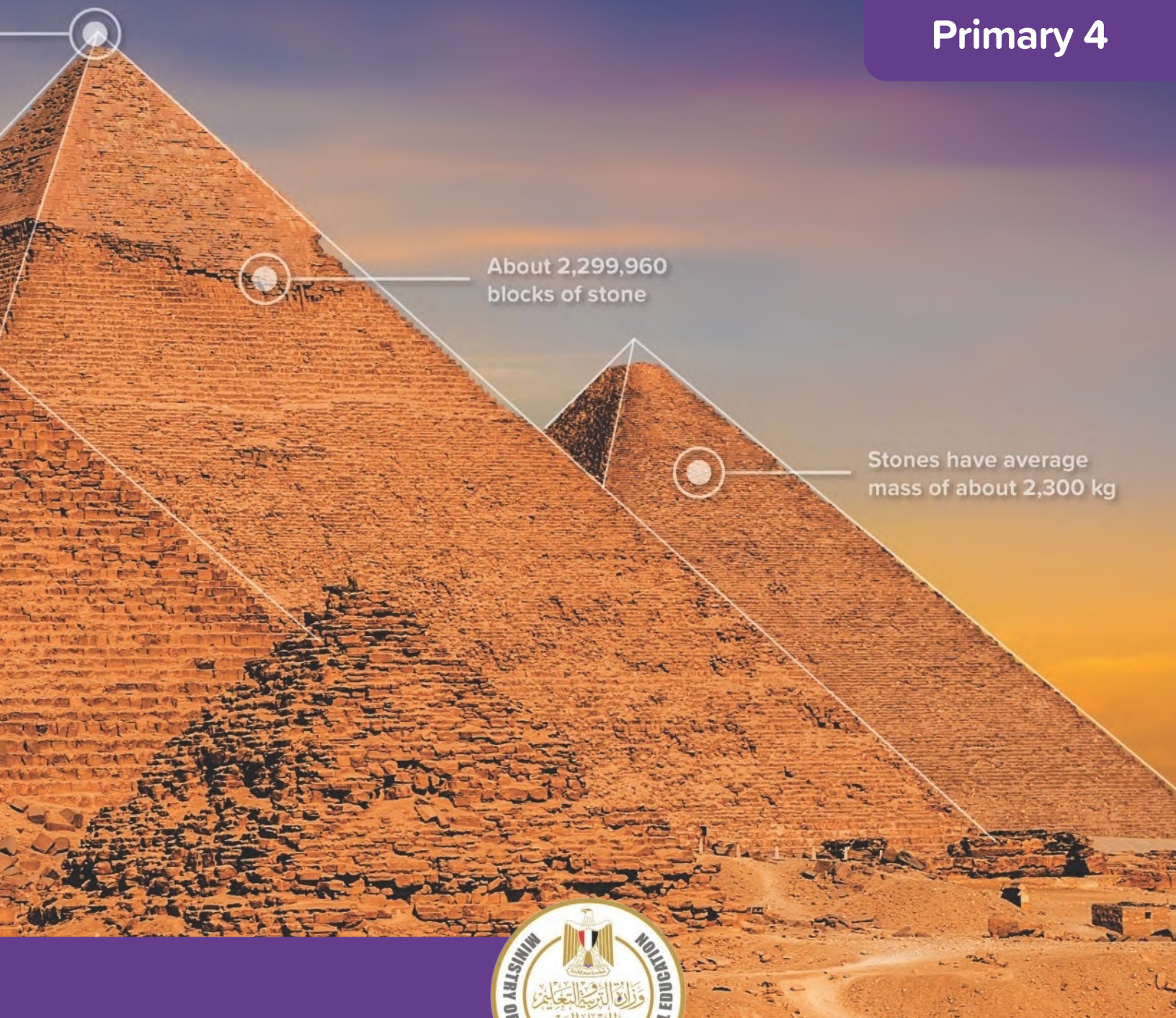# Math Term 2

Part 1

About 2,299,960 blocks of stone

Stones have average mass of about 2,300 kg

Primary 4 Math

Name _____

About 2,299,960
blocks of stone

Stones have average
mass of about 2,300 kg

Math Term 2

Part 1

Acknowledgments

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—— **Theme 3 | Fractions, Decimals, and Proportional Relationships** ——

Unit 9 Fractions

Unit 10 Decimals

Unit 11 Data with Fractions

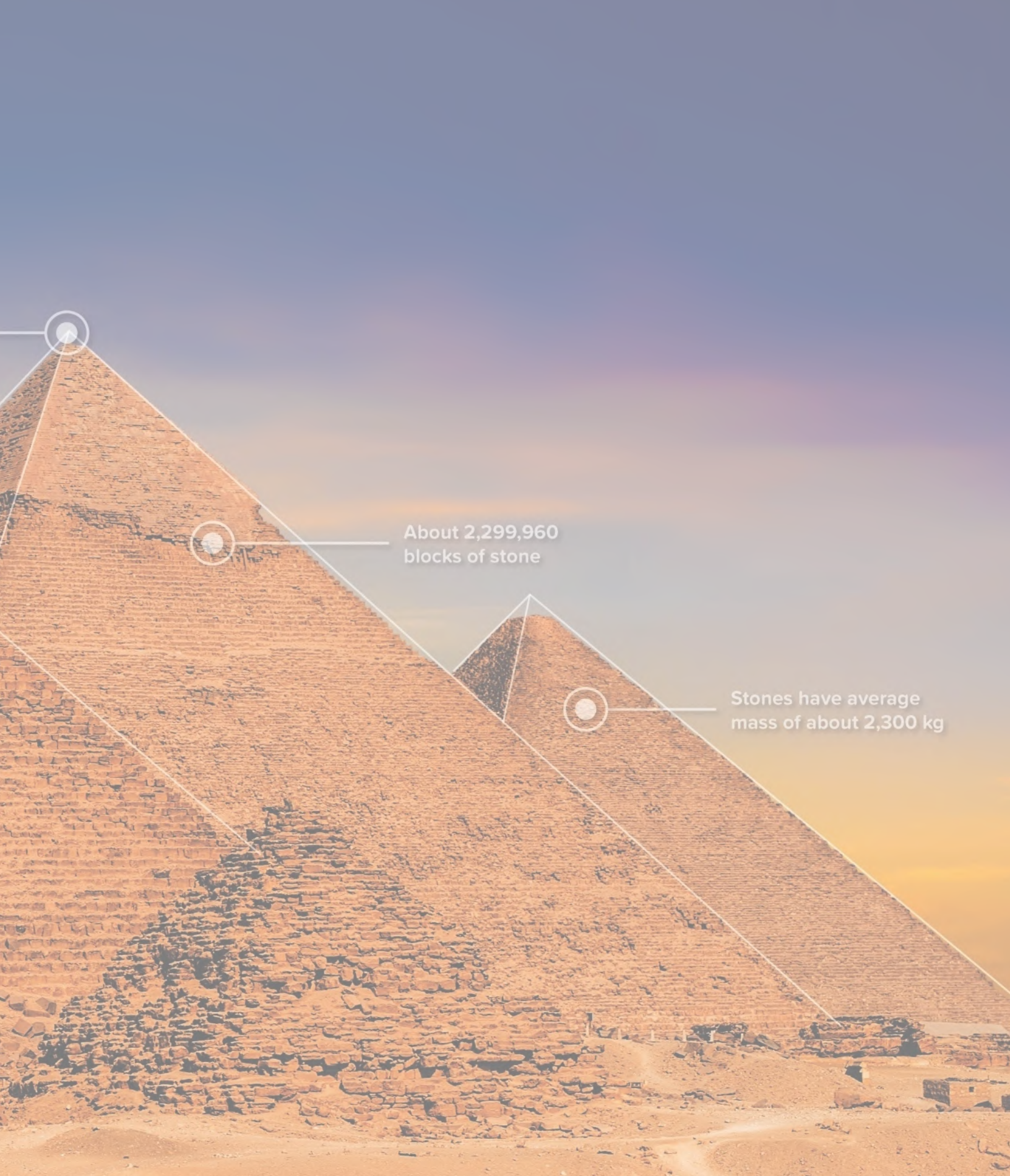**Additional Resources**

Originally stood
146.5 meters

About 453,592,370 kg
of mortar

About 2,299,960
blocks of stone

Stones have average
mass of about 2,300 kg

FOREWORD

This is a pivotal time in the history of the Ministry of Education and Technical Education (MOETE) in Egypt. We are embarking on the transformation of Egypt's K-12 education system. We started in September 2018 with the rollout of KG1, KG2 and Primary 1. In 2021 we have rolled out Primary 4, and we will continue with the rollout until 2030. We are transforming the way in which students learn to prepare Egypt's youth to succeed in a future world that we cannot entirely imagine.

