Unit 5

Measurement, Fraction Operations, and Data

Essential Questions

- How can we use the relationship between multiplication and division to convert between units?

- How can we add and subtract fractions with unequal denominators?

- How can we represent data in tables and graphs?

✴ Unit Story: The Monarchs

In this story, Jacob, Miriam, and Quique study the migration of monarch butterflies across North America.

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
Convert between metric units of length, mass, and liquid volume.		
Convert between customary units of length, mass, and liquid volume.		
Solve problems by converting units within customary or metric measurement systems.		
Represent addition and subtraction of fractions with related denominators using objects.		
Represent addition and subtraction of fractions with related denominators using pictorial models.		
Determine *common denominators* between unequal fractions and mixed numbers.		
Add and subtract fractions and *mixed numbers* with unequal denominators.		
Simplify expressions with up to 2 levels of grouping.		
Represent data with *bar graphs, frequency tables, dot plots*, and stem-and-leaf plots.		
Solve one-step problems using data from bar graphs, frequency tables, dot plots, and stem-and-leaf plots.		
Solve two-step problems using data from bar graphs, frequency tables, dot plots, and stem-and-leaf plots.		

Measurement Conversions

🧭 **Unit Story:** The Monarchs

Wael hamdan/Shutterstock.com

How can you determine the distance a monarch butterfly migrates in different-sized units?

Name _____   Date _____

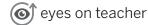🟥 **TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.E, 5.1.F, Building Toward 5.7.A**

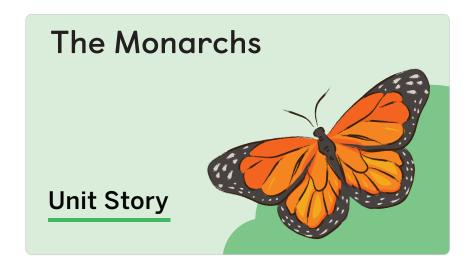# Explore: Relationships Between Units

How are units of measurement related?

Warm-Up   👁️↑ eyes on teacher

Discuss 💬 **Where did you see math in this story?**

The Monarchs

Unit Story

Create a poster to answer the questions below about Jacob and his sister's measurement system. You might include pictures, equations, comparison statements, and sentences.

- What can you infer about their measurement system?
- How are the units related?
- What other measurements can you determine based on the information provided and your inferences?
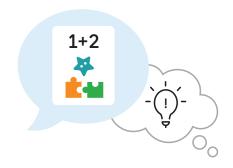
Ways to be a mathematician

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

1+2

Not yet   Almost   I got it!

3 I can see how ideas are connected and use patterns to help solve problems.

Not yet   Almost   I got it!

Name _____

Date _____

⭐ TEKS 5.1.A, 5.1.F, 5.7.A

Traveling Butterflies
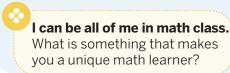
Let's convert metric length measurements.

90 km

I can be all of me in math class. What is something that makes you a unique math learner?

Warm-Up　　　👁️↑ eyes on teacher

Activity
1

Kilometers to Meters

The monarch butterfly was designated the state insect of Texas in 1995. Their migration path takes them through Texas every spring and fall.

1 Monarch butterflies traveled 90 kilometers in 1 day. What distance did the butterflies travel in meters?

Kilometers-to-Meters Conversions

Number of kilometers (km)	Number of meters (m)
1	1,000
5	5,000
10	10,000

✏️ **Show your thinking.**

answer: _____

2 **Discuss** 💬

How did you use the table to determine the relationship between the units?

Millions of Millimeters

3 If some monarch butterflies traveled 8,400,000 millimeters in 1 day, what distance did they travel in meters?

ℹ **Show your thinking.**

answer: _____

4 **Discuss** 💬

- What distance did the butterflies travel in centimeters? How do you know?

- Which unit do you think is best to report the distance that the butterflies traveled — millimeters, centimeters, or meters? Why?

Summary 5.02

You can convert a smaller unit to a larger unit using multiplication or division.

326,000 meters = 326 kilometers

1,000 meters = 1 kilometer

326,000 ÷ 1,000 = 326

or

$\frac{1}{1,000}$ kilometers = 1 meter

$326,000 \times \frac{1}{1,000} = 326$

So, 326,000 meters is equal to 326 kilometers.

Practice 5.02

1 🔴 Shawn biked 21,900 meters last week. How many kilometers did Shawn bike?

ⓘ **Record your answer in the space provided.**

Name _____ Date _____

2 Jada swam 480,000 centimeters last week. How many meters did Jada swim?

> ✎ **Show your thinking.**
>
>
> answer: _____

3 The length of 1 side of Han's garden is 320 centimeters. What is the length in millimeters?

> ✎ **Show your thinking.**
>
>
> answer: _____

Name _____ Date _____

4 Which statements are true? Select *all* that apply.

(A) 190 centimeters = 19 millimeters

(B) 1.7 kilometers = 170 meters

(C) 37 meters = 37,000 millimeters

(D) 4.52 kilometers = 4,520 meters

(E) 525,000 millimeters = 525 meters

Spiral Review

5 Evaluate the expression 1,824 ÷ 32.

ⓘ **Show your thinking.**

answer: _____

6 Round each length to the different place values shown in the table.

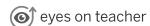|	Nearest meter	Nearest tenth of a meter	Nearest hundredth of a meter
18.708 meters			
19.052 meters			

Name _____ Date _____

🟥 **TEKS 5.1.F, 5.1.G, 5.7.A**

MASSive Measurements

Let's solve problems involving mass.

Warm-Up   **1** 👁 eyes on teacher

> **I can be all of me in math class.** If you tracked monarch butterflies like Jacob, Miriam, and Quique, what would be your favorite part?
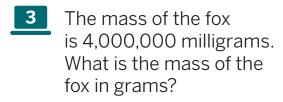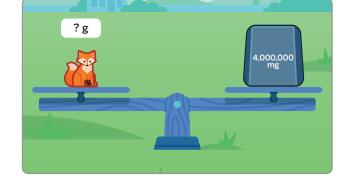
Activity **1**   Measure and See

2 The mass of the skunk is 800 grams. What is the mass of the skunk in milligrams?

? mg   800 g

_____ milligrams

3 The mass of the fox is 4,000,000 milligrams. What is the mass of the fox in grams?

? g   4,000,000 mg

_____ grams

4 **Discuss** 💬

How can you convert any number of grams to milligrams?
How can you convert any number of milligrams to grams?

5 The mass of the dog is 28,500 grams. What is the mass of the dog in kilograms?

? kg

28,500 g

_____ kilograms

6 **Discuss** 💬

What is the same about converting milligrams to grams and converting grams to kilograms?

Animal Masses

7 The combined mass of the raccoon and 1.5 kilograms is 9,500 grams. What is the mass of the raccoon in kilograms?

? kg

1.5 kg

9,500 g

ⓘ Show your thinking.

answer: _____

8 Discuss 💬

How did you determine the mass of the raccoon?

Animal Masses (continued)

9 This rabbit and 150 grams equal 0.55 kilograms. What is the mass of the rabbit in milligrams?

? mg

150 g

0.55 kg

✎ **Show your thinking.**

answer:

10 **Discuss** 💬

How did you determine the mass of the rabbit in milligrams?

Summary 5.03

In multi-step problems, sometimes the units of measurement need to be converted more than once. To convert between different-sized metric units of mass, you can use operations such as multiplication or division.

5 owls have a total mass of 25,000,000 milligrams. If each owl has the same mass, what is the mass of each owl in kilograms?

$$1 \text{ kg} = 1,000 \text{ g} \qquad 1 \text{ g} = 1,000 \text{ mg} \qquad 1 \text{ kg} = 1,000,000 \text{ mg}$$

$25,000,000 \div 1,000 = 25,000$, so 25,000 grams

$25,000 \div 1,000 = 25$, so 25 kilograms for all 5 owls.

$25 \div 5 = 5$, so 5 kilograms

Each owl has a mass of 5 kilograms.

Practice 5.03

1 A guinea pig and 7 kilograms equal 8,500 grams. What is the mass of the guinea pig in kilograms?

> **Record your answer in the space provided.**

Name _____ Date _____

2 A chicken and 150 grams equal 3.55 kilograms. What is the mass of the chicken in milligrams?

ℹ **Show or explain your thinking.**

answer: _____

3 A jellyfish and 1.5 kilograms equal 3,700 grams. What is the mass of the jellyfish in milligrams?

ℹ **Show or explain your thinking.**

answer: _____

Name _____ Date _____

4   Which of the following expressions equal a total mass of 1.6 kilograms? Select *all* that apply.

(A) 0.01 kilograms + 1.5 grams

(B) 1,000 grams + 0.6 kilograms

(C) 1,000 milligrams + 0.6 grams

(D) 100,000 milligrams + 1,500 grams

(E) 10,000 milligrams + 1,500 grams

Spiral Review

For Problems 5 and 6, determine the value of the expression.

i Show your thinking.

