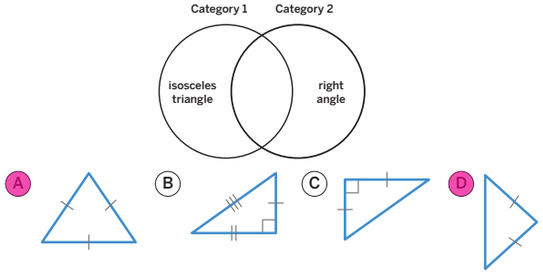
Name _____ Date _____

Classifying Triangles (continued)

3 Classify each triangle by placing a check mark in the correct column.

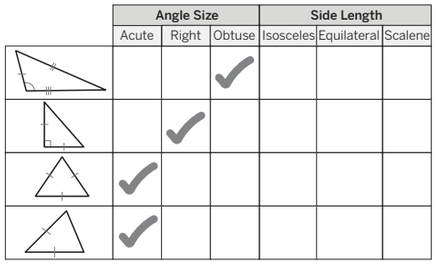
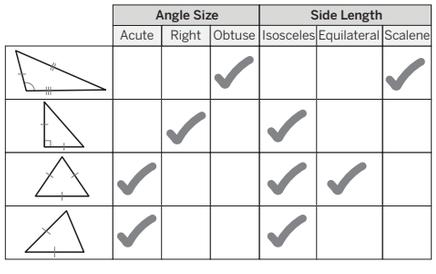
	Angle size			Side length		
	acute	right	obtuse	isosceles	equilateral	scalene
			✓			✓
		✓		✓		
	✓			✓	✓	
	✓			✓		

4 Which triangle belongs in Category 1 but *not* in Category 2? Select *all* that apply.



Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Classify triangles using only 1 attribute.		**Support** Ask, "What other ways can each triangle be classified?"
Classify each triangle by both angle size and side length.		**Strengthen** Ask, "Which attributes could be changed to classify the scalene triangle in other ways?"

Pairs | 20 min

Activity 2 Classifying Quadrilaterals

Purpose: Students use graphic organizers to classify quadrilaterals into categories to notice that some quadrilaterals can be classified into subcategories based on their properties.

Presentation Screens



Materials

Classroom Materials:

- Display the *Classifying Quadrilaterals* chart (from previous lessons) during the Launch.

Short on time? Consider completing Problem 7 as a whole class.

1 Launch



Review the *Classifying Quadrilaters* chart (from previous lessons).

Say, "Work with your partner to complete Problems 5–8."

2 Monitor



After students have completed **Problem 5**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What do the markings on the quadrilaterals tell you?"
- Ask, "What do you notice about the angle sizes and side lengths?"

A **Accessibility: Conceptual processing** Clarify vocabulary by referring to the *Classifying Quadrilaterals* chart.

3 Connect



Display the shapes from Problem 7.

MLR **MLR3: Critique, Correct and Clarify** ELPS 2.B, 2.D, 2.E, 3.E, 3.G

Display the following incorrect statement for Problem 7, "A square has the same defining attributes as all quadrilaterals." Ask:

- Critique: "What might this person be trying to say? How do you know?"
- Correct: "What could you add or change to make their statement true?"
- Clarify: "What could you add or change to make their statement easier to understand?"

Say, "A square can also be classified as a parallelogram, rhombus, and rectangle because it shares the defining attributes of those shapes, but square is the most specific name."

EB **Emergent Bilinguals** Invite students to restate the question in their own words and to ask any clarifying questions. Allow students to formulate and rehearse what they will say with a partner before sharing with the class. ELPS 1.E, 2.B, 2.D, 2.F

Key Takeaway: Say, "You can classify quadrilaterals in different ways. Some quadrilaterals can be classified into subcategories because their attributes can be described by both the category and the subcategory."

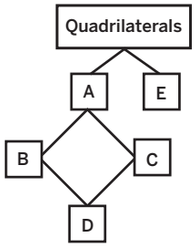
Activity 2

Name _____ Date _____

Classifying Quadrilaterals

5 Use the word bank to classify the quadrilaterals in the graphic organizer.

rectangle rhombus trapezoid parallelogram square



A: parallelogram

D: square

B: rectangle

E: trapezoid

C: rhombus

6 Discuss Oral response. No writing expected.

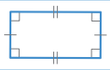
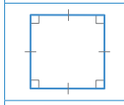
- Justify how you classified Quadrilaterals A, B, C, and D.
- Why is Quadrilateral E classified in a separate subcategory?

Activity 2

Name _____ Date _____

Classifying Quadrilaterals (continued)

7 Classify each quadrilateral by placing a check mark in the correct column.

	Quadrilaterals				
	trapezoid	parallelogram	rectangle	rhombus	square
		✓	✓		
		✓	✓	✓	✓
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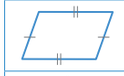
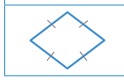
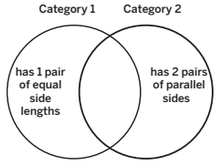
		✓			
		✓		✓	

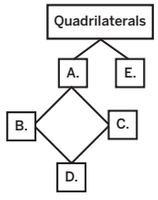
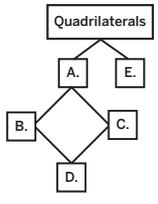
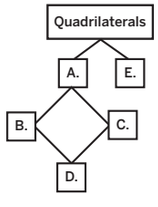
8 Which quadrilateral belongs in Category 1 but *not* in Category 2?



(A) trapezoid (B) rhombus (C) square (D) rectangle

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Classify some quadrilaterals into subcategories using 1 defining attribute.	 A. square B. rhombus C. rectangle D. parallelogram E. trapezoid	**Support** Ask, "This graphic organizer is used to show how the attributes of each quadrilateral build on the quadrilateral before it. What are some similar attributes between the shapes?"
Almost there Classify each quadrilateral into descending subcategories.	 A. trapezoid B. rhombus C. parallelogram D. _____ E. square and rectangle	**Support** Ask, "What do you notice about the structure of the graphic organizer? How can that help you classify each quadrilateral?"
Classify each quadrilateral into ascending subcategories.	 A. parallelogram B. rectangle C. rhombus D. square E. trapezoid	**Stretch** Ask, "Why is a square classified as a rectangle, but a rectangle is not classified as a square?"

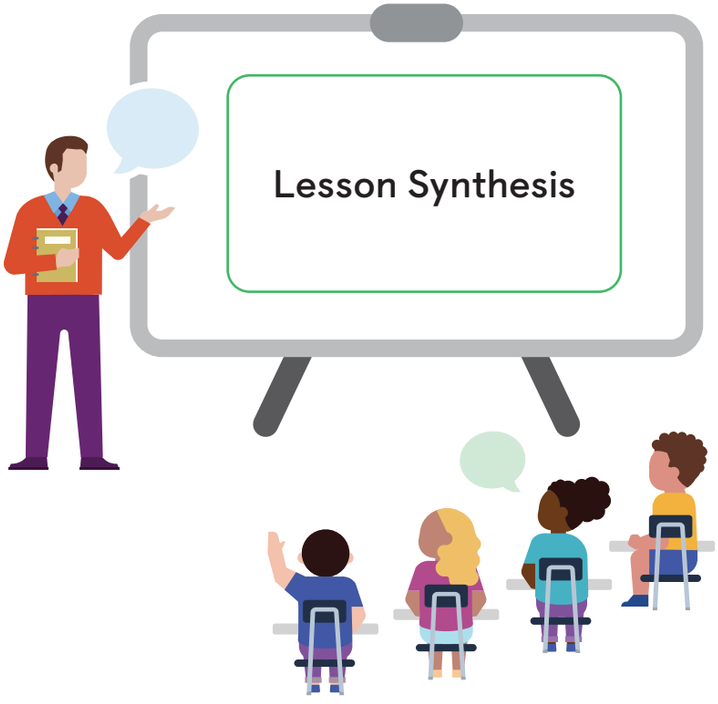
Whole Class | 10 min

Presentation Screens



Synthesis

Lesson Takeaway: Triangles and quadrilaterals can be classified into categories and subcategories that describe their attributes. Graphic organizers can be used to show different ways that shapes can be categorized.



Display the graphic organizers.

Use the Think-Pair-Share routine. Ask:

- "What is similar about all of the graphic organizers? What is different?"
- "What will always remain the same no matter how shapes are organized?"

Say, "Graphic organizers help to organize shapes by shared and individual attributes. Each subcategory represents an attribute that further defines each shape."

Invite students to refer to the **Summary** during Practice or anytime during the year.

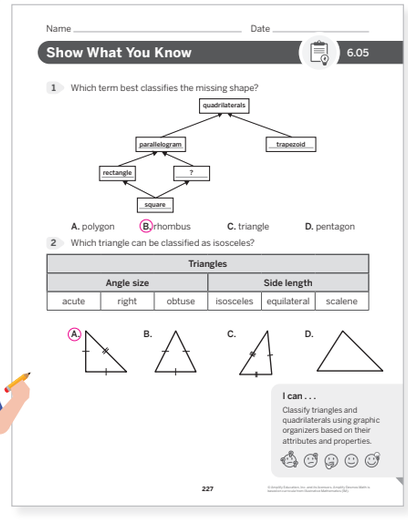
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.05

1 Which term best classifies the missing shape?

quadrilaterals
parallelogram
trapezoid
rectangle
?
square

A. polygon B. rhombus C. triangle D. pentagon

2 Which triangle can be classified as isosceles?

Triangles					
Angle size			Side length		
acute	right	obtuse	isosceles	equilateral	scalene

A. B. C. D.

I can . . .
Classify triangles and quadrilaterals using graphic organizers based on their attributes and properties.

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Today's Goals

1. **Goal:** Classify triangles and quadrilaterals using graphic organizers based on their attributes and properties.
   - In Problem 1 in the *Show What You Know*, students classified quadrilaterals using a graphic organizer.
   - In Problem 2 in the *Show What You Know*, students classified triangles using a graphic organizer.
2. **Language Goal:** Justify classifications of quadrilaterals and triangles based on their attributes and properties. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

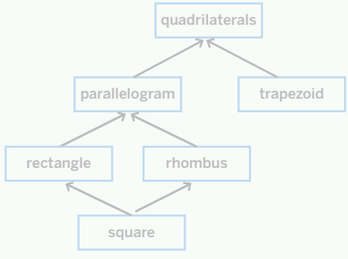
Lesson 5
Practice

Students using digital

Students using print

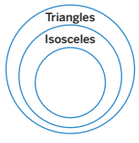
Summary 6.05

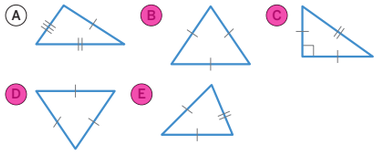
Shapes classified into a category share a set of attributes and properties. Triangles and quadrilaterals can be organized into categories and subcategories based on their attributes.



Practice 6.05

1 Which figures can be classified in the part of the organizer labeled Isosceles? Select *all* that apply.





Practice 6.05

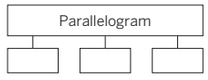
Name _____ Date _____

2 Which shape is *not* classified correctly?

At least 1 right angle	All acute angles	At least 1 obtuse angle
1	4	7
2	5	8
3	6	

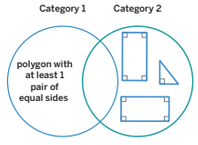
A Shape 1 B Shape 4 C Shape 5 D Shape 8

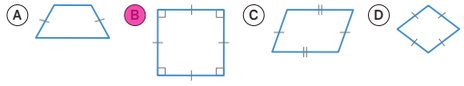
3 Which shapes can be classified in the graphic organizer? Select **THREE** correct answers.



A trapezoid B triangle C rhombus D square E rectangle

4 Which shape would best fit in the intersection of this Venn diagram?



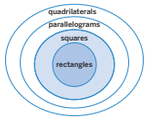


Practice 6.05

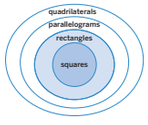
Name _____ Date _____

5 Clare and Jada classified these shapes.

Clare's work



Jada's work



Who do you agree with? Explain your thinking. Sample explanation shown.

Jada. Squares can be rectangles because rectangles have 4 right angles and 2 sets of equal sides, but rectangles cannot be squares because rectangles do not have 4 equal sides.

Spiral Review

Sample work shown.

Show your thinking.

6 Han took a road trip with his family. They drove 52.6 miles in 1 day. They drove the same distance for 12 days. How many miles did they drive altogether?

$$\begin{array}{r} {\scriptstyle 1} \\ 52.6 \\ \times \quad 12 \\ \hline 1052 \\ +\ 5260 \\ \hline 631.2 \end{array}$$

answer: 631.2 miles

7 Priya owes $21.70 and makes 14 equal payments. How much is 1 payment?

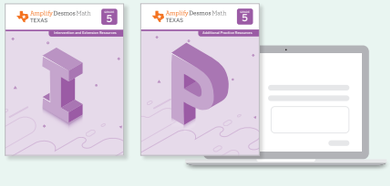
$$\begin{array}{r} 1.55 \\ 14\overline{)21.70} \\ -14 \\ \hline 77 \\ -\ 70 \\ \hline 70 \\ -\ 70 \\ \hline 0 \end{array}$$

answer: $1.55

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	1	5.5.A
Test Practice	**2, 3**	1	5.5.A
	4	1	5.5.A
	5	1	5.5.A
Spiral Review			
Fluency	**6**	1	5.3.E, 5.3.B
Fluency	**7**	1	5.3.G, 5.3.C

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 5

Lesson Goal: Classify triangles and quadrilaterals using graphic organizers based on their attributes and properties.

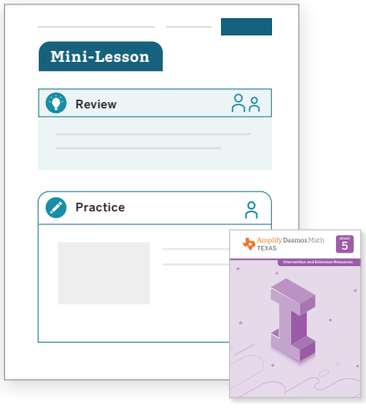
Support

Provide targeted intervention for students by using these resources.

If students incorrectly classify both the triangle and the quadrilateral:

Respond:

- Assign the *Using a Hierarchy to Classify Quadrilaterals* **Mini-Lesson. |** 15 min
- Revisit Lesson 2 and 3.



Strengthen

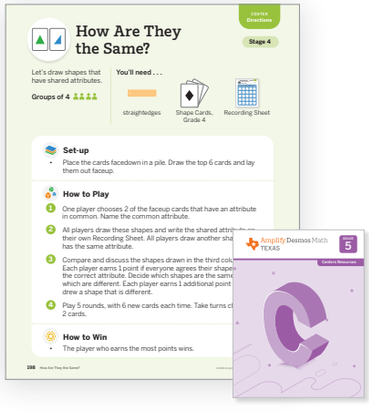
Reinforce students' understanding of the concepts assessed by using these resources.

If students correctly classify either the triangle or quadrilateral:

Respond:

- Invite students to play these **Centers**. **|** 15 min
  How Are They the Same?:
  - *Grade 4 Shapes*
  - ***Grade 5 Shapes***

  Mystery Shape: Grade 4 Shapes
  Can You Draw It?: Grade 5 Shapes
- Have students complete **Lesson 5 Practice**. **|** 15 min
- **Item Bank**



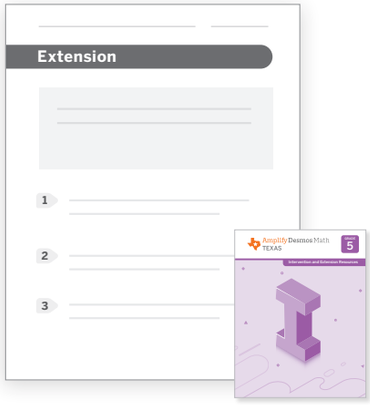
Stretch

Challenge students and extend their learning with these resources.

If students correctly classify both the triangle and quadrilateral:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities**. **|** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., *quadrilateral/cuadrilátero*
- Frayer Model templates
- Vocabulary routines





Professional Learning

Students have been classifying shapes in this sub-unit. How can you encourage students to revisit and use the idea of identifying attributes and properties to classify throughout other subjects and math topics?

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Quiz: Sub-Unit 1

Independent | 20 min

Facilitation: Assign this Sub-Unit Quiz at the end of Sub-Unit 1 to evaluate students' proficiency with the key concepts and skills addressed in this sub-unit.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis

Problem	Concept or skill	DOK	TEKS
1	Classifying triangles in a hierarchy	1	5.5.A *(R)*
2	Classifying quadrilaterals in a hierarchy	2	5.5.A *(R)*

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources include:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

During Sub-Unit 2, if students need further review or practice with concepts or skills, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

PDF *Assessment Resource PDF*

Digital

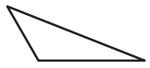
Unit 6
Quiz: Sub-Unit 1

Name _____ Date _____

Quiz: Sub-Unit 1

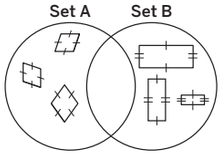
Unit 5.6

1 Complete the sentence by selecting **ONE** correct answer in each box.



The triangle can be classified as (A.) obtuse B. right C. acute and (A.) scalene B. equilateral C. isosceles.

2 Which shape can be classified in the intersection of Set A and Set B?



A. parallelogram
B. rectangle
C. quadrilateral
(D.) square

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D Differentiation (Quiz: Sub-Unit 1)

To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goals	Problem	Respond to Student Thinking

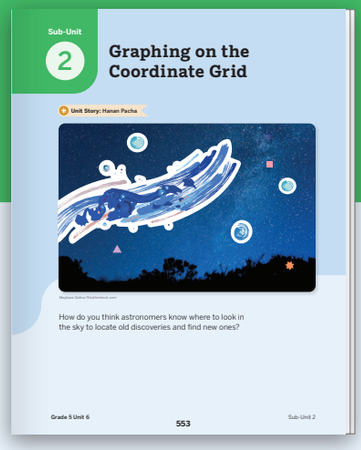
Sub-Unit 1: Classify quadrilaterals and triangles in a hierarchy using graphic organizers based on attributes and properties.	1	**Support**
		• **Mini-Lessons:**
		  • *Classifying Triangles Based on Their Side Lengths* (ML 6.02)
		  • *Classifying Triangles Based on Their Properties* (ML 6.03)

	2	**Support**
		• **Mini-Lessons:**
		  • *Describing and Sorting Quadrilaterals* (ML 6.04)
		  • *Using a Hierarchy to Classify Quadrilaterals* (ML 6.05)

Notes:

Sub-Unit 2

Graphing on the Coordinate Grid



Sub-Unit 2 Goals

- Describe the process for graphing an ordered pair on a coordinate grid using key attributes of the coordinate grid.
- Graph ordered pairs arising from mathematical problems on the coordinate grid.

Progression of TEKS in Sub-Unit 2

- **Lesson 6:** Students use the attributes of the coordinate grid to plot and describe the location of a point, recognizing that the **coordinate grid** is a tool for precisely locating points using both the horizontal and vertical distances from the **origin** on each **axis**.
- **Lessons 7–8:** Students apply their understanding of the attributes of the coordinate grid to graph points when given an ordered pair. They write the **ordered pairs** that represent the location of given points on the coordinate grid.
- **Lesson 9:** Students use the key attributes of the coordinate grid to describe the process for graphing ordered pairs on the coordinate grid as movements along the ***x*-axis** and ***y*-axis**.

Sub-Unit 2 Progression	Lesson 6*	Lesson 7	Lesson 8	Lesson 9
Geometry and Measurement				
TEKS 5.8.A	●	○	○	●
TEKS 5.8.B	○	○	○	●
TEKS 5.8.C	○	●	●	●

*This lesson builds toward the standard shown.

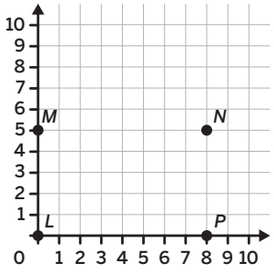
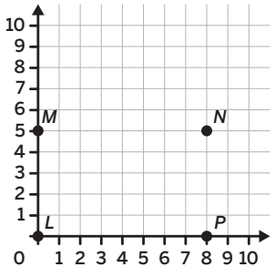
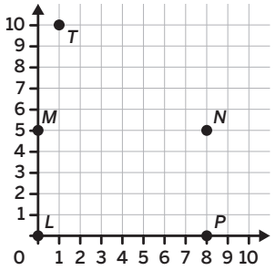
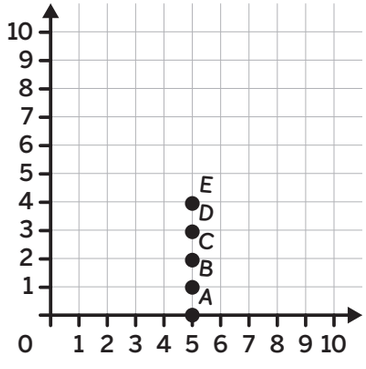
Coming up Next

- **Sub-Unit 3, Lessons 10–12:**
  - » Algebraic Reasoning: **TEKS 5.4.C, 5.4.D**
  - » Geometry and Measurement: **TEKS 5.8.C**
  - » Data Analysis: **TEKS 5.9.B**

Math That Matters Most

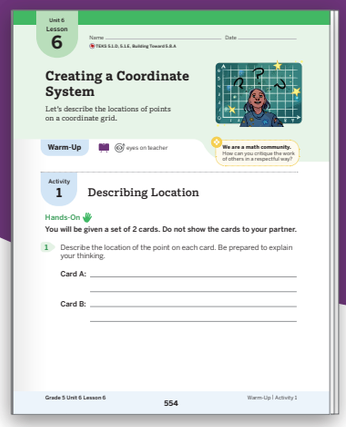
Sub-Unit 2: Describe and graph the location of a point using ordered pairs.

Progression of Strategies, Skills, or Language

Progression	For example . . .
Describing the location of a point using directional language.	Point *N* is 8 units to the right and 5 up from 0. 
Describing and identifying the location of a point using an ordered pair and the attributes of the coordinate grid.	Point *P* is located at (8, 0). Starting at the origin, the point is located 8 units to the right along the x-axis and 0 units up along the y-axis. 
Graphing given ordered pairs as a point on the coordinate grid.	Graph point *T* at (1, 10). 
Recognizing that points on the same vertical or horizontal line share 1 coordinate.	<table><tr><th>Point</th><th>Ordered pair</th></tr><tr><td>*A*</td><td>(5, 0)</td></tr><tr><td>*B*</td><td>(5, 1)</td></tr><tr><td>*C*</td><td>(5, 2)</td></tr><tr><td>*D*</td><td>(5, 3)</td></tr><tr><td>*E*</td><td>(5, 4)</td></tr></table> When the *x*-coordinate is the same in each ordered pair, the points form a vertical line. 

Unit 6
Lesson
6

Student Edition pages and Presentation Screens support learning in this lesson.



Creating a Coordinate System

Using the Coordinate Grid to Locate Points

Let's describe the locations of points on a coordinate grid.

Key Concepts

Today's Goals

1. **Goal:** Use the attributes of the coordinate grid and directional language to locate and plot points.
2. **Language Goal:** Describe the attributes of the coordinate grid. **(Listening, Speaking and Reading)** ELPS 1.B, 2.B, 2.E, 3.C, 3.H

Connections and Coherence

Students informally construct the **coordinate grid** as they consider how to describe the location of a point in two-dimensional space, first using 1 number line and then using 2 perpendicular number lines. They recognize that the coordinate grid is a tool for precisely identifying the location of points using both the horizontal and vertical distances from 0 on each **axis**. **(TEKS 5.1.D, 5.1.E)**

Note: In student-facing language, the coordinate plane is referred to as a coordinate grid.

Prior Learning

In Grade 4, students identified points, lines, line segments, rays, angles, and perpendicular and parallel lines.

Future Learning

In Lesson 7, students will use ordered pairs to plot and describe the location of points on a coordinate grid.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of the structure of a coordinate grid and its usefulness for precisely describing the locations of points.

Vocabulary

New Vocabulary

axis (axes)
coordinate grid
coordinates
origin

Review Vocabulary

intersecting lines
perpendicular lines
parallel lines

TEKS

Building Toward

5.8.A

Describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0, 0); the *x*-coordinate, the first number in an ordered pair, indicates movement parallel to the *x*-axis starting at the origin; and the *y*-coordinate, the second number, indicates movement parallel to the *y*-axis starting at the origin.

Math Process Standards: 5.1.D, 5.1.E

ELPS: 1.B, 1.E, 1.F, 2.B, 2.C, 2.D, 2.E, 2.F, 3.C, 3.D, 3.E, 3.F, 3.H

Building On

4.6.A

Building Math Identity

We are a math community.
How can you critique the work of others in a respectful way?

Invite students to reflect on this question as they complete this lesson.

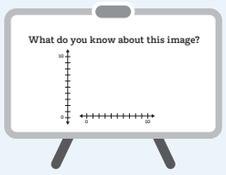
Lesson at a Glance 60 min

TEKS: 5.1.D, 5.1.E, Building Toward 5.8.A

Warm-Up

Whole Class | 10 min

Students use the **What Do You Know About _____?** routine, which provides an opportunity to hear the knowledge they already have about horizontal and vertical number lines and allows all students to contribute to the discussion.



Activity 1

Pairs | 20 min

Students describe the location of a point in two-dimensional space, allowing them to recognize the need for both horizontal and vertical axes. The terms **coordinate grid** and quadrant are introduced in the Connect.

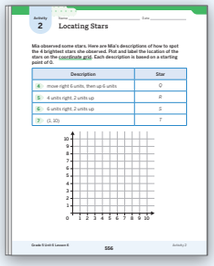
Materials: *Activity 1* PDF
Additional Prep Cut out: *Activity 1* PDF



Activity 2

Pairs | 15 min

Students use the structure of the coordinate grid to describe and plot points. The terms **coordinates**, **origin**, and **axes** are introduced in the Connect.



Synthesis

Whole Class | 10 min

Students review and reflect on a point plotted at (0, 0) on a coordinate grid.

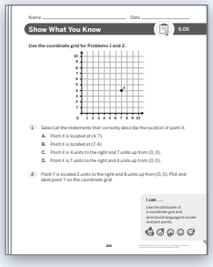


Show What You Know

Independent | 5 min

Students demonstrate their understanding of the structure of the coordinate grid by describing the location of points as horizontal and vertical distances from 0.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F, 3.C, 3.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to and **read** English. They **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** using longer sentences. Exemplar responses are provided.

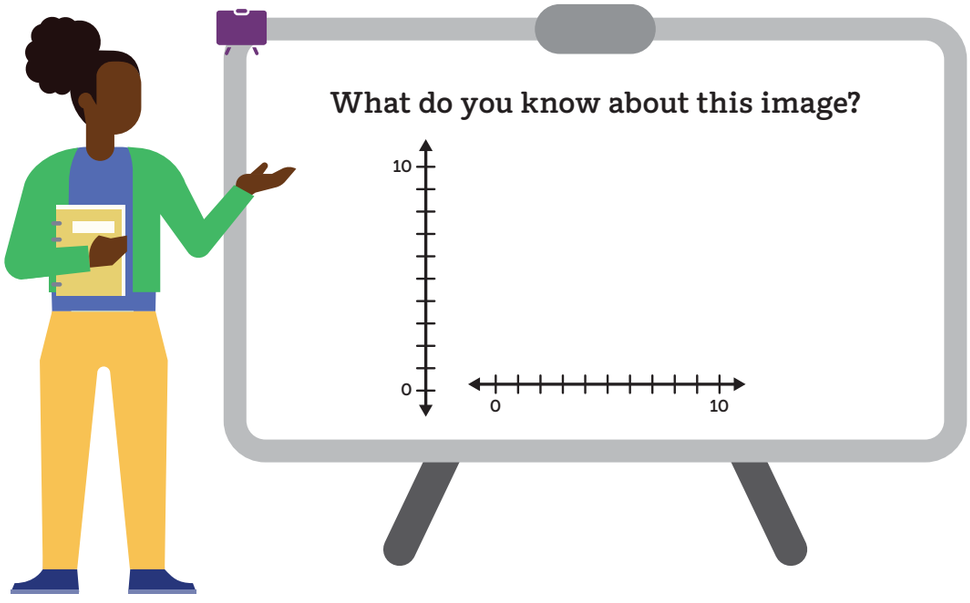
Whole Class | 10 min

Presentation Screens



Warm-Up What Do You Know About _?

Purpose: Students share ideas about vertical and horizontal number lines to prepare for learning more about the coordinate grid.





1 Launch

Display the question.

Use the What Do You Know About ___? routine.

Ask, "What do you know about this image?"

Invite students to share their responses.

