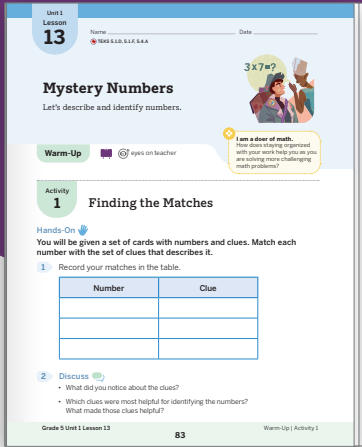Student Edition pages and Presentation Screens support learning in this lesson.

Mystery Numbers

Using Factors and Multiples to Describe and Identify Numbers

Let's describe and identify numbers.

Key Concepts

● **Today's Goals**

1. **Goal:** Apply understanding of factors, multiples, and prime and composite numbers to identify whole numbers.

2. **Language Goal:** Describe numbers using an understanding of factors, multiples, and prime and composite numbers. **(Listening, Speaking, Reading, and Writing)** 🔴 **ELPS 1.B, 2.B, 2.E, 3.C, 3.H, 4.C, 4.D, 4.F**

Connections and Coherence

Students use what they know about the factors and **multiples** of numbers along with their understanding of prime and composite numbers to identify numbers from given clues. They also have an opportunity to write their own clues, allowing students to use precise language and vocabulary to describe numbers of their choosing from a given set. **(TEKS 5.1.D, 5.1.F)**

◄ **Prior Learning**
In Lesson 12, students distinguished between prime and composite numbers.

► **Future Learning**
In Lesson 14, students will ask and answer questions about mystery numbers using their knowledge of prime and composite numbers, factors, and multiples.

Integrating Rigor in Student Thinking

• Students **apply** their understanding of factors, multiples, and prime and composite numbers to identify and describe whole numbers.

Vocabulary

New Vocabulary

multiple

Review Vocabulary

composite number

factor

prime number

🔴 TEKS

Addressing

5.4.A

Identify prime and composite numbers.

Math Process Standards: 5.1.D, 5.1.F

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

Building On	Building Toward
4.4.F	**5.4.F**

Building Math Identity

❇ **I am a doer of math.**
How does staying organized with your work help you as you are solving more challenging math problems?

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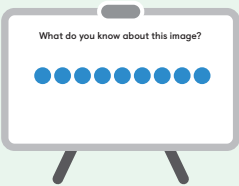

Lesson at a Glance 🕐 60 min

Warm-Up
👥 Whole Class | 🕐 10 min

Students use the **What Do You Know About _____?** routine, which provides an opportunity to develop an understanding that odd numbers can be composite.
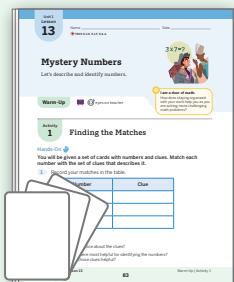
Activity 1
👥 Small Groups | 🕐 15 min

Students are given sets of cards with 3 different numbers and 3 sets of clues describing the numbers. They match each set of clues to the appropriate number and consider which clues were most helpful for identifying the numbers.
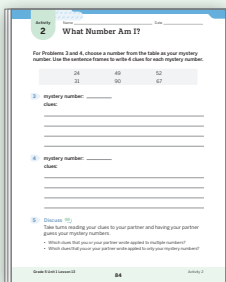
Materials: Activity 1 PDF
Additional Prep Cut out: Activity 1 PDF

Activity 2
👥 Pairs | 🕐 20 min

Students select their own mystery numbers from a given set of prime, composite, or neither prime nor composite numbers. They use sentence frames to write 4 clues for each mystery number and then read their clues to their partners so they can identify the mystery numbers.

Synthesis
👥 Whole Class | 🕐 10 min

Students review and reflect on ways to describe numbers using their understanding of factors, multiples, and prime and composite numbers.
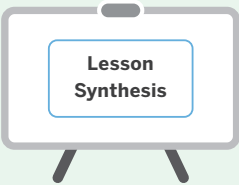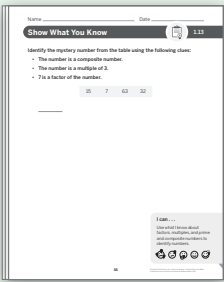
Show What You Know
👤 Independent | 🕐 5 min

Students demonstrate their understanding of factors, multiples, and prime and composite numbers by identifying a mystery number based on given clues.