MOETE is very proud to present this new series of textbooks, with the accompanying digital learning materials that captures its vision of the transformation journey. This is the result of much consultation, much thought and a lot of work. We have drawn on the best expertise and experience from national and international organizations and education professionals to support us in translating our vision into an innovative national curriculum framework and exciting and inspiring print and digital learning materials.

The MOETE extends its deep appreciation to its own "Center for Curriculum and Instructional Materials Development" (CCIMD) and specifically, the CCIMD Director and her amazing team. MOETE is also very grateful to the minister's senior advisors and to our partners including "Discovery Education," "National Geographic Learning" "Nahdet Masr," "Longman Egypt," UNICEF, UNESCO, and WB, who, collectively, supported the development of Egypt's national curriculum framework. I also thank the Egyptian Faculty of Education professors who participated in reviewing the national curriculum framework. Finally, I thank each and every MOETE administrator in all MOETE sectors as well as the MOETE subject counselors who participated in the process.

This transformation of Egypt's education system would not have been possible without the significant support of Egypt's current president, His Excellency President Abdel Fattah el-Sisi. Overhauling the education system is part of the president's vision of "rebuilding the Egyptian citizen" and it is closely coordinated with the ministries of Higher Education & Scientific Research, Culture, and Youth & Sports. Education 2.0 is only a part in a bigger national effort to propel Egypt to the ranks of developed countries and to ensure a great future to all of its citizens.

WORDS FROM THE MINISTER OF EDUCATION & TECHNICAL EDUCATION

It is my great pleasure to celebrate this extraordinary moment in the history of Egypt where we continue to launch a new education system designed to prepare a new Egyptian citizen proud of his Egyptian, Arab and African roots — a new citizen who is innovative, a critical thinker, able to understand and accept differences, competent in knowledge and life skills, able to learn for life and able to compete globally.

Egypt chose to invest in its new generations through building a transformative and modern education system consistent with international quality benchmarks. The new education system is designed to help our children and grandchildren enjoy a better future and to propel Egypt to the ranks of advanced countries in the near future.

The fulfillment of the Egyptian dream of transformation is indeed a joint responsibility among all of us; governmental institutions, parents, civil society, private sector and media. Here, I would like to acknowledge the critical role of our beloved teachers who are the role models for our children and who are the cornerstone of the intended transformation.

I ask everyone of us to join hands towards this noble goal of transforming Egypt through education in order to restore Egyptian excellence, leadership and great civilization.

My warmest regards to our children who will begin this journey and my deepest respect and gratitude to our great teachers.

Dr. Tarek Galal Shawki

Minister of Education & Technical Education

Dear Parent/Guardian,

Welcome to Primary 4 Mathematics Techbook™! This comprehensive program inspires students to make sense of the world around them and to think and act like mathematicians. Throughout the digital and print program, students learn to reason mathematically, communicate using mathematical language, ask meaningful questions, solve complex problems, and work collaboratively with peers.
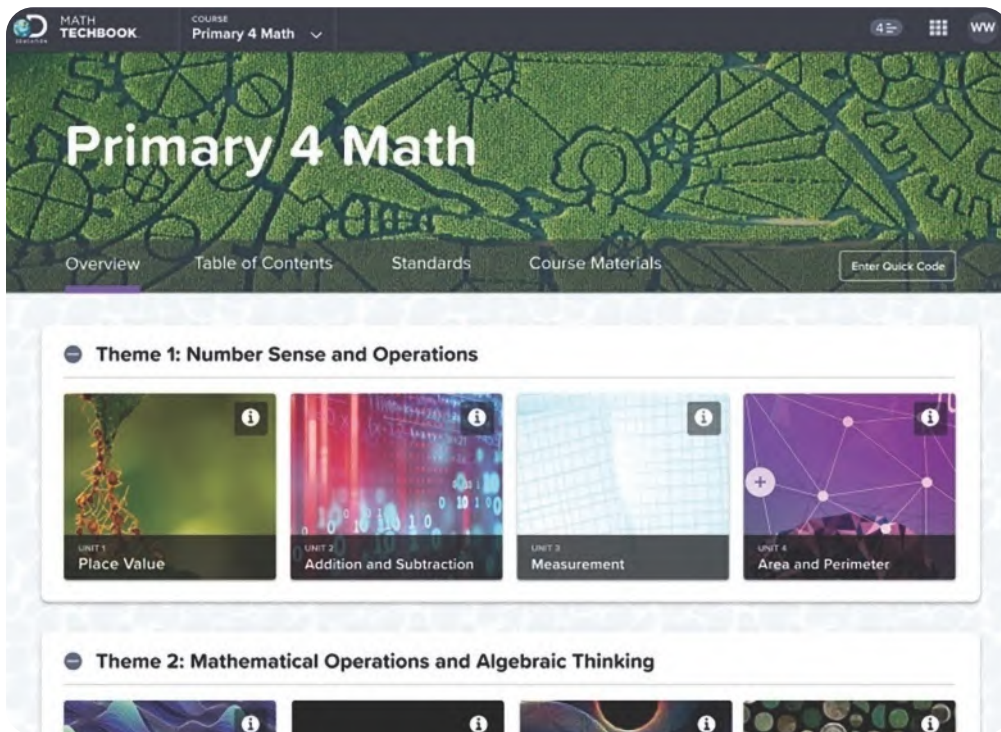
Primary 4 Mathematics Techbook was designed and written to teach to the Ministry of Education Primary 4 mathematics standards. The structure of Primary 4 Mathematics Techbook represents the Ministry's shifts in the Framework for Education 2.0, specifically focusing on accessing new and prior knowledge, building contextual understanding and procedural fluency, and making connections across mathematics to support application of skills and concepts. To help students make sense of mathematical content, the program also integrates a thematic approach and a variety of real-world scenarios.

Primary 4 Mathematics Techbook challenges students to build on what they learned in previous grades, applying concepts and skills in new ways. Students also learn new and complex concepts and skills that prepare them for the challenges of Primary 5 and beyond. Primary 4 students assume greater responsibility for their own learning and are encouraged to seek opportunities to apply the mathematics they are learning in the world around them.

The major work of Primary 4 includes multiplication, division, fractions, decimals, and plane figures such as lines, line segments, rays, and angles. Although these may seem like separate topics, students investigate and apply patterns and relationships among the topics to build a deeper understanding of each. They solve fraction multiplication problems, connect angle measurement to fractions, explore the inverse relationship between multiplication and division, and draw parallels among decimal numbers, fractions, and place value. Students learn to think like mathematicians as they notice patterns and rules, persevere to solve challenging problems, represent and explain their thinking, model their solutions, and strive for accuracy.

To inspire and motivate learning and curiosity, Primary 4 Mathematics Techbook features clear and engaging text, videos, digital tools, and Hands-On Activities. Hands-On Activities require students to investigate patterns and rules in mathematics and challenge them to communicate using mathematical language and models. The program also engages students in many kinds of writing and asks them to explain their reasoning and support their thinking using words, numbers, pictures, and symbols. When students engage in rich tasks that access prior knowledge and build reasoning, it is easier for them to make connections to the real world and to other mathematical learning.
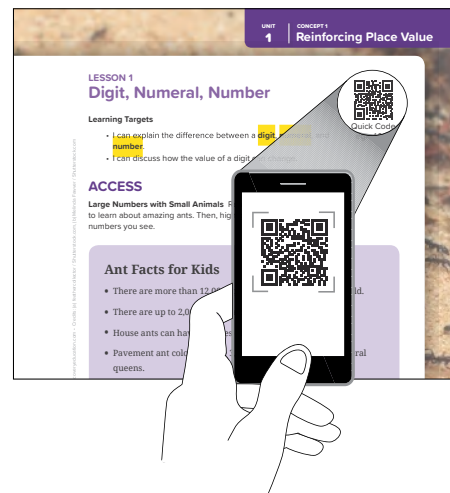
Dear Parent/Guardian, *continued*

Primary 4 Mathematics Techbook is divided into units. Each unit is divided into concepts, and each concept is divided into lessons. Each lesson has three main sections: ACCESS, BUILD, and CONNECT.