5   807 × 54

answer: _____

6   427 × 63

answer: _____

Name _____   Date _____

🔴 TEKS 5.1.A, 5.1.E, 5.7.A

Butterfly Feeders

Let's solve multi-step problems with metric measurements.

4.8 liters
500 mL
1½ liters
3,500 mL
2 liters

Warm-Up   👁 eyes on teacher

I can be all of me in math class.
How would you describe a mathematician?

Activity 1   How Much Nectar?

The table shows the capacities of 5 butterfly feeders used at a local butterfly garden.

Feeder A	Feeder B	Feeder C	Feeder D	Feeder E
4.8 liters	500 milliliters	1.5 liters	3,500 milliliters	2 liters

1   A cooler is filled with 9 liters of pre-mixed nectar that will be used to fill Feeders A, B, and C. How many milliliters of nectar will be left after filling the feeders?

✏ **Show or explain your thinking.**

answer: _____

2 A second cooler has 2.8 liters of nectar. The volunteers use all of the nectar by pouring half the nectar into Feeder D and half the nectar into Feeder E. How many more milliliters of nectar are needed to completely fill Feeder D?

> ℹ **Show or explain your thinking.**
>
> **answer:** _____

3 Later in the season, a volunteer needed to refill Feeders A and D. After they filled the feeders, they had 1,750 milliliters leftover. How many liters of nectar were in the cooler to begin with?

> ℹ **Show or explain your thinking.**
>
> **answer:** _____

Summary 5.04

When solving multi-step problems involving measurement conversions, you can convert at different points in the process and the final answer will be the same.

5 volunteers each mixed 4.5 liters of nectar with 3,800 milliliters of water. How many total liters of nectar mixture did they make?

Strategy A	Strategy B
3,800 ÷ 1,000 = 3.8, so 3.8 liters	5 × 4.5 = 22.5, so 22.5 liters 5 × 3,800 = 19,000, so 19,000 milliliters
4.5 + 3.8 = 8.3, so 8.3 liters	19,000 ÷ 1,000 = 19, so 19 liters
8.3 × 5 = 41.5, so 41.5 liters	22.5 + 19 = 41.5, so 41.5 liters

Practice 5.04

1 🟥 An artist mixes the 3 colors of paint to make a custom color. How many total liters of paint does the artist use to make the custom color?

Paint A	Paint B	Paint C
450 milliliters	0.25 liters	300 milliliters

(A) 1 liter (B) 1.5 liters

(C) 10 liters (D) 1,000 liters

Name _____   Date _____

Use what you know about measurement conversions to solve Problems 2–4.

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i Show or explain your thinking.

2 Clare drinks 8 glasses of water each day. There are 235 milliliters in each glass. How many liters of water does Clare drink each day?

answer: _____

⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯

3 1 lap around a track is 366 meters. An athlete runs 15 laps. How many kilometers did the athlete run?

answer: _____

⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯

4 Diego has a jar filled with sparkling water. After he poured 325 milliliters of sparkling water into each of 8 cups, there were 400 milliliters of sparkling water left in the jar. How many liters of sparkling water were originally in the jar?

answer: _____

Name _____ Date _____

Spiral Review

5 Round each capacity to the different place values shown in the table.

	Nearest liter	Nearest tenth of a liter	Nearest hundredth of a liter
6.615 liters			
6.489 liters			
6.083 liters			

For Problems 6–9, determine the value of the expression.

ℹ Show your thinking.

6 $4,140 \div 45$

answer: _____

7 $3,366 \div 22$

answer: _____

8 303×24

answer: _____

9 678×15

answer: _____

Name _____   Date _____

🔴 TEKS 5.1.A, 5.1.B, 5.1.F, 5.7.A
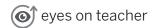
Collecting Compost

Let's solve multi-step problems about customary weight measurements.

Warm-Up   **1-2**   👁 eyes on teacher
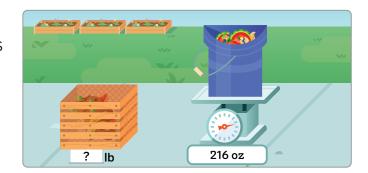
> **I can be all of me in math class.** How does Miriam act like a mathematician?

Activity 1   Pounds of Compost

3 Miriam's classroom collected 216 ounces (oz) of food scraps for composting. How many pounds (lb) of food scraps did they collect?

? lb   216 oz

✏ **Show your thinking.**

answer: _____

4 Miriam's garden club produced 50 pounds of compost. They will package the compost in 20-ounce bags to sell. How many 20-ounce bags can be made with 50 pounds of compost?

___?___ **bags**   50 lb

ⓘ Show your thinking.

answer: _____

5 **Discuss** 💬

How do you know when to represent an amount with both pounds and ounces?

Tons of Compost

6 Let's watch a video.

7 **Describe** 💬

What do you notice about the relationship between pounds and tons?

4000 lb   2 tons

8 Miriam's garden club partners with a local plant nursery to start composting. Their goal is to make $\frac{3}{4}$ tons of compost in a year. How many pounds of compost is this?

✏️ **Show your thinking.**

answer: _____

9 Miriam's garden club made $1\frac{1}{2}$ tons of compost! They will package the compost into 40-pound bags. How many 40-pound bags will the garden club make?

✏ **Show your thinking.**

answer: _____

10 Miriam's garden club has a goal of collecting 5 tons of compost.

- In March, they collected 2,350 pounds.

- In April, they collected 1 ton and 1,150 pounds.

- In May, they collected $1\frac{3}{4}$ tons.

Discuss 💬

Did the garden club reach their goal? How do you know?

You can use the relationship between tons, pounds, and ounces to solve multi-step problems.

An elephant weighs 3 tons and 1,000 pounds. How much does the elephant weigh in ounces?

16 ounces = 1 pound

2,000 pounds = 1 ton

32,000 ounces = 1 ton

32,000 + 32,000 + 32,000 = 96,000, so 96,000 ounces

1,000 × 16 = 16,000, so 16,000 ounces

96,000 + 16,000 = 112,000, so 112,000 ounces

The elephant weighs 112,000 ounces.

Practice 5.05

The table shows the weights of 3 animals. Use the table for Problems 1–3.

Animal	desert toad	lion	gecko
Weight	$1\frac{1}{2}$ pounds	$\frac{1}{5}$ tons	2 ounces

1 How much do 48 geckos weigh in pounds?

ⓘ **Show or explain your thinking.**

answer: _____

Name _____ Date _____

2 How many geckos will it take to weigh more than 1 desert toad?

> **i** Show or explain your thinking.
>
> answer: _____

3 Which weighs more — 1 lion or 200 desert toads and 400 geckos?

> **i** Show or explain your thinking.
>
> answer: _____

4 🔴 Use the animal facts to determine which statements are true. Select **THREE** correct answers.

- A rattlesnake weighs $4\frac{1}{2}$ pounds.

- A Gila monster weighs 56 ounces.

- A jackrabbit weighs 8 pounds.

(A) 1 rattlesnake weighs less than 1 Gila monster.

(B) 3 jackrabbits weigh more than 5 rattlesnakes.

(C) 6 Gila monsters weigh more than 3 jackrabbits.

(D) 1 jackrabbit weighs the same as 1 rattlesnake and 1 Gila monster.

(E) 8 rattlesnakes weigh more than 4 jackrabbits.

Spiral Review

For Problems 5 and 6, determine the value of the expression.

ℹ Show your thinking.

5 405 × 55

answer: _____

6 731 × 45

answer: _____

Name _____

Date _____

⭐ TEKS 5.1.A, 5.1.F, 5.1.G, 5.7.A

Butterfly Garden

Let's solve problems with customary
length measurements.

> **I can be all of me in math class.**
> What makes you a
> mathematician?

Warm-Up 👁 eyes on teacher

Activity
1

Card Sort: Customary Length

Hands-On ✋

**You and your partner will be given a set of cards with measurements in
inches, feet, yards, or <u>miles</u>.**

1 ▸ **Sort** 🃏

Work with your partner to compare the measurements on your cards and
arrange them in order from *shortest* to *longest*.

2 ▸ Join with a pair that has a different set of cards. Arrange *all* of the cards
in order from *shortest* to *longest*. Record your results in the table,
starting with the shortest measurement listed in the first row.

_____ _____ _____ _____ _____ _____ _____ _____

shortest   **longest**

3   Where would you place these 3 cards in your group sort? Be prepared to explain your thinking.

Card J $\frac{1}{4}$ miles	Card K 1.5 yards	Card L 6 inches

✏ **Show or explain your thinking.**

You can use multiplication or division to convert customary or metric units. The only difference is that in the Customary system, the relationships between units are not *powers of 10*, such as 10, 100 and 1,000.