2 Connect

Record students' responses as they share.

Ask, "Where have you seen a horizontal number line? Where have you seen a vertical number line?"

Students might say . . . ELPS1.E, 2.C, 2.D, 2.F

They are number lines.

They both show whole numbers 0 through 10.

They are both counting by 1.

One is horizontal and one is vertical.

Pairs | 20 min

Activity 1 Describing Location

Purpose: Students first use 1 number line and then 2 number lines to describe the locations of points, showing the utility of the coordinate grid, which is composed of perpendicular gridlines.

Presentation Screens



Materials

Lesson Resources:

- Distribute one set of pre-cut cards from the Activity 1 PDF to each student, ensuring each student in a pair receives a different set.

Short on time? Consider completing Problems 1 and 3 as a class.

1 Launch



Read aloud the introduction and Problems 1 and 2.

Say, "Complete Problem 1 independently. When you are both ready, work with your partner to complete Problems 2 and 3."

A **Accessibility: Executive functioning** Check for understanding by inviting students to rephrase the directions in their own words. Listen for and clarify any questions or misconceptions they have.

MLR **MLR8: Discussion Supports — Sentence Frames** ELPS 1.E, 2.C, 2.E

While students work, display these sentence frames for them to use as they share their responses for Problems 1–3.

- "What do you mean by . . .?"
- "Can you tell me more about . . .?"

2 Monitor



After students have completed **Problem 2**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What information is included on your card? How can you use the numbers to describe the location of the point?"
- Ask, "Imagine that the point was moved straight down or over to the numbers. How might that help you describe the location of the point?"

3 Connect



Invite students to share how they were able to describe the location of each point in Problem 2.

Play the animation. ELPS 1.F

Use the Think-Pair-Share routine. Ask:

- "What do you notice about the coordinate grids?"
- "How could you make it more helpful to describe the location of the point Z? Why?"
- "How would you describe the location of point Z?"

Key Takeaway: Say, "A grid with numbers labeling the vertical and horizontal or parallel and perpendicular number lines is called a **coordinate grid**. A coordinate grid consists of 4 sections called *quadrants* which helps you precisely describe the location of points."

Unit 6 Lesson 6

Name _____ Date _____

TEKS 5.1.D, 5.1.E, Building Toward 5.8.A

Creating a Coordinate System

Let's describe the locations of points on a coordinate grid.



Warm-Up eyes on teacher

We are a math community. How can you critique the work of others in a respectful way?

Activity 1 Describing Location

Hands-On

You will be given a set of 2 cards. Do not show the cards to your partner.
Sample responses shown for Problems 1 and 2.

1 Describe the location of the point on each card. Be prepared to explain your thinking.

Card A: The point is at 9.

Card B: The point is over at 5 and a little more than halfway up.

Name _____ Date _____

Describing Location (continued)

2 Combine cards with your partner. Using the information on *both* cards, describe the location of each point as precisely as you can.

Card A: The point is 9 over and 1 up.

Card B: The point is about 7 up and 5 over.

3 **Discuss**

How did having a vertical and a horizontal number line help you describe the location of each point?
Oral activity: No writing expected. Sample response shown.

The tick marks on both number lines represent the location of the point. I used the numbers on each number line to describe the exact location.

D Differentiation | Teacher Moves

Presentation Screens

Look for students who . . .	For example . . . (Set B)	Provide support . . .
Almost there Use the number line but no directional words to describe the location.	The point is at 7 and 5.	**Support** Ask, "How could you use more specific language to describe the location?"
Use both number lines to identify a location.	Go right 5 and then up almost 7. or Go up almost 7 and then to the right 5.	**Stretch** Ask, "How could you describe the location of the point using only 2 numbers and without any words?"

Pairs | 15 min

Presentation Screens



Activity 2 Locating Stars

Purpose: Students use the coordinate grid to describe and plot the location of points in terms of their horizontal and vertical coordinates, which each represent a distance from 0.

1 Launch



Read aloud the introduction.

Say, "Complete Problems 4–7 with your partner."

2 Monitor



After students have completed **Problem 7**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "Place your finger on 0. If you were following the description *move right 6 units*, where would your finger go? What about when it says *up 6 units*?"

3 Connect



Ask, "How did you plot star *T*?" Plot and label star *T* as students share.

EB **Emergent Bilinguals** Use gestures when describing how the star is plotted. ELPS 3.D, 3.F

A **Accessibility: Visual-spatial processing** Guide visualization of coordinates by coloring the *x*-axis one color and the *y*-axis another. Then record the coordinates with the color matching its corresponding axis.

Play the animation. ELPS 1.F

Key Takeaway: You can use the perpendicular and parallel number lines, or **axes**, to plot points on a coordinate grid. The description of star T shows its **coordinates**. Each coordinate is the distance from 0, or the **origin**, in 2 directions. The first number in a coordinate indicates movement parallel to the horizontal axis, and the second point in the coordinate indicates movement parallel to the vertical axis.

Student Edition

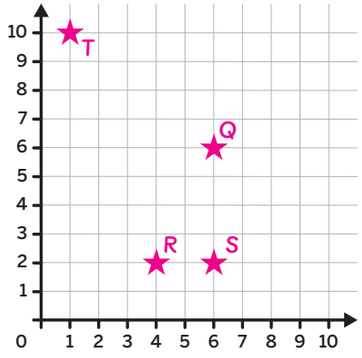
Activity 2

Name _____ Date _____

Locating Stars

Mia observed some stars. Here are Mia's descriptions of how to spot the 4 brightest stars she observed. Plot and label the location of the stars on the coordinate grid. Each description is based on a starting point of 0.

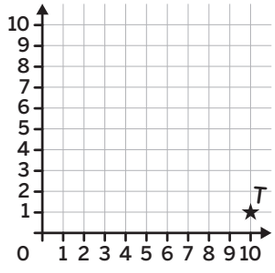
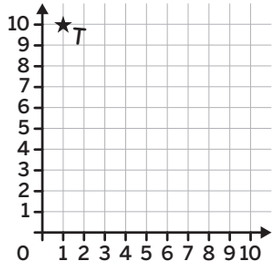
Description	Star
4 move right 6 units, then up 6 units	*Q*
5 4 units right, 2 units up	*R*
6 6 units right, 2 units up	*S*
7 (1, 10)	*T*



Grade 5 Unit 6 Lesson 6 556 Activity 2

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Plot the location by going up 1 and over 10.		**Support** Ask, "Using the pattern for stars *Q*, *R*, and *S*, how can you interpret (1, 10)?"
Plot the location by going over 1 and up 10.		**Stretch** Ask, "How can you identify the location of the other stars the same way as star *T*?"

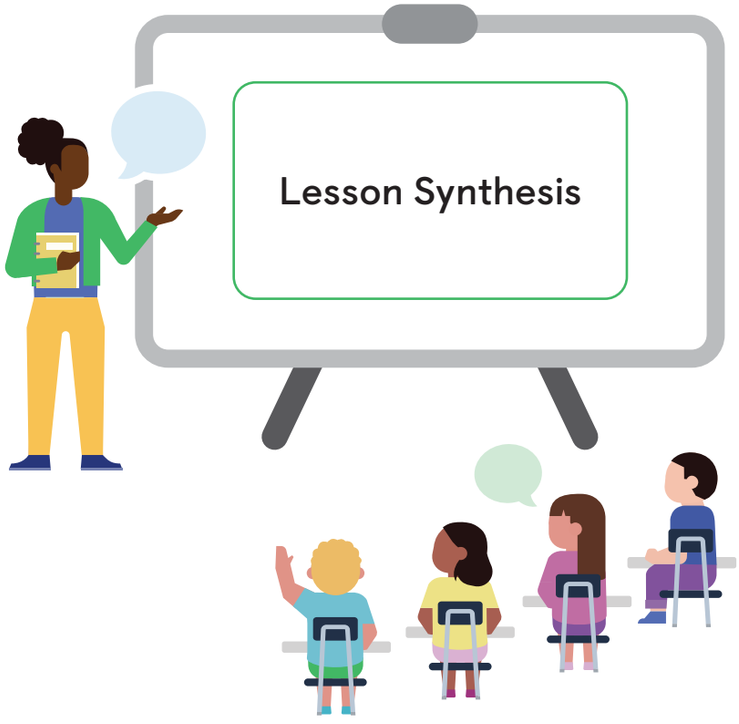
Whole Class | 10 min

Presentation Screen



Synthesis

Lesson Takeaway: The **coordinate grid** can be used to locate points with precision by using **coordinates** to describe the horizontal and vertical distances from the **origin**.



Use the Think-Pair-Share routine. Ask:

- "What do you notice about point *L*?"
- "What are the coordinates of point *L*?"

Say, "Point *L* is located at (0, 0), not just 0. The point (0, 0) is located where the 2 axes intersect, called the origin on a coordinate grid."

Formalize vocabulary: axis (axes), coordinates, coordinate grid, origin

(optional) **Consider using the Frayer Model routine** with one or more of the new vocabulary words. **ELPS 3.E, 3.F**

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

Invite students to refer to the **Summary** during Practice or anytime during the year.

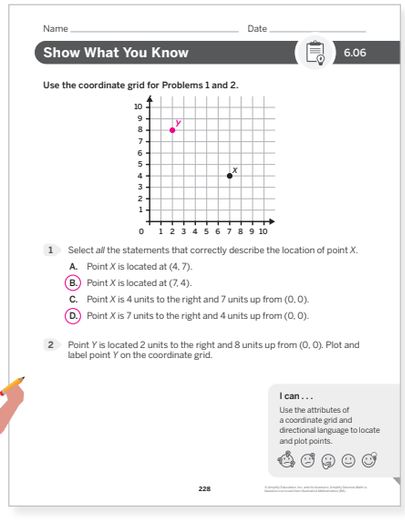
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.06

Use the coordinate grid for Problems 1 and 2.

1 Select *all* the statements that correctly describe the location of point *X*.

A. Point *X* is located at (4, 7).

B. Point *X* is located at (7, 4).

C. Point *X* is 4 units to the right and 7 units up from (0, 0).

D. Point *X* is 7 units to the right and 4 units up from (0, 0).

2 Point *Y* is located 2 units to the right and 8 units up from (0, 0). Plot and label point *Y* on the coordinate grid.

I can . . .
Use the attributes of a coordinate grid and directional language to locate and plot points.

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Today's Goals

1. **Goal:** Use the attributes of the coordinate grid and directional language to locate and plot points.
   - In Problem 1 in the *Show What You Know*, students located points on a coordinate grid.
   - In Problem 2 in the *Show What You Know*, students plotted a point on the coordinate grid.
2. **Language Goal:** Describe the attributes of the coordinate grid. **(Listening, Speaking and Reading)**
   ELPS 1.B, 2.B, 2.E, 3.C, 3.H

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

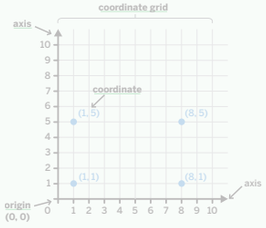
Lesson 6
Practice

Students using digital

Students using print

Summary 6.06

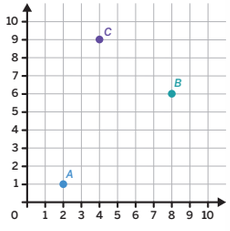
Coordinates describe the location of points on the coordinate grid. To describe the location of points with coordinates, use the horizontal and vertical distances starting at the origin (0, 0) on each axis.



coordinate grid A two-dimensional plane formed by 2 perpendicular number lines.

Practice 6.06

For Problems 1–3, describe the location of the point. Be as precise as possible.
Sample responses shown.



1 point *A*

2 units right, 1 unit up

2 point *B*

(8, 6)

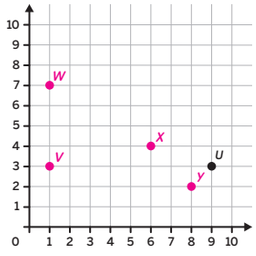
3 point *C*

(4, 9)

Practice 6.06

Name _____ Date _____

Use the coordinate grid to complete Problems 4–6.
Sample responses shown for Problems 4 and 6.



4 Describe the location of point *U* in 2 different ways.

It is located at (9, 3).

It is 9 units right from 0 and 3 units up.

5 Plot and label the points on the coordinate grid according to the description.

Point	Description
V	8 units to the left of point *U*
W	1 unit right, 7 units up
X	6 units right, 4 units up
Y	(8, 2)

6 Priya says, "Point *V* is located near 3." Rewrite her statement to more precisely describe the location of point *V*.

Point *V* is located at (1, 3). It is 1 unit from 0 to the right and then 3 units up.

Practice 6.06

Name _____ Date _____

7 Which coordinates describe where the horizontal axis and vertical axis intersect on a coordinate grid?

(A) (1, 1) (B) (0, 1)
(C) (1, 0) (D) (0, 0)

Spiral Review

8 Which comparison statement is true?

(A) 16.03 < 16.3 (B) 16.013 > 16.301
(C) 16.31 < 16.301 (D) 16.03 > 16.3

9 Which comparison statement is false?

(A) 2.97 > 2.709 (B) 2.07 < 2.097
(C) 2.9 > 2.901 (D) 2.007 < 2.7

10 Evaluate the expression 380 × 24.

Show your thinking.

Sample work shown.

$$\begin{array}{r} {\scriptstyle 1\ \ \ } \\ {\scriptstyle 3\ \ \ } \\ 380 \\ \times\ \ 24 \\ \hline 1520 \\ +\ 7600 \\ \hline 9{,}120 \end{array}$$

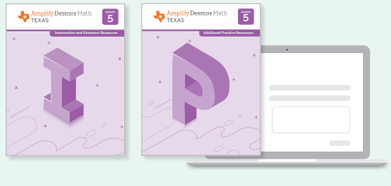
answer: 9,120

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–3	1	5.8.A*
	4	2	5.8.A*
	5	1	5.8.A*
	6	2	5.8.A*
Test Practice	7	2	5.8.A*
Spiral Review			
	8, 9	1	5.2.B
Fluency	10	1	5.3.B

*This problem builds toward the standard shown.

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 6

Lesson Goal: Use the attributes of the coordinate grid and directional language to locate and plot points.

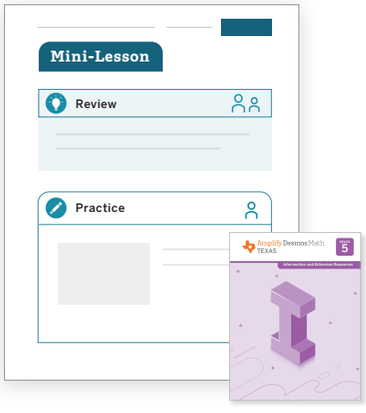
Support

Provide targeted intervention for students by using these resources.

If students select B or D in Problem 1:

Respond:

- Assign the *Creating a Coordinate System* **Mini-Lesson. |** 15 min
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



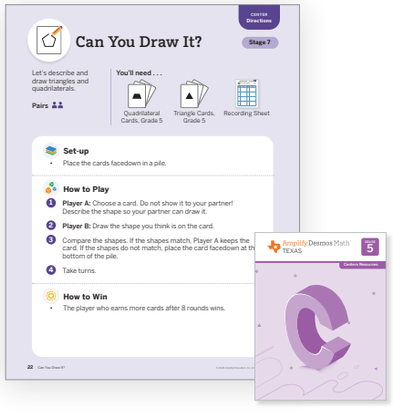
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students select B and D in Problem 1 or shows point *Y* located at (2, 8) in Problem 2:

Respond:

- Invite students to play these **Centers**. **|** 15 min
  Can You Draw It?, Grade 5 Shapes
  How Are They the Same?, Grade 5 Shapes
  Mystery Shape, Grade 5 Shapes
- Have students complete **Lesson 6 Practice**. **|** 15 min
- **Item Bank**



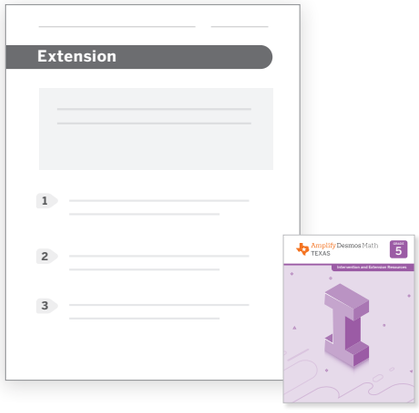
Stretch

Challenge students and extend their learning with these resources.

If students select B and D in Problem 1 and shows point *Y* located at (2, 8) in Problem 2:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities**. **|** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., **coordinate grid** / **el sistema coordenado**
- Frayer Model templates
- Vocabulary routines





Professional Learning

In what ways did students use informal language to explain the structure of the coordinate grid? How did you connect their informal language to more formal math vocabulary?

Unit 6
Lesson
7

Student devices recommended

We recommend students use devices for this lesson. Student Edition pages are also available.



Bullseye!

Points on the Coordinate Grid

Let's locate points on the coordinate grid.

Key Concepts

Today's Goals

1. **Goal:** Write an ordered pair to represent the location of a point on a coordinate grid.
2. **Language Goal:** Explain the relationship between an ordered pair and the location of a point on the coordinate grid. **(Listening and Speaking)**
   ELPS 1.B, 2.B, 2.E

Connections and Coherence

Students use the structure of the coordinate grid to plot points and record **ordered pairs**. They understand that the first number in an ordered pair, the ***x*-coordinate**, indicates how far to travel from the origin horizontally, and the second number, the ***y*-coordinate**, indicates how far to travel vertically. **(TEKS 5.1.F, 5.1.G)**

Prior Learning

In Lesson 6, students were introduced to the attributes of the coordinate grid and described locations of points using coordinates. They also plotted points on a coordinate grid.

Future Learning

In Lesson 8, students will continue to graph ordered pairs on a coordinate grid, including points on axes and points that form horizontal and vertical lines.

Depth and Rigor of Student Thinking

- Students continue to build **procedural skills** for locating points on a coordinate grid.
- Students **apply** their understanding of ordered pairs to design a collaborative activity for their classmates.

Vocabulary

New Vocabulary

ordered pair

***x*-coordinate**

***y*-coordinate**

Review Vocabulary

axis (axes)

coordinate

coordinate grid

origin

TEKS

Addressing

5.8.C

Graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table.

Math Process Standards: 5.1.F, 5.1.G

ELPS: 1.A, 1.B, 1.C, 1.E, 1.F, 2.B, 2.E, 3.D, 3.F

Building On	Building Toward
4.6.A	**6.11.A**

Building Math Identity

We are a math community.
How can you share your mathematical ideas as you work today?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.F, 5.1.G, 5.8.C



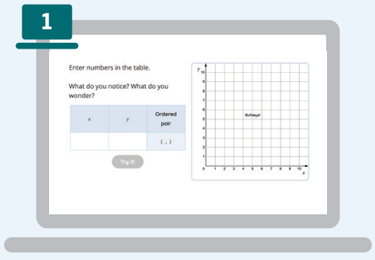
Why digital?

Students enter ordered pairs to graph points on the coordinate grid and receive interpretive feedback in real time.

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about points located on a coordinate grid and their corresponding **ordered pairs**.

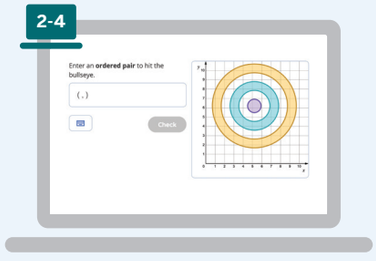


Activity 1

Pairs | 15 min

Students practice identifying the ordered pairs of a point on a coordinate grid. They understand the ordered pair (x, y) corresponds to the distance from 0 on the horizontal axis and the distance from 0 on the vertical axis.

Note: The Student Edition is not required for this activity.

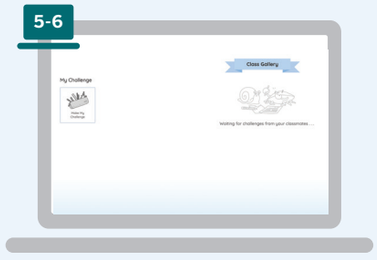


Activity 2

Pairs | 20 min

Students apply their understanding of the coordinate grid to create a challenge for their classmates that provides more practice with graphing and identifying ordered pairs.

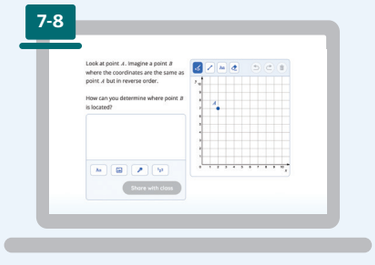
Note: The Student Edition is not required for this activity.



Synthesis

Whole Class | 10 min

Students review and reflect on how to graph ordered pairs.

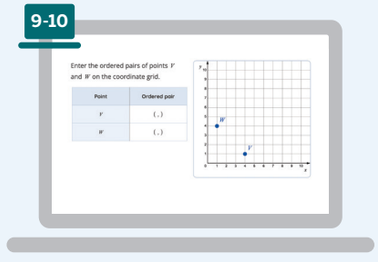


Show What You Know

Independent | 5 min

Students demonstrate their understanding by identifying ordered pairs represented by a point on a coordinate grid.

Students using print: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F

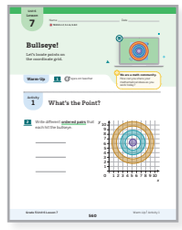
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

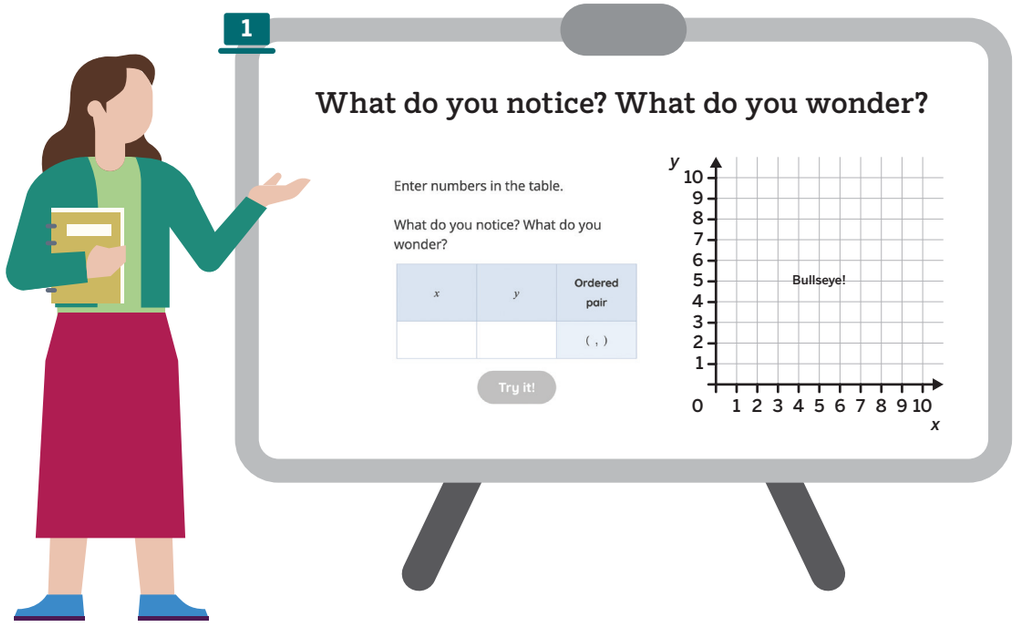
Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Notice and Wonder

Purpose: Students examine the relationship between the *x*- and *y*-coordinates, the corresponding ordered pairs, and the location of a point on the coordinate grid.

Students using print







1 Launch

1 **Display** the table and coordinate grid.

Use the Notice and Wonder routine.

Say, "Write numbers in the *x* and *y* columns of the table."

Student using print: Enter several pairs of coordinates provided by students. As pairs of coordinates are entered, students may write the ordered pairs and annotate the graph, but this is not required.

Use the Think-Pair-Share routine. Ask, "What do you notice as numbers are written in the table? What do you wonder?"

2 Connect

1 **Record** students' responses as they share.

Ask (if not yet mentioned during the discussion):

- "What information is provided in an **ordered pair**?"
- "In which direction does the *x*-value move? In which direction does the *y*-value move?"

Students might say . . . ELPS 2.B

I notice the x number is how far over and the y number is how far up.

I notice the coordinates in the ordered pair are always x then y.

I wonder what happens if the numbers get really big.

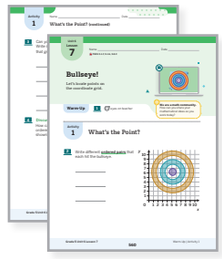
I wonder what happens if we use fractions or decimals.

Pairs | 15 min | Suggested Pacing: Screen 2, Screens 3-4

Activity 1 What's the Point?

Purpose: Students use ordered pairs to locate and identify points on a coordinate grid.

Students using print



1 Launch



2 **Display** the dartboard.

Say, "On a dartboard, you throw darts and earn a score depending on where they land. The *bullseye* is the smallest circle at the center of the dartboard. Work with your partner to write ordered pairs that will hit the bullseye."

Invite pairs to share their responses and strategies. Consider displaying snapshots of students' thinking or entering students' responses as they share.

Ask (if not yet mentioned during discussion), "How could you hit the exact center of the bullseye?"

Say, "Continue on to Screens 3 and 4 to try more dartboard challenges."

2 Monitor



While students complete **Screen 3**, refer to the Ⓓ **Differentiation | Teacher Moves** table on the following page.

3-4 **If students need help getting started . . .**

- Ask, "Where on the dartboard can you earn the greatest score?"
- Ask, "How can you use what you did on Screen 2 to help you get started?"

Snapshot: Use Screens 3 and 4 as an opportunity to capture snapshots of students' thinking for sharing in the Connect.

3 Connect



3-4 **Invite students to share** their responses and strategies for each screen. Consider displaying snapshots of students' thinking or entering students' responses as they share.

Ask, "How was your thinking for Screens 3 and 4 similar? How was it different? Why?"

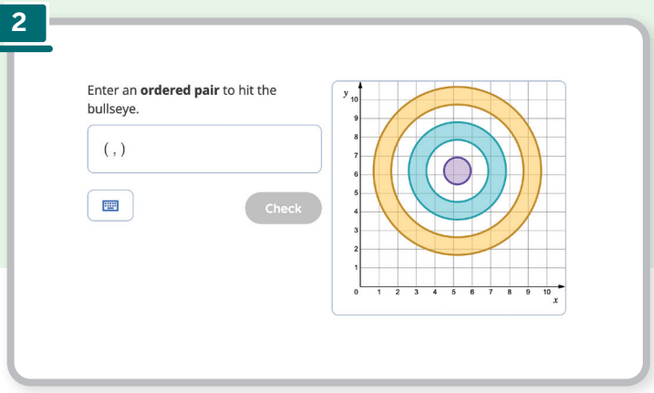
EB **Emergent Bilinguals** When discussing the horizontal and vertical axes, use gestures to highlight the difference between the axes. **ELPS 3.D, 3.F**

EB **Emergent Bilinguals** Invite students to share different meanings of the terms score and points. Clarify which meaning these words will have for this unit. **ELPS 3.D, 3.F**

Key Takeaway: Say, "In an ordered pair, the ***x*-coordinate** describes how far to move along the horizontal axis from the origin at (0, 0), and the ***y*-coordinate** describes how far to move along the vertical axis from (0, 0)."

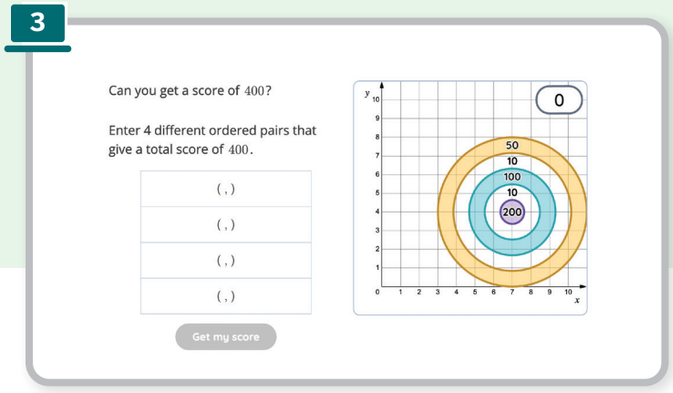
Students using digital

2



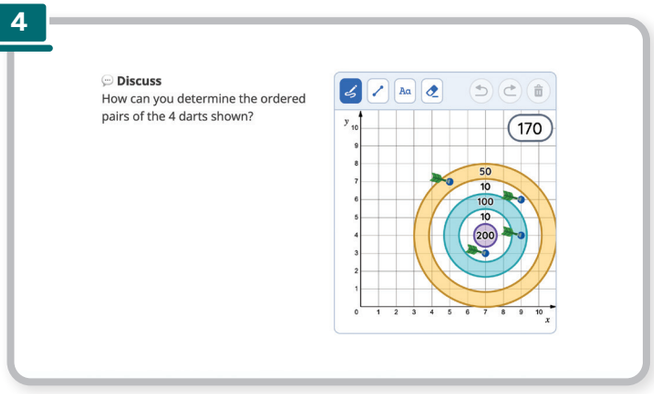
Students enter an ordered pair to hit the bullseye on the coordinate grid, such as (5, 6).