ACCESS Students activate their prior knowledge and begin to develop and express mathematical language.

BUILD Students focus on communicating their understanding, reasoning, evidence, and mathematical strategies.

CONNECT Students build deep conceptual understanding and a strong foundation for accessing knowledge in future lessons.

In addition, **WRAP-UP**, **PRACTICE**, and **CHECK YOUR UNDERSTANDING** features allow students to demonstrate their learning either verbally or in writing.

Within this Student Edition, you will find QR codes and quick codes that take you and your student to a corresponding section of Primary 4 Mathematics Techbook online.

We encourage you to support your student in using the print and online interactive materials on any device. Together, may you and your student enjoy a fantastic year of mathematics.

Sincerely,

The Discovery Education Math Team
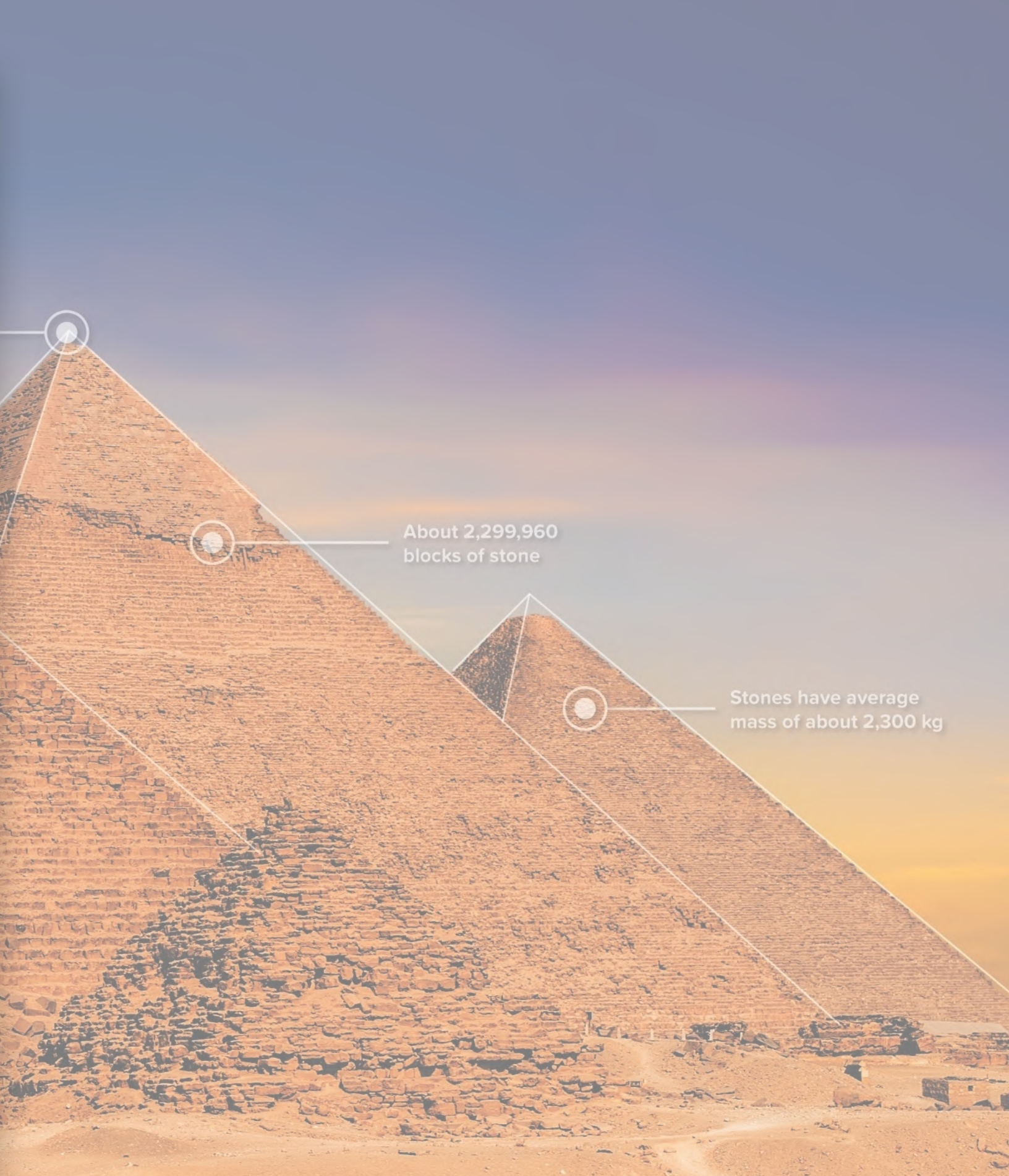
About 2,299,960
blocks of stone

Stones have average
mass of about 2,300 kg

Theme 3 | Fractions, Decimals, and Proportional
Relationships

Unit 9
Fractions
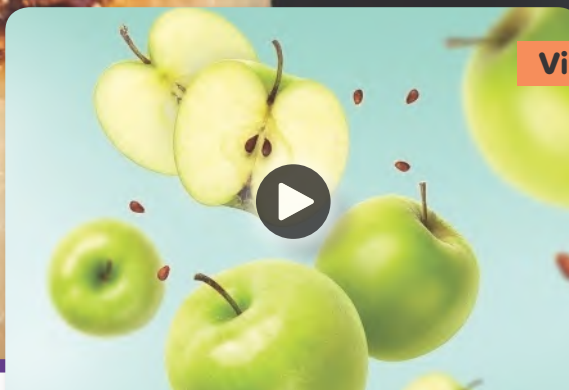
Video

Apple Fractions

Unit Video Questions

The video Apple Fractions illustrates how to read, write, and compare fractions. We can cut an apple into fractions, we can think of fractions of a set of apples, or apples can be a fraction of a set of fruit.

Quick Code
egm4098

☐ How are fractions of a whole different from fractions of a set? How are they alike?

☐ As you eat meals throughout the day, think about how you could represent the quantities as fractions of a whole or fractions of a set.

Composing and Decomposing Fractions

LESSON 1
Let's Build It

Learning Targets

- I can define **unit fractions**.
- I can identify unit fractions.
- I can **compose** other **fractions** with unit fractions.

Quick Code
egm4100

ACCESS

Identify the Unit Fraction Fill in the table with information about each fraction.

	Total Number of Equal Parts	Total Number of Equal Parts Shaded	Word Form	Fraction Form
1.				
2.				
3.				
4.				
5.				
6.				

7. Record the definition of each term.

Numerator _____

Denominator _____

Unit Fraction _____

BUILD

Let's Build It Use the picture to help you understand what it means to compose a fraction. Then, compose fractions to solve the problems.
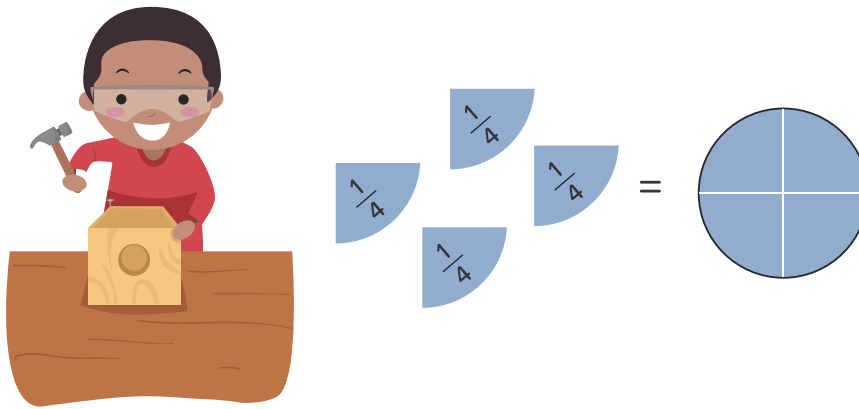
1. What do you think it means to compose a fraction? Record your ideas.