Compare: $\frac{1}{5}$ miles and 360 yards	
Convert	**Convert to a common unit**
1 **mile** = 5,280 feet 1 yard = 3 feet 1 mile = 1,760 yards $\frac{1}{5} \times 1,760 = \frac{1,760}{5} = 352$ 360 yards > 352 yards	1 mile = 5,280 feet $\frac{1}{5} \times 5,280 = 1,056$, so 1,056 feet 1 yard = 3 feet $360 \times 3 = 1,080$, 1,080 feet 1,080 feet > 1,056 feet
360 yards > $\frac{1}{5}$ miles	

Mile A unit of length in the U.S. Customary measurement system, which is equal to 5,280 feet or 1,760 yards.

Practice 5.06

1   A lap around a track is 400 yards. If an athlete wants to run at least 2 miles, how many full laps should the athlete run?

    i   **Show or explain your thinking.**

    answer: _____

Name _____ Date _____

2 Order the lengths from *greatest* to *least*.

Lengths				
82 yards	$\frac{1}{20}$ miles	3,000 inches	84 yards	245 feet

i Show or explain your thinking.

_____ **greatest**

_____

_____

_____

_____ **least**

Name _____ Date _____

3 🔴 Priya has 5 yards of string for an art project. What is the length of the string in inches?

(A) 150 inches (B) 15 inches

(C) 180 inches (D) 18 inches

Spiral Review

4 Determine the product.

972 × 86

ℹ **Show your thinking.**

answer: _____

5 Round each length to the different place values shown in the table.
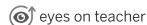
	Nearest foot	Nearest tenth of a foot	Nearest hundredth of a foot
19.201 feet			
26.745 feet			

Name _____   Date _____

⬢ TEKS 5.1.A, 5.1.B, 5.1.F, 5.7.A

Taking Care of the Butterfly Garden

Let's solve multi-step problems about customary liquid volume.

7.5 quarts

12 quarts

6 pints

Warm-Up   🖼️   👁️ eyes on teacher

I can be all of me in math class. Miriam often makes mistakes while working in her garden. How are mathematicians similar to Miriam?

Activity
1

Card Sort: Plant Groups

Hands-On ✋

You and your partner will be given a set of cards with clues about plants in the butterfly garden.
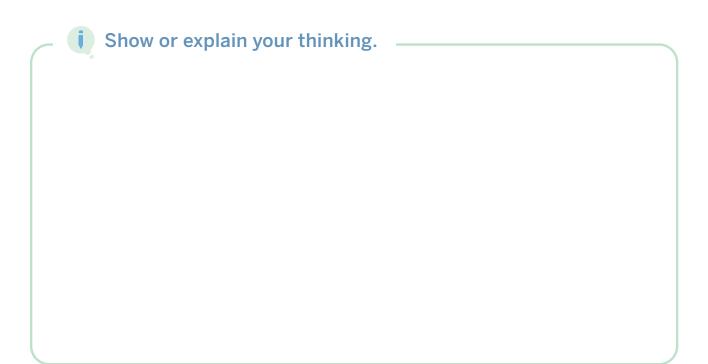
1 ▸ **Sort** 🎴

Use the clues to determine which plants belong in each section of the garden. Record the letter of each plant in the table.

Section 1 (12 gallons of water)	Section 2 (15 gallons of water)	Section 3 (21 gallons of water)

Card Sort: Plant Groups (continued)

💡 **Show or explain your thinking.**

Preparing Popsicles

Fifth graders made popsicles for their school trip to the butterfly garden. They made popsicles with each kind of juice.

- 12 quarts of lemonade
- 6 pints of fruit punch
- 240 fluid ounces of orange juice

2 If they used $\frac{1}{2}$ cups of the juice mixture to make each popsicle, how many popsicles did they make?

✏️ **Show or explain your thinking.**

answer: _____

When you have multiple steps in a customary measurement conversion problem, you can start the problem using any strategy.

Jenny gave water to 6 dogs and 9 cats at an animal shelter. She gave 1 pint of water to each dog and 1 cup of water to each cat. How many quarts of water did Jenny give?

1 pint = 2 cups, 1 quart = 4 cups

6 dogs need 12 cups and 9 cats need 9 cups.

12 + 9 = 21, so 21 cups

21 cups = $5\frac{1}{4}$ quarts because $21 \div 4 = 5\frac{1}{4}$.

$5\frac{1}{4}$ quarts

Practice 5.07

1 🟥 A machine requires a total of 96 cups of water each day to work properly. How many gallons of water does the machine require for 5 days?

ⓘ **Record your answer in the space provided.**

Name _____ Date _____

2 🔺 In 1 week, a family drinks 2 gallons of milk. How many cups of milk does the family drink in 1 week?

(A) 8 cups (B) 24 cups

(C) 16 cups (D) 32 cups

Use the information on the cards to solve Problems 3 and 4.

A 18 cups	B 5 quarts	C 12 pints

3 Which contains more — 10 containers of A or 6 containers of C?

✏ **Show or explain your thinking.**

answer: _____

4 How many full containers of B does Shawn need to have 24 gallons?

✏ **Show or explain your thinking.**

answer: _____

Spiral Review

5 Evaluate the expression 1,881 ÷ 33.

> ⓘ **Show your thinking.**
>
>
>
>
>
>
>
>
>
> **answer:** ⎯⎯⎯⎯⎯⎯⎯⎯⎯

6 Round each liquid volume to the different place values shown in the table.

	Nearest gallon	Nearest tenth of a gallon	Nearest hundredth of a gallon
9.199 gallons			
10.728 gallons			
11.099 gallons			

Adding and Subtracting Fractions With Unequal Denominators

✳ **Unit Story: The Monarchs**

AlvaroMedina/Shutterstock.com

How can you determine the total amount of food in butterfly feeders if 1 feeder measures with thirds and another measures with sixths?

Name _____ Date _____

🔺 TEKS 5.1.A, 5.1.C, 5.1.E, 5.3.H

Spread Your Wings and Fly

Let's use objects to add and subtract fractions with unequal denominators.

$\frac{1}{2}$ grams $\frac{1}{5}$ grams

Warm-Up 👁 eyes on teacher

I can be all of me in math class. How is it helpful when mathematicians make mistakes?

Activity 1

Got Milkweed?

Hands-On ✋

You will be given a set of fraction strips. Use the fraction strips to determine each sum.

1 Volunteers bought milkweed seeds for their monarch butterfly habitat. They bought $\frac{1}{6}$ pounds of orange milkweed seeds and $\frac{2}{3}$ pounds of snowy milkweed seeds. How many pounds of milkweed seeds did the volunteers buy altogether?

answer: _____

2 **Discuss** 💬

Join another pair. Share and compare your work.

• What is similar? What is different?

Got Milkweed? (continued)

3 A monarch caterpillar ate $\frac{1}{4}$ ounces of milkweed in the morning and $\frac{1}{8}$ ounces of milkweed in the evening. How many ounces of milkweed did the caterpillar eat?

answer: _____

4 The monarch butterflies flew $\frac{2}{9}$ miles of their journey in the first week. The next week they traveled $\frac{1}{3}$ miles of their journey. How many miles have the butterflies traveled in the 2 weeks?

answer: _____

5 Last year, there were $\frac{3}{10}$ acres of milkweed along the monarch butterfly's migration trail. This year, $\frac{1}{2}$ an acre of milkweed was added to the trail. How many acres of milkweed are now along the migration trail?

answer: _____

Name _____ Date _____

Itsy Bitsy Butterflies

Hands-On ✋

You will be given a set of fraction strips. Use the fraction strips to determine each difference.

6 The mass of 1 butterfly is $\frac{1}{2}$ grams, and the mass of another butterfly is $\frac{1}{6}$ grams. What is the difference between the masses of the 2 butterflies?

answer: _____

7 **Discuss** 💬

Join another pair. Share and compare your work.

- What is similar? What is different?

8 An orange monarch butterfly flies $\frac{2}{3}$ miles. A blue monarch butterfly flies $\frac{1}{6}$ miles. How much further did the orange butterfly fly than the blue butterfly?

answer: _____
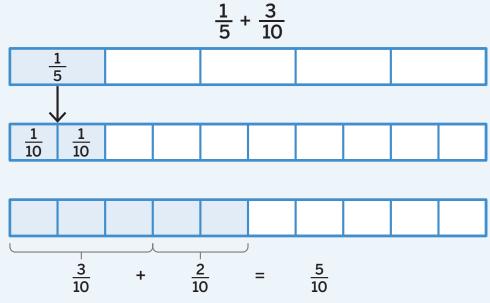
9 An adult butterfly has a wingspan that measures $\frac{3}{4}$ inches long. A baby butterfly has a wingspan that measures $\frac{3}{8}$ inches long. How much longer is the wingspan of the adult butterfly than the wingspan of the baby butterfly?

answer: _____

10 This year, the monarch butterflies covered $\frac{7}{10}$ of the field where Jacob lives. Last year, the monarch butterflies covered $\frac{2}{5}$ of the field. What is the difference between how many butterflies covered the field from this year to last year?

answer: _____

You can add and subtract fractions with unequal denominators by using fraction strips to determine a common denominator before solving.

$$\frac{1}{5} + \frac{3}{10}$$

$\frac{1}{5}$				

$\frac{1}{10}$	$\frac{1}{10}$								

$$\frac{3}{10} \quad + \quad \frac{2}{10} \quad = \quad \frac{5}{10}$$

Practice 5.08

1 A dog eats $\frac{3}{4}$ cups of dog food in the morning and $\frac{7}{8}$ cups in the evening. How many cups of dog food does the dog eat altogether? Represent your thinking using the fraction model.