3



Students identify 4 ordered pairs on the coordinate grid to reach a total score of 400, such as (9, 4), (4, 2), (7, 4) and (3.5, 4).

4



Students discuss how to identify different ordered pairs on the coordinate grid such as by describing how to move along the horizontal and vertical axes starting at the origin.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

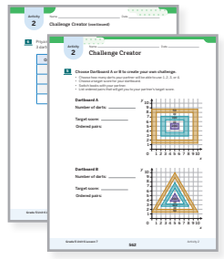
Look for students who . . .	For example . . .	Provide support . . .
Almost there Write the reverse coordinates of points.	**(4, 7)** **(1, 8)** **(2, 4)** **(4, 9)**	**Support** Say, "The first coordinate moves to the right. Trace your finger along the horizontal axis. The second coordinate moves up. Trace your finger along the vertical axis. Use your finger to show me where [(*x*, *y*)] is."
Write 4 ordered pairs using whole number coordinates.	**(7, 4)** **(8, 1)** **(4, 2)** **(9, 4)**	**Strengthen** Ask, "How could you reach a score of 400 with only 2 ordered pairs?"
Reach the target score using fewer than 4 ordered pairs.	**(7, 4)** **(5, 4)** **(9, 4)**	**Stretch** Ask, "How could you reach the same score using all 4 darts?"

Pairs | 20 min | Suggested Pacing: Screen 5, Screen 6

Activity 2 Challenge Creator

Purpose: Students apply their understanding of the attributes of the coordinate grid and ordered pairs to design their own dartboard games.

Students using print



1 Launch



5 **Display** the first *Make My Challenge* screen.

Say, "Now you will customize a dartboard challenge for your classmates to try."

Students using digital: Demonstrate how to move the dartboard. Tell students that once they submit their challenge, they should try the challenges their classmates made.

Students using print: Read aloud the directions in the Student Edition and answer any clarifying questions. Tell students that once they complete their partner's challenge, they can choose the other dartboard and repeat the game. **ELPS 1.E**

Say, "You will have 5 minutes to create your own challenge and try your classmates' challenges before moving on to Screen 6."

2 Monitor



While students complete **Screen 5**, refer to the **D Differentiation | Teacher Moves** table on the following page.

5-6 **If students need help getting started . . .**

- Ask, "Which section do you want to hit to start working toward your target score? How far to the right do you need to move? How far up do you need to move?"
- Ask, "Which section makes sense to hit next? What ordered pair will land in that section?"

3 Connect



5-6 **Display** the Challenge Creator.

Invite a few students to share how they got as close as possible to the target scores of their classmates' challenges. Display snapshots of students' thinking from Screen 5 or demonstrate students' responses as they share.

6 **Display** Priya's dartboard.

Say, "Priya thinks that because a dart at (3, 2) will help her earn a score of 450, a dart at (2, 3) will also help her earn a score of 450."

Use the Think-Pair-Share routine. Ask:

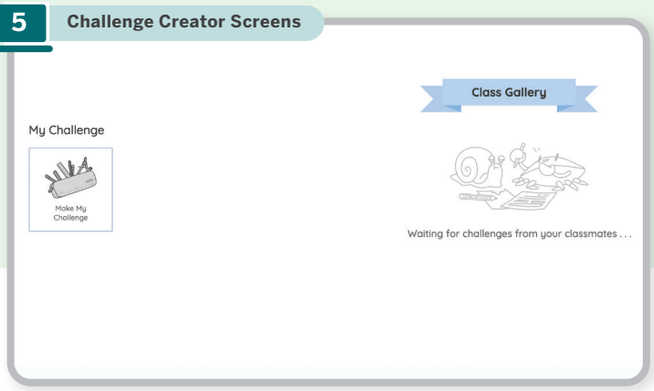
- "Do you agree with Priya? Why or why not?"
- "What does your answer tell you about the numbers listed in an ordered pair?"

A **Accessibility: Conceptual processing** Guide processing by inviting students to identify the details they want to remember. Provide sentence frames, such as "When I need to graph points using an ordered pair, I will . . ."

Key Takeaway: Say, "Order matters when listing numbers in an ordered pair."

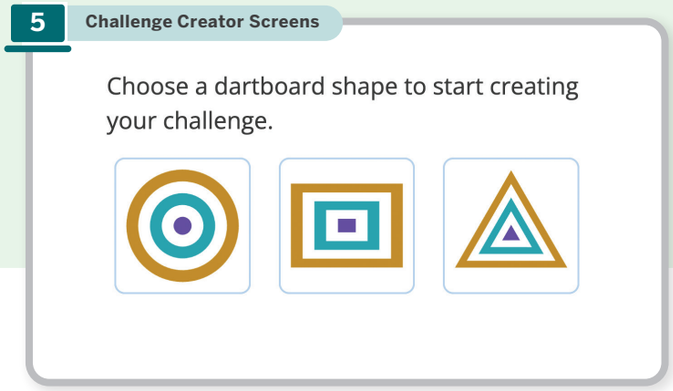
Students using digital

5 **Challenge Creator Screens**



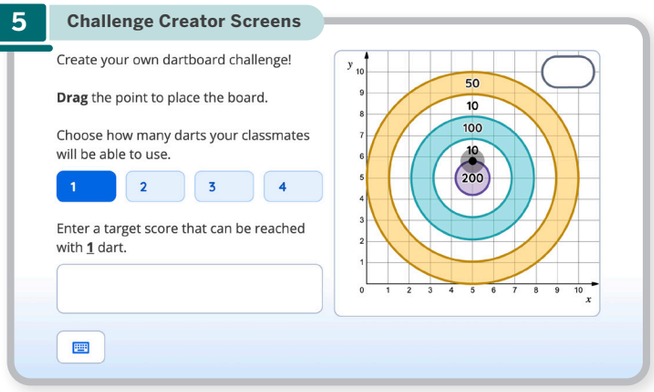
Students enter the class gallery to begin creating their own challenge.

5 **Challenge Creator Screens**



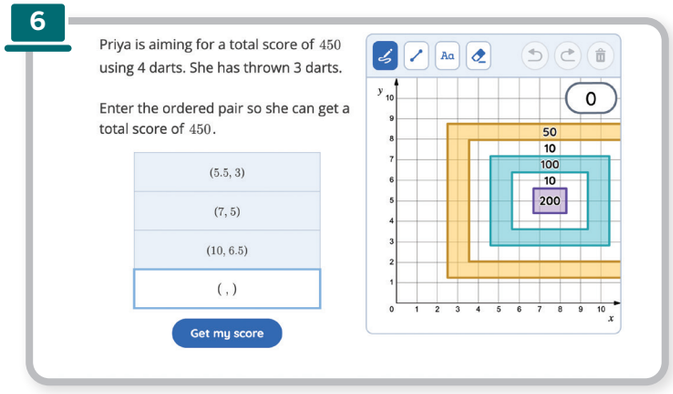
Students design their own challenge by positioning the board, choosing the number of darts, and choosing a target score, such as 3 darts with a target score of 310.

5 **Challenge Creator Screens**



Students identify ordered pairs on the coordinate grid that will match the score of their challenge, such as (5, 5), (7, 3) and (6, 4).

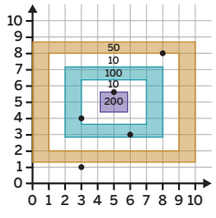
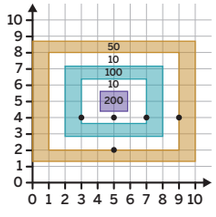
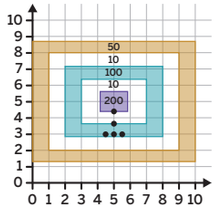
6



Students graph ordered pairs and identify 1 additional pair on the coordinate grid that will lead to a target score, such as (3,6).

Students using print **will arrive at similar answers.**

D Differentiation | Teacher Moves

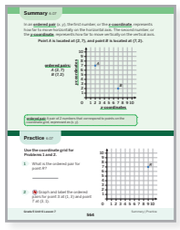
Look for students who . . .	For example . . .	Provide support . . .
Plot darts anywhere in the ring.		**S Strengthen** Ask, "Choose one of your points. How could you change only 1 coordinate to earn the same score?"
Choose a first point and then keep the *x*- or *y*-coordinate the same.		
Choose *x*- or *y*-coordinates close to the original point by using decimals or fractions.		**S Stretch** Ask, "In how many different ways can you earn a score of 300?"

Whole Class | 10 min | Suggested Pacing: Screen 7, Screen 8

Synthesis

Lesson Takeaway: In an **ordered pair**, the first number is the ***x*-coordinate**, which shows how far to move horizontally from the origin. The second number is the ***y*-coordinate**, which shows how far to move vertically.

Students using print





7 **Display** the graph of point *A*.

Say, "Here is point *A*. Point *B*'s coordinates are the same as point *A* but reversed."

Ask, "How could you determine where point *B* is located?"

8 **Play** each animation, one at a time. ELPS 1.F

Say, "In an ordered pair, the first number is the *x*-coordinate, which shows how far to move horizontally from the origin. The second number is the *y*-coordinate, which shows how far to move vertically."

Formalize vocabulary: ordered pair, **x-coordinate**, and **y-coordinate**

(optional) **Consider using the Total Physical Response routine** by inviting students to use hand gestures such as holding their left arm vertically with the number 1 up to show the *y*-coordinate axis and that *y* comes first, and their right arm horizontally and the number 2 to show the *x*-coordinate axis and that *x* comes second. Cup your hands to represent the parentheses used in ordered pairs. ELPS 1.A, 1.B, 1.C, 1.E

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

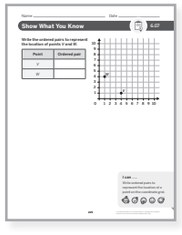
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

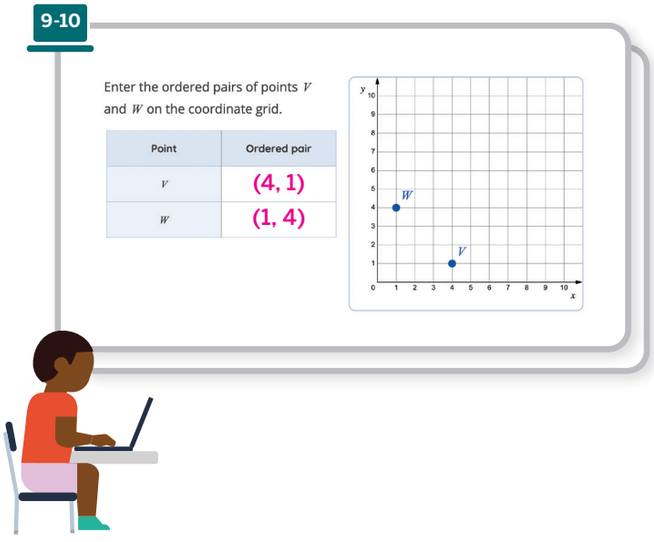
Independent | 5 min |
Suggested Pacing: Screens 9–10

Students using print

(Show What You Know PDF)



Students using digital



Today's Goals

1. **Goal:** Write an ordered pair to represent the location of a point on a coordinate grid.
   - In the *Show What You Know*, students wrote an ordered pair to represent the location of points on a coordinate grid.
2. **Language Goal:** Explain the relationship between an ordered pair and the location of a point on the coordinate grid. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 7
Practice

Students using digital

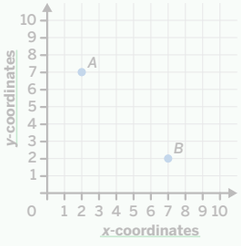
Students using print

Summary 6.07

In an **ordered pair** (*x*, *y*), the first number, or the ***x*-coordinate**, represents how far to move horizontally on the horizontal axis. The second number, or the ***y*-coordinate**, represents how far to move vertically on the vertical axis.

Point *A* is located at (2, 7), and point *B* is located at (7, 2).

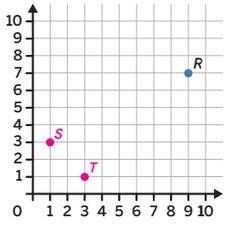
ordered pairs:
A (2, 7)
B (7, 2)



ordered pair A pair of 2 numbers that correspond to points on the coordinate grid, expressed as (x, y).

Practice 6.07

Use the coordinate grid for Problems 1 and 2.



1 What is the ordered pair for point *R*?

(9, 7)

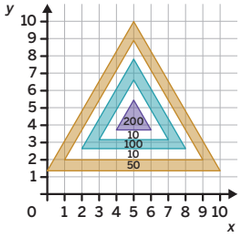
2 Graph and label the ordered pairs for point *S* at (1, 3) and point *T* at (3, 1).

Practice 6.07

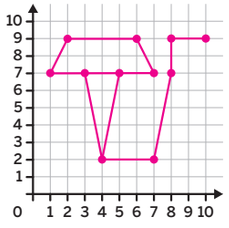
Name _____ Date _____

3 Priya is aiming for a total score of 300 using 4 darts. She has thrown 3 darts. Write an ordered pair so she can get a total score of 300.
Sample response shown.

Ordered pairs
(6, 2)
(6, 3)
(2, 2)
(7, 3)



Use the coordinate grid for Problems 4 and 5.



4 Create a design on the coordinate grid with at least 10 points.
Sample response shown.

5 List *all* the ordered pairs for the design that you made.
Sample response shown.
(1, 7), (2, 9), (6, 9), (7, 7)
(5, 7), (3, 7), (4, 2), (7, 2)
(8, 7), (8, 9), (10, 9)

Practice 6.07

Name _____ Date _____

Spiral Review

For Problems 6–9, evaluate the expression. Sample work shown.

Show your thinking.

6 12.7 + 3.84

$$\begin{array}{r} {\scriptstyle 1} \\ 12.70 \\ +\ 3.84 \\ \hline 16.54 \end{array}$$

answer: 16.54

7 $1\frac{4}{5} + 2\frac{3}{4}$

$$1\tfrac{16}{20} + 2\tfrac{15}{20}$$
$$= 3\tfrac{31}{20}$$
$$= 4\tfrac{11}{20}$$

answer: $4\frac{11}{20}$ or equivalent

8 347 × 16

$$\begin{array}{r} {\scriptstyle 2\ 4} \\ 347 \\ \times\ \ 16 \\ \hline 2082 \\ +\ 3470 \\ \hline 5{,}552 \end{array}$$

answer: 5,552

9 42 × 752

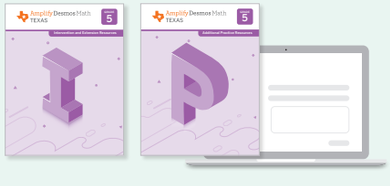
$$\begin{array}{r} {\scriptstyle 2} \\ {\scriptstyle 1} \\ 752 \\ \times\ \ 42 \\ \hline 1504 \\ +30080 \\ \hline 31{,}584 \end{array}$$

answer: 31,584

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	1	5.8.C
Test Practice	2	1	5.8.C
	3	2	5.8.C
	4, 5	1	5.8.C
Spiral Review			
	6	1	5.3.E
	7	1	5.3.H
Fluency	8, 9	1	5.3.B

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 7

Lesson Goal: Write an ordered pair to represent the location of a point on a coordinate grid.

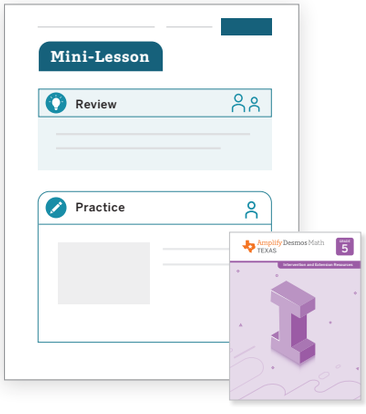
Support

Provide targeted intervention for students by using these resources.

If students write an inaccurate ordered pair as (*y*, *x*):

Respond:

- Assign the *Using the Coordinate Grid to Locate Points* **Mini-Lesson. |** 15 min
- Revisit Lesson 6.



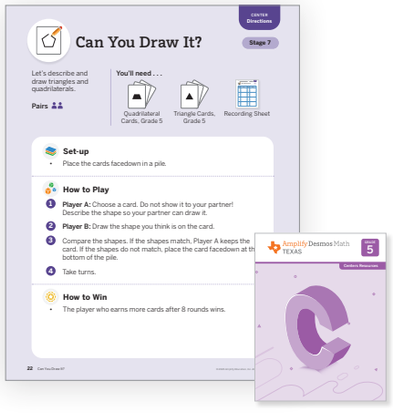
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students write an accurate ordered pair for 1 point:

Respond:

- Invite students to play these **Centers. |** 15 min
  Can You Draw It?, Grade 5 Shapes
  How Are They the Same?, Grade 5 Shapes
  Mystery Shape, Grade 5 Shapes
- Have students complete **Lesson 7 Practice. |** 15 min
- **Item Bank**



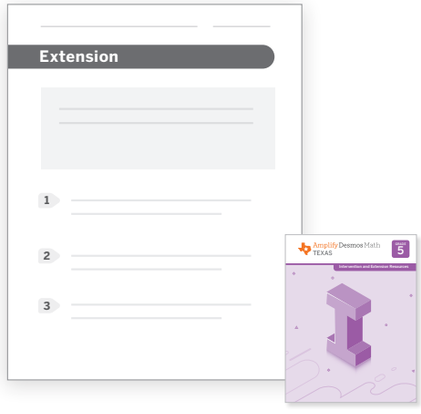
Stretch

Challenge students and extend their learning with these resources.

If students write accurate ordered pairs for both points:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., ordered pair / par ordenado
- Frayer Model templates
- Vocabulary routines





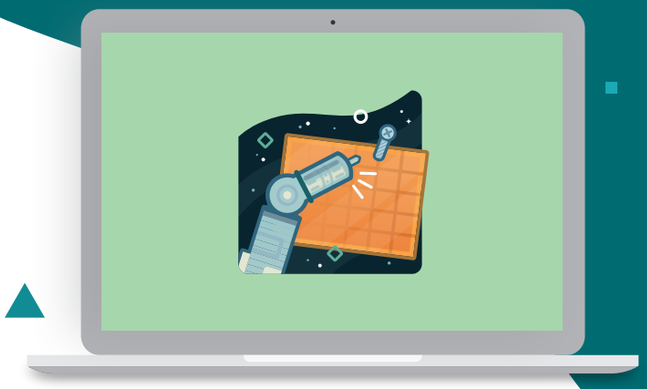
Professional Learning

Who participated in math class today? What assumptions are you making about those who did not participate? How can you leverage your students' ideas to support them in being seen and heard in the next math class?

Unit 6
Lesson
8

Student devices recommended

We recommend students use devices for this lesson. Student Edition pages are also available.



Coordinating Satellite Repairs

Graphing Points on Lines

Let's graph more points and write ordered pairs to notice patterns.

Key Concepts

Today's Goals

1. **Goal:** Graph points on a coordinate grid given an ordered pair.
2. **Goal:** Write ordered pairs to represent a location on a coordinate grid.
3. **Language Goal:** Describe patterns when graphing points on vertical or horizontal lines. **(Listening and Speaking)** **ELPS 1.E, 2.E, 2.F**

Connections and Coherence

Students write ordered pairs of points and graph points on horizontal and vertical lines on a coordinate grid, including points on both axes for the first time. They reason that if the *x*-coordinate is the same in ordered pairs, a vertical line is formed between those points, and if the *y*-coordinate is the same in ordered pairs, a horizontal line is formed between those points. Students then use their understanding of vertical and horizontal lines formed by ordered pairs to determine the least amount of information needed to graph rectangles. **(TEKS 5.1.B, 5.1.D, 5.1.F)**

Prior Learning

In Lesson 7, students used ordered pairs to graph and name points on a coordinate grid.

Future Learning

In Lesson 9, students will generate ordered pairs and describe the process for graphing ordered pairs.

Depth and Rigor of Student Thinking

- Students continue to build **procedural skills** for graphing and identifying points on a coordinate grid.
- Students **apply** their understanding of the coordinate grid by describing patterns formed by graphed points that create horizontal and vertical lines.

Vocabulary

Review Vocabulary

axis (axes)	*parallel lines*
coordinate grid	*perpendicular lines*
ordered pair	*x-coordinate*
origin	*y-coordinate*

TEKS

Addressing

5.8.C

Graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, **including those generated by number patterns or found in an input-output table.**

Math Process Standards: 5.1.B, 5.1.D, 5.1.F

ELPS: 1.E, 1.F, 2.B, 2.C, 2.D, 2.E, 2.F

Building On	Building Toward
4.6.A	**6.11.A**

Building Math Identity

I can be all of me in math class.
Think of a time when you felt nervous about sharing. What would help you feel comfortable?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.B, 5.1.D, 5.1.F, 5.8.C



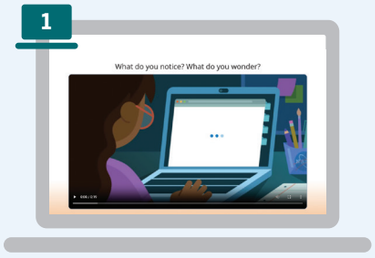
Why digital?

Students explore graphing and identifying points that form lines on coordinate grids and revise their thinking as they go.

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about an animation that sets the context for the lesson — a satellite in space.

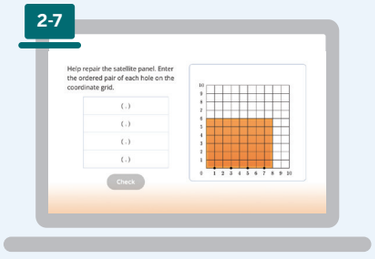


Activity 1

Pairs | 20 min

Students write ordered pairs to represent the location of points on vertical and horizontal lines. They recognize that the points will create a line if 1 coordinate in a set of ordered pairs is the same.

Note: The Student Edition is not required for this activity.

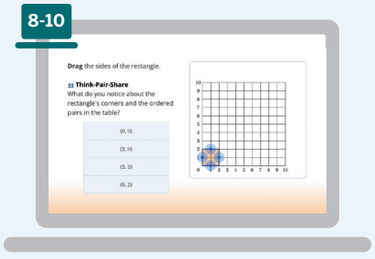


Activity 2

Pairs | 15 min

Students graph ordered pairs that represent the corners of rectangles on a coordinate grid. They see that to create a horizontal line, the *x*-coordinates need to be the same, and to create a vertical line, the *y*-coordinates need to be the same.

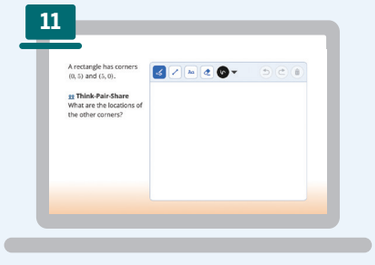
Note: The Student Edition is not required for this activity.



Synthesis

Whole Class | 10 min

Students review and reflect on what they know about a rectangle built on a coordinate grid with the ordered pairs (0, 5) and (5, 0).

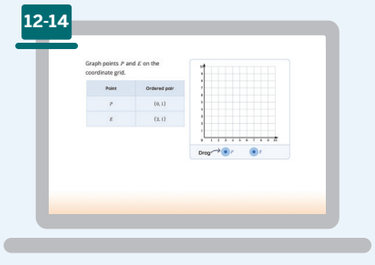


Show What You Know

Independent | 5 min

Students demonstrate their understanding by graphing and identifying points that form a line on a coordinate grid.

Students using print: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

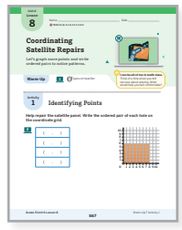
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Notice and Wonder

Purpose: Students watch an animation that sets the context for solving problems on a coordinate grid that represents repair satellite panels in Activities 1 and 2.

Students using print





1 Launch

1 **Play** the animation. ELPS 1.F

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

1 **Record** students' responses as they share.

Say, "Today, you will use a coordinate grid to think about how to repair satellite panels in space."

Students might say . . . ELPS 2.B

I notice the student sees a satellite through her telescope.

I notice a satellite in space is being repaired.

I wonder whether that is a robot repairing the satellite.

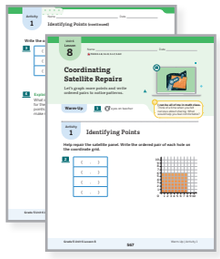
I wonder how satellites are repaired in space.

Pairs | 20 min | Suggested Pacing: Screens 2-7

Activity 1 Identifying Points

Purpose: Students write ordered pairs of points that form horizontal and vertical lines, including ordered pairs on the axes.

Students using print



1 Launch



2 **Say**, "With your partner, write the ordered pair of each hole on the coordinate grid."

EB **Emergent Bilinguals** If possible, pair students with different levels of English language proficiency together as they complete this activity. This will provide a structured opportunity for students to interact with and receive feedback from their peers with varied language backgrounds. ELPS 1.E, 2.C, 2.D

2 Monitor



After students have completed **Screen 7**, refer to the D **Differentiation | Teacher Moves** table on the following page.

2-7 **If students need help getting started . . .**

- Ask, "What are the ordered pairs of the first hole? What does the next hole have in common with the first hole?"
- Ask, "When writing ordered pairs, what does the first number represent? How could you use this to write an ordered pair?"

3 Connect



7 **Ask**, "What conclusions could you make about the ordered pairs on any horizontal line? On any vertical line?"

MLR **MLR8: Discussion Supports — Pressing for Details** ELPS 2.E

As students share their conclusions about ordered pairs on any horizontal and vertical lines, press for details in their reasoning. For example:

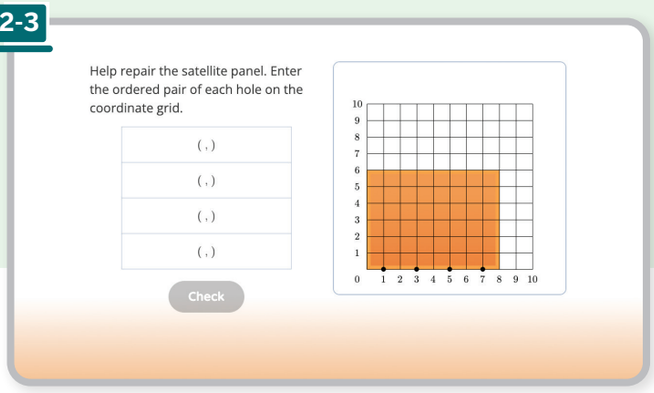
- If a student says, "Only 1 coordinate changes in the ordered pair on horizontal and vertical lines." . . .
- Press for details by asking, "Which coordinate in the ordered pair remains the same on a vertical line? Which coordinate changes? Why? Which coordinate in the ordered pair remains the same on a horizontal line? Which coordinate changes? Why?"

A **Accessibility: Visual-spatial processing** Extend both lines on the screen using a different color so students can see that the horizontal line passes through 6 on the *y*-axis and the vertical line passes through 8 on the *x*-axis.

Key Takeaway: Say, "When points are located on a vertical line, the *x*-coordinate in each ordered pair is the same. When points are located on a horizontal line, the *y*-coordinate in each ordered pair is the same."

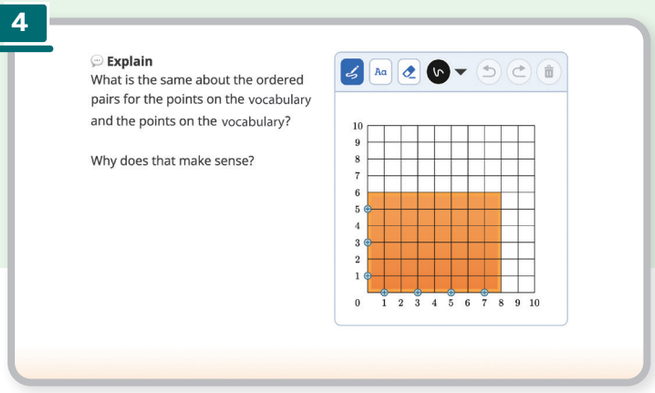
Students using digital

2-3



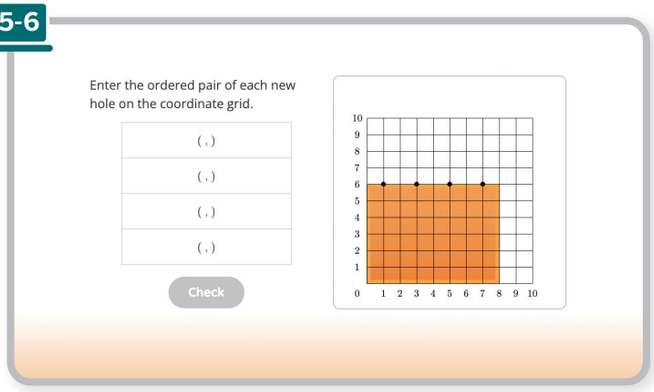
Students identify ordered pairs of points on the vertical and horizontal axes, such as (1, 0), (3, 0), (5, 0) and (7, 0).