2. Draw and label a composed model for these unit fractions:

$$\frac{1}{5} \qquad \frac{1}{5}$$

$$\frac{1}{5} \qquad =$$

$$\frac{1}{5} \qquad \frac{1}{5}$$
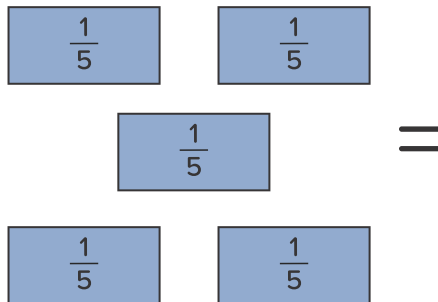
3. Create a model that represents $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$ whole. Use circles or rectangles.

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4. How many unit fractions compose five-eighths? _____
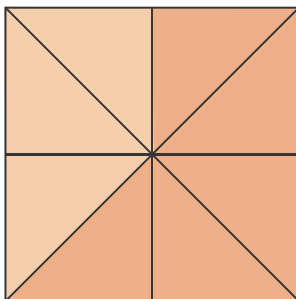
5. Look at the strip diagram. Write an equation using unit fractions to show how to compose this fraction.
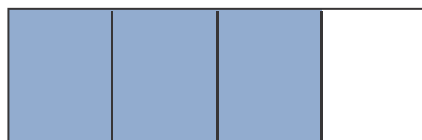
6. What fraction of the boxes are colored? Write an equation using unit fractions to show how to compose this fraction.
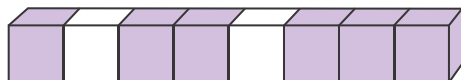
7. Look at point E on the number line. How many unit fractions of $\frac{1}{8}$ do you need to represent point E? _____

8. Which of the following expressions is the same as $\frac{5}{6}$? Highlight or circle the correct answer.

A. $\frac{1}{6} + \frac{2}{6} + \frac{3}{6} + \frac{4}{6} + \frac{5}{6}$

B. $\frac{5}{6} + \frac{5}{6} + \frac{5}{6} + \frac{5}{6} + \frac{5}{6}$

C. $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$

D. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$

Draw a model to show this. Use circles or rectangles.

CONNECT

Food Fraction Fun Read the problem. Draw a model to show your solution.

Two families went to the local restaurant. Each family ordered the feteer meshaltet. Eman's family wanted their feteer cut into 6 equal pieces. Ayman's family wanted their feteer cut into 8 equal pieces. If both feteer are the same size, which family will have larger pieces to eat? How do you know?

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Break It Down

Learning Target

- I can **decompose** fractions into unit fractions.

ACCESS

Fraction Charades When directed by your teacher, work with a small group to act out a fraction. You will also guess what fraction other groups show.

BUILD

Decompose It Use the picture to help you understand what it means to decompose a fraction.
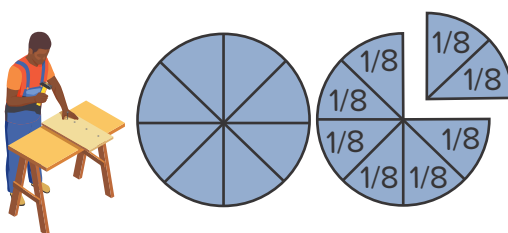
1. What do you think it means to decompose a fraction? Record your ideas.

2. Write an equation decomposing this whole into unit fractions.

 = _____

3. Write an equation decomposing $\frac{3}{5}$ into unit fractions.

CONNECT

Food Fraction Fun Read the problem. Then, draw a model and write an equation using unit fractions to show your solution.

Mazen needed $\frac{3}{4}$ cup of sugar for his recipe. He had a measuring cup that held $\frac{1}{4}$ cup of sugar. How many times will he need to fill the measuring cup for his recipe?

Check Your Understanding

Follow your teacher's instructions to complete this activity.

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LESSON 3
Break It Down Again

Learning Target

- I can represent fractions with repeated addition and subtraction of unit and other fractions.

ACCESS

Race to the Finish Line Mark where each runner stops running.

Start   Finish

1. Runner 1 begins at Start, stops at _____.

2. Runner 2 begins at _____, stops at _____.

3. Runner 3 begins at _____, stops at Finish.

BUILD

I Have . . . Who Has . . . ? Listen to your teacher for the rules for the game. Pay attention to what your classmates say and read aloud your card when it is your turn.

Many Ways to Break It Down Draw models and write as many equations as you can to decompose the given fractions.

1. $\dfrac{9}{12}$

2. $\dfrac{12}{15}$

3.
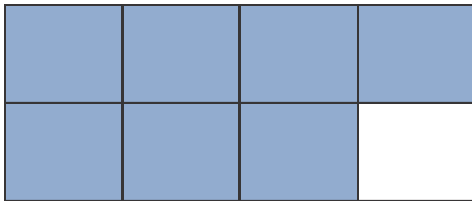
4.
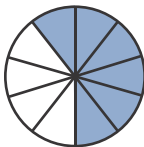
CONNECT

Sharing Popcorn Omar ate $\frac{1}{5}$ of a bag of popcorn. He and his brother Amir shared the rest of the bag. Write equations to show two ways they could share the remaining popcorn.

Popcorn Expanding as It Pops

Check Your Understanding

Follow your teacher's instructions to complete this activity.

All Mixed Up

Learning Targets

- I can define **mixed numbers**.
- I can define **improper fractions**.
- I can explain how mixed numbers and improper fractions relate to unit fractions.

ACCESS

Error Analysis Analyze the student's work and answer. Identify what the student did correctly and incorrectly, and then try to correctly answer the question.

Problem: Decompose the following fraction

$$\frac{3}{5}$$

Student Solution:

$$\boxed{\frac{\boxed{3}}{\boxed{5}}} = \frac{\boxed{2}}{\boxed{3}} + \frac{\boxed{1}}{\boxed{2}}$$

Photo Credit: YesPhotographers / Shutterstock.com

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

BUILD

Improper Fractions Work with a partner to solve the problems.

1. Draw a model for $\frac{3}{2}$.

2. Draw and label a model for $\frac{7}{3}$.

3. Look at the model and answer the questions.
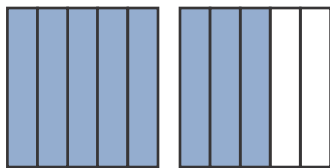
What unit fraction is used to build this improper fraction? _____

How many unit fractions are colored in? _____

What is the improper fraction represented by this model? _____

4. Draw and label a model for $\frac{16}{6}$.

Circle the correct model for the given improper fraction.

5. $\frac{7}{6}$
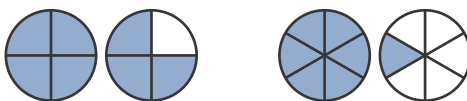
6. $\frac{5}{4}$
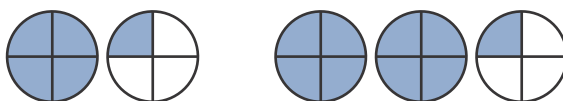
Mixed to Improper Part 1 Shade the model to represent the mixed number. Then, write the equivalent improper fraction.

$3\frac{1}{5}$
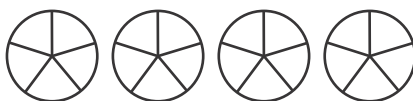
Mixed to Improper Part 2 Shade a model to represent the mixed number. Then, write the equivalent improper fraction. $2\frac{1}{3}$

Mixed to Improper Part 3 Convert the mixed numbers to improper fractions.

1. $5\frac{1}{4} =$ _____

2. $2\frac{1}{6} =$ _____

3. $4\frac{1}{5} =$ _____

4. $3\frac{1}{2} =$ _____

CONNECT

Food Fraction Fun Mona baked a square cake for her mom's birthday. She wanted to put a border of frosting on the top of the cake. If one side of the cake measures $\frac{3}{8}$ meter, what is the perimeter of the top of the cake? Write the answer as both a mixed number and an improper fraction.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

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Pieces from the Whole

Learning Target

- I can add and subtract fractions and whole numbers.

ACCESS

Comparing Loaves Talk with a partner about the story problem, then explain your thinking using words, pictures, or numbers.

Jana thinks that $\frac{4}{4}$ of a loaf of bread is the same thing as 1 whole loaf. Do you agree or disagree?

BUILD

Add Them Up Solve the fraction addition problems. Show your work.