ⓘ **Show your thinking.**

answer: _____

Name _____   Date _____
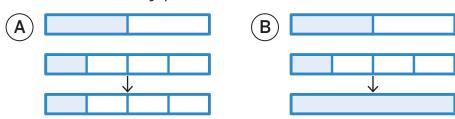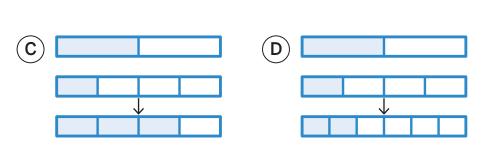
2 A librarian has 2 cactus plants at her desk. One cactus is $\frac{12}{15}$ feet tall. The other cactus is $\frac{3}{5}$ feet tall. How much taller is the first cactus than the second? Represent your thinking using the fraction model.

✏️ **Show your thinking.**

answer: _____

3 🔺 Priya is baking protein bars for a hike. She adds $\frac{1}{2}$ cups of walnuts and then decides to add another $\frac{1}{4}$ cups. How many cups of walnuts has she added altogether? Choose the representation that best matches the story problem.

A

B

C

D

Spiral Review

4 Han drove a go-kart. He recorded his time from each lap.

- Lap 1: 81.456 seconds

- Lap 2: 82.567 seconds

- Lap 3: 83.979 seconds

Estimate how long it took Han to complete the 3 laps to the nearest tenth of a second.

ⓘ **Show your thinking.**

answer: ————————————————

5 Claire bought 8 movie tickets. Each ticket cost $12.32. What was the total cost of all the tickets?

ⓘ **Show your thinking.**

answer: ————————————————

Name _____ Date _____

🍁 TEKS 5.1.A, 5.1.C, 5.1.E, 5.3.H

Preparing for Winter With Unequal Fractions

Let's use objects and models to add and subtract fractions with unequal denominators.

Warm-Up   👁 eyes on teacher

> ⚙ **I am a doer of math.**
> Why is it important to represent problems in more than one way?

Activity **1**   Migration

Hands-On ✋

You will be given a set of fraction strips.
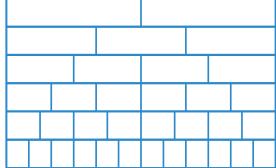
1 A group of ducks are migrating south for the winter. In 1 minute, they flew $\frac{1}{4}$ miles. The next minute, they flew $\frac{3}{8}$ miles. How many miles did they fly altogether? Solve using fraction strips. Then represent your thinking on the model.

> ✎ **Show your thinking.**

answer: _____

2 ▶ Last year, a flock of geese traveled $\frac{5}{6}$ of their total migration distance in 2 days. This year, the flock only traveled $\frac{1}{3}$ of the total migration distance in 2 days. How much less of the total distance did the flock of geese travel in 2 days this year? Solve using fraction strips. Then represent your thinking on the model.

Last year

This year

---

3 ▶ Mexican free-tailed bats travel from Texas to Mexico in the winter, stopping at caves along the way. At the first cave, the bats stopped for $\frac{4}{6}$ hours. At the next cave, they rested for $\frac{3}{12}$ hours. How many hours did the bats rest altogether? Represent and solve the story problem using the model.

Cave 1

Cave 2

---

4 ▶ In 2010, $\frac{3}{4}$ of all the birds in the U.S. migrated. In 2020, only $\frac{5}{12}$ of all birds migrated. How many fewer birds migrated in 2020 than 2010? Represent and solve the story problem using the model.
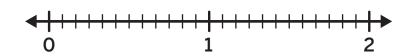
2010

2020

Other Adaptations

For Problems 5–8, represent and solve the story problem on the number line.

5 Deer grow thicker fur to protect them in the colder weather. A deer's fur measured $\frac{1}{4}$ inches in the summer. The fur grew $\frac{7}{12}$ inches more by winter. What is the total length of the deer's fur by winter?
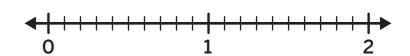
ⓘ **Show your thinking.**

answer: _____

6 Some bears and snakes hibernate during the winter. Some bears typically hibernate for $\frac{3}{5}$ of the year. Some snakes hibernate for $\frac{4}{10}$ of the year. Who hibernates for more of the year? How much more?
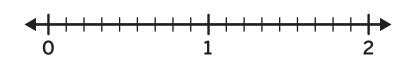
ⓘ **Show your thinking.**

_____ **hibernate** _____ **of the year more.**

7   Squirrels collect food to store for winter. A squirrel has collected $\frac{2}{3}$ pounds of nuts and $\frac{4}{9}$ pounds of berries. How many pounds of nuts and berries has the squirrel collected altogether?
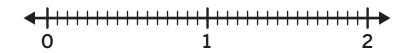
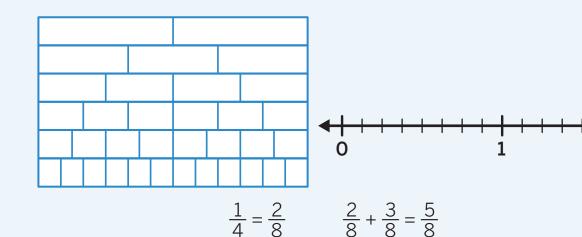**i**   **Show your thinking.**

answer: _____

8   Some fish slow down their heart rate to conserve energy during the winter. A fish's heart rate changes from $\frac{5}{8}$ beats per second to $\frac{1}{16}$ beats per second. What is the difference between the number of beats per second?
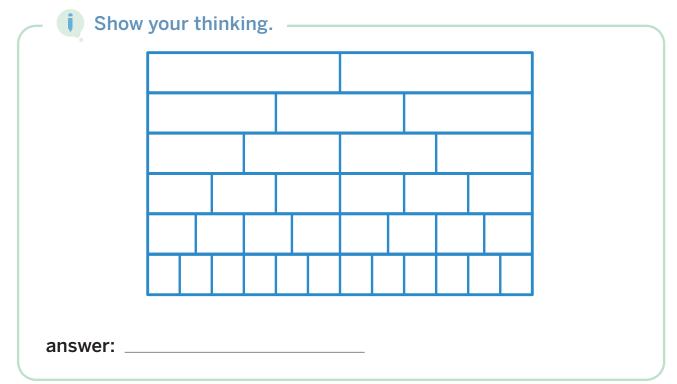
i   **Show your thinking.**

answer: _____

Summary 5.09

Using models to represent addition and subtraction of fractions with unequal denominators is a helpful strategy to determine how fractions are related and to identify a common denominator.

$$\frac{1}{4} = \frac{2}{8} \qquad \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

Practice 5.09

1 Jada and Diego each had part of a sandwich. Jada ate $\frac{1}{6}$ of the sandwich. Diego ate $\frac{1}{12}$ of the sandwich. How much of the sandwich did they both eat? Represent and solve the story problem using the model.

Show your thinking.

answer: _____

Name _____ Date _____

2 Clare collected $\frac{4}{7}$ ounces of seashells at the beach. She gave $\frac{3}{14}$ ounces of her collection to her friend. How many ounces of seashells does Clare have now? Represent and solve the story problem on the number line.

✏ **Show your thinking.**

answer: _____

3 🔴 Han added $\frac{1}{4}$ cups of apples and $\frac{5}{12}$ cups of bananas to a smoothie. Which expressions represent how many cups of fruit Han used?
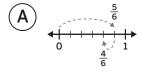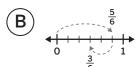
Select **TWO** correct answers.

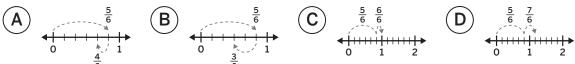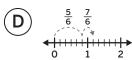Ⓐ $\frac{1}{4} + \frac{5}{12}$ Ⓑ $\frac{1}{4} + \frac{5}{4}$ Ⓒ $\frac{1}{12} + \frac{5}{12}$

Ⓓ $\frac{12}{12} + \frac{5}{12}$ Ⓔ $\frac{3}{12} + \frac{5}{12}$

4 On Tuesday, Pryia walked for $\frac{5}{6}$ miles. On Wednesday, she walked $\frac{1}{3}$ miles. How many more miles did she walk on Tuesday than Wednesday? Select the model that represents the story problem.

Ⓐ   Ⓑ   Ⓒ   Ⓓ

Spiral Review

5 A soccer field has a perimeter of 400 yards and a length of 125 yards. What is the width of the soccer field?

> **i** Show your thinking.
>
> answer: _____
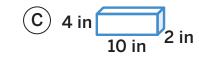
6 Which rectangular prism has a volume of 64 cubic inches? Select **TWO** correct answers.