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 ✔ Frayer model
✔ Visuals ✔ Sentence frames

🟥 ELPS 1.B, 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.E, 3.C, 3.F, 3.G, 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 and **read** English. They **speak** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** and **write** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** and **write** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** and **write** using longer sentences. Exemplar responses are provided.

Whole Class | 🕐 10 min

Warm-Up What Do You Know About ___?

Purpose: Students share ideas about an array to relate to their developing understanding that odd numbers can be composite.
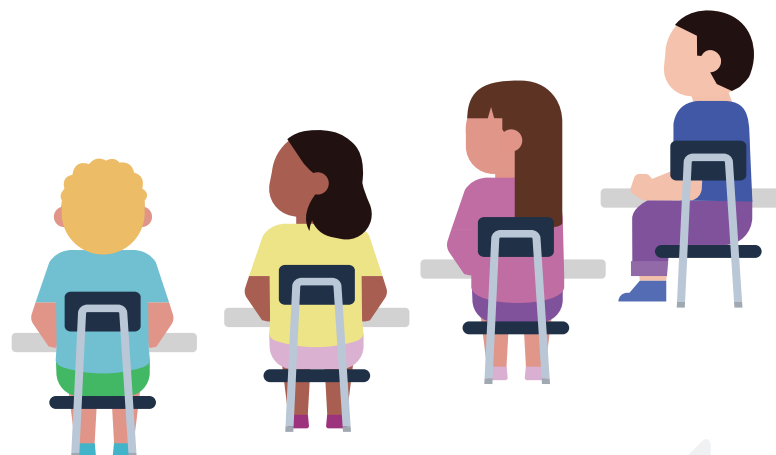
What do you know about this image?
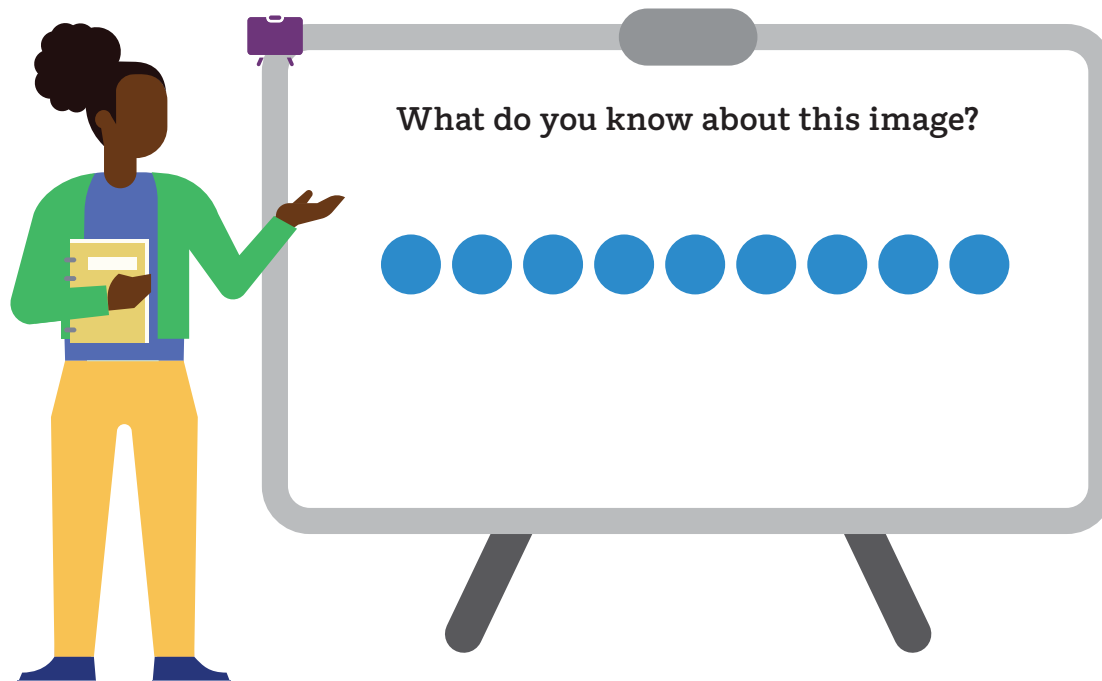
1 Launch

Display the question.

Use the **What Do You Know About _____? routine.**

Ask, "What do you know about the array?"

Invite students to share their responses.

2 Connect

Record students' responses as they share.

Say, "A **multiple** is the result of multiplying a number by a whole number. For example, 9 is a multiple of 3."

Ask, "How could you use what you know about factors, multiples, and prime and composite numbers to describe 9 in different ways?"