1. Rewrite the model with whole numbers and fractions, and then solve the problem.

_____ + _____ + _____ + _____ + _____ = _____

Solve the following problems using numbers.

2. $2 + 2 + \frac{3}{5} + \frac{3}{5} =$ _____

3. $\frac{3}{5} + \frac{2}{5} =$ _____

4. $4 + \dfrac{4}{8} + 2 + \dfrac{5}{8} = $ _____

5. $\dfrac{4}{9} + \dfrac{1}{9} + \dfrac{2}{9} + 4 = $ _____

6. $\dfrac{10}{12} + \dfrac{1}{12} + 3 + 2 = $ _____

Break Them Down Use the model to help you solve the problem. Then, show your work as an equation and solve.

1. Adam has one loaf of bread. He uses $\dfrac{3}{4}$ of it to make sandwiches for himself and his family. How much of the loaf does Adam have left? Use the model to help you solve the problem.

2. Rewrite the problem with numbers and fractions, and then solve the problem.

_____ − _____ =

Use the models to solve the problems.

3. $2 - \dfrac{1}{4} = $ _____

4. $1 - \dfrac{2}{5} - \dfrac{1}{5} = $ _____

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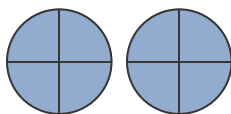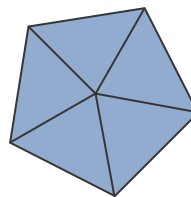
Draw a model to solve the problems.

5. $3 - \dfrac{1}{3} = $ _____

6. $1 - \dfrac{2}{8} = $ _____

7. $2 - \dfrac{2}{3} = $ _____

CONNECT

Party Planning Read and solve the story problem. Express your answer as an equation, and then solve.

Nadia is making falafel for a party. Her recipe calls for $\dfrac{1}{2}$ teaspoon sodium bicarbonate. The recipe makes enough for 10 people. Nadia is having 40 guests. In order to feed all her guests, she wants to quadruple her recipe. How many teaspoons of sodium bicarbonate will she use?

Falafel

✅ Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 6

Adding Mixed Numbers

Learning Target

- I can add mixed numbers with like **denominators**.

ACCESS

Collecting Pineapple Juice Read the story problem. Talk to your Shoulder Partner about how you could solve the problem. Work together to solve it.

Rajaa has 1 full liter of pineapple juice and $\frac{1}{3}$ liter left in another container. Ola has 2 full liters of pineapple juice and $\frac{2}{3}$ liter left in another container. How much juice do they have altogether?

Pineapple Juice

BUILD

Mixed Together Add the mixed numbers. Solve each problem using a number line, a model, and an equation. For each model, color the first fraction one color and use a different color for the second fraction.

1. $1\frac{1}{4} + \frac{3}{4}$

   Number line:

   0   1   2   3
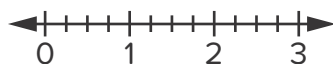
   Model:

   Equation: _____

2. $2\dfrac{1}{5} + 1\dfrac{2}{5}$

Number line:
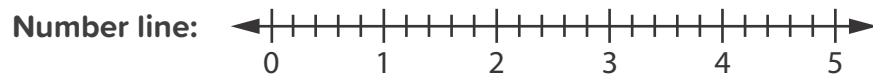
Model:

Equation: _____

3. $2\dfrac{1}{6} + 1\dfrac{5}{6}$

Number line:
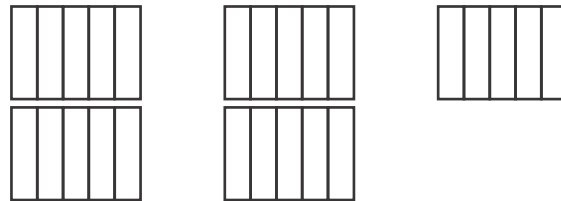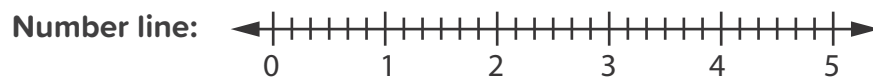
Model:

Equation: _____

4. Solve the problem using your favorite strategy.

$2\dfrac{4}{9} + 1\dfrac{2}{9}$

5. Solve the problem using your favorite strategy.

$2\dfrac{3}{5} + 1\dfrac{4}{5}$

CONNECT

Create Your Own Problem Write and solve your own addition story problem. You can use one of the equations provided or create your own.

Sample equations:

$2\frac{2}{9} + 3\frac{5}{9} = $ _____

$1\frac{4}{5} + 2\frac{1}{5} = $ _____

$3\frac{3}{10} + 1\frac{9}{10} = $ _____

Check Your Understanding

Follow your teacher's instructions to complete this activity.

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Subtracting Mixed Numbers

Learning Target

- I can subtract mixed numbers with like denominators.

ACCESS

Error Analysis Read the story problem and analyze the student's work and answer. Identify what the student did correctly and incorrectly, and try to solve the problem correctly.

A student says that $2\frac{3}{4} + 1\frac{3}{4} = 3\frac{6}{4}$. Their teacher tells them their addition is correct, but their work is not complete.

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

BUILD

Mixed Apart Subtract the mixed numbers. For each problem, solve it using a number line, a model, and an equation. For each model, color in the minuend one color and use a pencil to cross off the subtrahend.

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

   Number line:

   Model:

   Equation: _____

2. $5 - 2\frac{1}{4}$

   Number line:

   Model:

   Equation: _____

3. $3 - 1\frac{1}{6}$

   Number line:
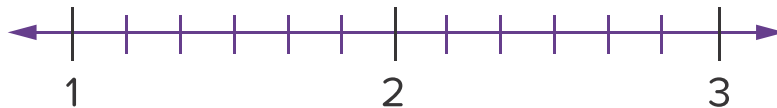
   Model:

   Equation: _____

4. $2\frac{1}{5} - 1\frac{2}{5}$

Number line:

Model:

Equation: _____

Solve the problems using the strategy of your choice. Show your work.

5. $3\frac{2}{5} - 2\frac{1}{5} =$ _____

6. $3 - 2\frac{1}{8} =$ _____

Use the model to help you solve the story problem.
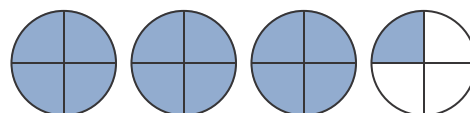
7. Hady had $3\frac{1}{4}$ cookies. He gave $2\frac{3}{4}$ to his sister. How many cookies does he have left?

CONNECT

Writing About Math Why do we sometimes need fractions to solve real-life problems? What is an example from your life when you could use fractions to help you solve a problem? Use words, pictures, or numbers to show your thinking.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Comparing Fractions

LESSON 8
Like Denominators and Numerators

Learning Targets

- I can ==compare== and ==order== fractions with like denominators.
- I can compare and order fractions with like ==numerators==.

ACCESS

Fractional Candy Bars Would you rather have $\frac{5}{12}$ of a candy bar or $\frac{6}{12}$? Use numbers, pictures, or words to explain your thinking.