4



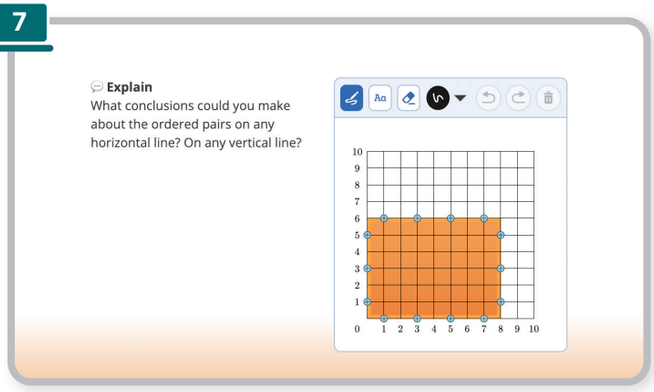
Students explain what the points on the horizontal axis and the vertical axis have in common, such as that there is a 0 in each coordinate, but the coordinates seem to be reversed depending on which axis.

5-6



Students identify ordered pairs of points that create horizontal and vertical lines on the coordinate grid, such as (1, 6), (3, 6), (5, 6) and (7, 6).

7



Students explain their conclusions about the ordered pairs on horizontal and vertical lines, such as that when points are located on a vertical line, only the *y*-coordinate changes.

Students using print **will arrive at similar answers.**

D Differentiation | Teacher Moves

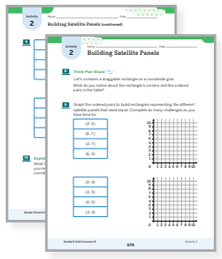
Look for students who . . .	For example . . .	Provide support . . .
Almost there Describe patterns for a vertical or horizontal line.	The *x*-coordinate changes on a vertical line. or The *y*-coordinate changes on a horizontal line.	**Support** Ask, "What are the ordered pairs of the points on the line? How could you use this to rethink your response?"
Describe patterns when identifying points on vertical and horizontal lines.	When points are located on a vertical line, the *x*-coordinate does not change. When points are located on a horizontal line, the *y*-coordinate does not change.	**Strengthen** Ask, "What coordinate in the ordered pair changes? Why does that make sense?"
Describe patterns when identifying points on vertical and horizontal lines with precise language.	When points are located on a vertical line, only the *y*-coordinate changes because the vertical axis is a vertical line. When points are located on a horizontal line, only the *x*-coordinate changes because the horizontal axis is a horizontal line.	**Stretch** Ask, "Will your thinking always be true? How do you know?"

Pairs | 15 min | Suggested Pacing: Screens 8-10

Activity 2 Building Satellite Panels

Purpose: Students graph ordered pairs that form rectangles on a coordinate grid. They recognize that *x*-coordinates are needed to make a horizontal line, and *y*-coordinates are needed to create a vertical line.

Students using print



1 Launch



8 **Use the Think-Pair-Share routine.** Ask, "What do you notice about the rectangle's corners and the ordered pairs in the table?"

Say, "The ordered pairs in the table represent the ordered pairs of the rectangle's corners."

9 **Say**, "With your partner, use the ordered pairs to build the rectangles on the coordinate grids to repair the satellite panels."

2 Monitor



After students have completed **Screen 9**, refer to the D **Differentiation | Teacher Moves** table on the following page.

9-10 **If students need help getting started . . .**

- Ask, "Where is the first ordered pair located on the coordinate grid? How does this relate to the rectangle?"
- Ask, "Is there another ordered pair in the table that has something in common with your first ordered pair? How could you use this to identify the next corner of your rectangle?"

3 Connect



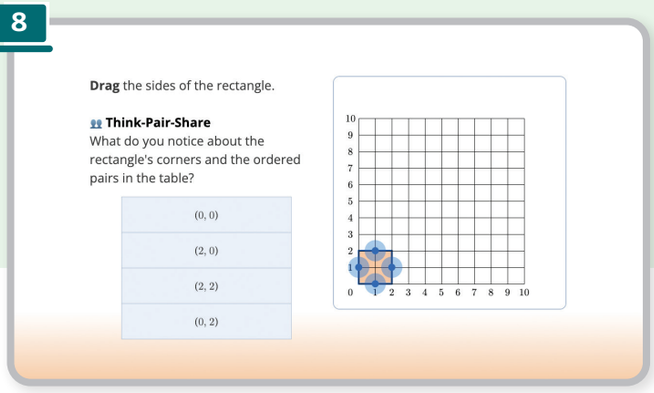
10 **Use the Think-Pair-Share routine.** Ask, "What is the least amount of information you need to build a rectangle on a coordinate grid?"

A **Accessibility: Visual-spatial processing** Use 2 points representing opposite corners of the rectangle to build the horizontal and vertical lines on screen. Then finish building the rectangle.

Key Takeaway: Say, "To make a line through horizontal points, you need to know the *x*-coordinates. To make a line through vertical points, you need to know the *y*-coordinates."

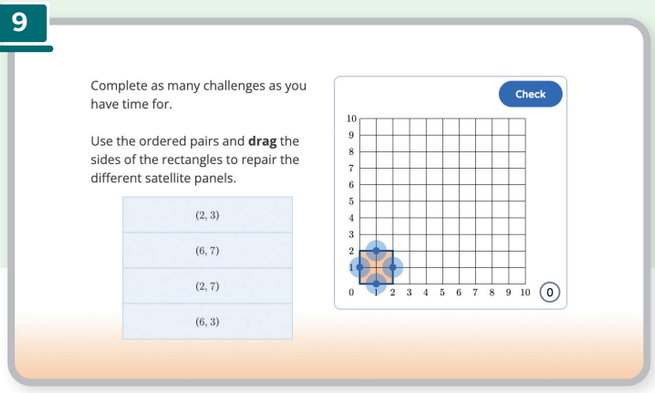
Students using digital

8



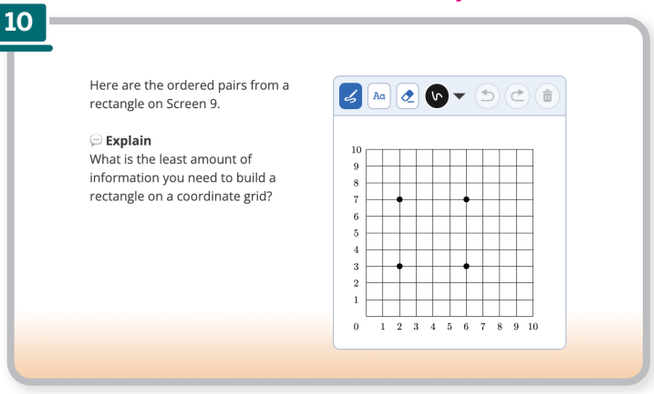
Students drag a rectangle on a coordinate grid and share how the ordered pairs relate to the rectangle's corners, such as by sharing that corners that share a vertical line have the same *x*-coordinate and corners that share a horizontal line have the same *y*-coordinate.

9



Students graph ordered pairs to build rectangles on a coordinate grid.

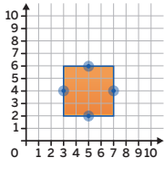
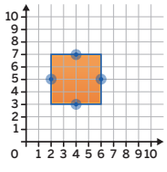
10



Students explain what information is needed to build a rectangle on a coordinate grid, such as the ordered pairs of 2 opposite corners.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

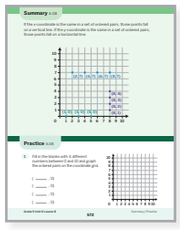
Look for students who . . .	For example . . .	Provide support . . .
Almost there Graph points based on switching the order of the coordinates in the ordered pair.		**Support** Ask, "Where is (2, 3) on the coordinate grid? Where do you see the ordered pair (2, 3) represented on your rectangle? How could you use this to adjust your thinking?"
Use the *x*-coordinates to make a horizontal line and the *y*-coordinates to make a vertical line.	 *I know the horizontal line goes from 2 to 6 because of the x-coordinates in the ordered pairs (2, 3) and (6, 3). I know the vertical line goes from 3 to 7 because of the y-coordinates in the ordered pairs (2, 3) and (2, 7).*	**Strengthen** Ask, "Is there a way to build the rectangle using fewer ordered pairs? How do you know?"
Use 2 ordered pairs that represent the opposite corners of the rectangle.	*I can build the rectangle using the ordered pairs (2, 3) and (6, 7). The vertical lines are between 3 and 7, and the horizontal lines are between 2 and 6.*	**Stretch** Ask, "Will your thinking always work? How do you know?"

Whole Class | 10 min | Suggested Pacing: Screen 11

Synthesis

Lesson Takeaway: If the *x*-coordinate is the same in a set of ordered pairs, those points create a vertical line. If the *y*-coordinate is the same in a set of ordered pairs, those points create a horizontal line.

Students using print





11 **Use the Think-Pair-Share routine.** Ask, "A rectangle has corners (0, 5) and (5, 0). What are the locations of the other corners?"

Record students' thinking as they share.

Say, "When using 2 ordered pairs to create lines, the *x*-coordinates in both ordered pairs determine the length of the horizontal line. The *y*-coordinates in both ordered pairs determine the length of the vertical line."

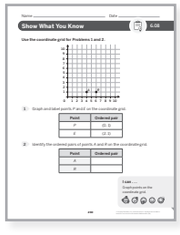
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

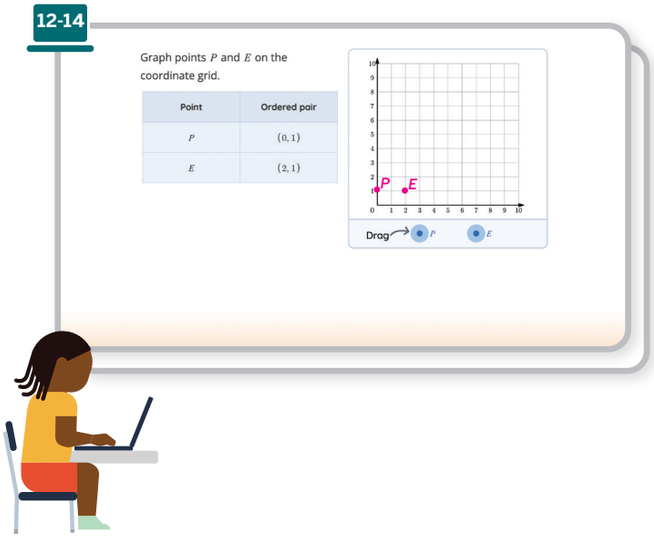
Independent | 5 min |
Suggested Pacing: Screens 12-14

Students using print

(Show What You Know PDF)



Students using digital



Today's Goals

1. **Goal:** Graph points on a coordinate grid given an ordered pair.
   - In Problem 1 in the *Show What You Know*, students graphed points on the coordinate grid using ordered pairs.
2. **Goal:** Write ordered pairs to represent a location on a coordinate grid.
   - In Problem 2 in the *Show What You Know*, students identified and wrote the ordered pairs to represent a location on the grid.
3. **Language Goal:** Describe patterns when graphing points on vertical or horizontal lines. **(Listening and Speaking)**
   ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

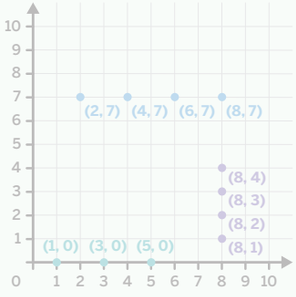
Lesson 8
Practice

Students using digital

Students using print

Summary 6.08

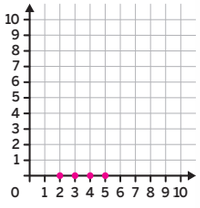
If the *x*-coordinate is the same in a set of ordered pairs, those points fall on a vertical line. If the *y*-coordinate is the same in a set of ordered pairs, those points fall on a horizontal line.



Practice 6.08

1 Fill in the blanks with 4 different numbers between 0 and 10 and graph the ordered pairs on the coordinate grid. Sample response shown.

(2 , 0)
(3 , 0)
(4 , 0)
(5 , 0)



Grade 5 Unit 6 Lesson 8 — 572 — Summary | Practice

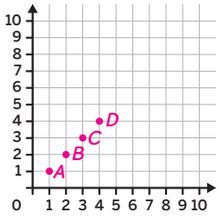
Practice 6.08

Name _____ Date _____

Use the coordinate grid for Problems 2–4.

2 Graph and label the ordered pairs on the coordinate grid.

Point	Ordered pair
A	(1, 1)
B	(2, 2)
C	(3, 3)
D	(4, 4)



3 What do you notice about the points? Sample response shown.

The points form a diagonal line.

4 If this pattern continued, would a point be located at (7, 9)? Explain your thinking. Sample explanation shown.

No. The pattern is that the *x*-coordinate and *y*-coordinate are the same, so (7, 9) would not be one of the points.

Grade 5 Unit 6 Lesson 8 — 573 — Practice

Practice 6.08

Name _____ Date _____

Spiral Review

For Problems 5–8, evaluate the expression. Sample work shown.

Show your thinking.

5 8.3 – 6.84

$$\begin{array}{r} 12 \\ 7\ \cancel{2}10 \\ \cancel{8}.\cancel{3}\cancel{0} \\ -\ 6.84 \\ \hline 1.46 \end{array}$$

answer: 1.46

6 $4\frac{1}{4} - 1\frac{3}{8}$

$4\frac{2}{8} - 1\frac{3}{8}$

$= 3\frac{10}{8} - 1\frac{3}{8} = 2\frac{7}{8}$

answer: $2\frac{7}{8}$ or equivalent

7 2,136 ÷ 12

$$\begin{array}{r} 178 \\ 12\overline{)2136} \\ -12 \\ \hline 93 \\ -\ 84 \\ \hline 96 \\ -\ 96 \\ \hline 0 \end{array}$$

answer: 178

8 531 × 24

$$\begin{array}{r} {}^{1} \\ 531 \\ \times\ 24 \\ \hline 2124 \\ +\ 10620 \\ \hline 12{,}744 \end{array}$$

answer: 12,744

Grade 5 Unit 6 Lesson 8 — 574 — Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	1	5.8.C
Test Practice	2	1	5.8.C
	3, 4	2	5.8.C
Spiral Review			
Fluency	5, 6	1	5.3.K
Fluency	7	1	5.3.C
Fluency	8	1	5.3.B

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 8

Lesson Goal: Graph points on a coordinate grid given an ordered pair.

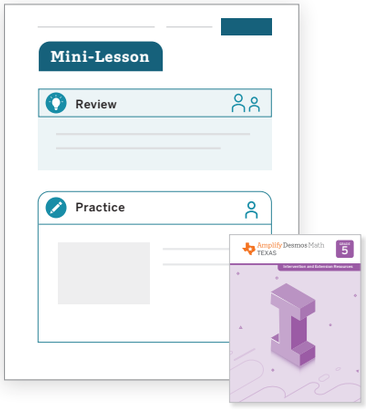
Support

Provide targeted intervention for students by using these resources.

If students graph and identify points as (y, x) on the coordinate grid:

Respond:

- Assign the *Plotting Points on the Coordinate Grid* **Mini-Lesson. |** 15 min
- Revisit Lesson 7.



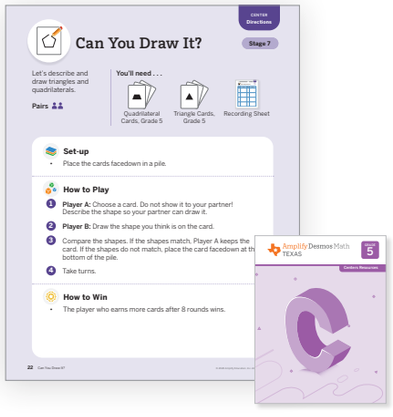
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students graph and identify 1 point accurately on the coordinate grid:

Respond:

- Invite students to play these **Centers. |** 15 min
  Can You Draw It?, Grade 5 Shapes
  How Are They the Same?, Grade 5 Shapes
  Mystery Shape, Grade 5 Shapes
- Have students complete **Lesson 8 Practice. |** 15 min
- **Item Bank**



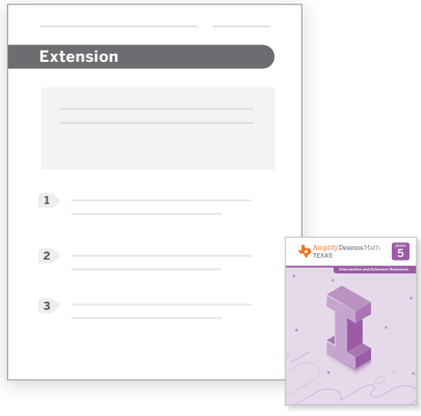
Stretch

Challenge students and extend their learning with these resources.

If students graph and identify 2 points accurately on the coordinate grid:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines



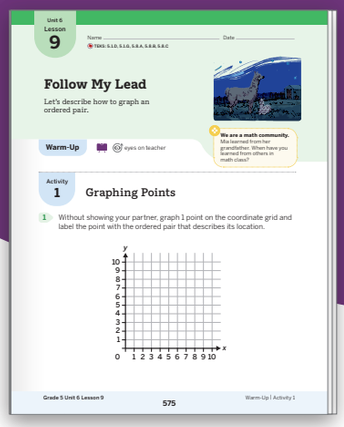


Professional Learning

What questions did you ask to deepen students' understanding of the structure of a coordinate grid?

Unit 6
Lesson
9

Student Edition pages and Presentation Screens support learning in this lesson.



Follow My Lead

Describing the Process for Graphing Ordered Pairs

Let's describe how to graph an ordered pair.

Key Concepts

Today's Goals

1. **Goal:** Graph in the first quadrant of the coordinate grid.
2. **Language Goal:** Describe the process for graphing an ordered pair. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E
3. **Language Goal:** Compare the process for graphing ordered pairs with whole number and decimal coordinates. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E

Connections and Coherence

Students follow their partner's verbal directions to graph ordered pairs in the first quadrant of the coordinate grid. Students notice and discuss the implications of graphing ordered pairs with decimal coordinates on an ***x*-axis** or ***y*-axis** with intervals of 1. As students describe and compare the processes involved in graphing different sets of ordered pairs, they develop a deeper understanding of the key attributes of the coordinate grid. **(TEKS 5.1.D, 5.1.G)**

Prior Learning

In Lesson 8, students graphed ordered pairs in the first quadrant of the coordinate grid.

Future Learning

In Lessons 10 and 11, students will generate and graph numerical patterns.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of the structure of a coordinate grid and its usefulness for precisely describing the locations of points.
- Students continue to build **procedural skills** for plotting points on a coordinate grid.

Vocabulary

New Vocabulary

***x*-axis**

***y*-axis**

Review Vocabulary

axis (axes)	*origin*
coordinate grid	*x-coordinate*
ordered pair	*y-coordinate*

TEKS

Addressing

5.8.B

Describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane.

Also Addressing: **5.8.A, 5.8.C**

Math Process Standards: 5.1.D, 5.1.G

ELPS: 1.A, 1.B, 1.C, 1.E, 2.B, 2.C, 2.E, 3.C, 3.D, 3.E, 3.F

Building On	Building Toward
4.6.A	**6.11.A**

Building Math Identity

We are a math community.
Mia learned from her grandfather. When have you learned from others in math class?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

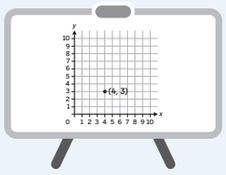
60 min

TEKS: 5.1.D, 5.1.G, 5.8.A, 5.8.B, 5.8.C

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about a graph that represents the ordered pair (4, 3). This prepares them to describe the process for graphing ordered pairs in Activity 1.



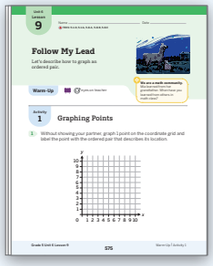
Activity 1

Pairs | 20 min

Students graph an ordered pair that contains whole number coordinates on a graph with *x*- and *y*-axes scaled by 1. Then, without showing their partner their graph, students give their partner directions for plotting a point.

Materials: chart paper, *Graphing Ordered Pairs* chart (teacher made), markers

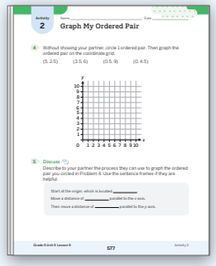
Additional Prep Prepare: blank chart titled *Graphing Ordered Pairs*



Activity 2

Pairs | 15 min

Students graph an ordered pair that contains whole number and decimal coordinates on a graph with *x*- and *y*-axes scaled by 1. Then, without showing their partner their graph, students give their partner directions for plotting a point.



Synthesis

Whole Class | 10 min

Students review and reflect on the process for graphing ordered pairs.

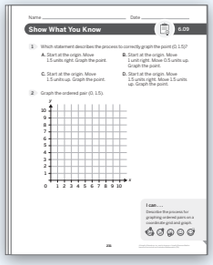


Show What You Know

Independent | 5 min

Students demonstrate their understanding by identifying how to graph an ordered pair and graphing the ordered pair on a coordinate grid.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

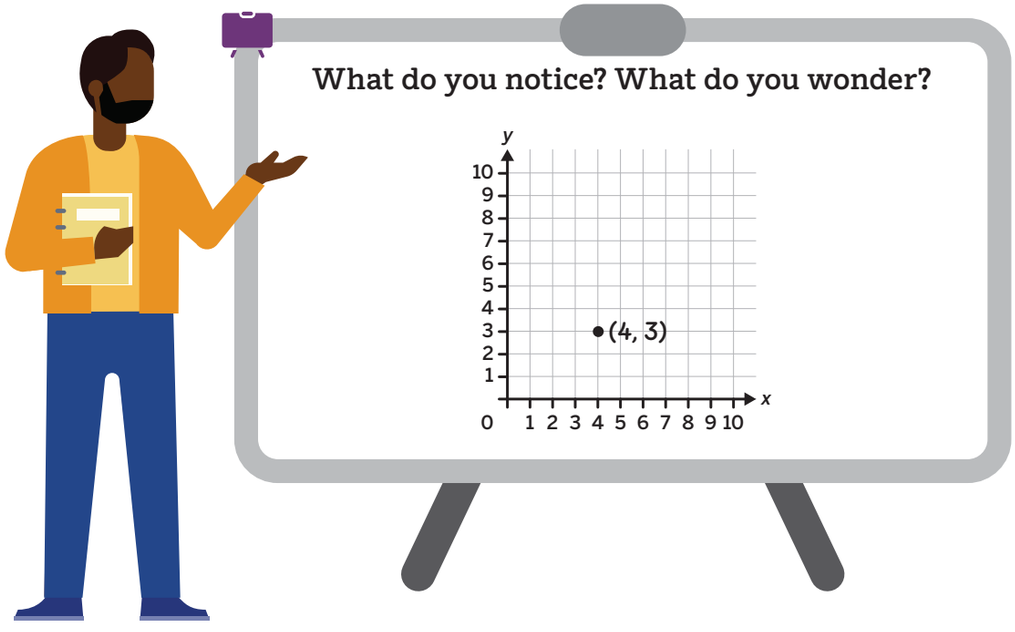
Whole Class | 10 min

Presentation Screen



Warm-Up Notice and Wonder

Purpose: Students examine a graph to make connections between number lines and the *x*- and *y*-axes.





1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Say, "The *x*-coordinate indicates how far to travel along the horizontal number line called the ***x*-axis**. The *y*-coordinate indicates how far to travel along the vertical number line called the ***y*-axis**. These axes are labeled with *y* and *x* and begin at the origin (0, 0)."

Students might say . . . ELPS 2.B

I notice the ordered pair matches the plotted point.

I notice there is only 1 ordered pair.

I wonder why the axes are labeled with x and y.

I wonder what the ordered pair represents.

Pairs | 20 min

Activity 1 Graphing Points

Purpose: Students describe the process for graphing ordered pairs to develop an understanding of the attributes of the coordinate grid.

Presentation Screens



Materials

Classroom materials:

- Use chart paper and markers to prepare the *Graphing Ordered Pairs* chart before the activity. Display the *Graphing Ordered Pairs* chart during the Connect.

Short on time? Consider providing students with a point already plotted on the graph for Problem 1.

1 Launch



Display Problem 1.

Ask, "What words would be helpful to use if you were going to describe the location of a point on the coordinate grid to someone who could not see the grid?"

MLR **MLR2: Collect and Display** ELPS 3.C, 3.D, 3.E, 3.F

Collect students' language used to describe the process for plotting a point on the coordinate grid on the *Graphing Ordered Pairs* chart. For example, *origin, x-coordinate, y-coordinate, x-axis, y-axis, horizontal, and vertical.*

Add the language students use to the class display and remind them to continue to refer to the display during class discussions.

Ask, "How could you describe the meaning of the origin of a coordinate plane? How could you describe the meaning of an ordered pair?"

Say, "Work with your partner to complete Problems 1–3."

2 Monitor



While students complete **Problem 2**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "Where will you place your point on the coordinate grid?"
- Ask, "How can you create an ordered pair that represents the *x*- and *y*-coordinates?"

3 Connect



Display the graph.

Use the Think-Pair-Share routine. Ask, "How could you describe the location of the plotted point on this graph to someone who was unfamiliar with ordered pairs?"

EB **Emergent Bilinguals** Encourage students to use the sentence frames from Problem 2 in the Student Edition and the words collected on the *Graphing Ordered Pairs* chart to support them with the discussion. ELPS 1.E, 2.C, 2.E

Key Takeaway: Say, "One way to describe the process for graphing an ordered pair is to start at the origin and use directional words to describe any necessary movements along the axes. The *x*-coordinate, which is the first number in an ordered pair, indicates movement parallel to the *x*-axis. The *y*-coordinate, which is the second number in an ordered pair, indicates movement parallel to the *y*-axis.

Unit 6 Lesson 9

Name _____ Date _____

TEKS: 5.1.D, 5.1.G, 5.8.A, 5.8.B, 5.8.C

Follow My Lead

Let's describe how to graph an ordered pair.

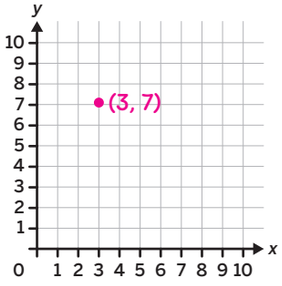


We are a math community. Mia learned from her grandfather. When have you learned from others in math class?

Warm-Up eyes on teacher

Activity 1 Graphing Points

1 Without showing your partner, graph 1 point on the coordinate grid and label the point with the ordered pair that describes its location. Sample response shown.



Activity 1

Name _____ Date _____

Graphing Points (continued)

2 **Discuss** Oral activity: No writing expected.

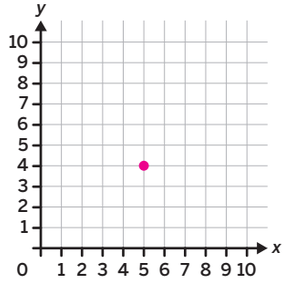
Describe to your partner the process they can use to graph the ordered pair shown in Problem 1. Use the sentence frames if they are helpful.

Start at the origin, which is located _____.

Move a distance of _____ parallel to the x-axis.

Then move a distance of _____ parallel to the y-axis.

3 Follow your partner's directions to plot a point on the coordinate grid. Then compare your graph from this problem to your partner's graph from Problem 1. Sample response shown



Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Name the ordered pair.	The ordered pair is (3, 7).	**Support** Ask, "How could you tell your partner which direction to move on the coordinate grid without telling them the ordered pair?"
Describe the process for graphing the ordered pair using directional language.	Go right 3 and then go up 7.	**Strengthen** Ask, "How could you describe this process using some of the language collected on the *Graphing Ordered Pairs* chart?"
Describe the process for graphing the ordered pair using precise language, including the attributes of the coordinate grid.	Start at the origin located at (0, 0). Move to the right 3 along the *x*-axis. Then move up 7 along the *y*-axis.	**Stretch** Ask, "Do you need to move along both the *x*- and *y*-axes for all ordered pairs? Why or why not?"