Say, "Today, you will use everything you know about factors, multiples, prime numbers, and composite numbers to help you identify and describe mystery numbers."

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

1: This is 1 group of 9.

2: It is odd.

3: I know that there are 3 groups of 3.

4: It is composite because it has more than 2 factors.

Activity 1 Finding the Matches

Purpose: Student match numerals with clues that describe the numerals to practice identifying prime and composite numbers.

1 Launch

Distribute the Set 1 cards to each group.

📣 **Say**, "Some cards have clues on them, and some cards have a number on them. You will work together to identify the set of clues that matches each number and then discuss the questions in Problem 2. If you finish, you can get a new set of cards to match and discuss."

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, "Choose 1 clue card. Which of the numbers in the set does the first clue apply to?"
• Ask, "Can you narrow down the number options using this clue or do you need to read the next clue?"

3 Connect

📣 **Invite students to share** their responses to Problem 2, focusing on their explanations of which clues in Set 1 were most helpful for identifying the mystery numbers. Highlight reasoning about which clues provided information that was unique to 1 number and which clues applied to more than 1 number in the set.

📣 **Display** the numbers 15, 39, and 45.

Ask:
• "What is a clue you could write that would apply to all 3 of the numbers?"
• "What is a clue you could write that would only apply to 2 of the numbers?"
• "What is a clue you could write that would apply to just 1 of the numbers?"

🔑 **Key Takeaway:** Say, "Knowing how to identify a number as prime, composite, odd, even or a multiple of another number is helpful because then you can use those words to describe the number and distinguish it from other numbers."

Unit 1 Lesson **13**

Name _____ Date _____

✚ TEKS 5.1.D, 5.1.F, 5.4.A

3 × 7 = ?

Mystery Numbers

Let's describe and identify numbers.

> 🔶 **I am a doer of math.**
> How does staying organized with your work help you as you are solving more challenging math problems?

Warm-Up 📺 ◎ eyes on teacher

Activity 1 Finding the Matches

Hands-On ✋ **Sample response shown for Set 1.**

You will be given a set of cards with numbers and clues. Match each number with the set of clues that describes it.

1 Record your matches in the table.

Number	Clue
54	A
42	C
60	B

2 Discuss 💬 **Oral activity: No writing expected.**
- What did you notice about the clues?
- Which clues were most helpful for identifying the numbers? What made those clues helpful?

📺 **Presentation Screens**
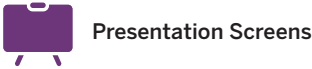
Ⓓ Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Identify information about factors as being helpful.	*The clues that told us factors of a number were most helpful.*	🔺 **Support** Ask, "How were those clues most helpful? What other information would be helpful to identify the number?"
Recognize that clues about the number being composite, prime, or neither applied to one of each of the numbers in the set.	*Some of the clues about prime, composite, or neither were helpful when there was one of each in the set.*	Ⓢ **Strengthen** Ask, "What would be a set of 3 numbers where a clue about a prime or composite number would not be helpful?"
Recognize that using clues about the number being composite, prime, or neither, as well as clues about the numbers' factors and multiples, is helpful.	*The clues that told us "___ is a multiple of this number" were most helpful when we knew that the number was also composite.*	🔶 **Stretch** Ask, "Would it be possible to come up with a number that is a multiple of 2 numbers in the set? Why or why not?"

Activity 2 What Number Am I?

Purpose: Students write clues involving the terms *prime, composite, neither prime nor composite* and *factor* to identify mystery numbers.

Short on time? Consider having students write clues for only 1 mystery number instead of 2.

1 Launch

Read aloud the directions and answer any clarifying questions.

Say, "All 4 of the clues you write should apply to your mystery number, but you might want to write some of the clues so they also apply to other numbers in the set to make your mystery number more challenging to identify."

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, "Choose 1 of the sentence frames that you want to use for your clue. What are some possible ways you could fill in the blank that would make the sentence true for your mystery number?"
- Ask, "Could that clue apply to any other numbers in the set?"

3 Connect

Invite pairs to share their responses to Problem 5 and how the clues helped them identify the mystery numbers. Focus on clues that applied to multiple numbers and clues that applied to only the mystery numbers.

Ask:

- "What did some of the numbers you worked with in this activity have in common?"
- "What made some of the numbers unique?"

🔑 **Key Takeaway:** Say, "Identifying a specific number from given information about factors and multiples could require you to consider what that number has in common with other numbers and what makes it unique."

Activity 2

What Number Am I?