Candy Bar

Photo Credit: Dina Saeed / Shutterstock.com, (b) NatalyaBond / Shutterstock.com

BUILD

Comparing Fractions with Like Denominators Shade each shape to show the given fractions. Then, compare the fractions using the symbols <, >, or =.
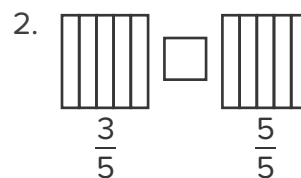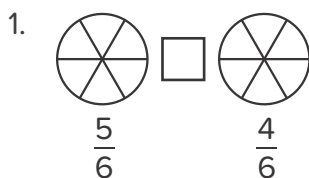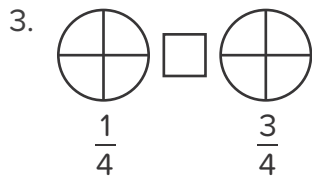
1. $\frac{5}{6}$ ☐ $\frac{4}{6}$

2. $\frac{3}{5}$ ☐ $\frac{5}{5}$

3.

$$\frac{1}{4} \quad \Box \quad \frac{3}{4}$$

4. Fill in the blanks to complete the statement.

If fractions have the same _____, then the one with the

_____ numerator is the _____ fraction.

5. Order the following fractions from least to greatest.

$$\frac{6}{8} \quad \frac{2}{8} \quad \frac{5}{8} \quad \frac{3}{8} \quad \frac{7}{8} \quad \frac{1}{8} \quad \frac{8}{8}$$

_____ ; _____ ; _____ ; _____ ; _____ ; _____ ; _____

Comparing Fractions with Like Numerators Write the fractions shown underneath each shape, and then compare each pair of fractions using the symbols <, >, or =.
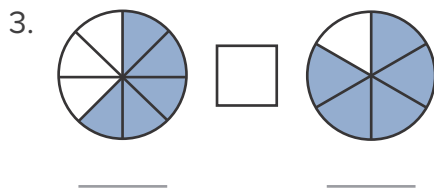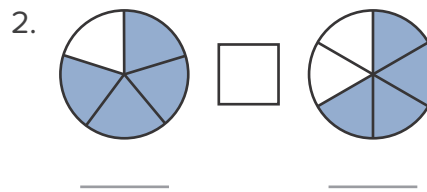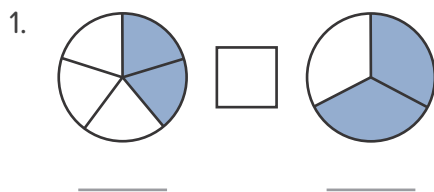
1.

_____   _____

2.

_____   _____

3.

_____   _____

4. Fill in the blanks to complete the statement.

If fractions have the same _____, then the one with the

_____ denominator is the _____ fraction.

Write <, >, or = in each box to compare the two fractions.

5. $\dfrac{5}{6}$ ☐ $\dfrac{5}{8}$

6. $\dfrac{3}{6}$ ☐ $\dfrac{3}{4}$

7. $\dfrac{4}{8}$ ☐ $\dfrac{4}{5}$

8. Order the following fractions from least to greatest.

$\dfrac{3}{5}$ $\dfrac{3}{8}$ $\dfrac{3}{3}$ $\dfrac{3}{6}$ $\dfrac{3}{12}$

————; ————; ————; ————; ————

CONNECT

Top Heavy Compare the fractions.

1. $\dfrac{4}{7}$ ☐ $\dfrac{4}{3}$

2. $\dfrac{5}{10}$ ☐ $\dfrac{5}{2}$

3. Do improper fractions follow the rule you wrote about how to compare fractions with common numerators? How do you know? Use a model to explain your thinking.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 9

Glass $\frac{1}{2}$ Full or $\frac{2}{4}$ Empty?

Learning Target

- I can use visual models to identify **equivalent** fractions.

ACCESS

Who Ate More? Read the scenario and look at the images of sandwiches. Discuss with a partner whether you agree or disagree with Doha and why.

1. Amir and his sister, Doha, were having sandwiches. Amir likes his cut into 2 pieces and Doha likes hers cut into 4. Amir eats one piece and Doha eats 2. Doha proudly announces, "I ate more of my sandwich than Amir." Is Doha correct?

Amir   Doha
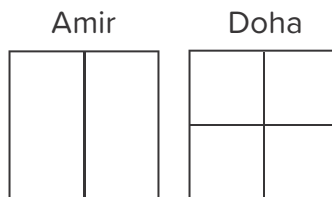
2. Draw another way the sandwich could be cut into multiple pieces and shade in $\frac{1}{2}$ of it.

BUILD

What Is Equivalent? Solve the problems to explore and identify equivalent fractions.

1. Record the fraction of the whole that is shaded.
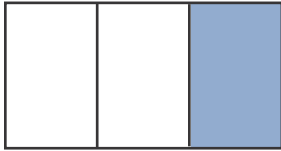
   Fraction: _____

2. Divide the rectangle into two equal rows.
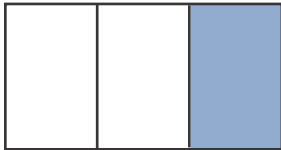
3. Record the fraction that is now shaded in the previous item.

   New fraction: _____

4. Record the fraction of the whole that is shaded.
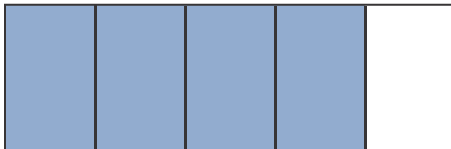
   Fraction: _____

5. Divide the rectangle into two equal rows.
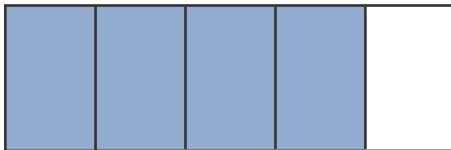
6. Record the fraction that is now shaded in the previous item.

   New fraction: _____

7. Record the fraction that is shaded first as an improper fraction and then as a mixed number.
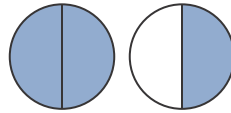
Improper fraction: _____   **Mixed number:** _____

8. Divide each circle into four equal parts.
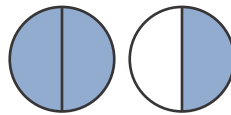
9. Record the fraction that is now shaded in the previous item.

Improper fraction: _____   **Mixed number:** _____

10. Circle the fraction that is equivalent.   11. Circle the fraction that is equivalent.
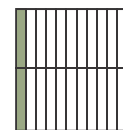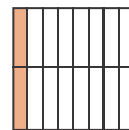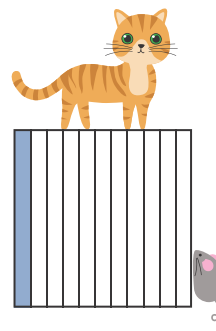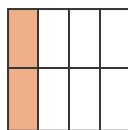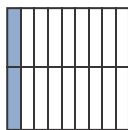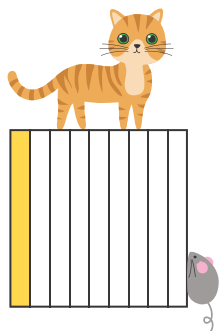
12. Circle the fraction that is equivalent.

13. Circle the fraction that is equivalent.
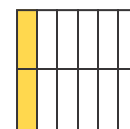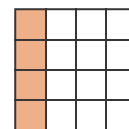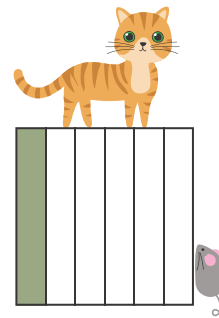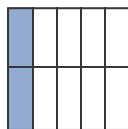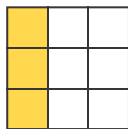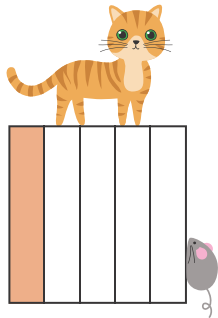
Record the equivalent fraction in the second model.

14.

$$\frac{3}{4} = \frac{}{8}$$

15.

$$\frac{2}{3} = \frac{}{9}$$
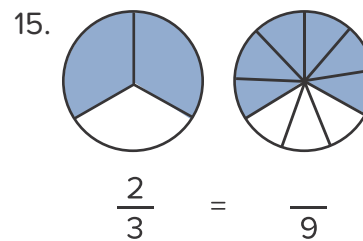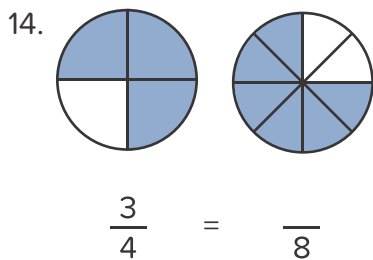
16. Record the model as a mixed number and an improper fraction.
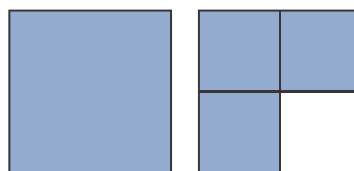
Improper fraction: _____   **Mixed number:** _____

17. Record the model as a mixed number and an improper fraction.
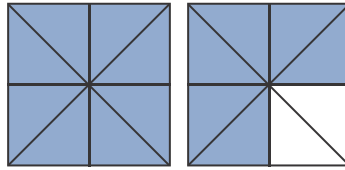
Improper fraction: _____   **Mixed number:** _____

18. Genet and Habila have the same kind of candy bar. Genet eats $\frac{1}{4}$ of hers. Habila eats the same amount. Color in Habila's bars to represent the amount she ate.
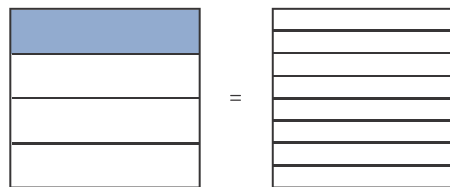
19. Write the fraction showing how much of Habila's bar she ate in the previous item.