Pairs | 15 min

Activity 2 Graph My Ordered Pair

Purpose: Students describe the process for graphing ordered pairs to explore the process for graphing when a coordinate is between 2 whole numbers on the *x*- or *y*-axis.

Presentation Screens



1 Launch



Display Problem 4.

Use the Notice and Wonder routine. Ask, "What do you notice about the ordered pairs? What do you wonder about the ordered pairs?"

Say, "Some of the coordinates are whole numbers, and some of the coordinates are decimals. Work with your partner to complete Problems 4–7."

A **Accessibility: Visual-spatial processing** Have students draw tick marks between each whole number scale to help them see the decimals between the scaled numbers.

2 Monitor



While students complete **Problem 4**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "Which ordered pair do you want to graph?"
- Ask, "How could you use the ordered pair to help you determine the distance you should move along each axis?"

3 Connect



Display Problem 4 with a point plotted at (0, 4.5).

Use the Think-Pair-Share routine. Ask:

- "How could you describe the location of the point without sharing the ordered pair?"
- "How would the location of the point on the coordinate grid be different if the *y*-coordinate was 4 instead of 4.5?"

Key Takeaway: Say, "When an *x*- or *y*-coordinate is between 2 numbers on the *x*- or *y*-axis, the point that represents the ordered pair will not be located directly on intersecting lines within the coordinate grid."

Record the location of the remaining ordered pairs from Problem 4. Encourage students to graph them in their Student Edition.

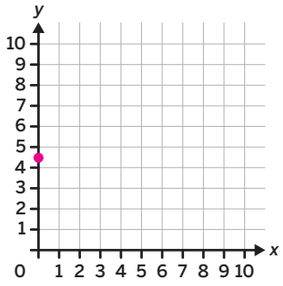
Activity 2

Name _____ Date _____

Graph My Ordered Pair

4 Without showing your partner, circle 1 ordered pair. Then graph the ordered pair on the coordinate grid. **Sample response shown**

(5, 2.5) (3.5, 6) (0.5, 9) (0, 4.5)



5 **Discuss**

Describe to your partner the process they can use to graph the ordered pair you circled in Problem 4. Use the sentence frames if they are helpful.

Start at the origin, which is located _____.

Move a distance of _____ parallel to the *x*-axis.

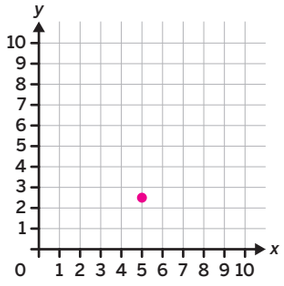
Then move a distance of _____ parallel to the *y*-axis.

Activity 2

Name _____ Date _____

Graph My Ordered Pair (continued)

6 Follow your partner's directions to plot a point on the coordinate grid. Then compare your graph from this problem to your partner's graph from Problem 4. **Sample response shown.**



7 **Discuss**

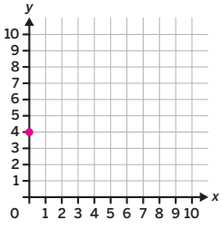
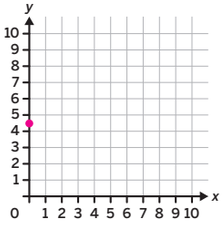
How was the process for graphing ordered pairs similar to or different from the ordered pairs you graphed in Activity 1?

Oral activity: No writing expected. Sample response shown.

The process was similar because I graphed the coordinates in the same way by making movements along the x- and y-axes. The difference was that one of the coordinates in each ordered pair was between 2 numbers on the x- or y-axis.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . . (0, 4.5)	Provide support . . .
Almost there Determine that the ordered pair cannot be graphed.	*The ordered pair has a decimal. The x- and y-axes do not have decimals, so these ordered pairs cannot be graphed.*	**Support** Ask, "How could you use what you know about representing data on a scaled bar graph to help you graph the ordered pair?"
Almost there Graph the ordered pair using whole number coordinates.		
Graph the ordered pair.		**Stretch** Ask, "How would the graph change if neither coordinate was a whole number?"

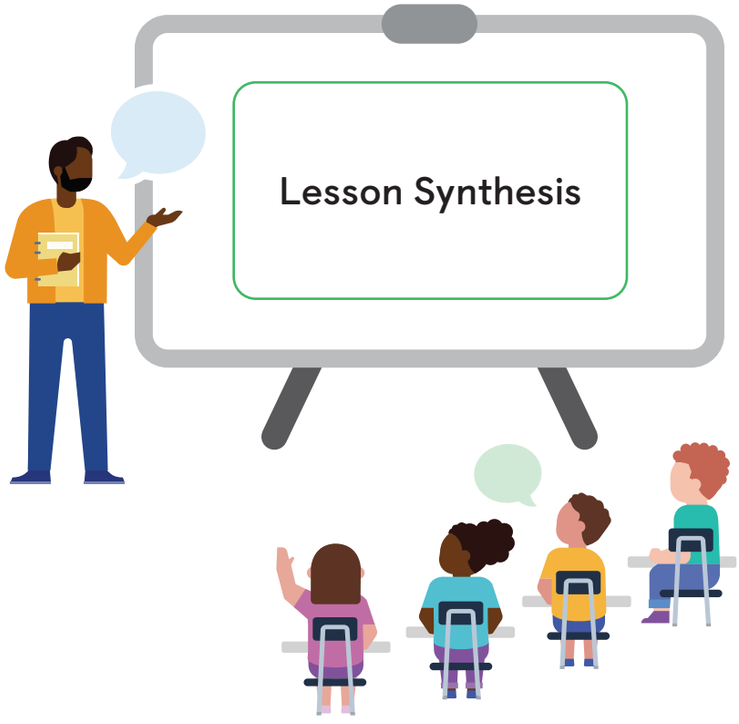
Whole Class | 10 min

Presentation Screens



Synthesis

Lesson Takeaway: The process for graphing an ordered pair can be described as starting at the origin and making a movement parallel to the ***x*-axis** for the *x*-coordinate and a movement parallel to the ***y*-axis** for the *y*-coordinate.



Use the Think-Pair-Share routine. Ask, "What ordered pair describes the location of the point on this graph?"

Say, "The location of this point can be described with the ordered pair (0.5, 6) which contains an *x*-coordinate of 0.5 and a *y*-coordinate of 6. To graph this point, you start at the origin (0, 0) which is where the *x*-axis and *y*-axis intersect. Then you move halfway between 0 and 1 in a movement parallel to the *x*-axis. Then you move 6 parallel to the *y*-axis."

Ask, "How would graphing the ordered pair (0.5, 6) be different if the *x*-axis was scaled by 0.5?"

Formalize vocabulary: *x*-axis, *y*-axis

(optional) **Consider using the Total Physical Response routine** by inviting students to make a movement horizontally or vertically as they say each axis. **ELPS 1.A, 1.B, 1.C, 1.E**

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

Invite students to refer to the **Summary** during Practice or anytime during the year.

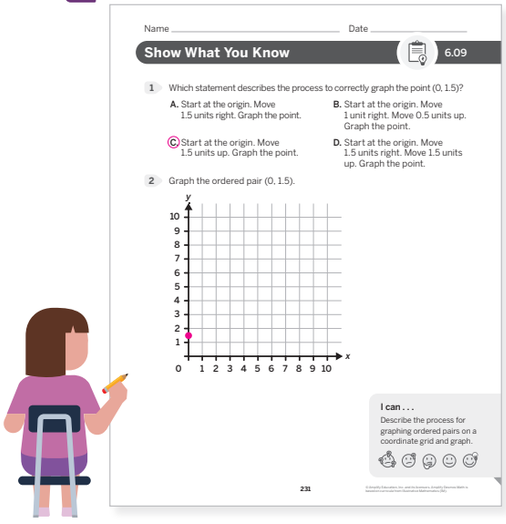
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.09

1 Which statement describes the process to correctly graph the point (0, 1.5)?

A. Start at the origin. Move 1.5 units right. Graph the point.

B. Start at the origin. Move 1 unit right. Move 0.5 units up. Graph the point.

C. Start at the origin. Move 1.5 units up. Graph the point.

D. Start at the origin. Move 1.5 units right. Move 1.5 units up. Graph the point.

2 Graph the ordered pair (0, 1.5).

I can . . .
Describe the process for graphing ordered pairs on a coordinate grid and graph.

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Today's Goals

1. **Goal:** Graph in the first quadrant of the coordinate grid.
   - In Problem 2 in the *Show What You Know*, students graphed an ordered pair.
2. **Language Goal:** Describe the process for graphing an ordered pair. **(Listening and Speaking)** **ELPS 1.B, 2.B, 2.E**
   - In Problem 1 in the *Show What You Know*, students identified the process for graphing an ordered pair.
3. **Language Goal:** Compare the process for graphing ordered pairs with whole number and decimal coordinates. **(Listening and Speaking)** **ELPS 1.B, 2.B, 2.E**

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

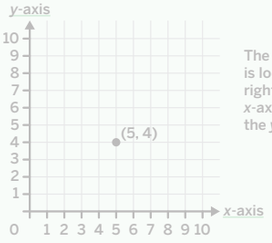
Lesson 9
Practice

Students using digital

Students using print

Summary 6.09

The steps for graphing ordered pairs on a coordinate grid can be described as movements along the x-axis and y-axis starting at the origin.



The point on the graph is located 5 units to the right of the origin along the *x*-axis and up 4 units along the *y*-axis.

x-axis The horizontal number line on a graph.
y-axis The vertical number line on a graph.

Practice 6.09

1 Han described the process for graphing the ordered pair (2, 5) on a coordinate grid as moving up 2 units and 5 units left from the origin. Do you agree with Han's description? Explain your thinking.
Sample explanation shown.

No. An ordered pair shows the x-coordinate, then the y-coordinate. Han should have explained that he moved 2 units to the right of the origin along the x-axis, then 5 units up along the y-axis.

Grade 5 Unit 6 Lesson 9 579 Summary | Practice

Practice 6.09

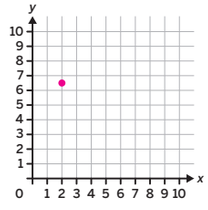
Name _____ Date _____

2 Complete the statements so that they correctly describe the process for graphing the ordered pair (3, 4).

Choose **ONE** correct answer in each box to complete the sentence.

From the origin, move [A horizontally / B vertically] along the [C *x*-axis / D *y*-axis] to [E 3 / F 4]. Then move [A horizontally / B vertically] along the [C *x*-axis / D *y*-axis] to [E 3 / F 4].

3 Graph the ordered pair (2, 6.5).



4 Describe the steps you took to graph the ordered pair from Problem 3 on the coordinate grid. Sample response shown.

I graphed (2, 6.5) by moving to the right from the origin to the 2 along the x-axis. Then I moved up along the y-axis to 6.5.

Grade 5 Unit 6 Lesson 9 580 Practice

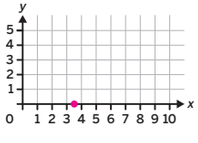
Practice 6.09

Name _____ Date _____

5 Starting at the origin, which step should come first to graph the ordered pair (3.5, 0)?

- A Move up along the *y*-axis to 3.5.
- B Move to the right along the *x*-axis to 3.5.
- C Move up along the *y*-axis to 0.
- D Move to the right along the *x*-axis to 0.

6 Graph the ordered pair from Problem 5.



Spiral Review

Sample work shown.
Show your thinking.

7 There are 8 tasks to do. If each task takes 4.25 hours to complete, how long will it take to complete all 8 tasks?

$$\begin{array}{r} 24 \\ 425 \\ \times\ \ 8 \\ \hline 3400 \end{array}$$

answer: 34 hours

8 A baker used 3.5 ounces of flour to make a batch of bread. The next batch, the baker added 1.5 ounces. If the baker adds the same amount for each new batch, how much flour will be used in Batch 4?

$$\begin{array}{r} 3.5 \leftarrow \text{Batch 1} \\ +\ 1.5 \leftarrow \text{Batch 2} \\ \hline 5.0 \\ +\ 1.5 \leftarrow \text{Batch 3} \\ \hline 6.5 \\ +\ 1.5 \leftarrow \text{Batch 4} \\ \hline 8.0 \end{array}$$

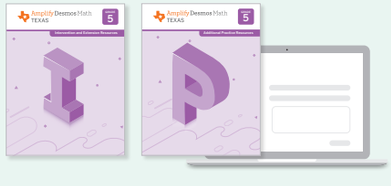
answer: 8 ounces

Grade 5 Unit 6 Lesson 9 581 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 4, 5	1	5.8.A, 5.8.B
Test Practice	2	1	5.8.A, 5.8.B
	3, 6	1	5.8.C
Spiral Review			
	7	1	5.3.E
Fluency	8	1	5.3.K

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 9

Lesson Goal: Graph in the first quadrant of the coordinate grid.

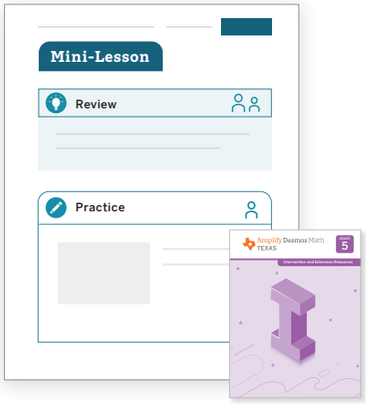
Support

Provide targeted intervention for students by using these resources.

If students identify the process of graphing *x* as moving up and *y* as moving right:

Respond:

- Assign the *Describing How to Graph an Ordered Pair* **Mini-Lesson.** | 15 min
- Revisit Lesson 9.



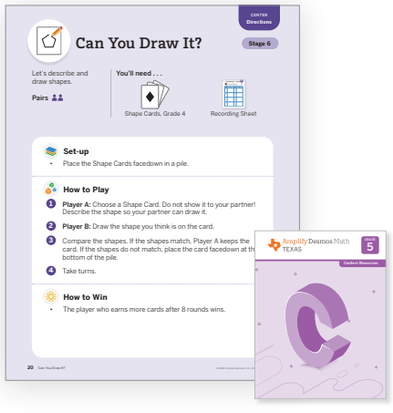
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students identify the correct process and graph incorrectly:

Respond:

- Invite students to play the **Centers**. | 15 min
  Can You Draw It?, Grade 5 Shapes
  How Are They the Same?, Grade 5 Shapes
  Mystery Shape, Grade 5 Shapes
- Have students complete **Lesson 9 Practice**. | 15 min
- **Item Bank**



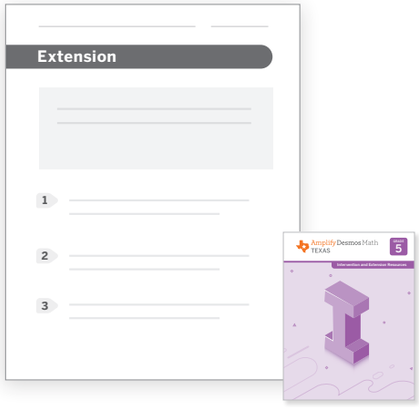
Stretch

Challenge students and extend their learning with these resources.

If students identify the correct process and graph correctly:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities**. | 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., ***x*-axis** / **eje *x***
- Frayer Model templates
- Vocabulary routines





Professional Learning

In the next sub-unit, students will graph additive and multiplicative patterns. How can you ensure you continue to grow and reinforce students' understanding of the coordinate grid?

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Quiz: Sub-Unit 2

Independent | 20 min

Facilitation: Assign this Sub-Unit Quiz at the end of Sub-Unit 2 to evaluate students' proficiency with the key concepts and skills addressed in this sub-unit.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis

Problem(s)	Concept or skill	DOK	TEKS
1–3	Labeling points on the coordinate grid using ordered pairs	1	5.8.C *(R)*
4, 5	Plotting points on the coordinate grid	1	5.8.C *(R)*
6	Describing the process for graphing ordered pairs	1	5.8.B *(S)*

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources include:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

During Sub-Unit 3, if students need further review or practice with concepts or skills, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

PDF *Assessment Resource PDF*

Digital

Unit 6
Quiz: Sub-Unit 2

Name _____ Date _____

Quiz: Sub-Unit 2

Unit 5.6

Use the coordinate grid for Problems 1–5.
Answers for Problems 4 and 5 are shown on the coordinate grid.

1 Write the ordered pair for point *A*.

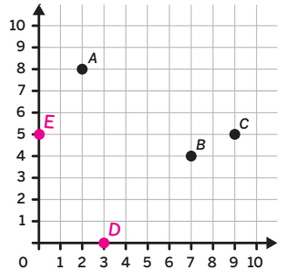
(2, 8)

2 Write the ordered pair for point *B*.

(7, 4)

3 Write the ordered pair for point *C*.

(9, 5)



4 Graph the ordered pair (3, 0) on the coordinate grid and label it *D*.

5 Graph the ordered pair (0, 5) on the coordinate grid and label it *E*.

6 Which statement describes the process for graphing the ordered pair (5, 0)?

A. Start at the origin and move 5 units up along the *y*-axis.

B. Start at the origin and move 5 units right along the *x*-axis.

C. Start at the origin and move 5 units right along the *x*-axis and move 5 units up along the *y*-axis.

D. Start at the origin and move 5 units down along the *y*-axis.

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D Differentiation (Quiz: Sub-Unit 2)

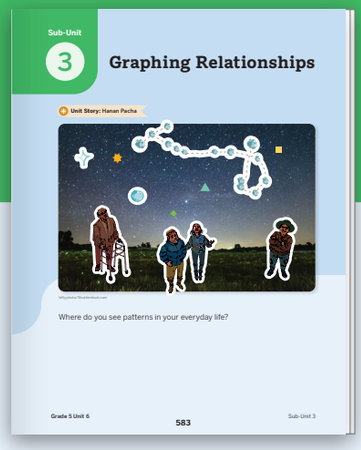
To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goals	Problem(s)	Respond to Student Thinking
Sub-Unit 2: • Describe how to graph an ordered pair on a coordinate grid using key attributes of the coordinate grid. • Graph ordered pairs arising from mathematical problems on the coordinate grid.	1–3	**Support** • **Mini-Lesson:** *Using the Coordinate Grid to Locate Points* (ML 6.07) • **Teacher Move:** Consider revisiting Lesson 7.
	4, 5	**Support** • **Mini-Lesson:** *Plotting Points on the Coordinate Grid* (ML 6.08) • **Teacher Move:** Have students review the problems by labeling the origin as (0, 0). Then provide other opportunities for students to plot points with both zero and non-zero coordinates.
	6	**Support** • **Mini-Lesson:** *Describing How to Graph an Ordered Pair* (ML 6.09) • **Teacher Move:** Invite students to review the problem and then provide additional opportunities for students to describe the steps for graphing ordered pairs.

Notes:

Sub-Unit 3

Graphing Relationships



Sub-Unit 3 Goals

- Recognize the difference between additive and multiplicative patterns in graphs and tables.
- Generate and graph a numerical pattern when given a rule in the form of an equation, such as $y = ax$ or $y = x + a$.
- Represent and interpret real-world and mathematical problems on a coordinate grid and scatterplot.

Progression of TEKS in Sub-Unit 3

- **Lesson 10:** Students identify the difference between additive and multiplicative numerical patterns in input-output tables and graphs.
- **Lesson 11:** Students generate additive and multiplicative numerical patterns in input-output tables and graphs using a rule in the form of an equation.
- **Lesson 12:** Students graph real-world data in the form of numerical patterns and **scatterplots**.

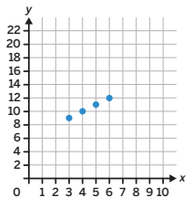
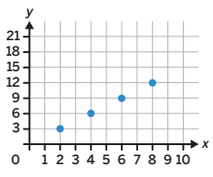
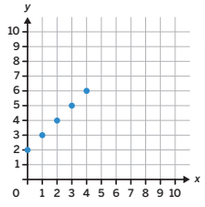
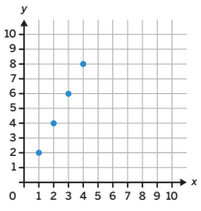
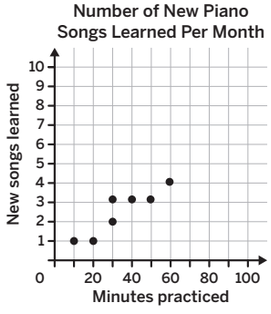
Sub-Unit 3 Progression	Lesson 10*	Lesson 11	Lesson 12
Algebraic Reasoning			
TEKS 5.4.C	○	●	○
TEKS 5.4.D	●	●	○
Data Analysis			
TEKS 5.9.B	○	○	●
Geometry and Measurement			
TEKS 5.8.C	○	○	●

*This lesson builds toward the standard shown.

Math That Matters Most

Sub-Unit 3: Graph data on the coordinate grid using input-output tables and identify numerical patterns or trends.

Progression of Strategies, Skills, or Language

Progression	For example . . .	
Identifying additive and multiplicative numerical patterns in input-output tables.	<table><tr><th>x</th><th>y</th><th></th></tr><tr><td>4</td><td>26</td><td>4 + 22 = 26</td></tr><tr><td>5</td><td>27</td><td>5 + 22 = 27</td></tr><tr><td>6</td><td>28</td><td>6 + 22 = 28</td></tr><tr><td>7</td><td>29</td><td>7 + 22 = 29</td></tr></table> *The table shows an additive relationship because the y value is 22 more than the x value.*	<table><tr><th>x</th><th>y</th><th></th></tr><tr><td>8</td><td>16</td><td>8 x 2 = 16</td></tr><tr><td>16</td><td>32</td><td>16 x 2 = 32</td></tr><tr><td>24</td><td>48</td><td>24 x 2 = 48</td></tr><tr><td>32</td><td>64</td><td>32 x 2 = 64</td></tr></table> *The table shows a multiplicative relationship because the y value is 2 times more than the x value.*
Identifying additive and multiplicative numerical patterns in graphs.	 <table><tr><th>x</th><th>y</th><th></th></tr><tr><td>3</td><td>9</td><td>3 + 6 = 9</td></tr><tr><td>4</td><td>10</td><td>4 + 6 = 10</td></tr><tr><td>5</td><td>11</td><td>5 + 6 = 11</td></tr><tr><td>6</td><td>12</td><td>6 + 12 = 12</td></tr></table> *The graph shows an additive relationship because the y value is 6 more than the x value.*	 <table><tr><th>x</th><th>y</th><th></th></tr><tr><td>2</td><td>3</td><td>2 x 1.5 = 3</td></tr><tr><td>4</td><td>6</td><td>4 x 1.5 = 6</td></tr><tr><td>6</td><td>9</td><td>6 x 1.5 = 9</td></tr><tr><td>8</td><td>12</td><td>8 x 1.5 = 12</td></tr></table> *The graph shows a multiplicative relationship because the y value is 1.5 times more than the x value.*
Generating numerical patterns using a rule in the form of an equation in input-output tables and on graphs.	$y = x + 2$  <table><tr><th>x-value</th><th>y-value</th><th>ordered pair</th><th></th></tr><tr><td>0</td><td>2</td><td>(0, 2)</td><td>0 + 2 = 2</td></tr><tr><td>1</td><td>3</td><td>(1, 3)</td><td>1 + 3 = 4</td></tr><tr><td>2</td><td>4</td><td>(2, 4)</td><td>2 + 2 = 4</td></tr><tr><td>3</td><td>5</td><td>(3, 5)</td><td>3 + 2 = 5</td></tr><tr><td>4</td><td>6</td><td>(4, 6)</td><td>4 + 2 = 6</td></tr></table>	$y = 2x$  <table><tr><th>x-value</th><th>y-value</th><th>ordered pair</th><th></th></tr><tr><td>0</td><td>0</td><td>(0, 0)</td><td>0 x 2 = 2</td></tr><tr><td>1</td><td>2</td><td>(1, 2)</td><td>1 x 2 = 2</td></tr><tr><td>2</td><td>4</td><td>(2, 4)</td><td>2 x 2 = 4</td></tr><tr><td>3</td><td>6</td><td>(3, 6)</td><td>3 x 2 = 6</td></tr></table>
Graphing discrete data on a scatterplot.	Ordered Pairs (10, 1) (20, 1) (30, 2) (30, 3) (40, 3) (50, 3) (60, 4) 	*This information could be used to determine if there are any trends between how many minutes are spent practicing the piano and how many new songs are learned.*

Unit 6
Lesson
10

Student Edition pages and Presentation Screens support learning in this lesson.



Patterns in Tables and Graphs

Recognizing Additive and Multiplicative Relationships

Let's recognize different numerical patterns.

Key Concepts

Today's Goal

1. **Goal:** Recognize additive and multiplicative patterns given in a table or graph.
2. **Language Goal:** Explain how to identify a pattern in a table or graph. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students analyze data represented in input-output tables and graphs to recognize the difference between additive and multiplicative patterns. They notice that an input-output table is a helpful tool to determine the type of pattern represented by ordered pairs on a graph. They communicate their mathematical ideas as they explain how they identified each pattern. **(TEKS 5.1.B, 5.1.D, 5.1.E, 5.1.F, 5.1.G)**

Prior Learning

In Grade 4, students used an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship between the values in the resulting sequence.

Future Learning

In Lesson 11, students will generate and graph numerical patterns when given a rule in the form of $y = ax$ or $y = x + a$.

Integrating Rigor in Student Thinking

- Students develop their **conceptual understanding** of additive and multiplicative patterns in input-output tables and graphs.

Vocabulary

Review Vocabulary

input-output table

ordered pair(s)

TEKS

Addressing

5.4.D

Recognize the difference between additive and multiplicative numerical patterns given in a table or graph.

Mathematical Practices: 5.1.B, 5.1.D, 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.C, 3.D, 3.E, 3.F

Building On	Building Toward
4.5.B	5.4.C

Building Math Identity

I am a doer of math.
How and when do you use math outside of the classroom?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

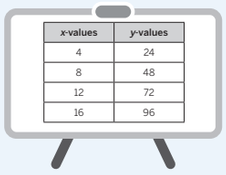
60 min

TEKS: 5.1.B, 5.1.D, 5.1.E, 5.1.F, 5.1.G, 5.4.D

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to analyze input-output tables with additive and multiplicative patterns. They discuss similarities and differences between the patterns in the tables.



Activity 1

Pairs | 20 min

Students analyze data represented in input-output tables and determine whether the tables represent an additive or multiplicative pattern.

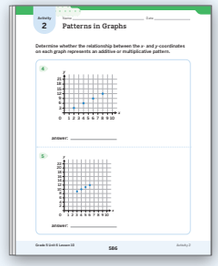
Materials: Activity 1 PDF
Additional Prep Cut out: Activity 1 PDF



Activity 2

Pairs | 15 min

Students apply their understanding of additive and multiplicative patterns in input-output tables to determine the relationship between *x*- and *y*-coordinates on graphs.



Synthesis

Whole Class | 10 min

Students review and reflect on strategies for identifying the numerical pattern represented on a graph and input-output table.

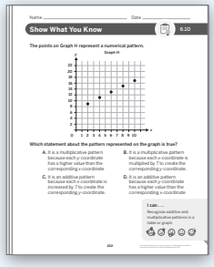


Show What You Know

Independent | 5 min

Students demonstrate their understanding of additive and multiplicative patterns by recognizing the pattern shown on a graph.