For Problems 3 and 4, choose a number from the table as your mystery number. Use the sentence frames to write 4 clues for each mystery number. **Sample responses shown.**

24	49	52
31	90	67

3 mystery number: ___**24**___

clues:

6 is a factor of my number.

My number is composite.

My number is a multiple of 4.

48 is a multiple of my number.

4 mystery number: ___**90**___

clues:

My number is a multiple of 3.

My number is composite.

9 is a factor of my number.

My number is a multiple of 10.

5 Discuss 💬 **Oral activity: No writing expected.**
Take turns reading your clues to your partner and having your partner guess your mystery numbers.

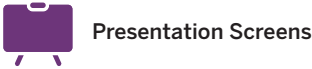- Which clues that you or your partner wrote applied to multiple numbers?
- Which clues that you or your partner wrote applied to only your mystery numbers?

Grade 5 Unit 1 Lesson 13

84

Activity 2

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Write 4 clues that apply to their mystery number and other numbers in the set.	**mystery number: 90** *My number is composite. 6 is a factor of my number. My number is a multiple of 3. 7 is not a factor of my number.*	⚠ **Support** Ask, "What other clues could you write to help your partner narrow down their choices?"
Write 4 clues that only apply to their mystery number.	**mystery number: 49** *7 is a factor of my number. 98 is a multiple of my number. My number is a composite. My number has 3 factors.*	**S Strengthen** Ask, "How could you adjust at least 1 of your clues so it applies to your mystery number and at least 1 other number in the set?"
Write 4 clues that apply to their mystery number, with some clues also applying to other numbers in the set.	**mystery number: 24** *My number is composite. 4 is a factor of my number. My number is a multiple of 6. 48 is a multiple of my number.*	**S Strengthen** Ask, "How many numbers in the set are described by each of your clues?"

Synthesis

Lesson Takeaway: Factors, **multiples**, and prime and composite numbers can be used to represent and describe how whole numbers can be composed and decomposed multiplicatively.

Lesson Synthesis

Ask, "What is a statement you could make using the terms *factor*, *multiple*, *prime*, or *composite* that would only be true about 1 of these numbers?"

Say, "You can describe a number based on its multiples, factors, whether it is prime, composite or neither, and other characteristics."

Formalize vocabulary: A **multiple** is the result of multiplying a number by a whole number.

Consider using the Word Connections: Prior Knowledge **routine** with the term **multiple**. Consider asking, "How can you use your understanding of the terms multiply or multiplication to help you understand the term multiple? How are they alike? How are they different?" 🔴 **ELPS 3.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

📄 **Show What You Know PDF**

Name _____ Date _____

Show What You Know 📋 1.13

Identify the mystery number from the table using the following clues:
- The number is a composite number.
- The number is a multiple of 3.
- 7 is a factor of the number.

| 15 | 7 | 63 | 32 |

___63___

I can . . .
Use what I know about factors, multiples, and prime and composite numbers to identify numbers.

😅 😕 🙂 😊 😎

35

📋 **Today's Goals**

1. **Goal:** Apply understanding of factors, multiples, and prime and composite numbers to identify whole numbers.
   - In the Show What You Know, students used clues involving factors, multiples, prime, composite, or neither to identify a mystery number.

2. **Language Goal:** Describe numbers using an understanding of factors, multiples, and prime and composite numbers. **(Listening, Speaking, Reading, and Writing)**
   🔴 **ELPS 1.B, 2.B, 2.E, 3.C, 3.H, 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.

Students using print

Summary 1.13

Numbers can be described and identified using information about their factors, multiples, and whether they are prime or composite.

21

21 is a **multiple** of 7.
3 is a factor of 21.
21 is a composite number.

> **multiple** A number you get by multiplying another number (ex: some multiples of 4 are 4, 8, 12, and 16)

Practice 1.13

1 Match the numbers with the given clues.

| 15 | 40 | 32 |

3 is a factor of this number. _____**15**_____

This number has 6 factors. _____**32**_____

This number is a multiple of 10. _____**40**_____

2 Identify the mystery number using the clues. **Sample response shown.**

- Clue 1: This number is composite.
- Clue 2: 8 is a factor of this number.
- Clue 3: 128 is a multiple of this number.
- Clue 4: This number is a multiple of 4.

mystery number: _____**64**_____

Practice 1.13

Name _____ Date _____

3 Determine whether each number is a *multiple of 3*, a *factor of 36*, or *neither*. Place a check mark in the correct column.

	Multiple of 3	Factor of 36	Neither
4		✔	
6	✔	✔	
10			✔
12	✔	✔	
13			✔

Sample responses shown for Problems 4 and 5.