Genet's   Habila's

$\frac{1}{4}$ =

20. Mona ate $1\frac{1}{2}$ brownies. Her brother, Malek, ate $\frac{6}{4}$. Color in each person's brownies to show the amount that they ate.

Mona   Malek
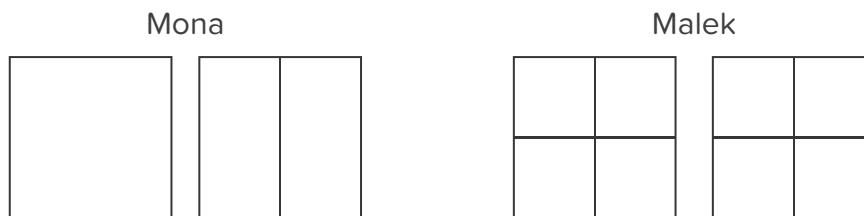
21. Who ate more brownies, Mona or Malek? Explain how you know.

CONNECT

Pizza Contest Magdy and Kareem enter a pizza eating contest. The person who eats the most pizza wins. Magdy eats pieces of the circle pizza and Kareem eats pieces of the rectangle pizza. They each manage to eat $\frac{1}{2}$ of their pizza. However, Kareem is given the prize. Why?

Pizza

Magdy's Pizza
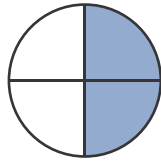
Kareem's Pizza
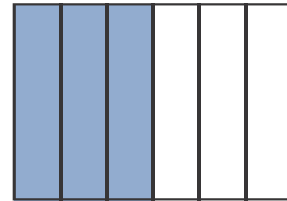
Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 10

Same Fraction, Different Day

Learning Targets

- I can use visual models to generate equivalent fractions.
- I can explain what makes two fractions equivalent.

ACCESS

Equal Sets Read the problem and color in the buttons to answer the question.

Amany had 2 buttons and 1 of them was red.

If Amany had 6 buttons and wanted to have the same fraction of the set be red, how many red buttons would that be? Color them and then write the equivalent fraction.
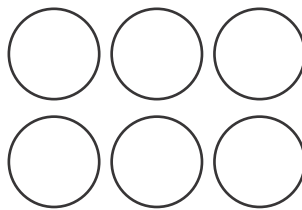
BUILD
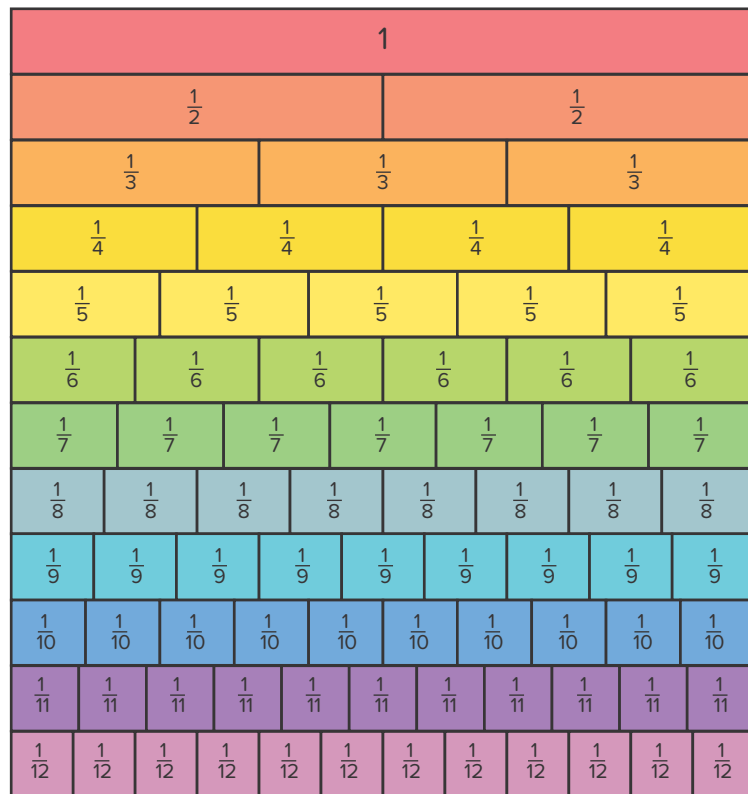
Fraction Wall

Photo Credit: Dina Saeed / Shutterstock.com

1. Look at the fraction wall and talk to a partner about what you notice. Do you see any equivalent fractions? Record two fractions that are equivalent to $\frac{1}{4}$.

2. Record two fractions that are equivalent to $\frac{2}{3}$.

CONNECT

Recipe Trouble Read the problem, and then rewrite the recipe replacing the fractions in the recipe with equivalent fractions.

Samar has a recipe for healthy snack bars that she received from her friend. The recipe uses measuring cups and teaspoons. Her friend sent a $\frac{1}{4}$ cup and $\frac{1}{4}$ teaspoon, so Samar has to rewrite the recipe using equivalent fractions.

(Hint: Think about an equivalent fraction for $\frac{1}{2}$ using fourths.)

Granola Bars

Healthy Snack Bars

Ingredients:

$\frac{1}{2}$ cup rolled oats

2 cups crispy rice cereal

$\frac{1}{4}$ cup honey

$1\frac{1}{2}$ cups peanut butter

$\frac{1}{2}$ teaspoon of vanilla

1 cup chocolate chips

Rewrite:

_____ cup rolled oats

_____ cup peanut butter

_____ cup crispy rice cereal

_____ teaspoon of vanilla

_____ cup honey

_____ cup chocolate chips

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Benchmark Fractions

Learning Targets

- I can identify **benchmark fractions**.
- I can generate fractions equivalent to benchmark fractions.

ACCESS

Walking the Path Read the problem and draw the benches in the appropriate spots along the path.

Sherif was in charge of placing benches along a 1 kilometer walking path in Cairo. He was supposed to put the benches at the beginning, middle, and end of the path.

At what kilometer marker posts should Sherif put benches? Draw benches in the appropriate spots along the path.

$\frac{0}{8}$ $\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ $\frac{8}{8}$

BUILD

Continuing Down the Path Read the questions and solve them with a partner.

Sherif did such a great job placing benches along the walking path that he was hired again to do more. He needs to put a bench at the beginning, middle, and end of the following 1-kilometer paths. Draw benches in the appropriate spots along the path.

1.

$\frac{0}{12}$ $\frac{1}{12}$ $\frac{2}{12}$ $\frac{3}{12}$ $\frac{4}{12}$ $\frac{5}{12}$ $\frac{6}{12}$ $\frac{7}{12}$ $\frac{8}{12}$ $\frac{9}{12}$ $\frac{10}{12}$ $\frac{11}{12}$ $\frac{12}{12}$

2.

$\frac{0}{10}$ $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ $\frac{10}{10}$

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For Sherif's next job, the path is 2-kilometers long. He must place a bench every $\frac{1}{2}$ kilometer from the beginning to end. Where should he place them? Draw benches in the appropriate spots along the path.

3.
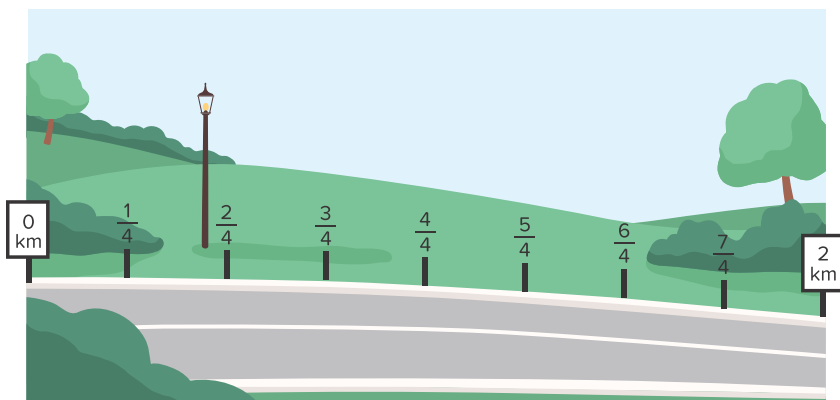
CONNECT

Writing About Math What strategies did you use to decide where to place the cards when you played Mixed-Up Fractions? Explain your thinking and share examples.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 12
Half or Whole?