Ⓐ 4 in, 4 in, 4 in

Ⓑ 7 in, 3 in, 3 in

Ⓒ 4 in, 10 in, 2 in

Ⓓ 16 in, 2 in, 2 in

Ⓔ 8 in, 2 in, 2 in

Ⓕ 2 in, 2 in, 2 in

For Problems 7–8, determine the value of the expression.

7 423 × 13

answer: _____

8 6,225 ÷ 15

answer: _____

Name _____ Date _____

⭐ TEKS 5.1.A, 5.1.B, 5.1.C, 5.3.H

Quique's Monarch Butterflies

Let's add and subtract fractions with unequal denominators.

$\frac{3}{4}$ km
$\frac{6}{8}$ km

I can be all of me in math class. How has what makes you a unique math learner changed throughout the unit?

Warm-Up 👁 eyes on teacher

Flights of the Butterflies

1 Quique said that a monarch butterfly traveled $\frac{3}{4}$ kilometers and then another $\frac{6}{8}$ kilometers. What is the distance the butterfly traveled?

✏ **Show or explain your thinking.**

answer: _____

Flights of the Butterflies (continued)

A butterfly traveled $\frac{1}{3}$ kilometers in the morning and another $\frac{8}{12}$ kilometers in the afternoon. How many more kilometers did the butterfly travel in the afternoon than in the morning?

2 Complete the statement to estimate your answer using *greater than, less than or equal to*, then solve.

My answer will be _____ $\frac{8}{12}$.

ℹ **Show or explain your thinking.**

answer: _____

3 **Discuss** 💬

How do you know your answer to Problem 2 is reasonable?

Very Hungry Caterpillar

In the morning, a monarch caterpillar ate $\frac{1}{4}$ of a milkweed plant. In the afternoon, the caterpillar ate more of the plant. By the evening, the caterpillar had eaten $\frac{4}{5}$ of the plant. How much of the plant did the caterpillar eat in the afternoon?

4 Complete the statement to estimate your answer using *greater than, less than or equal to*, then solve.

My answer will be _____ $\frac{4}{5}$.

✏️ **Show or explain your thinking.**

answer: _____

5 **Discuss** 💬

How do you know your answer to Problem 4 is reasonable?

Very Hungry Caterpillar (continued)

6 A caterpillar ate $\frac{2}{3}$ ounces of milkweed in 1 week. The next week, the caterpillar ate $\frac{3}{5}$ ounces of milkweed. How many ounces of milkweed has the caterpillar eaten?

i **Show or explain your thinking.**

answer: _____

When 1 denominator is a multiple of the other, an equivalent fraction for only one of the original fractions needs to be created. When 1 denominator is not a multiple of the other, you can determine equivalent fractions for both.

Rename 1 fraction	Rename both fractions
$\frac{3}{4} + \frac{5}{8}$ $\frac{3 \times 2}{4 \times 2} = \frac{6}{8}$ $\frac{6}{8} + \frac{5}{8} = \frac{11}{8}$ $\frac{6}{9} - \frac{1}{3}$ $\frac{6 \div 3}{9 \div 3} = \frac{2}{3}$ $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$	$\frac{3}{5} + \frac{5}{8}$ $\frac{3 \times 8}{5 \times 8} = \frac{24}{40}$ $\qquad$ $\frac{5 \times 5}{8 \times 5} = \frac{25}{40}$ $\frac{25}{40} + \frac{24}{40} = \frac{49}{40}$

Practice 5.10

For Problems 1 and 2, evaluate the expression.

✏ **Show or explain your thinking.**

1 $\frac{2}{3} + \frac{11}{12}$

2 $\frac{2}{3} - \frac{3}{6}$

answer: _____

answer: _____

3 Which statements are *true* about the expression $\frac{2}{5} + \frac{3}{10}$? Select *all* that apply.

(A) The sum of the expression is greater than $\frac{1}{2}$.

(B) The sum of the expression is greater than 1.

(C) 5 is a common denominator of $\frac{2}{5}$ and $\frac{3}{10}$.

(D) The value of the expression is $\frac{7}{10}$.

(E) 10 is a common denominator of $\frac{2}{5}$ and $\frac{3}{10}$.

For Problems 4 and 5, use the number bank.

Number Bank					
$\frac{3}{10}$	$\frac{38}{30}$	$\frac{13}{10}$	$\frac{7}{30}$	$\frac{2}{6}$	1

4 🟥 Priya picked $\frac{1}{2}$ bushels of apples. Her sister picked $\frac{8}{10}$ bushels of pears. How many bushels of fruit did Priya and her sister pick? Complete the equation to make it true.

$$\frac{1}{2} + \frac{8}{10} = \boxed{}$$

5 🟥 A grasshopper is $\frac{5}{6}$ inches long. A spider is $\frac{3}{5}$ inches long. How much longer is the grasshopper than the spider? Complete the equation to make it true.

$$\frac{5}{6} - \frac{3}{5} = \boxed{}$$

Name _____ Date _____

6 Solve the expression $\frac{2}{5} + \frac{1}{4}$.

ⓘ Show or explain your thinking.

answer: _____

Spiral Review

7 Determine the value of the expression.

94 × 384

ⓘ Show your thinking.

answer: _____

Name _____   Date _____

🔺 TEKS 5.1.D, 5.1.E, 5.1.F, 5.3.H
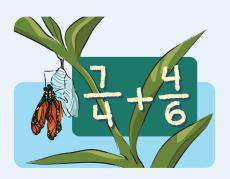
All Sorts of Denominators

Let's add and subtract all kinds of fractions.

$$\frac{7}{4} + \frac{4}{6}$$

Warm-Up   👁 eyes on teacher

I can be all of me in math class. Adding and subtracting fractions can look different but still share the same ways of thinking. How can mathematicians be the same yet different?

Activity

1   # Determining Denominators

1   To evaluate the expression $\frac{7}{4} + \frac{4}{6}$, Tyler says, "I can use 12 as a common denominator." Is Tyler correct? Write *yes* or *no*.

✏ **Show or explain your thinking.**

answer: _____

Determining Denominators (continued)

Determine the sum or difference.

ⓘ **Show your thinking.**

2 $\dfrac{9}{8} + \dfrac{3}{10}$

answer: _____

3 $\dfrac{11}{9} - \dfrac{5}{12}$

answer: _____

4 **Discuss** 💬

Did you use the same strategy to determine the common denominator in Problems 2 and 3? Why or why not?

Name _____ Date _____

So Many Denominators

Determine the sum or difference.

> **ⓘ Show your thinking.**
>
> **5** $\dfrac{2}{8} + \dfrac{12}{24}$
>
>
>
>
>
>
>
>
> **answer:** _____
> ┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄
>
> **6** $\dfrac{15}{25} - \dfrac{2}{10}$
>
>
>
>
>
>
>
>
> **answer:** _____

ⓘ Show your thinking.

7 $\frac{15}{18} + \frac{2}{12}$

answer: _____

---

8 **Discuss** 💬

Join another pair. Choose 1 problem and discuss why you chose your common denominator.

Summary 5.11

When adding and subtracting unequal denominators, you can always use multiples or the product of the two denominators as a common denominator. A factor that each denominator shares can sometimes be used as a common denominator.

$\dfrac{3}{4} - \dfrac{7}{10}$	$\dfrac{14}{8} + \dfrac{9}{12}$
$\dfrac{3 \times 5}{4 \times 5} = \dfrac{15}{20} \qquad \dfrac{7 \times 2}{10 \times 2} = \dfrac{14}{20}$ $\dfrac{15}{20} - \dfrac{14}{20} = \dfrac{1}{20}$	$\dfrac{14 \div 2}{8 \div 2} = \dfrac{7}{4} \qquad \dfrac{9 \div 3}{12 \div 3} = \dfrac{3}{4}$ $\dfrac{7}{4} + \dfrac{3}{4} = \dfrac{10}{4}$

Practice 5.11

1 Which numbers could be used as a common denominator when adding or subtracting $\frac{7}{8}$ and $\frac{5}{6}$? Select *all* that apply.

(A) 3   (B) 12   (C) 14

(D) 16   (E) 24   (F) 48

2 Which common denominator from Problem 1 would you use to determine the sum of or difference between $\frac{7}{8}$ and $\frac{5}{6}$? Explain your thinking.

_____

_____

_____

Name _____ Date _____

For Problems 3 and 4, evaluate the expression.

i Show or explain your thinking.

3 $\dfrac{9}{6} + \dfrac{1}{15}$

answer: _____

4 $\dfrac{12}{21} - \dfrac{8}{28}$

answer: _____

For Problem 5, use the number bank.

Number Bank

| $\dfrac{6}{30}$ | $\dfrac{16}{30}$ | $\dfrac{41}{30}$ | 6 | $\dfrac{25}{30}$ | 1 |

5 🤠 Complete the equation to make it true.

$$\dfrac{11}{5} - \dfrac{5}{6} = \boxed{}$$

Name _____ Date _____

Spiral Review

For Problems 6 and 7, evaluate the expressions.

i Show your thinking.