Materials: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

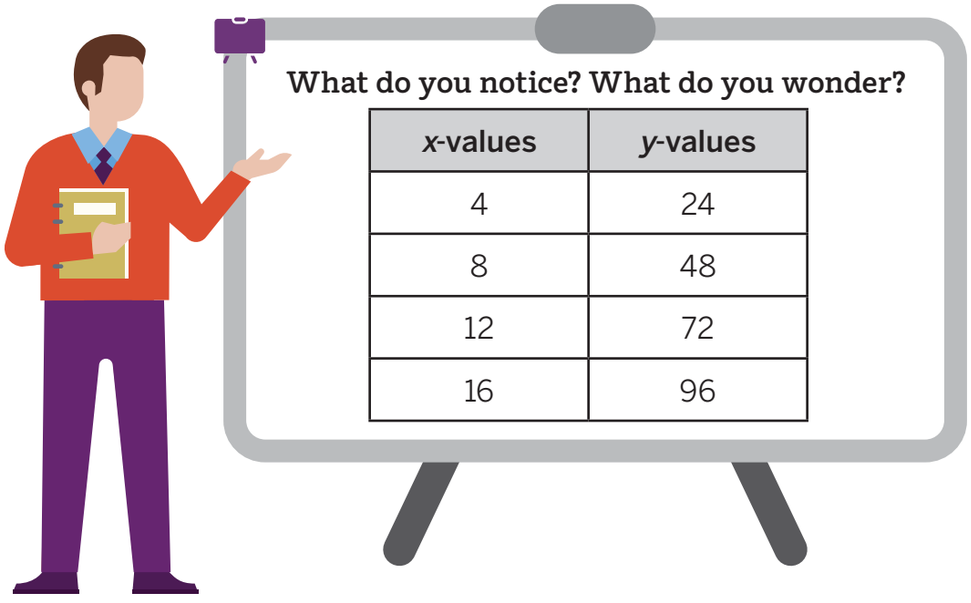
Whole Class | 10 min

Presentation Screens

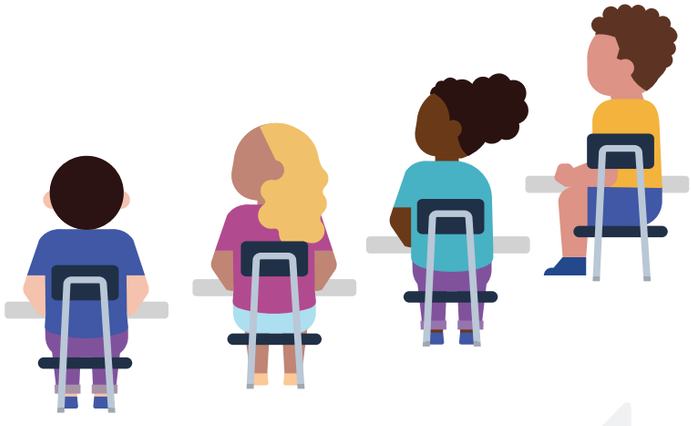


Warm-Up Notice and Wonder

Purpose: Students examine an input-output table to prepare for recognizing the difference between additive and multiplicative patterns in Activity 1.



x-values	*y*-values
4	24
8	48
12	72
16	96



1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Use the Think-Pair-Share routine, Ask, "What rule describes the relationship between the *x*- and *y*-values? How do you know?"

Say, "When the relationship between values represented in an input-output table shows addition, that is an *additive* pattern. When the relationship between values represented in an input-output table shows multiplication, that is a *multiplicative* pattern."

Students might say . . . ELPS 2.B

I notice that the output is larger than the input.

I notice that the input is always multiplied by 6 to get the output.

I wonder if the x and y values could be graphed on the coordinate plane.

I wonder if these are ordered pairs.

Pairs | 20 min

Activity 1 Patterns in Tables

Purpose: Students analyze data in input-output tables to recognize and differentiate between additive and multiplicative patterns.

Presentation Screens



Materials

Lesson Resources:

- Distribute the pre-cut cards from the Activity 1 PDF to each pair.

Short on time? Consider completing Problem 3 as a whole class.

1 Launch



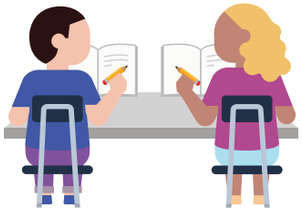
Read aloud the directions for Problem 1.

Say, "Work with your partners to complete Problems 1 and 2."

Have students complete Problem 3 independently.

EB **Emergent Bilinguals** Encourage pairs to restate the directions to one another, in their own words, before starting Problem 1. ELPS 1.E, 2.C, 2.D, 2.F

2 Monitor



While students complete **Problem 2**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "How is the *y*-value changing in relation to the *x*-value?"
- Ask, "How could you use what you know about rules to determine the relationship?"

MLR **MLR2: Collect and Display** ELPS 3.C, 3.D, 3.E, 3.F

Collect student language used to describe the relationship between the terms in each pattern, such as the language shown in Rows 2 and 3 in the *Differentiation* table, on a class display.

3 Connect



Display Cards E and H from the Activity 1 PDF.

Use the Think-Pair-Share routine. Ask, "How did you determine the pattern shown in the table?"

Key Takeaway: Say, "You can determine whether the pattern shown in an input-output table is additive or multiplicative by determining how each *y*-value changes relative to the *x*-value. If you can add the same amount to each *x*-value to get the *y*-value, then the relationship is additive. If you can multiply the same amount by each *x*-value to get each *y*-value, then the relationship is multiplicative."

Student Edition

Unit 6
Lesson
10

Name _____ Date _____

TEKS: 5.1.B, 5.1.D, 5.1.E, 5.1.F, 5.1.G, 5.4.D

Patterns in Tables and Graphs

Let's recognize different numerical patterns.



Warm-Up eyes on teacher

I am a doer of math.
How and when do you use math outside of the classroom?

Activity 1

Patterns in Tables

Hands-On

You and your partner will be given a set of cards with different input-output tables.

1 **Sort**

Determine whether each table shows an *additive* or *multiplicative* pattern. Write the letter in the correct column.

Additive	Multiplicative
B, D, F, H	A, C, E, G

2 **Discuss** Oral activity: No writing expected.

How did you identify the pattern?

Activity 1

Name _____ Date _____

Patterns in Tables (continued)

3 Mia's parents own a small business. As a kid, Mia wanted to start a business too. She knew how to make colorful string bracelets that represent the constellations, so she sold her bracelets after school. The table shows the number of bracelets sold (x) each day and the dollars of profit earned that day (y).

Day	x	y
Monday	4	10
Tuesday	2	8
Wednesday	7	13
Thursday	6	12

Which statement about the pattern represented in the table is true?

(A) It is an additive pattern because the y-value is 6 more than the x-value.

(B) It is an additive pattern because the x-value is less than the y-value.

(C) It is a multiplicative pattern because the y-value is greater than the x-value.

(D) It is a multiplicative pattern because the y-value is 6 times as much as the x-value.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Recognize that the y-value is increasing.	*Each y-value is more than each x-value.*	**Support** Ask, "What do you notice about the way the y-values are increasing in relation to the x-values?"
Almost there Recognize an additive or multiplicative pattern by only looking at the first set of values in a table that shows addition.	*The pattern on Card A is additive because the y-value in Row 2 is 1.5 more than the x-value in Row 2.*	**Support** Ask, "How could you prove that the pattern is additive for all x-values?"
Recognize that the patterns are additive or multiplicative by identifying the relationship between the x- and y-values.	*The pattern on Card A is multiplicative because each y-value is 2.5 times each x-value.*	**Stretch** Ask, "How could you determine what the y-value would be if the x-value was 4?"

Pairs | 15 min

Presentation Screens



Activity 2 Patterns in Graphs

Purpose: Students analyze data represented on graphs to recognize and differentiate between additive and multiplicative patterns.

1 Launch



Read aloud the directions for Problems 4 and 5.

Say, "Work with your partner to complete Problems 4–7."

A **Accessibility: Memory and attention** Provide blank input-output tables. Encourage students to record the *x*- and *y*-coordinates of the points represented on the coordinate grid.

2 Monitor



While students complete **Problem 4**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What do you notice about the graphs?"
- Ask, "How could you use the coordinates to help you determine whether the patterns in the graphs are multiplicative or additive?"

MLR **MLR2: Collect and Display** ELPS 3.C, 3.D, 3.E, 3.F

- Collect student language used to justify number patterns, such as *more than* or *times*.
- Add the language students use to a class display and remind them to continue to refer to and use the display while analyzing graphs.

3 Connect



Display the graphs from Problems 4 and 5.

Use the Think-Pair-Share routine. Ask, "How did you determine the pattern shown on the graph?"

Key Takeaway: Say, "You can determine whether the pattern shown on a graph is additive or multiplicative by determining how each *y*-value changes relative to the *x*-value. You can use an input-output table to represent the *x*- and *y*-values of each point on the coordinate grid to help you determine whether the pattern is multiplicative or additive."

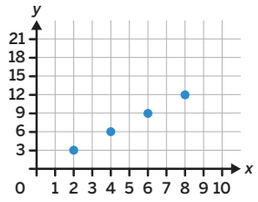
Activity 2

Name _____ Date _____

Patterns in Graphs

Determine whether the relationship between the *x*- and *y*-coordinates on each graph represents an additive or multiplicative pattern.
Sample work shown.

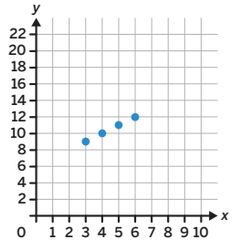
4



x	y	
2	3	2 × 1.5 = 3
4	6	4 × 1.5 = 6
6	9	6 × 1.5 = 9
8	12	8 × 1.5 = 12

answer: multiplicative

5



x	y	
3	9	3 + 6 = 9
4	10	4 + 6 = 10
5	11	5 + 6 = 11
6	12	6 + 6 = 12

answer: additive

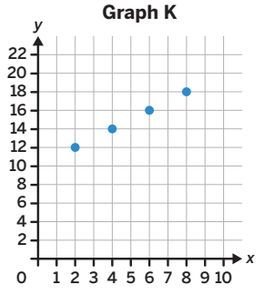
Patterns in Graphs (continued)

6 Discuss Oral activity: No writing expected. Sample response shown.
How did you determine whether the points on the graph in Problem 5 represent a multiplicative or additive pattern?

I used the points to create an input-output table. I noticed that all of the y-values are 6 more than the x-values. So, the pattern is additive.

The points on Graph K represent a numerical pattern.

Graph K



7 Which table contains the ordered pairs from the graph and represents the same pattern?

(A)

x-value	12	14	16	18
y-value	2	4	6	8

(B)

x-value	2	4	6	8
y-value	12	14	16	18

(C)

x-value	2	4	6	8
y-value	10	12	14	16

(D)

x-value	2	4	6	8
y-value	6	8	10	12

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Explain that they determined the pattern by examining 1 point on the graph.	*I looked at 1 point and could see that the y-value is 1.5 more than the x-value.*	**Support** Ask, "Writing down the ordered pairs from the graph can help you determine the pattern. What pattern do you notice from the ordered pairs?"
Explain that they determined the pattern by representing a point on the graph with an ordered pair.	*I represented this point with (4, 6). I can see the y-value is 2 more than the x-value.*	**Strengthen** Ask, "What is the relationship between each *x*- and *y*-value?"
Explain that they determined the pattern by representing all the points on the coordinate grid using an input-output table to determine whether the rule was additive or multiplicative.	*I represented all the points from the graph in an input-output table, and I can see that all of the y-values are 1.5 times the value of all the x-values.*	**Stretch** Ask, "What equation represents the relationship between *x* and *y* on the graph?"

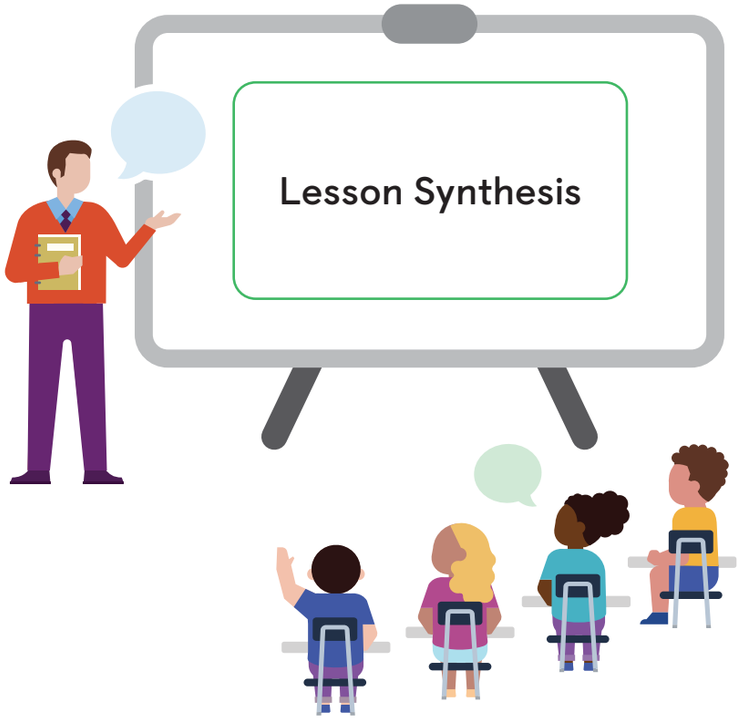
Whole Class | 10 min

Synthesis

Lesson Takeaway: The data represented in input-output tables and on graphs can be analyzed to determine whether they follow a multiplicative or additive pattern.

Presentation Screens





Use the Think-Pair-Share routine. Ask, "The graph and table represent the same data. How could you determine whether the data on the graph and input-output table follow a multiplicative or additive pattern?"

Say, "You can analyze data in input-output tables and graphs to determine if they follow a multiplicative or additive pattern. When the relationship between the *x*- and *y*-coordinates shows addition, the pattern is additive. When the relationship shows multiplication, the pattern is multiplicative."

Invite students to refer to the **Summary** during Practice or anytime during the year.

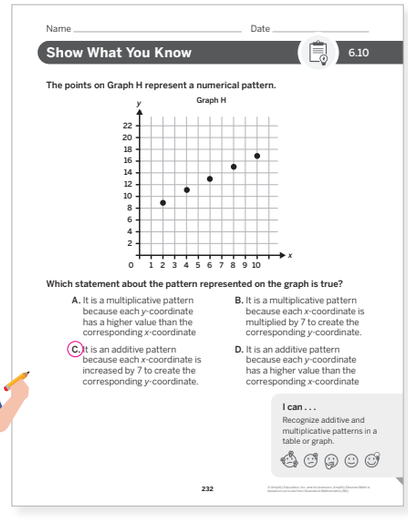
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.10

The points on Graph H represent a numerical pattern.

Graph H

Which statement about the pattern represented on the graph is true?

A. It is a multiplicative pattern because each *y*-coordinate has a higher value than the corresponding *x*-coordinate

B. It is a multiplicative pattern because each *x*-coordinate is multiplied by 7 to create the corresponding *y*-coordinate.

C. It is an additive pattern because each *x*-coordinate is increased by 7 to create the corresponding *y*-coordinate.

D. It is an additive pattern because each *y*-coordinate has a higher value than the corresponding *x*-coordinate

I can . . .
Recognize additive and multiplicative patterns in a table or graph.

232



Today's Goal

1. **Goal:** Recognize additive and multiplicative patterns given in a table or graph.
   - In the *Show What You Know*, students identified the numerical pattern represented on a graph.
2. **Language Goal:** Explain how to identify a pattern in a table or graph. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 10
Practice

Students using digital

Students using print

Summary 6.10

You can analyze the data in input-output tables and graphs to determine whether they follow an additive or multiplicative pattern.

Table A

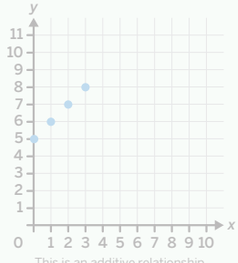
x	y
0 × 5	0
1 × 5	5
2 × 5	10
3 × 5	15

Multiplicative

Table B

x	y
0 + 5	5
1 + 5	6
2 + 5	7
3 + 5	8

Additive



This is an additive relationship.
It represents the relationship in Table B.

Practice 6.10

The table represents a numerical pattern.

x-value	5	10	15	20
y-value	23	28	33	38

1 Which statement about the pattern represented in the table is true?

(A) It is a multiplicative pattern because each *y*-coordinate has a higher value than the corresponding *x*-coordinate.

(B) It is an additive pattern because each *x*-coordinate has a higher value than the corresponding *y*-coordinate.

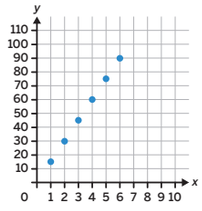
(C) It is a multiplicative pattern because each *x*-coordinate is multiplied by 18 to create the corresponding *y*-coordinate.

(D) It is an additive pattern because each *x*-coordinate is increased by 18 to create the corresponding *y*-coordinate.

Practice 6.10

Name _____ Date _____

The points on the graph represent a numerical pattern.



2 Complete the statement about the pattern represented by the relationship between *x* and *y*.

Choose **ONE** correct answer in each box to complete the sentence.

The relationship shown is an (A) additive / (B) multiplicative pattern because each *x*-coordinate is (A) increased by 15 / (B) multiplied by 15 in order to create the corresponding *y*-coordinate.

3 Which table represents an additive relationship?

(A)

x-value	2	4	6	8
y-value	1	2	3	4

(B)

x-value	0	1	2	3
y-value	0	1	2	3

(C)

x-value	6	12	24	36
y-value	10	16	28	40

(D)

x-value	5	10	15	20
y-value	10	20	30	40

Practice 6.10

Name _____ Date _____

Spiral Review

Determine each quotient. Sample work shown.

4 35.25 ÷ 5

```
     7.05
5)35.25
 -35 ↓
     .2
 -   0↓
     .25
 -   .25
       0
```

answer: 7.05

5 99.60 ÷ 12

```
     8.30
12)99.60
 -96 ↓
     3.6
 -   3.6
       0
```

answer: 8.30

6 Order the decimals from *least* to *greatest*.

0.86	0.806	0.608	0.086	0.68
0.086	0.608	0.68	0.806	0.86
least				greatest

7 Order the decimals from *greatest* to *least*.

0.104	0.014	0.401	0.41	0.14
0.41	0.401	0.14	0.104	0.014
greatest				least

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 3	2	5.4.B
Test Practice	2	2	5.4.B
Spiral Review			
Fluency	4, 5	1	5.3.C
	6, 7	1	5.2.B

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 10

Lesson Goal: Recognize additive and multiplicative patterns given in a table or graph.

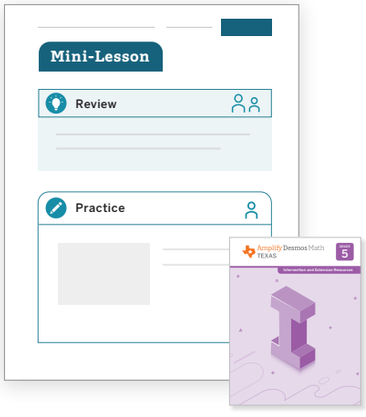
Support

Provide targeted intervention for students by using these resources.

If students determine that the pattern is multiplicative:

Respond:

- Assign the *Identifying Additive and Multiplicative Patterns* **Mini-Lesson. |** 15 min
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



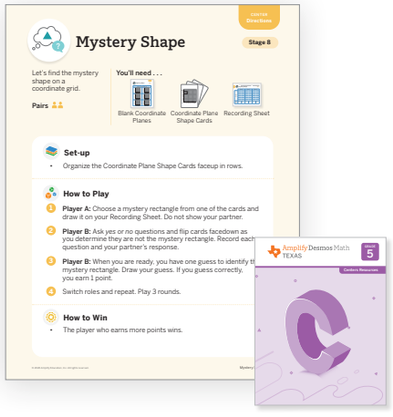
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students determine that the pattern is additive because the *y*-value is greater than the *x*-value:

Respond:

- Invite students to play these **Centers. |** 15 min ***Mystery Shape: Shapes on the Coordinate Plane***
- Have students complete **Lesson 10 Practice. |** 15 min
- **Item Bank**



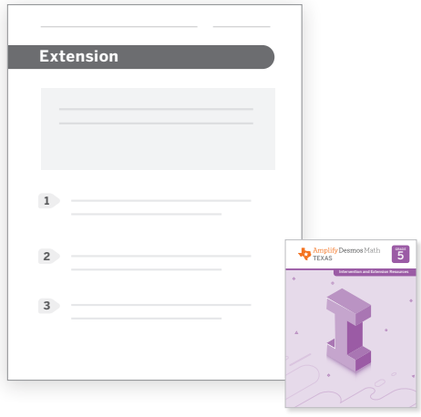
Stretch

Challenge students and extend their learning with these resources.

If students determine that the pattern is additive because the same number can be added to each *x*-coordinate to determine each *y*-coordinate:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates,
- Frayer Model templates
- Vocabulary routines



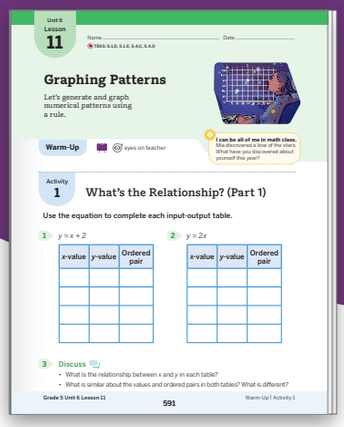


Professional Learning

How effective were your questions in supporting students' thinking today? What did students say or do that showed they were effective?

Unit 6
Lesson
11

Student Edition pages and Presentation Screens support learning in this lesson.



Graphing Patterns

Graphing Multiplicative and Additive Patterns

Let's generate and graph numerical patterns using a rule.

Key Concepts

Today's Goals

1. **Goal:** Generate and graph numerical patterns when given a rule in the form of $y = ax$ or $y = x + a$.
2. **Language Goal:** Explain whether a relationship between x- and y-values is multiplicative or additive. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use a rule to generate numerical patterns and graph those patterns on a coordinate grid. They analyze input-output tables and graphs to determine whether the pattern is additive or multiplicative and describe the relationship between x and y using the support of the coordinate grid. **(TEKS 5.1.D, 5.1.E)**

Prior Learning

In Lesson 10, students analyzed tables and graphs to recognize the difference between additive and multiplicative patterns.

Future Learning

In Lesson 12, students will graph ordered pairs generated from real-world problems.

Integrating Rigor in Student Thinking

- Students continue to develop their **conceptual understanding** of graphing additive and multiplicative numerical patterns.
- Students **apply** their understanding of graphing additive and multiplicative patterns to generate a numerical pattern when given a rule.

Vocabulary

Review Vocabulary

axis (axes)	*x-coordinate*
coordinate grid	*y-coordinate*

TEKS

Addressing

5.4.C

Generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph.

Also Addressing: **5.4.D**

Math Process Standards: 5.1.D, 5.1.E

ELPS: 1.E, 2.B, 2.C, 2.E, 2.F, 3.D, 3.F

Building On	Building Towards
4.6.A	**6.4.A**

Building Math Identity

I can be all of me in math class.
Mia discovered a love of the stars.
What have you discovered about yourself this year?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

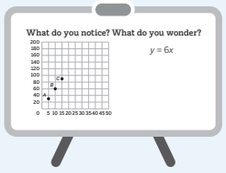
60 min

TEKS: 5.1.D, 5.1.E, 5.4.C, 5.4.D

Warm-Up

Whole Class | 10 min

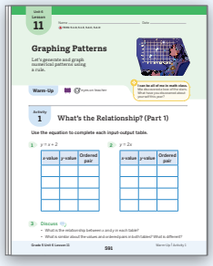
Students use the **Notice and Wonder** routine to share what they notice and wonder about a coordinate grid and an equation.



Activity 1

Pairs | 15 min

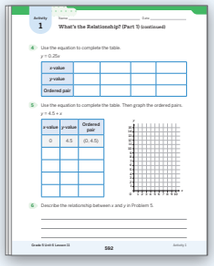
Students use an equation to generate a numerical pattern in an input-output table. They conclude that the ordered pairs follow the numerical pattern represented by the equation.



Activity 2

Pairs | 20 min

Students use an equation to generate ordered pairs in an input-output table before graphing the ordered pairs. They then describe the relationship between *x* and *y* using an input-output table and graph.



Synthesis

Whole Class | 10 min

Students review and reflect on describing the relationship between *x*- and *y*-values as additive or multiplicative.

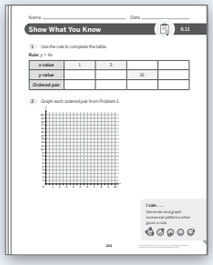


Show What You Know

Independent | 5 min

Students demonstrate their understanding by generating a numerical pattern from a given rule and graphing the numerical pattern as ordered pairs.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilingual

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

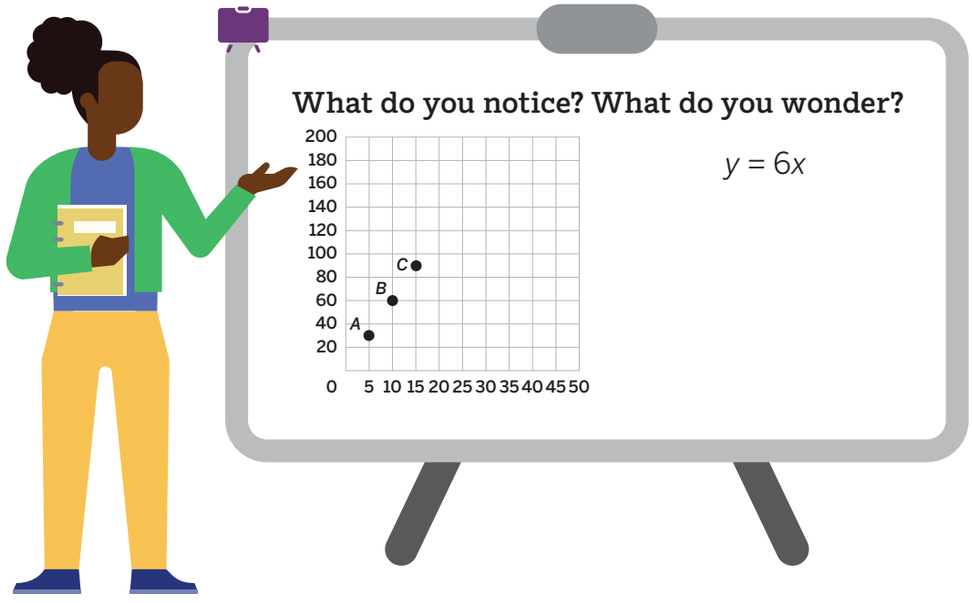
Whole Class | 10 min

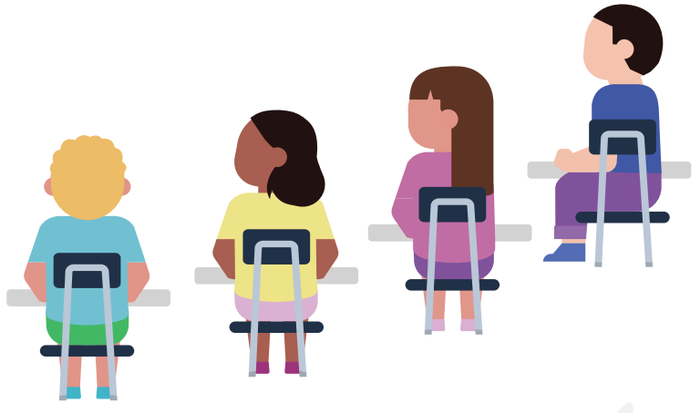
Presentation Screen



Warm-Up Notice and Wonder

Purpose: Students examine a coordinate grid and an equation to prepare for graphing patterns generated from a rule in the form of an equation.





1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Say, "Today, you will graph patterns on the coordinate grid. When you graph patterns, you call the coordinate grid a graph."

Students might say . . . ELPS 2.B

I notice that the coordinates on the graph make the equation true.

I notice that the pattern is to multiply by 6 each time.

I wonder if the next point would be (20, 100).

I wonder if graphs always match a pattern.

Pairs | 15 min

Activity 1 What's the Relationship? (Part 1)

Purpose: Students generate numerical patterns when given a rule in the form of an equation to represent additive and multiplicative relationships in an input-output table.

Presentation Screens



Short on time? Consider completing Problems 5 and 6 as a whole class.

1 Launch



Read aloud the directions. ELPS 1.E

EB **Emergent Bilinguals** Invite students to share different meanings of the term *rule*. Clarify which meaning this word will have for this activity. ELPS 3.D, 3.F

Say, "Work with your partner to complete Problems 1–6."

2 Monitor



After students have completed **Problem 1**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What number could be used to represent x?"
- Ask, "How could you determine the output, or y-value?"

3 Connect



Display partially completed table and the equation $y = x + 3$

Use the Think-Pair-Share routine. Ask, "How can you use the equation to complete the pattern in the table?"

Key Takeaway: Say, "You can generate a numerical pattern in an input-output table using a rule given in the form of an equation. The rule is represented by the operation being performed and either the addend or the multiplier in the equation."

Unit 6 Lesson **11**

Name _____ Date _____

TEKS: 5.1.D, 5.1.E, 5.4.C, 5.4.D

Graphing Patterns

Let's generate and graph numerical patterns using a rule.



Warm-Up eyes on teacher

I can be all of me in math class. Mia discovered a love of the stars. What have you discovered about yourself this year?

Activity 1 What's the Relationship? (Part 1)

Use the equation to complete each input-output table.
Sample responses shown for Problems 1 and 2.

1 $y = x + 2$

x-value	*y*-value	Ordered pair
0	2	(0, 2)
2	4	(2, 4)
4	6	(4, 6)
5	7	(5, 7)

2 $y = 2x$

x-value	*y*-value	Ordered pair
0	0	(0, 0)
2	4	(2, 4)
4	8	(4, 8)
5	10	(5, 10)

3 Discuss Oral activity: No writing expected.

- What is the relationship between *x* and *y* in each table?
- What is similar about the values and ordered pairs in both tables? What is different?