4 Choose a mystery number between 20 and 50. Write 4 clues for your mystery number.

mystery number: _____**42**_____

Clue 1: **My number is composite.**
Clue 2: **My number is a multiple of 21.**
Clue 3: **7 is a factor of my number.**
Clue 4: **84 is a multiple of my number.**

5 Consider the mystery number 31. Write 4 clues for the mystery number. 3 clues should be true and 1 clue should be false.

true: **The mystery number is prime.**
true: **The mystery number has only 2 factors.**
true: **1 and 31 are factors of the mystery number.**
false: **The mystery number is a multiple of 62.**

Practice 1.13

Name _____ Date _____

6 🏵 Which clue is true for the number 51?
- (A) 51 is prime.
- (B) 102 is a factor of 51.
- (C) 3 is a multiple of 51.
- (D) 51 is a multiple of 17.

Spiral Review

For Problems 7–10, determine the value of the expression.

7 9 × 8 _____**72**_____
8 18 ÷ 2 _____**9**_____
9 6 × 3 _____**18**_____
10 45 ÷ 9 _____**5**_____

For Problems 11 and 12, plot and label the decimal 0.50 on the number line.

11

0 —— **0.50** —— 1

12

0 —— **0.50** —— 1

Practice Problem Item Analysis

	Problem(s)	DOK	🏵 TEKS
On-Lesson			
	1–5	2	5.4.A
🏵 **Test Practice**	6	2	5.4.A
Spiral Review			
Fluency	7–10	1	4.4.D
	11, 12	2	4.3.G

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).

Lesson Goal: Apply understanding of factors, multiples, and prime and composite numbers to identify whole numbers.
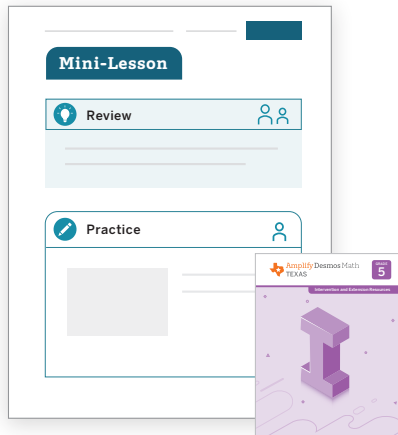
S Support

Provide targeted intervention for students by using these resources.

If students apply one of the clues to identify a mystery number:

Respond:

- Assign the *Identifying Numbers Using Factors, Multiples, and Prime and Composite Numbers* Mini-Lesson. **|** ⏱ 15 min
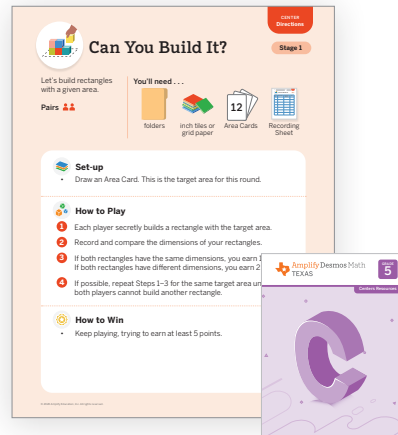
S Strengthen

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

If students apply two of the clues to identify a mystery number:

Respond:

- Invite students to play these **Centers. |** ⏱ 15 min
  Can You Build It?: Multiple Rectangles Cover Up:
  • *Factors 1–5 and 10*
  • *Factors 1–9*
  Related Numbers: Factors and Multiples

- Have students complete **Lesson 13 Practice. |** ⏱ 15 min
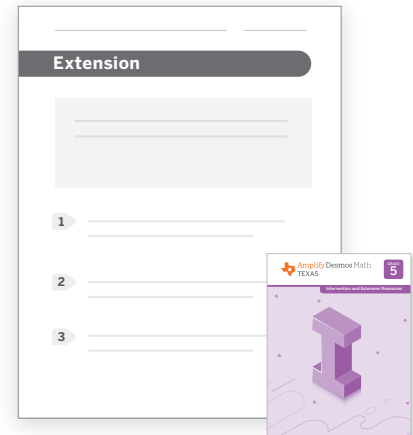
- **Item Bank**

S Stretch

Challenge students and extend their learning with these resources.

If students apply all three clues to identify the mystery number:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** ⏱ 15 min

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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., **multiple/múltiple**
- Frayer Model templates
- Vocabulary routines

Professional Learning

As students worked in their small groups today, whose ideas were heard, valued, and accepted? How could you adjust the group structure to ensure each student's ideas are a part of the collective learning?