6 5.2×6.8

answer: _____

7 $64.6 \div 17$
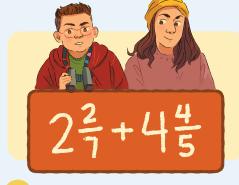
answer: _____

8 Evaluate the expression $15 + 10[24 - (8 + 2) \div 5]$.

i Show your thinking.

answer: _____

What's in a Sum?

Let's add mixed numbers.

$$2\frac{2}{7} + 4\frac{4}{5}$$

I can be all of me in math class.
Why is it important as a mathematician to share your thinking?

Warm-Up   👁 eyes on teacher

Activity 1

Adding Mixed Numbers

1   Estimate the sum $5\frac{2}{3} + 7\frac{5}{8}$. Explain your thinking.

Adding Mixed Numbers (continued)

2 Determine the sum $5\frac{2}{3} + 7\frac{5}{8}$ and represent your thinking with equations.

i Show or explain your thinking.

answer: _____

3 Discuss 💬

How can you use your estimate to justify whether your answer in Problem 2 is reasonable?

Name _____   Date _____

Going the Distance

For Problems 4–6, represent your thinking with equations.

4   Quique and his dad tagged and tracked a butterfly that flew $3\frac{5}{6}$ kilometers in the morning and another $4\frac{24}{36}$ kilometers in the evening. How far did the butterfly travel?

    ℹ Show or explain your thinking.

      answer: _____

5   Evaluate the expression $5\frac{5}{9} + 6\frac{12}{36}$.

    ℹ Show or explain your thinking.

      answer: _____

6 Evaluate the expression $3\frac{9}{10} + 1\frac{1}{6}$.

> ℹ️ **Show or explain your thinking.**
>
> **answer:** _____

7 **Discuss** 💬

Join another pair of students.

- Justify why your answer in Problem 4 is reasonable.
- Choose 1 problem where your sums are different. Are they equivalent? How do you know?

Summary 5.12

You can estimate sums of mixed numbers just like you did with fractions. Once you have an equivalent expression with a common denominator, you can use any strategy to add mixed numbers.

$$3\frac{2}{3} + 4\frac{5}{8}$$

Estimate	Add using any strategy
The sum is between 8 and 9 because 3 + 4 = 7 and both fractions are greater than $\frac{1}{2}$.	$3 + 4 + \frac{2}{3} + \frac{5}{8} = 7 + \frac{2}{3} + \frac{5}{8}$ $\frac{2 \times 8}{3 \times 8} = \frac{16}{24}$ and $\frac{5 \times 3}{8 \times 3} = \frac{15}{24}$ $7 + \frac{16}{24} + \frac{15}{24} = 7\frac{31}{24}$ or $8\frac{7}{24}$

Practice 5.12

1 If Clare uses $2\frac{5}{6}$ ounces of purple glitter and $1\frac{9}{10}$ ounces of red glitter on a project, about many ounces of glitter does she use?

_____

_____

Name _____ Date _____

Use the information for Problems 2 and 3. Represent your thinking with equations.

A teacher has white paint, red paint, and black paint for an art project.

> ✏ **Show or explain your thinking.**
>
> **2** If Han mixes $3\frac{3}{8}$ ounces of white paint and $2\frac{5}{6}$ ounces of red paint to make pink paint, how many ounces of pink paint will he have?
>
>
>
> **answer:** _____
>
> ┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄
>
> **3** If Jada mixes $3\frac{3}{8}$ ounces of white paint and $1\frac{9}{10}$ ounces of black paint to make gray paint, how many ounces of gray paint will she have?
>
>
>
> **answer:** _____

Name _____ Date _____

4 🏴 What is the sum $3\frac{1}{5} + 9\frac{5}{6}$? Select **TWO** correct answers.

(A) $11\frac{1}{30}$ (B) $12\frac{1}{30}$

(C) $12\frac{31}{30}$ (D) $13\frac{1}{30}$

(E) $13\frac{1}{3}$ (F) $12\frac{35}{30}$

Spiral Review

For Problems 5 and 6, determine the value of the expression.

ℹ **Show your thinking.**

5 709×85

answer: _____

6 8.7×2.5

answer: _____

Name _____ Date _____

🔺 **TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.E, 5.3.H**

Measuring Growth

Let's subtract mixed numbers.

Warm-Up   📋   👁 eyes on teacher

> ❀ **I can be all of me in math class.**
> What makes you similar to the other students in your math class? What makes you different?

Activity
1   ## Before and After the Metamorphosis

For Problems 1 and 2, determine the difference and represent your thinking using equations.

1   Quique and his dad measured the wingspans of butterflies at his dad's work. The longest wingspan is $4\frac{3}{4}$ inches, and the shortest wingspan is $3\frac{11}{12}$ inches. What is the difference between the 2 butterflies' wingspans in inches?

📍 **Show or explain your thinking.**

answer: _____

2 Quique and his dad measured the lengths of 2 monarch caterpillars. One was $4\frac{1}{2}$ centimeters, and the other was $2\frac{3}{8}$ centimeters. What is the difference between the 2 caterpillars' lengths in centimeters?

✏ **Show or explain your thinking.**

answer: _____

3 **Discuss** 💬

• How do you know your answer is reasonable?

• Did you use the same strategy in each problem? Why or why not?

Summary 5.13

Once you have an equivalent expression with a common denominator, you can use any strategy to subtract mixed numbers.

$$3\frac{3}{16} - 1\frac{5}{8} = 3\frac{3}{16} - 1\frac{10}{16}$$

Subtract whole numbers and fractions	Add up
$3\frac{3}{16} = 2\frac{19}{16}$ $2\frac{19}{16} - 1\frac{10}{16}$ $2 - 1 = 1$ $\frac{19}{16} - \frac{10}{16} = \frac{9}{16}$ $\frac{9}{16} + 1 = 1\frac{9}{16}$	$1\frac{10}{16} + \frac{6}{16} = 2$ $2 + 1 = 3$ $3 + \frac{3}{16} = 3\frac{3}{16}$ $\frac{6}{16} + 1 + \frac{3}{16} = 1\frac{9}{16}$

Practice 5.13

1 🔴 Diego adds $2\frac{7}{9}$ cups of green grapes and $1\frac{3}{4}$ cups of red grapes to a bowl. How many more cups of green grapes are there than red grapes?

ℹ Record your answer in the space provided.

Name _____ Date _____

Use the information for Problems 2 and 3. Represent your thinking with equations.

Priya has sparkling water, orange sherbet, and pineapple juice to make punch.

> ℹ **Show or explain your thinking.**
>
> **2** Priya uses $7\frac{1}{2}$ cups of sparkling water and $5\frac{2}{5}$ cups of pineapple juice in a punch bowl. How much more sparkling water did Priya use?
>
>
>
>
>
>
>
> **answer:** _____
>
> -
>
> **3** Priya uses $6\frac{3}{4}$ cups of orange sherbet and $7\frac{3}{8}$ cups of pineapple juice in a punch bowl. How much more pineapple juice did Priya use?
>
>
>
>
>
>
>
> **answer:** _____

Name _____ Date _____

4 What is the difference $7\frac{3}{4} - 5\frac{3}{12}$? Select *all* that apply.

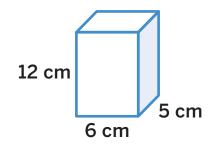(A) $2\frac{1}{4}$

(B) $2\frac{1}{2}$

(C) $2\frac{3}{12}$

(D) $1\frac{3}{4}$

(E) $\frac{10}{4}$

(F) $\frac{10}{2}$

Spiral Review

5 Determine the volume of the figure.

_____

12 cm

6 cm

5 cm

For Problems 6 and 7, determine the value of the expression.

ⓘ **Show your thinking.**

6 11.3 − 7.541

answer: _____
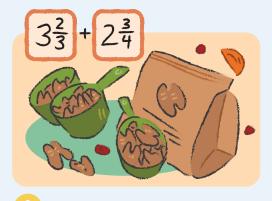
7 0.28 + 0.932

answer: _____

Name _____   Date _____

🔴 TEKS 5.1.A, 5.1.B, 5.3.H, 5.4.F

Road Trip

Let's practice adding and subtracting fractions and mixed numbers.

$$3\tfrac{2}{3} + 2\tfrac{3}{4}$$

I can be all of me in math class.
What are some words that mathematicians might say as they solve problems?

Warm-Up   👁 eyes on teacher

The Monarch Highway

The Monarch Highway is a nickname for a highway that passes through 6 states in the U.S. It is the path that millions of monarch butterflies take as they migrate south. Volunteers work to ensure a successful migration. Represent your thinking using equations.