Activity **1** Name _____ Date _____

What's the Relationship? (Part 1) (continued)

4 Use the equation to complete the table. **Sample response shown.**

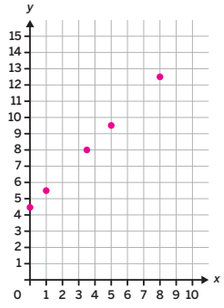
$y = 0.25x$

x-value	1	2	4	5
y-value	0.25	0.50	1	1.25
Ordered pair	(1, 0.25)	(2, 0.50)	(4, 1)	(5, 1.25)

5 Use the equation to complete the table. Then graph the ordered pairs.

$y = 4.5 + x$ **Sample response shown.**

x-value	*y*-value	Ordered pair
0	4.5	(0, 4.5)
1	5.5	(1, 5.5)
3.5	8	(3.5, 8)
5	9.5	(5, 9.5)
8	12.5	(8, 12.5)



6 Describe the relationship between *x* and *y* in Problem 5.
Sample response shown.

X and y have an additive relationship because the pattern is to add 4.5 to every x to get the y-values.

D Differentiation | Teacher Moves

Presentation Screens

Look for students who . . .	For example . . .	Provide support . . .
Almost there Use the rule to generate the ordered pairs as (*y*, *x*).	*x*-value: 2, 4, 6, 7 *y*-value: 0, 2, 4, 5 ordered pair: (2, 0), (4, 2), (6, 4), (7, 5)	**Support** Say, "When generating ordered pairs, *x* always comes first."
Almost there Interpret the rule as multiplicative to generate ordered pairs.	*x*-value: 0, 2, 4, 5 *y*-value: 0, 4, 8, 10 ordered pair: (0, 0), (2, 4), (4, 8), (5, 10)	**Support** Say, "The rule is *x* plus 2 equals *y*. When you plug in *x*, you are adding 2 to get *y*."
Use the additive rule to generate ordered pairs.	*x*-value: 0, 2, 4, 5 *y*-value: 2, 4, 6, 7 ordered pair: (0, 2), (2, 4), (4, 6), (5, 7)	**Strengthen** Ask, "What do you notice about the graph? Would the pattern of the graph continue if you graphed more ordered pairs? How do you know?"

Pairs | 20 min

Activity 2 What's the Relationship? (Part 2)

Purpose: Students generate numerical patterns when given a rule in the form of an equation to represent additive and multiplicative relationships in an input-output table and on the coordinate grid.

Presentation Screens



1 Launch



Read aloud the directions.

Say, "Work with your partner to complete Problems 7–11."

2 Monitor



After students have completed **Problem 7**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What operation is indicated when the number is right next to x?"
- Ask, "What number could be used to represent x?"

A **Accessibility: Memory and attention** Generate the x-values for students by filling in their tables.

3 Connect



Display the partially completed graph and the equation $y = 2x$.

Use the Think-Pair-Share routine. Ask:

- "Does the coordinate grid represent the pattern in the equation? How do you know?"
- "How could you use the equation to continue the pattern on the graph?"

Record the x- and y-values generated by students in the blank input-output table and graph an additional ordered pair.

Key Takeaway: Say, "When graphing an equation, it can be helpful to create an input-output table first to represent each ordered pair and then graph each ordered pair."

Activity 2

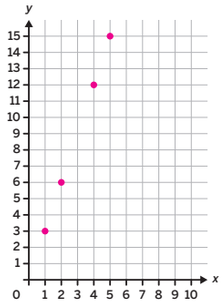
Name _____ Date _____

What's the Relationship? (Part 2)

For Problems 7–9, use the equation to complete the table. Then graph the ordered pairs. Sample responses shown for Problems 7–10.

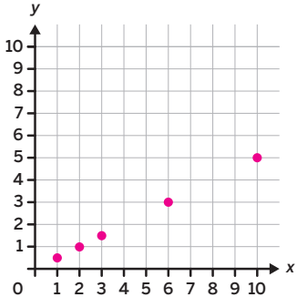
7 $y = 3x$

x-value	*y*-value	Ordered pair
1	3	(1, 3)
2	6	(2, 6)
4	12	(4, 12)
5	15	(5, 15)



8 $y = 0.5x$

x-value	*y*-value	Ordered pair
1	0.5	(1, 0.5)
2	1	(2, 1)
3	1.5	(3, 1.5)
6	3	(6, 3)
10	5	(10, 5)



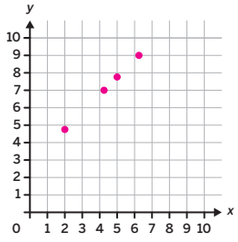
Activity 2

Name _____ Date _____

What's the Relationship? (Part 2) (continued)

9 $y = 2.75 + x$

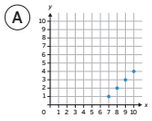
x-value	*y*-value	Ordered pair
2	4.75	(2, 4.75)
4.25	7	(4.25, 7)
5	7.75	(5, 7.75)
6.25	9	(6.25, 9)

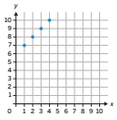


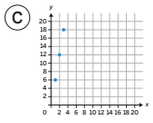
10 Describe the relationship between *x* and *y* in Problem 9.

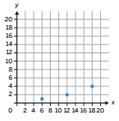
X and y have an additive relationship because the pattern is to add 2.75 to each x-value to get the y-value.

11 Which graph represents the equation $y = x + 6$?

(A) 

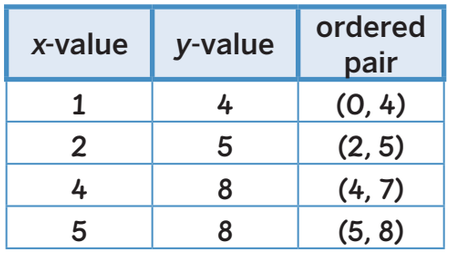
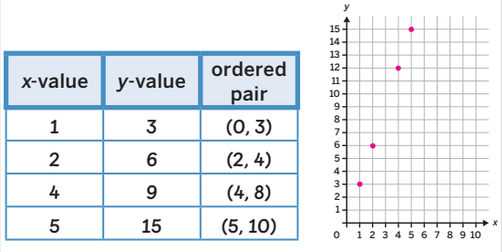
(B) 

(C) 

(D) 

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Interpret the rule as additive to generate ordered pairs.	 *x*-value | *y*-value | ordered pair 1 | 4 | (0, 4) 2 | 5 | (2, 5) 4 | 8 | (4, 7) 5 | 8 | (5, 8)	**Support** Ask, "The rule is 3*x* equals *y*. How could you revise the *x*- and *y*-values and ordered pairs to represent the rule?"
Use the rule to generate and graph ordered pairs.	 *x*-value | *y*-value | ordered pair 1 | 3 | (0, 3) 2 | 6 | (2, 4) 4 | 9 | (4, 8) 5 | 15 | (5, 10)	**Stretch** Ask, "What could the points represent in the real-world?"

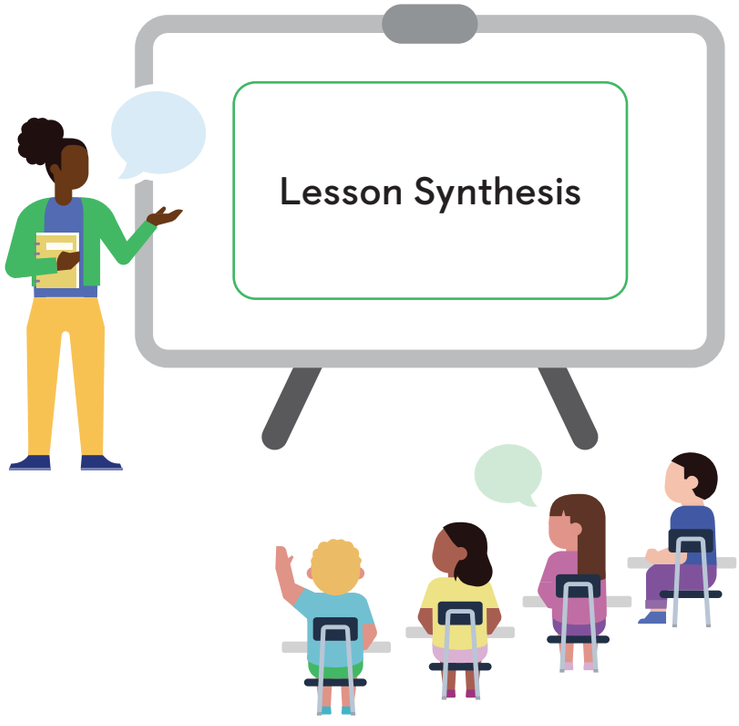
Whole Class | 10 min

Presentation Screen



Synthesis

Lesson Takeaway: Relationships between *x*- and *y*-values can be generated using rules and then represented using coordinate grids and input-output tables.



Display the graph and table representing $y = 1.5x$.

Use the Think-Pair-Share routine. Ask:

- "Is the relationship between *x* and *y* multiplicative or additive? How do you know?"
- "What is another ordered pair that could be added to the graph to continue the pattern?"

MLR **MLR8: Discussion Supports – Sentence Frames** ELPS 1.E, 2.C, 2.E

Display these sentence frames to support discussion.

- "I think ___ because ___."
- "I agree/disagree because ___."

Say, "Rules in the form of an equation can be used to determine whether the relationship between *x* and *y* is additive or multiplicative. By using an equation, you can generate and graph ordered pairs that represent the relationship."

Invite students to refer to the **Summary** during Practice or anytime during the year.

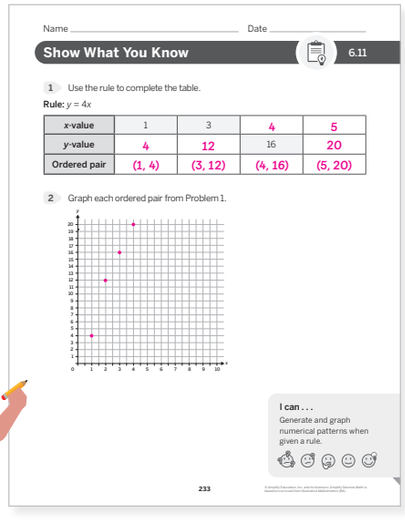
Show What You Know

Independent | 5 min

Students using digital



PDF Show What You Know PDF


Name _____ Date _____

Show What You Know 6.11

1 Use the rule to complete the table.

Rule: $y = 4x$

x-value	1	3	4	5
y-value	4	12	16	20
Ordered pair	(1, 4)	(3, 12)	(4, 16)	(5, 20)

2 Graph each ordered pair from Problem 1.

I can . . .
Generate and graph numerical patterns when given a rule.

233

Today's Goals

1. **Goal:** Generate and graph numerical patterns when given a rule in the form of $y = ax$ or $y = x + a$.
   - In the *Show What You Know*, students generated and graphed numerical patterns using a rule.
2. **Language Goal:** Explain whether a relationship between *x*- and *y*-values is multiplicative or additive. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

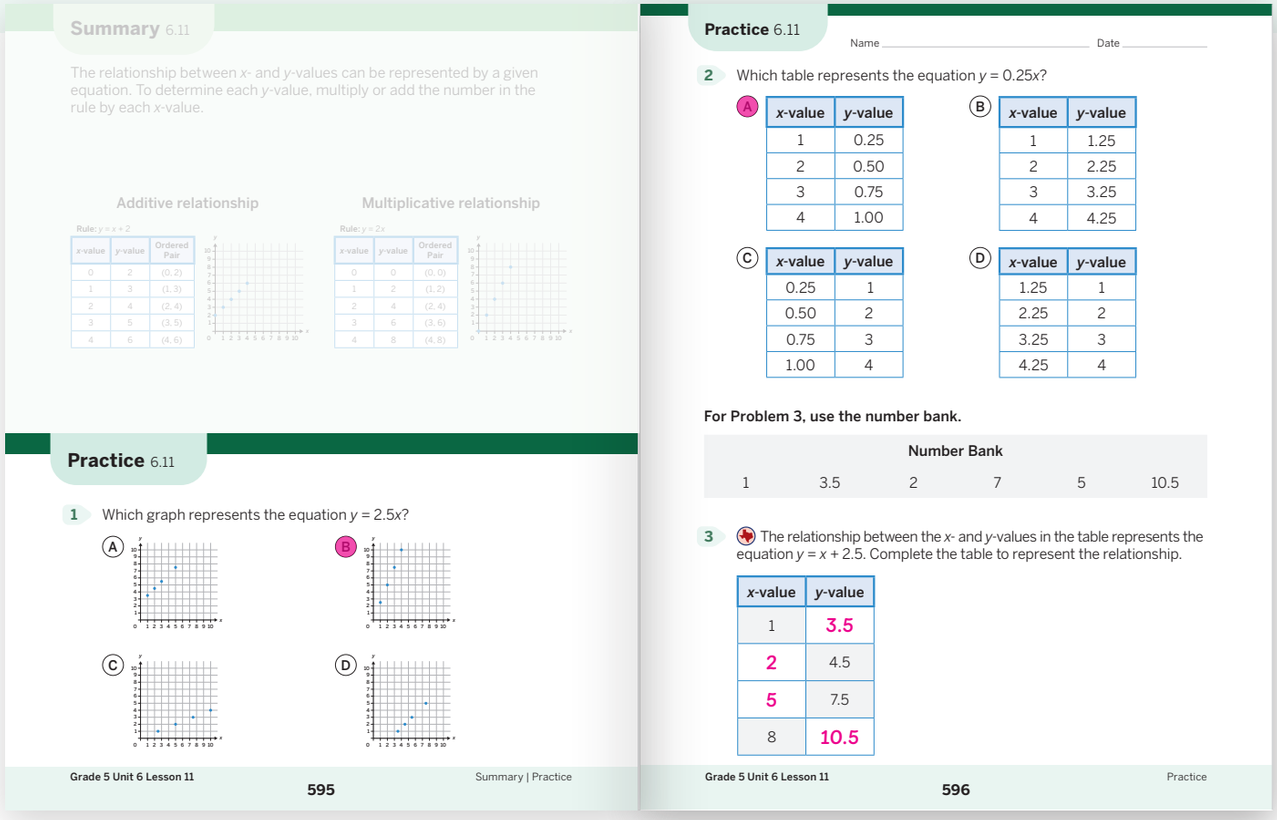
Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 11
Practice

Students using digital

Students using print



Summary 6.11

The relationship between *x*- and *y*-values can be represented by a given equation. To determine each *y*-value, multiply or add the number in the rule by each *x*-value.

Additive relationship

Rule: $y = x + 2$

x-value	*y*-value	Ordered Pair
0	2	(0, 2)
1	3	(1, 3)
2	4	(2, 4)
3	5	(3, 5)
4	6	(4, 6)

Multiplicative relationship

Rule: $y = 2x$

x-value	*y*-value	Ordered Pair
0	0	(0, 0)
1	2	(1, 2)
2	4	(2, 4)
3	6	(3, 6)
4	8	(4, 8)

Practice 6.11

1 Which graph represents the equation $y = 2.5x$?

A B C D

Grade 5 Unit 6 Lesson 11 595 Summary | Practice

Practice 6.11

Name _____ Date _____

2 Which table represents the equation $y = 0.25x$?

A

x-value	*y*-value
1	0.25
2	0.50
3	0.75
4	1.00

B

x-value	*y*-value
1	1.25
2	2.25
3	3.25
4	4.25

C

x-value	*y*-value
0.25	1
0.50	2
0.75	3
1.00	4

D

x-value	*y*-value
1.25	1
2.25	2
3.25	3
4.25	4

For Problem 3, use the number bank.

Number Bank

1 3.5 2 7 5 10.5

3 The relationship between the *x*- and *y*-values in the table represents the equation $y = x + 2.5$. Complete the table to represent the relationship.

x-value	*y*-value
1	3.5
2	4.5
5	7.5
8	10.5

Grade 5 Unit 6 Lesson 11 596 Practice

Practice 6.11

Name _____ Date _____

Spiral Review

4 Round each number to the different place values shown in the table.

	Nearest whole number	Nearest tenth	Nearest hundredth
7.018	7	7.0	7.02
13.763	14	13.8	13.76
0.895	1	0.9	0.90

For Problems 5 and 6, evaluate the expression. Sample work shown.

Show your thinking.

5 5.82 + 6.59

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 5.82 \\ +\ 6.59 \\ \hline 12.41 \end{array}$$

answer: 12.41

6 12.41 – 7.8

$$\begin{array}{r} {\scriptstyle 11} \\ {\scriptstyle 0\ 1\ 14} \\ {\scriptstyle 12.4\ 1} \\ -\ 7.8\ 0 \\ \hline 4.61 \end{array}$$

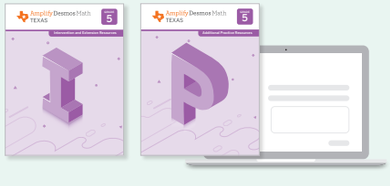
answer: 4.61

Grade 5 Unit 6 Lesson 11 597 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 2	1	5.4.C
Test Practice	3	1	5.4.C
Spiral Review			
	4	1	5.2.C
Fluency	5, 6	1	5.3.K

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 11

Lesson Goal: Generate and graph numerical patterns when given a rule in the form of $y = ax$ or $y = x + a$.

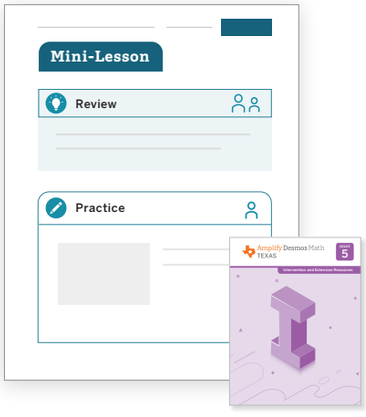
Support

Provide targeted intervention for students by using these resources.

If students generate and graph 0–1 points using the rule:

Respond:

- Assign the *Graphing Ordered Pairs Generated From Number Patterns* **Mini-Lesson. |** 15 min
- Revisit Lesson 10.



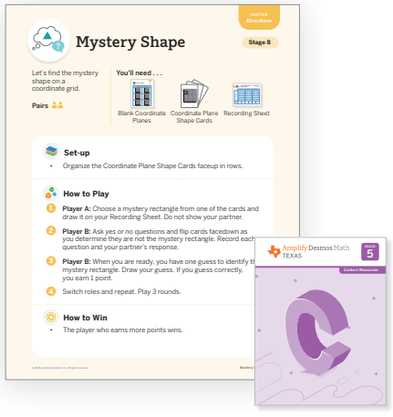
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students generate and graph 2–3 points using the rule:

Respond:

- Invite students to play these **Centers. |** 15 min
  Mystery Shape: Shapes on the Coordinate Plane
- Have students complete **Lesson 11 Practice. |** 15 min
- **Item Bank**



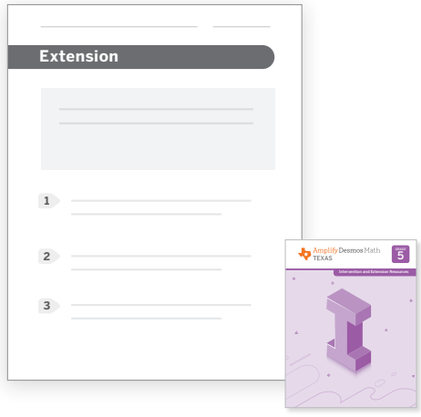
Stretch

Challenge students and extend their learning with these resources.

If students generate and graph 4 points using the rule:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., *coordinate grid/el sistema coordenado*
- Frayer Model templates
- Vocabulary routines



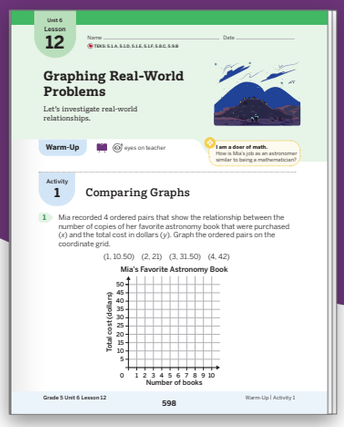


Professional Learning

With only 1 lesson remaining in the unit, where do you see evidence of growth in your students' understanding?

Unit 6
Lesson
12

Student Edition pages and Presentation Screens support learning in this lesson.



Graphing Real-World Problems

Graphing Ordered Pairs Generated From Real-World Problems

Let's investigate real-world relationships.

Key Concepts

Today's Goals

1. **Goal:** Graph ordered pairs generated by number patterns on the coordinate grid.
2. **Goal:** Graph discrete, paired data on a scatterplot.
3. **Language Goal:** Explain how data from a scatterplot can be used to make future decisions. **(Listening, Speaking, and Writing)** **ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F**

Connections and Coherence

Students graph ordered pairs from real-world scenarios and notice that, when graphed, some data form a scattered arrangement of points. Students are introduced to the term **scatterplot** and make connections between scatterplots and the graphs they have worked with previously in the unit that represent multiplicative and additive patterns. **(TEKS 5.1.A, 5.1.D, 5.1.E, 5.1.F)**

Prior Learning

In Lesson 11, students used rules to graph numerical patterns.

Future Learning

In Grade 6, students will represent a given situation using descriptions, tables, graphs, and equations.

Integrating Rigor in Student Thinking

- Students develop their **conceptual understanding** of graphing discrete paired data on scatterplots.
- Students continue to build **procedural skills** for graphing ordered pairs on a coordinate grid.

Vocabulary

New Vocabulary

scatterplot

Review Vocabulary

coordinate grid
ordered pair
origin
x-coordinate
y-coordinate

TEKS

Addressing

5.9.B

Represent discrete paired data on a scatterplot.

Also Addressing: **5.8.C**

Math Process Standards: 5.1.A, 5.1.D, 5.1.E, 5.1.F

ELPS: 1.B, 1.E, 2.B, 2.D, 2.E, 3.C, 3.D, 3.F, 4.C, 4.D, 4.F

Building On	Building Toward
5.4.C	**6.6.C**

Building Math Identity

I am a doer of math.
How is Mia's job as an astronomer similar to being a mathematician?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.A, 5.1.D, 5.1.E, 5.1.F, 5.8.C, 5.9.B

Warm-Up

Whole Class | 10 min

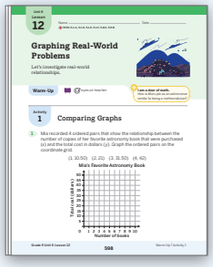
Students use the **Notice and Wonder** routine to share what they notice and wonder about a graph based on a real-world scenario that shows a relationship between *x*- and *y*-values.



Activity 1

Pairs | 20 min

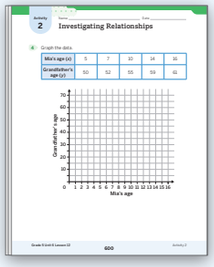
Students graph ordered pairs from real-world scenarios and notice that in some graphs, data points form a straight line, while in others the data points form a scattered arrangement. Students are introduced to the term **scatterplot** and consider how the location of the data points on the graph can be used to investigate trends between 2 sets of data.



Activity 2

Pairs | 15 min

Students continue to graph ordered pairs from real-world scenarios on the coordinate grid. They consider how scatterplots can be used to determine trends between 2 sets of data and how data can be used to inform future decisions.



Synthesis

Whole Class | 10 min

Students review and reflect on graphing and describing real-world relationships represented in graphs.

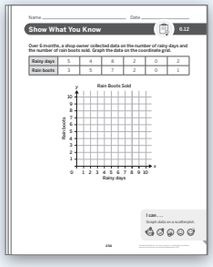


Show What You Know

Independent | 5 min

Students demonstrate their understanding by graphing real-world data on a scatterplot.

Materials: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.



- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 4.C, 4.D, 4.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **write** using short phrases or simple sentences.	Students **listen** to spoken English and **write** using a variety of sentence types.	Students **listen** to spoken English and **write** using longer sentences. Exemplar responses are provided.

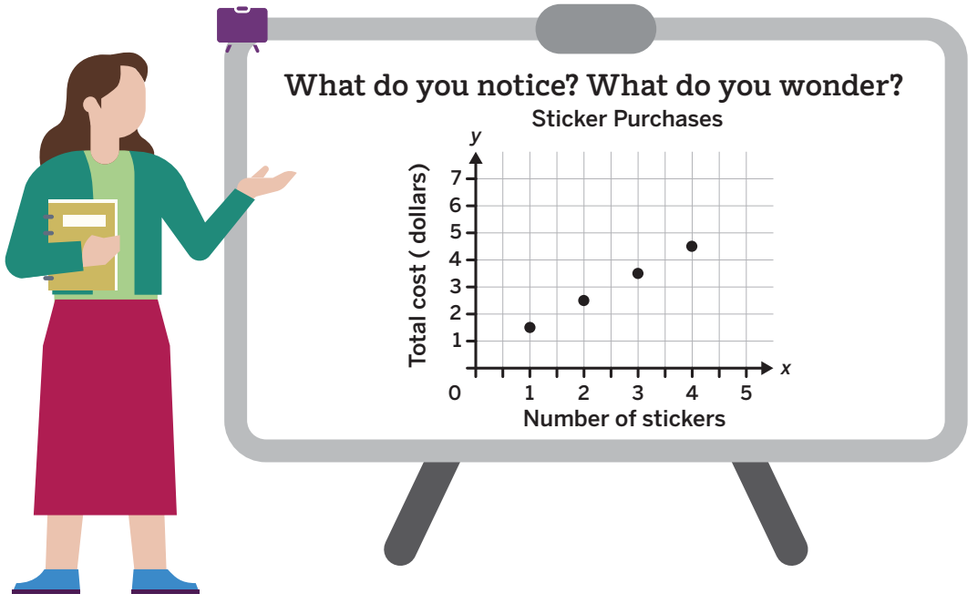
Whole Class | 10 min

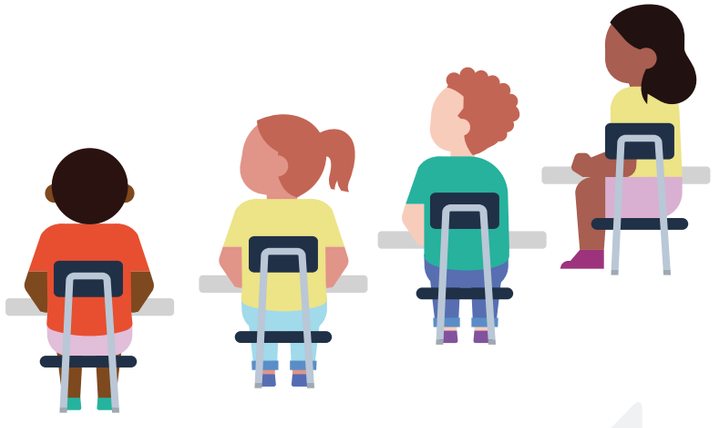
Presentation Screen



Warm-Up Notice and Wonder

Purpose: Students examine a graph to activate their prior knowledge about graphing ordered pairs on the coordinate grid.





1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Use the Think-Pair-Share routine. Ask, "How could you use the data on the graph to determine the total cost for 5 stickers?"

Say, "Some graphs show a relationship between the *x*- and *y*-values that can be used to show real-world scenarios. You will explore these relationships as you graph data in Activity 1."

Students might say . . . ELPS 2.B

I notice the total cost increases as the number of stickers increases.

I notice 1 sticker costs $1.50.

I wonder why the graph only shows 4 stickers.

I wonder if the price includes tax.

Pairs | 20 min

Activity 1 Comparing Graphs

Purpose: Students graph ordered pairs on the coordinate grid to notice that sometimes the plotted points do not form a straight line.

Presentation Screens



Short on time? Consider having students graph only the first 3 ordered pairs in Problems 1 and 2.

1 Launch



Display Problem 1.

Say, "Mia loves reading about astronomy. She has a favorite astronomy book and decided to purchase more than 1 copy to give to her friends as gifts."

Say, "Work with your partner to complete Problems 1–3."

2 Monitor



After students have completed **Problem 2**, refer to the **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "Which ordered pair will you graph first?"
- Ask, "What do the x-values and y-values in each ordered pair represent?"

A **Accessibility: Memory and attention** Encourage students to cross off ordered pairs as they plot to keep track of the ones they have already graphed and the ones that still need to be graphed.

3 Connect



Display the graphs from Problems 1 and 2.

MLR **MLR7: Compare and Connect** ELPS 1.B, 1.E, 2.B, 2.D, 2.E

Use the Think-Pair-Share routine. Ask:

- "What do you notice about the location of the points that are plotted on the graphs?"
- "What relationships are shown on each graph?"

Say, "Some sets of data have a relationship in which each point represents the same equation. For example, every point on the graph in Problem 1 represents the equation $y = 10.5x$ because the total cost, or y-value, is always 10.5 times the number of books, or the x-value. The points plotted on the graph in Problem 2 cannot be represented with 1 equation because each plotted point does not represent the same relationship between all of the x- and y-values. The graph in Problem 2 is called a **scatterplot**."