1   Quique made a bag of trail mix to share with the other volunteers. He added $3\tfrac{2}{3}$ cups of walnuts to the trail mix and then another $2\tfrac{3}{4}$ cups. If the recipe requires $6\tfrac{1}{8}$ cups of walnuts, did Quique add enough walnuts to the trail mix?

✏️ **Show your thinking.**

answer: _____

2 Quique also made the volunteers lemonade. He had a container with $2\frac{8}{9}$ gallons of lemonade and poured $\frac{10}{15}$ gallons into cups for the volunteers. The next day, he made $2\frac{1}{4}$ more gallons of lemonade. How much lemonade does he have now?

> **Show your thinking.**
>
> answer: _____

3 Quique filled 4 water bottles with $\frac{4}{15}$ gallons of water each, and 3 coolers with $1\frac{3}{5}$ gallons of water each. If Quique started with $6\frac{9}{10}$ gallons of water, how much water was left?

> **Show your thinking.**
>
> answer: _____

Summary 5.14

When adding and subtracting with more than 2 fractions and mixed numbers, you can choose a common denominator for all the fractions or for 2 at a time.

$$13\frac{3}{8} + \frac{19}{16} - 4\frac{25}{32}$$

All fractions	2 fractions at a time
$13\frac{12}{32} + \frac{38}{32} - 4\frac{25}{32} = 9\frac{25}{32}$	$13\frac{6}{16} + \frac{19}{16} = 13\frac{25}{16}$ $13\frac{50}{32} - 4\frac{25}{32} = 9\frac{25}{32}$

Practice 5.14

For Problems 1 and 2, evaluate the expression.

i Show your thinking.

1 $7\frac{2}{4} + 3\left(\frac{3}{2}\right) + 2\left(4\frac{5}{6}\right)$

answer: _____

Name _____ Date _____

ⓘ Show your thinking.

2 $9\frac{2}{3} + 3\left(5\frac{6}{18} - \frac{8}{12}\right)$

answer: _____

3 🔶 Jada picked $4\frac{2}{3}$ cups of blueberries, and Shawn picked $3\frac{5}{8}$ cups of blueberries. They later found that $\frac{1}{6}$ cups of blueberries were rotten. How many cups of blueberries were not rotten?

ⓘ Record your answer in the space provided.

Name _____ Date _____

4 Which number is *not* a common denominator of all the mixed numbers in the expression $1\frac{2}{5} + 2\frac{2}{4} + 1\frac{5}{20}$?

(A) 40

(B) 20

(C) 4

(D) 60

Spiral Review

ℹ Show your thinking.

5 45×207

answer: _____

For Problems 6–9, determine the value of the expression.

6 80×50 _____

7 30×12 _____

8 80×100 _____

9 30×24 _____

Representing and Interpreting Data
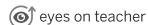
⭐ **Unit Story:** The Monarchs

dugdax/Shutterstock.com

How many different ways can you represent the total number of butterflies that migrate across North America?

Frequent Fliers

Let's create frequency tables and bar graphs to represent data.

Warm-Up   🖼 👁 eyes on teacher

We are a math community.
Quique, Jacob, and Miriam compare notes in the story. Why is comparison an important part of data collection?

Activity 1

How Many Visits?

1 Create a frequency table that represents the data set assigned to you.

How Many Visits? (continued)

2 **Discuss** 💬

- How are your frequency tables similar? How are they different?
- What do you notice about the data across both frequency tables?

Put It on the Graph

3 Create a scaled bar graph using the data you represented in your frequency table in Activity 1.

For Problems 4 and 5, share your bar graph with your partner.

4 Write two questions you will ask your partner about their bar graph.

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5 **Discuss** 💬

Share your bar graph with your partner.

• Why did you choose the scale that you did for your bar graph? Explain your thinking.

• How are your bar graphs similar? How are they different?

When creating frequency tables and bar graphs to represent data, it is important to clearly label the categories to represent the data accurately. When choosing a scale for a bar graph, consider the data you need to represent and what scale will make it easier to interpret that data.

Sport	Number of athletes
soccer	19
basketball	24
swimming	20
gymnastics	16

Practice 5.15

1 🟥 The list shows the number of pencils in student desks.

5	4	3	0	5	2
5	4	1	3	2	5

Which frequency table represents the data?
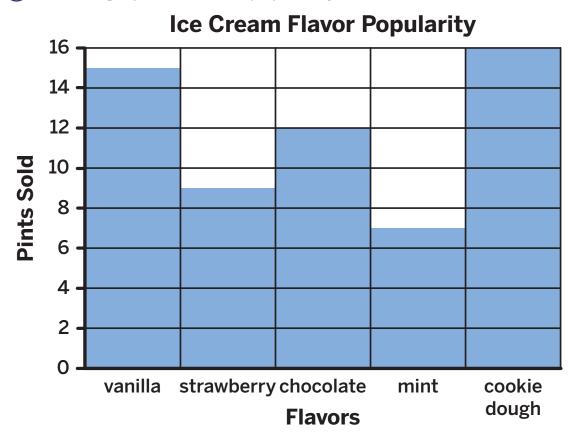
(A)

Number of pencils	0	1	2	3	4	5
Frequency	1	1	2	2	2	4

(B)

Number of pencils	1	1	2	2	2	4
Frequency	0	1	2	3	4	5

(C)

Number of pencils	0	1	2	3	4	5
Frequency	1	2	2	1	2	4

(D)

Number of pencils	0	1	2	3	4	6
Frequency	1	1	2	2	2	3

Name _____ Date _____

2 🔴 The bar graph shows the popularity of ice cream flavors in 1 hour.

Ice Cream Flavor Popularity

Which frequency table represents the data?

Ⓐ

Ice cream flavor	Pints sold
vanilla	16
strawberry	10
chocolate	12
mint	8
cookie dough	16

Ⓑ

Ice cream flavor	Pints sold
vanilla	15
strawberry	9
chocolate	12
mint	7
cookie dough	16

Ⓒ

Ice cream flavor	Pints sold
vanilla	14
strawberry	8
chocolate	12
mint	6
cookie dough	16

Ⓓ

Ice cream flavor	Pints sold
vanilla	15
strawberry	9
chocolate	10
mint	7
cookie dough	15

Name _____ Date _____

3 A teacher asked her class to share their favorite apple colors.
She recorded the apple colors. Create a frequency table of the data.

yellow	red	green	red	red	green
green	yellow	red	yellow	red	yellow
yellow	red	yellow	green	green	yellow
green	yellow	red	red	red	green

Spiral Review

For Problems 4–7, determine the value of each expression.

4 3 − 1.27 _____

5 5.06 − 0.43 _____

6 1.25 − 0.99 _____

7 10 − 7.81 _____

Name _____   Date _____

⭐ TEKS 5.1.A, 5.1.B, 5.1.C, 5.1.E, 5.9.A, 5.9.C

Homemade Nectar

Let's represent data using a dot plot and stem-and-leaf plot.

$2\frac{3}{8}$ $\frac{7}{8}$ $1\frac{1}{8}$ $1\frac{7}{8}$

$1\frac{1}{8}$ $1\frac{1}{2}$ $1\frac{5}{8}$ $1\frac{2}{4}$

$1\frac{1}{4}$ $1\frac{3}{4}$ $1\frac{5}{8}$ $1\frac{5}{8}$

$1\frac{3}{4}$ $1\frac{5}{8}$ $1\frac{6}{8}$ $1\frac{5}{8}$

I can be all of me in math class. What are some ways that mathematicians work together to solve problems?

Warm-Up   👁 eyes on teacher

Activity
1   ## Dot Plot Data

Quique and his sister Lula are making homemade nectar for butterfly feeders. Quique mixed batches of nectar in different containers. The table shows the number of liters of nectar in each container.

$2\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{4}$	$1\frac{4}{8}$
$1\frac{2}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{2}{4}$

1   Create a dot plot of the data shown in the table. Be sure to include a title and labels.

💧 **Show your thinking.**

Use the dot plot data from Problem 1 to solve Problems 2–4.

2 What fraction of containers have $1\frac{1}{2}$ or less liters of nectar?

answer: _____

3 What fraction of containers have $1\frac{2}{8}$ or more liters of nectar?

answer: _____

4 What is the difference between the greatest and least amount of homemade nectar in liters?

answer: _____

Name _____   Date _____

Stem-and-Leaf Plot Data

Lula made more homemade nectar for the butterfly feeders. She mixed batches of nectar in different containers. The table shows the number of liters of nectar in each container.

$\frac{3}{8}$	$1\frac{2}{4}$	$2\frac{3}{4}$	$2\frac{7}{8}$
$1\frac{6}{8}$	$2\frac{1}{4}$	$2\frac{4}{4}$	$1\frac{1}{8}$

5 Create a stem-and-leaf plot to represent the data shown in the table. Be sure to include a title, labels, and a key.

✎ **Show your thinking.**

Use the stem-and-leaf plot data from Problem 5 to solve Problems 6–8.

i Show your thinking.

6 What fraction of the containers have more than $1\frac{1}{2}$ liters?
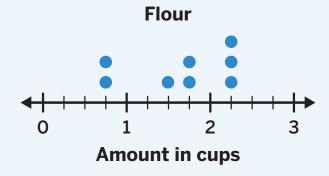
answer:

7 What is the total number of liters of nectar in containers filled with less than $1\frac{1}{2}$ liters?

answer:

8 What is the difference between the greatest and least amount of homemade nectar in liters?

answer:

You can represent data involving fractions and mixed numbers on a dot plot and stem-and-leaf plot. It is important to represent and label data accurately to solve real-world problems related to the data.

Flour

0   1   2   3

Amount in cups

Flour

Stem	Leaf
0	$\frac{3}{4}$ $\frac{3}{4}$
1	$\frac{2}{4}$ $\frac{3}{4}$ $\frac{3}{4}$
2	$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

$2\mid\frac{1}{4}$ means $2\frac{1}{4}$ cups

Practice 5.16

The stem-and-leaf plot shows the heights of plants in inches.

Plant height

Stem	Leaf
6	$\frac{1}{4}$ $\frac{3}{4}$ $\frac{3}{4}$
7	$\frac{2}{4}$ $\frac{3}{4}$ $\frac{3}{4}$

$6\mid\frac{1}{4}$ means $6\frac{1}{4}$ inches

1 🚩 What is the sum of the height of the tallest plant and the shortest plant?

(A) $13\frac{3}{4}$ inches

(B) $1\frac{1}{2}$ inches

(C) $13\frac{1}{2}$ inches

(D) 14 inches

Name _____ Date _____

Several students were surveyed about how many hours they read in a week. The results are shown in the table. Use the information for Problem 2.

$3\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{2}{4}$	$2\frac{1}{2}$	3	$2\frac{2}{8}$	$3\frac{4}{8}$
$2\frac{1}{2}$	2	$2\frac{2}{8}$	$3\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{4}{8}$	$2\frac{1}{4}$
$1\frac{1}{4}$	$2\frac{3}{4}$	3	$2\frac{4}{8}$	$3\frac{1}{2}$	$3\frac{1}{4}$	$1\frac{1}{4}$

2 Create a dot plot of the data shown in the table. Be sure to include a title and label.

✏️ **Show your thinking.**

Use the information from the dot plot in Problem 2 for Problems 3–6.

3 How many students completed the survey? _____

4 What fraction of the students read less than $2\frac{1}{4}$ hours? _____

5 What fraction of the students read at least $2\frac{1}{2}$ hours? _____

Name _____ Date _____

6 What is the difference between the greatest number of hours read and the least number of hours read?

ℹ **Show or explain your thinking.**

answer: _____

Spiral Review

For Problems 7 and 8, determine the value of the expression.

ℹ **Show your thinking.**

7 294 × 54

answer: _____

8 306 × 77

answer: _____

Name _____ Date _____
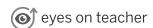
Wings of Wonder

Let's solve problems using
a dot plot.
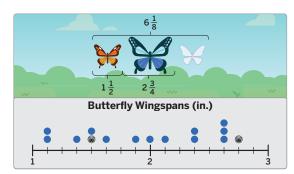
I can be all of me in math class.
Describe how your problem-solving
strategies have changed from the
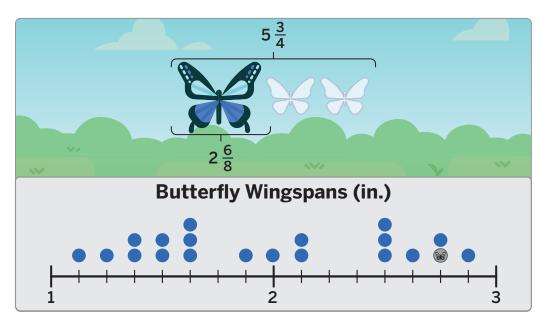beginning of the unit.

Warm-Up   **1**   👁️↻ eyes on teacher

Activity
1   ## Making Combinations

2   Select another point so the combined wingspan is $6\frac{1}{8}$ inches.

$6\frac{1}{8}$

$1\frac{1}{2}$ $2\frac{3}{4}$

Butterfly Wingspans (in.)

1   2   3

✏️💬 **Show or explain your thinking.**

answer: _____

Making Combinations (continued)

3 Select 2 more points so the combined wingspan is $5\frac{3}{4}$ inches.

Butterfly Wingspans (in.)

ⓘ **Show or explain your thinking.**

answer: _____

Discuss 💬
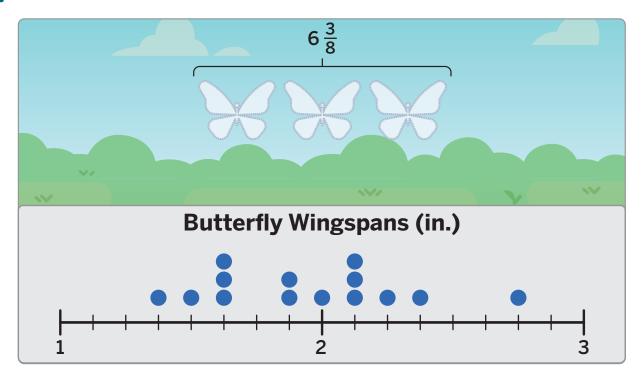
Is another solution possible? Why or why not?
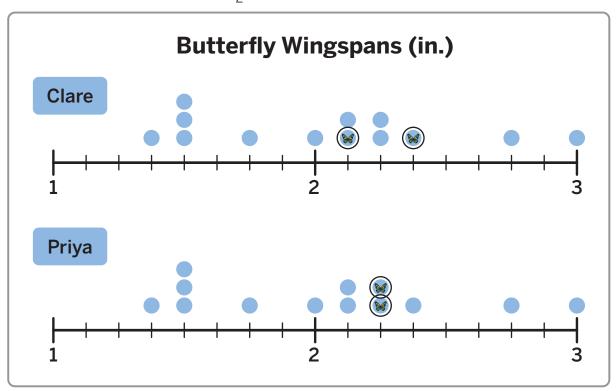
4 Select 3 points so the combined wingspan is $6\frac{3}{8}$ inches.

$6\frac{3}{8}$

Butterfly Wingspans (in.)

1   2   3

✎ **Show or explain your thinking.**

answer: _____

5 Clare and Priya selected different butterflies to represent a combined wingspan of $4\frac{1}{2}$ inches.

Butterfly Wingspans (in.)

Who is correct? Explain your thinking.

_____

_____

_____

_____

_____

_____

_____

Summary 5.17
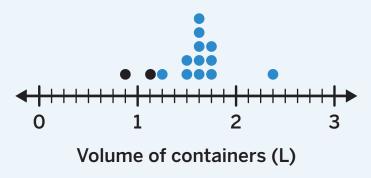
You can use different strategies to solve problems with dot plot data involving mixed numbers and whole numbers that may require using 1 or more operations. Some problems may have 1 answer, and others may have multiple answers.

How many total liters of nectar do the 2 containers with the least volume hold?
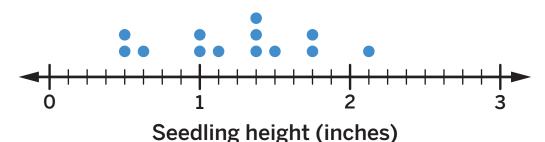
Containers for Homemade Nectar

$$\frac{7}{8} + 1\frac{1}{8} = 1\frac{8}{8} \text{ or } 2$$
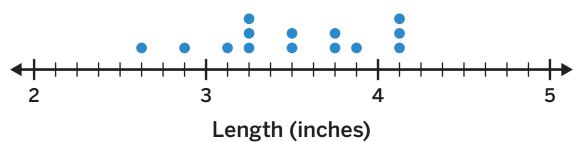
Volume of containers (L)

Practice 5.17

1 Han is making a dot plot representing the height of the seedlings his class grew. Use the information to complete the dot plot.

- There are 15 seedlings altogether.
- The tallest seedling is $2\frac{1}{8}$ inches taller than the shortest seedling.
- There are 3 seedlings of the shortest height.

Growing Plants

Seedling height (inches)

Name _____ Date _____

Use the dot plot for Problems 2 and 3.

Ribbon Measurements

Length (inches)

ⓘ Show your thinking.

2 Is the total length of the ribbons *greater than* or *less than* 1 yard?

answer: _____

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3 🔷 How many inches longer is the longest ribbon than the shortest ribbon?

(A) $1\frac{1}{2}$ inches

(B) $6\frac{6}{8}$ inches

(C) $6\frac{4}{8}$ inches

(D) $2\frac{1}{2}$ inches

Spiral Review

4 Round each length to the different place values shown in the table.

	Nearest meter	Nearest tenth of a meter	Nearest hundredth of a meter
1.088 meters			
10.917 meters			
14.455 meters			
7.251 meters			
9.304 meters			
12.928 meters			

5 Evaluate the expression 3,408 ÷ 48.

ℹ **Show your thinking.**

answer: _____