Ask, "Although there is not 1 equation that represents each point plotted on the scatterplot in Problem 2, the graph can be used to describe general patterns, or *trends*. What trend do you notice about the relationship between the number of rainy days in a month and the number of books Mia read?"

EB **Emergent Bilinguals** Invite students to share different meanings of the term *trend*. Clarify which meaning this word will have for this lesson. ELPS 3.D, 3.F

Key Takeaway: Say, "Scatterplots can be used to graph ordered pairs to investigate trends between 2 sets of data."

Unit 6 Lesson **12**

Name _____ Date _____

TEKS: 5.1.A, 5.1.D, 5.1.E, 5.1.F, 5.8.C, 5.9.B

Graphing Real-World Problems

Let's investigate real-world relationships.



Warm-Up eyes on teacher

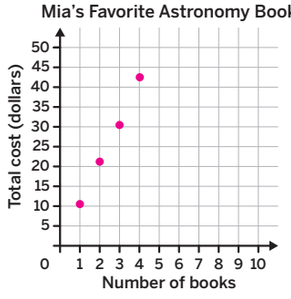
I am a doer of math.
How is Mia's job as an astronomer similar to being a mathematician?

Activity **1**

Comparing Graphs

1 Mia recorded 4 ordered pairs that show the relationship between the number of copies of her favorite astronomy book that were purchased (x) and the total cost in dollars (y). Graph the ordered pairs on the coordinate grid.

(1, 10.50) (2, 21) (3, 31.50) (4, 42)



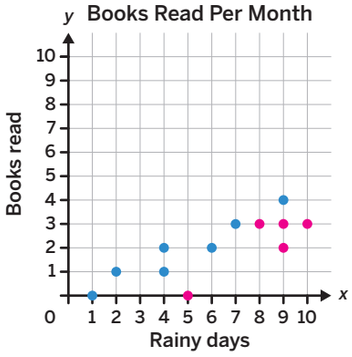
Activity **1**

Name _____ Date _____

Comparing Graphs (continued)

2 Mia loves to read on rainy days. She plotted some points on the graph that represent the number of days it rained each month (x) and the number of books she read in each of those months (y). Help Mia finish the graph by graphing the 5 remaining ordered pairs.

(10, 3) (8, 3) (9, 2) (9, 3) (5, 0)

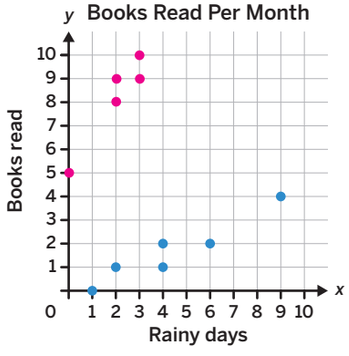
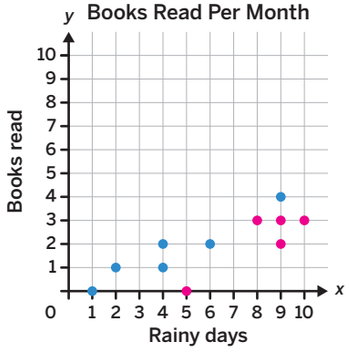


3 What do you notice about the location of the points on the graph in Problem 2? **Sample response shown.**

I notice that the points do not form a straight line. I also notice that there are 3 different points that have an x-value of 9.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Reverse the x- and y-coordinates.		**Support** Ask, "How could you describe how the location of the point relates to the number of books read and the number of rainy days?"
Graph the ordered pairs on the coordinate grid.		**Stretch** Ask, "Why do some points form a straight vertical line?"

Pairs | 15 min

Activity 2 Investigating Relationships

Purpose: Students graph ordered pairs generated from real-world scenarios to recognize relationships represented by *x*- and *y*-values.

Presentation Screens



1 Launch



Display Problem 4.

Say, "Mia was looking at old photos of her and her grandfather. In some photos, Mia was unable to determine her grandfather's age. Mia knows that her grandfather was 45 years old when she was born. She decided to create an input-output table to help her determine her grandfather's age at different times in her life."

Use the Think-Pair-Share routine. Ask, "How could you use the table to determine the ordered pairs?"

Say, "When Mia was 5 years old, her grandfather was 50. The *x*-value is 5 and the *y*-value is 50, so you could graph the ordered pair (5, 50). Work with your partner to complete Problems 4–6."

2 Monitor



After students have completed **Problem 6**, refer to the **D Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "How could you use the table to determine which numbers represent *x*-values and which numbers represent *y*-values?"
- Ask, "How could you use the *x*- and *y*-values in the table to graph ordered pairs?"

3 Connect



Display the completed graphs from Problems 4 and 5.

Use the Think-Pair-Share routine. Ask:

- "Which of these graphs can be used to determine an unknown *y*-value when given the *x*-value?
- "Which of these graphs can be used to analyze trends between 2 sets of data?"

Say, "The graph in Problem 4 shows a relationship in which Mia's grandfather is always 45 years plus her age. Mia can use this pattern to determine how old her grandfather is or will be at different points in her life. The graph in Problem 5 is a scatterplot that shows a trend between the number of hours Mia's niece studies and her test scores. Mia's niece can use this trend to make future decisions about her studying habits."

Key Takeaway: Say, "Real-world data can be collected and graphed on the coordinate grid. Graphs are helpful data displays that can be used to investigate patterns and trends that can help you answer questions and make informed decisions."

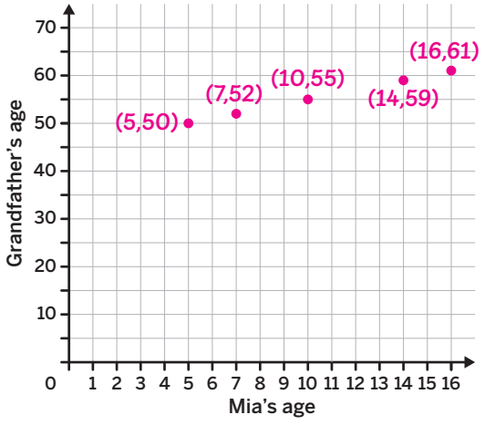
Activity 2

Name _____ Date _____

Investigating Relationships

4 Graph the data.

Mia's age (x)	5	7	10	14	16
Grandfather's age (y)	50	52	55	59	61



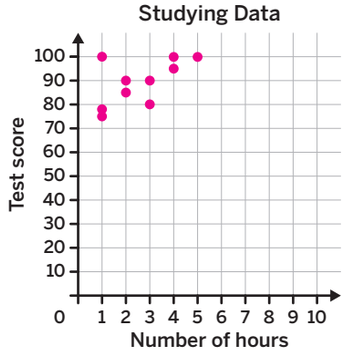
Activity 2

Name _____ Date _____

Investigating Relationships (continued)

5 Mia's niece has been studying to be an astronomer, like Mia. She collected data on her last 10 tests to investigate the relationship between the number of hours she studied (x) and the test scores she earned (y). Graph the data on the coordinate grid.

(1, 75) (3, 90) (2, 90) (5, 100) (4, 95) (1, 78) (2, 85) (1, 100) (3, 80) (4, 100)



6 How could this data be useful to Mia's niece? Sample response shown.

She could use the data to determine if there is a trend that describes the relationship between the the number of hours she studies and her test scores. She could use that information to decide wow many hours to study for her next test.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Indicate that Mia's niece can use the data to determine a future test score.	Mia's niece can see from the graph that if she studies for 1 hour, she will earn a 100 on the test.	**Support** Ask, "How could you prove that the relationship between the x- and y-coordinates is the same for each ordered pair?"
Indicate that Mia's niece can use the data to identify a trend.	Mia's niece can use the data to see if there is a trend. Then she can use that information to make future studying decisions.	**Stretch** Ask, "How could you describe the trend? Are there any data points that do not follow the trend?"

Whole Class | 10 min

Presentation Screens



Synthesis

Lesson Takeaway: Scatterplots are graphs that represent paired data as points on a coordinate grid. The location of the points on the grid can be used to investigate trends between the 2 sets of data.



Display the scatterplot.

Use the Think-Pair-Share routine. Ask:

- "How might this data be helpful to a smoothie shop owner?"
- "Can this data be used to determine the exact number of smoothies that will be sold when the temperature is 95? Why or why not?"

Say, "Some data show a direct relationship between the *x*- and *y*-values. In these instances, the *y*-value changes based on the *x*-value. Other data, like the data shown on this scatterplot, represent 2 sets of independent data. These data can be paired and graphed to determine whether there is a trend."

Formalize vocabulary: scatterplot a set of disconnected data points plotted on a coordinate grid that allow us to investigate connections between 2 sets of data.

(optional) **Consider using the Word Structure: Compound Words routine** by asking, "How does thinking about **scatterplot** as a compound word of *scatter* and *plot* help you remember the meaning of this graph?" **ELPS 1.B, 3.C, 3.F**

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

Invite students to refer to the **Summary** during Practice or anytime during the year.

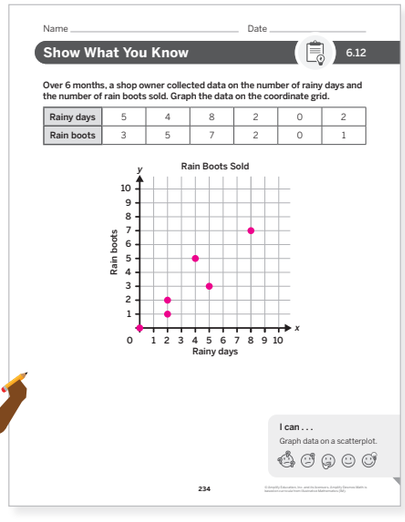
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 6.12

Over 6 months, a shop owner collected data on the number of rainy days and the number of rain boots sold. Graph the data on the coordinate grid.

Rainy days	5	4	8	2	0	2
Rain boots	3	5	7	2	0	1

Rain Boots Sold

Rain boots

Rainy days

I can . . .
Graph data on a scatterplot.

234

Today's Goals

1. **Goal:** Graph ordered pairs generated by number patterns on the coordinate grid.
2. **Goal:** Graph discrete, paired data on a scatterplot.
   - In the *Show What You Know*, students graphed ordered pairs that created a scatterplot.
3. **Language Goal:** Explain how data from a scatterplot can be used to make future decisions. **(Writing)**

   ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

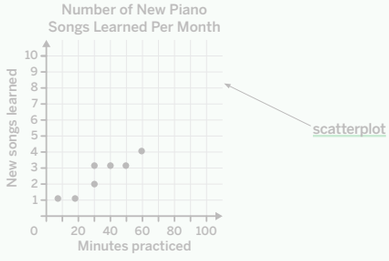
Lesson 12
Practice

Students using digital

Students using print

Summary 6.12

Scatterplots are graphs that represent 2 sets of data on a coordinate grid. Scatterplots can be used to investigate trends between the 2 sets of data.

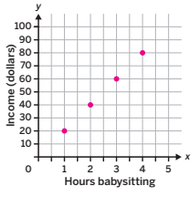


scatterplot A set of disconnected data points plotted on the coordinate grid, which allows us to investigate the connections between 2 sets of data.

Practice 6.12

1 Han earned money babysitting. The table shows the relationship between the hours Han spent babysitting and the amount of income he made. Use the table to graph the data.

Hours	Income (dollars)
1	20
2	40
3	60
4	80



Practice 6.12

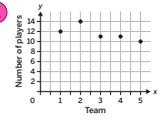
Name _____ Date _____

2 Jada is playing in a basketball tournament. The table shows the relationship between the team (x), and the number of players on the team (y).

Team	1	2	3	4	5
Players	12	14	11	11	10

Which scatterplot best represents the data in the table?

A



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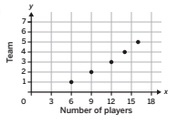
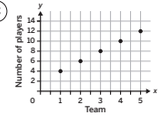
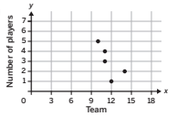


C

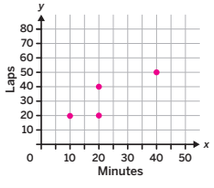


D



3 The table shows the relationship between the minutes spent swimming on different days and the number of laps swam. Complete the table and graph the ordered pairs.

Minutes	Laps	Ordered pair
10	20	(10, 20)
20	20	(20, 20)
20	40	(20, 40)
40	50	(40, 50)

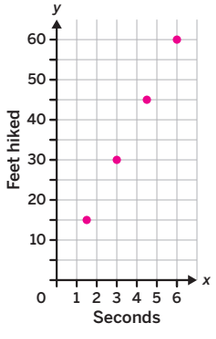


Practice 6.12

Name _____ Date _____

4 The table shows the relationship between how many seconds were spent hiking and how many feet were hiked. Use the table to graph the data.

Seconds	Feet
1.5	15
3	30
4.5	45
6	60



Spiral Review

For Problems 5 and 6, evaluate the expression. Sample work shown.

Show your thinking.

5 $20 - (5 \times 3) + (8 \div 2)$

$20 - (15) + (4)$
$5 + 4$

answer: 9

6 $88 - 2(18 + 6) - 12$

$88 - 2(24) - 12$
$88 - 48 - 12$
$40 - 12$

answer: 28

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 4	1	5.8.C
Test Practice	2	1	5.8.C, 5.9.B
	3	1	5.8.C, 5.9.B
Spiral Review			
Fluency	5, 6	1	5.4.F

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 12

Lesson Goal: Graph discrete, paired data on a scatterplot.

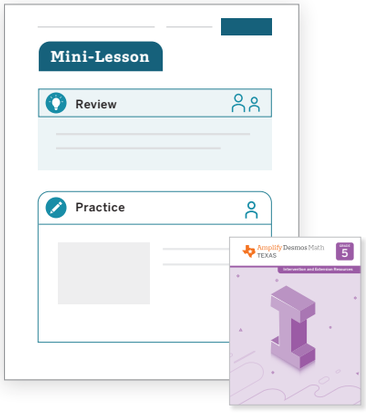
Support

Provide targeted intervention for students by using these resources.

If students graph the *x*-coordinates as the *y*-coordinates and graph the *y*-coordinates as the *x*-coordinates:

Respond:

- Assign the *Introducing Scatterplots* **Mini-Lesson. |** 15 min
- Review how to graph ordered pairs.



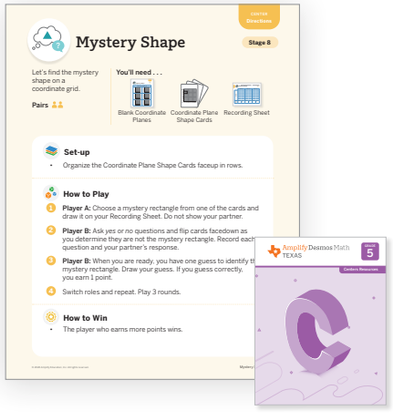
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students represent some of the data points on the scatterplot:

Respond:

- Invite students to play the **Centers. |** 15 min ***Mystery Shape: Shapes on the Coordinate Plane***
- Have students complete **Lesson 12 Practice. |** 15 min
- **Item Bank**



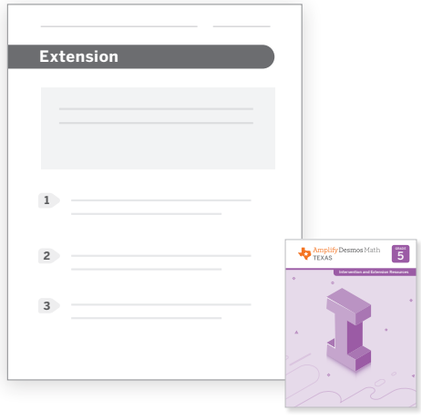
Stretch

Challenge students and extend their learning with these resources.

If students represent all of the data points on the scatterplot:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines





Professional Learning

Graphing and identifying patterns will continue to appear in Grade 6. How could you support students to continue noticing relationships in the real-world that could be graphed?

Notes:

Watch Your Knowledge Grow

Purpose: At the beginning of the unit, students rated their understanding of the concepts they were about to explore in the unit. Return to this page at the end of the unit and invite them to rate their understanding again to see how their knowledge has grown.

Invite students to return to the *Watch Your Knowledge Grow* page at the beginning of their Student Edition for this unit.

Say, "These were the math concepts that you explored in this unit." Read aloud, or ask a student volunteer to read aloud, the *I can* statements.

Invite students to rate their understanding of each concept now that they have completed the unit. Then invite them to compare their new understanding to how they rated it at the beginning of the unit. Consider pairing students with a partner and inviting them to discuss these questions:

- "What do you notice? What do you wonder?"
- "How did your knowledge grow in this unit?"
- "What questions do you still have?"

EB **Emergent Bilinguals** Consider displaying sentence frames, such as:

"I notice _____."

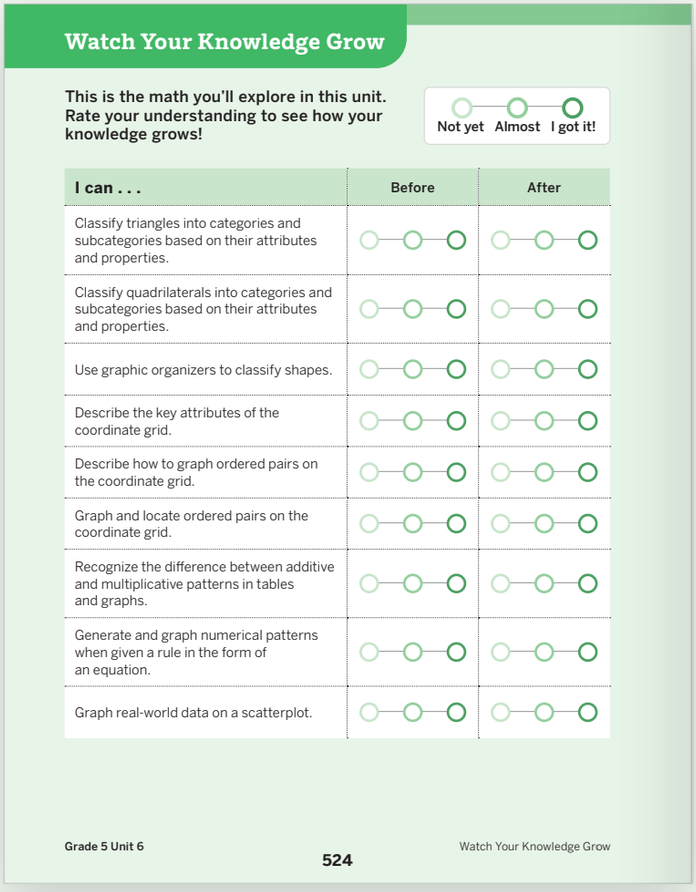
"I wonder_____."

"I learned about _____."

"I still have questions about _____."

ELPS 1.E, 2.C, 2.E

Math Identity and Community Celebrate the growth of student knowledge throughout the unit, as well as any questions that students still may have about the math concepts they explored. Remind students that it is a normal part of learning to continue to have questions. If you displayed a chart in prior units of students' questions, refer back to it and ask if any of their questions from the prior units have been answered. Celebrate any new growth in knowledge, as well as any additional questions that may get added to the chart for this unit!



Watch Your Knowledge Grow

This is the math you'll explore in this unit. Rate your understanding to see how your knowledge grows!

Not yet Almost I got it!

I can . . .	Before	After
Classify triangles into categories and subcategories based on their attributes and properties.		
Classify quadrilaterals into categories and subcategories based on their attributes and properties.		
Use graphic organizers to classify shapes.		
Describe the key attributes of the coordinate grid.		
Describe how to graph ordered pairs on the coordinate grid.		
Graph and locate ordered pairs on the coordinate grid.		
Recognize the difference between additive and multiplicative patterns in tables and graphs.		
Generate and graph numerical patterns when given a rule in the form of an equation.		
Graph real-world data on a scatterplot.		

Grade 5 Unit 6 524 Watch Your Knowledge Grow

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

End-of-Unit Assessment

Independent | 45 min

Facilitation: Assign the End-of-Unit Assessment to learn about your students' understanding of concepts and skills in this unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis, Forms A and B

Problem(s)	Concept or skill	Addressed in	DOK	TEKS
1, 2	Understanding that attributes of a category are shared by all sub-categories	Lesson 5	2	5.5.A *(R)*
3	Generating a number pattern that follows a rule	Lesson 9	1	5.4.C *(R)* 5.1.E
4	Identifying a multiplicative relationship	Lesson 10	1	5.4.C *(R)* 5.1.D
5	Recognizing the difference between additive and multiplicative numerical patterns in a graph	Lesson 11	2	5.4.C *(R)* 5.1.D
6	Graphing data points to create a scatterplot	Lesson 12	2	5.9.B *(S)* 5.1.E
Extended Response				
7	Describing attributes of a coordinate grid	Lesson 6	1	5.8.A *(S)* 5.1.G
8	Describing the process for graphing ordered pairs	Lesson 9	1	5.8.B *(S)* 5.1.G

Assessment Resources



- Student Print Assessments (Forms A and B)
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources include:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

If students need further review or practice with concepts or skills from Unit 6, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

Name _____ Date _____

End-of-Unit Assessment

Unit 5.6

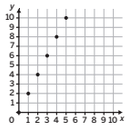
For Problems 1 and 2, select the word that best completes the sentence. Place a check mark in the correct column.

	Always	Sometimes	Never
1 A parallelogram is _____ a rhombus.		✔	
2 A rectangle is _____ a parallelogram.	✔		

3 The relationship between the number of items bought and the total cost can be represented with the equation $y = 5.25x$. Complete the table to represent this relationship.

Amount (x)	Cost (y)
1	5.25
2	10.50
3	15.75
4	21

4 Complete the sentence by selecting **ONE** correct answer in each box to describe the graph.



The table represents a/an [**A.** additive / (**B.**) multiplicative] pattern because the y-values are always 2 [(**A.**) times the x-values / **B.** more than the x-values].

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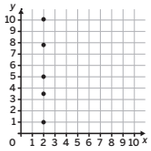
Name _____ Date _____

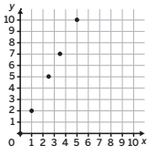
End-of-Unit Assessment (continued)

5 Which graph represents the relationship $y = x + 2$?

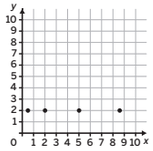
A.



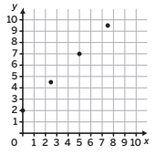
B.



C.

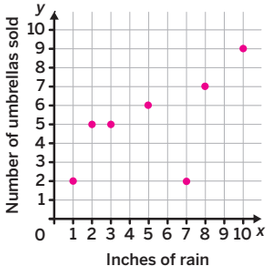


(D.)



6 The table shows the number of inches of rain per day and the number of umbrellas sold on those days. Represent the data on the coordinate grid.

Inches of rain (x)	Number of umbrellas sold (y)
1	3
2	6
3	6
5	7
7	3
8	8
10	10



Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.6

For Problems 7 and 8, you can use this rubric to help you.

Place a check mark as you complete each part.

- ☐ Analyze the given information.
- ☐ Come up with a plan.
- ☐ Determine your solution.
- ☐ Justify your solution, using math language from the unit.
- ☐ Read your response. Does your solution make sense?

7 Use the words from the word bank to write 2 statements that describe the attributes of the coordinate grid. Sample response shown.

Word bank	
x-axis	y-axis
origin	ordered pair
perpendicular	parallel



The x-axis is a horizontal line that is perpendicular to the vertical y-axis and the axes intersect at the origin. Any point on the grid can be described using an ordered pair (x, y).

8 Graph a point on the coordinate grid. Label it with the ordered pair that it represents and then describe what steps you took to graph the ordered pair.

Sample response shown.

I graphed the ordered pair (3, 2). I started at the origin and went over 3 units to the right along the x-axis and then up 2 units.

Name _____ Date _____

End-of-Unit Assessment

Unit 5.6

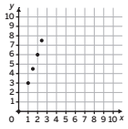
For Problems 1 and 2, select the word that best completes the sentence. Place a check mark in the correct column.

	Always	Sometimes	Never
1 A rectangle is _____ a parallelogram.	✔		
2 A parallelogram is _____ a rhombus.		✔	

3 The relationship between the number of items bought and the total cost can be represented with the equation $y = 6.25x$. Complete the table to represent this relationship.

Amount (x)	Cost (y)
1	6.25
2	12.50
3	18.75
4	25

4 Complete the sentence by selecting **ONE** correct answer in each box to describe the graph.



The table represents a/an [A. additive / B. multiplicative] pattern because the y-values are always 3 [A. times / B. more than] the x-values.

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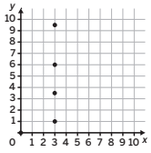
Name _____ Date _____

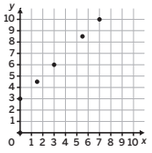
End-of-Unit Assessment (continued)

5 Which graph represents the relationship $y = x + 3$?

A.



B.



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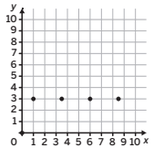

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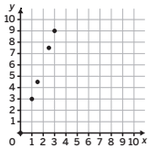
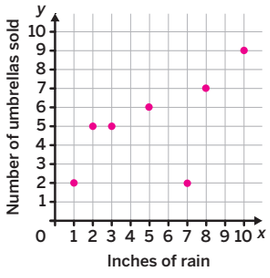


6 The table shows the number of inches of rain per day and the number of umbrellas sold on those days. Represent the data on the coordinate grid.

Inches of rain (x)	Number of umbrellas sold (y)
1	2
2	5
3	5
5	6
7	2
8	7
10	9



Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.6

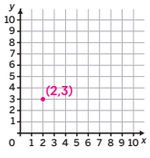
For Problems 7 and 8, you can use this rubric to help you.

Place a check mark as you complete each part.

- ☐ Analyze the given information.
- ☐ Come up with a plan.
- ☐ Determine your solution.
- ☐ Justify your solution, using math language from the unit.
- ☐ Read your response. Does your solution make sense?

7 Use the words from the word bank to write 2 statements that describe the attributes of the coordinate grid. **Sample response shown.**

Word bank	
y-axis	x-axis
parallel	perpendicular
ordered pair	origin



The y-axis is a vertical line that is perpendicular to the horizontal x-axis and the axes intersect at the origin. Any point on the grid can be described using an ordered pair (x, y).

8 Graph a point on the coordinate grid. Label it with the ordered pair that it represents and then describe what steps you took to graph the ordered pair. **Sample response shown.**

I graphed the ordered pair (2, 3). I started at the origin and went over 2 units to the right along the x-axis and then up 3 units.

D Differentiation (End-of-Unit Assessment)

To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Unit.

Sub-Unit Goal(s)	Problem(s)	Respond to Student Thinking
Sub-Unit 1: Classify quadrilaterals and triangles in a hierarchy using graphic organizers based on attributes and properties.	1, 2	**Support** • **Mini-Lesson:** *Using a Hierarchy to Classify Quadrilaterals* (ML 6.05) • **Center:** *Can You Draw It?, Grade 5 Shapes*
Sub-Unit 2: • Describe how to graph an ordered pair on a coordinate grid using key attributes of the coordinate grid. • Graph ordered pairs arising from mathematical problems on the coordinate grid.	7, 8	**Support** • **Mini-Lesson:** *Describing How to Graph an Ordered Pair* (ML 6.09) • **Teacher Move:** Invite students to review the problem and then provide additional opportunities for students to describe a coordinate grid and how to graph an ordered pair. **EB** **Emergent Bilinguals** Invite students to review Problem 8. Ask them to write a revised draft of their explanation using their primary language and then write a second draft in English. Consider pairing students who speak the same primary language. **ELPS 4.C, 4.D, 4.E, 4.F**
Sub-Unit 3: • Recognize the difference between additive and multiplicative patterns in graphs and tables. • Generate and graph a numerical pattern when given a rule in the form of an equation, such as $y = ax$ or $y = x + a$. • Represent and interpret real-world and mathematical problems on a coordinate grid and scatterplot.	3, 4	**Support** • **Mini-Lesson:** *Identifying Additive and Multiplicative Patterns* (ML 6.10) • **Teacher Move:** *Consider revisiting Lesson 10.*
	5	**Support** • **Mini-Lesson:** *Graphing Ordered Pairs Generated From Number Patterns* (ML 6.11) • **Teacher Move:** Consider inviting students to review the problem by creating a table of coordinate points.
	6	**Support** • **Mini-Lesson:** *Introducing Scatterplots* (ML 6.12) • **Teacher Move:** Consider revisiting Lesson 12. **EB** **Emergent Bilinguals** Invite students to use colored pencils to color-code the x- and y- axes and corresponding columns in the table to help make connections. **ELPS 3.E, 3.F**