Learning Target

- I can compare fractions to a benchmark fraction.

ACCESS

Error Analysis Analyze the student's work and answer. Identify what the student did correctly and incorrectly, and then try to solve the problem correctly.

Problem: Circle the fraction that is closer to 1 and explain your thinking.

$\frac{3}{12}$ $\frac{3}{8}$

Student's Solution:

$\frac{3}{12}$ $\frac{3}{8}$

$\frac{3}{12}$ is closer to 1 whole because both numerators are 3 but the denominator 12 is larger, so that means it is closer to being one whole.

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

BUILD

Use a Benchmark For her birthday party, Menna made two cakes because she had so many friends coming. The two cakes were the same size. Her mom cut one cake into 10 pieces and the other into 6 pieces. $\frac{5}{10}$ of one cake was eaten and $\frac{5}{6}$ of the other cake was eaten. Which cake had more eaten? Use benchmark fractions to solve the problem.

Spin to Win

HANDS-ON ACTIVITY

Play the game with your partner.

- Player 1 spins the spinner once.

- Player 1 writes their fraction in the first row of the chart.

- Player 2 takes their turn spinning and recording their fraction.

- Players work together to use benchmarks $\left(0, \frac{1}{2}, 1\right)$, to compare the two fractions.

- The biggest fraction wins the round.

- Keep playing until you complete the chart.

Spin Your Fraction

Spin to Win

HANDS-ON ACTIVITY
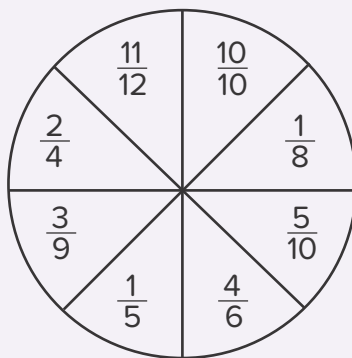
My Fraction	<, >, or =	My Partner's Fraction

Story Problems Use benchmark fractions to solve the story problems.

1. Rashad and Malek each got a candy bar that was the same size. Rashad ate $\frac{4}{6}$ of his candy bar and Malek ate $\frac{4}{8}$ of his. Who ate more than $\frac{1}{2}$? How do you know?

2. Mariam and Jana each had identical sandwiches. Mariam cut her sandwich into 12 pieces and ate 4 of them. Jana cut hers into 6 pieces and ate 3. Who ate more? How do you know?

Sandwich Wrap
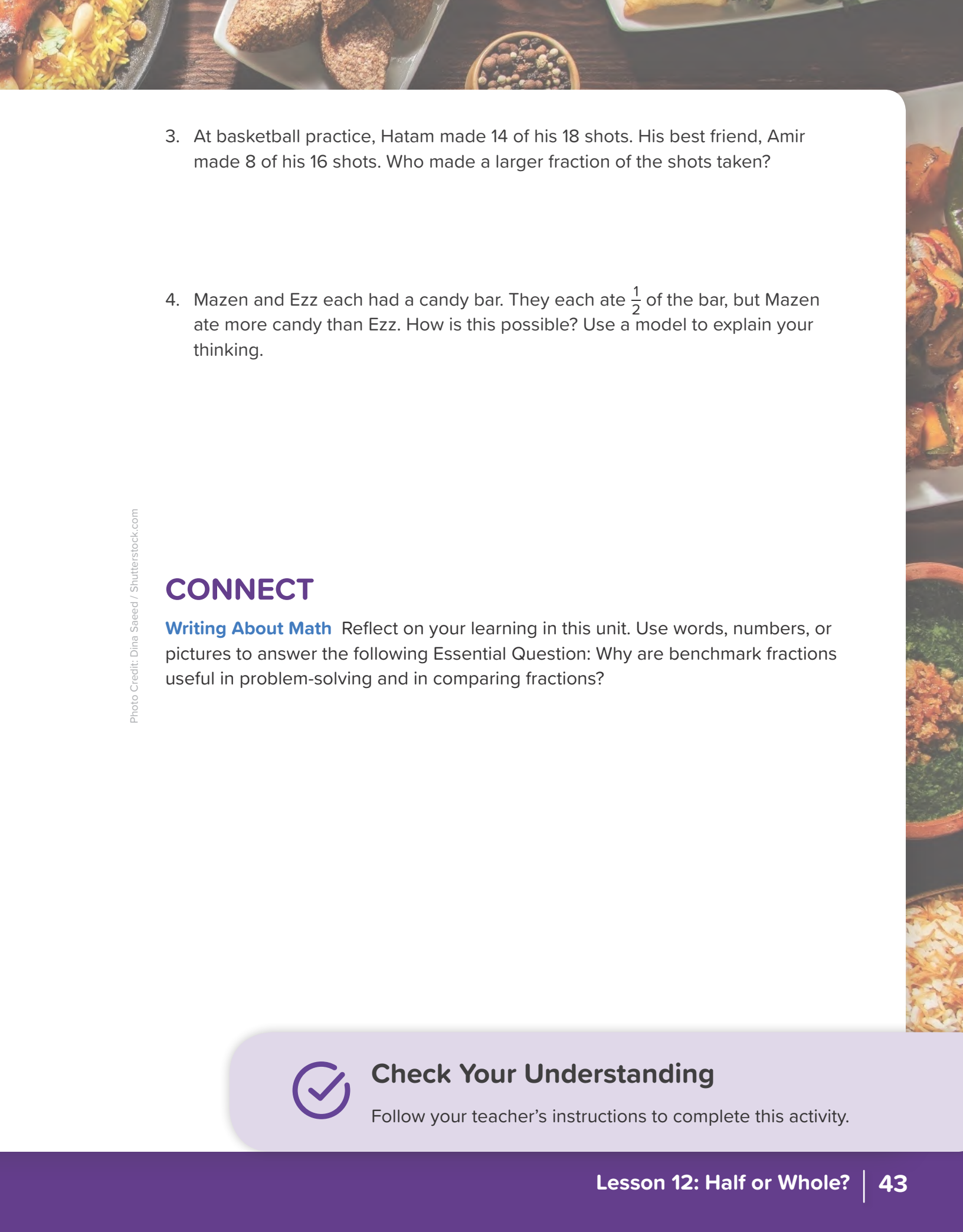
3. At basketball practice, Hatam made 14 of his 18 shots. His best friend, Amir made 8 of his 16 shots. Who made a larger fraction of the shots taken?

4. Mazen and Ezz each had a candy bar. They each ate $\frac{1}{2}$ of the bar, but Mazen ate more candy than Ezz. How is this possible? Use a model to explain your thinking.

CONNECT

Writing About Math Reflect on your learning in this unit. Use words, numbers, or pictures to answer the following Essential Question: Why are benchmark fractions useful in problem-solving and in comparing fractions?

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

Multiplication and Fractions

LESSON 13

Fractions and the Identity Property

Learning Target

- I can use the Identity Property of Multiplication to create equivalent fractions.

ACCESS

Identity Property Review Solve each problem. Then, circle the problems that show the Identity Property of Multiplication.

1. $45 \times 1 =$ _____

2. $1 \times 34{,}953 =$ _____

3. $\dfrac{2}{3} \times 1 =$ _____

4. $0 \times 4 =$ _____

5. $1 \times \dfrac{4}{5} =$ _____

6. $\dfrac{1}{1} \times \dfrac{1}{8} =$ _____

7. $\dfrac{3}{7} \times \dfrac{4}{4} =$ _____

8. $\dfrac{5}{6} \times 0 =$ _____

Photo Credit: David Fuentes Prieto / Shutterstock.com

BUILD

From Parts to a Whole Use the fraction wall to answer the questions.
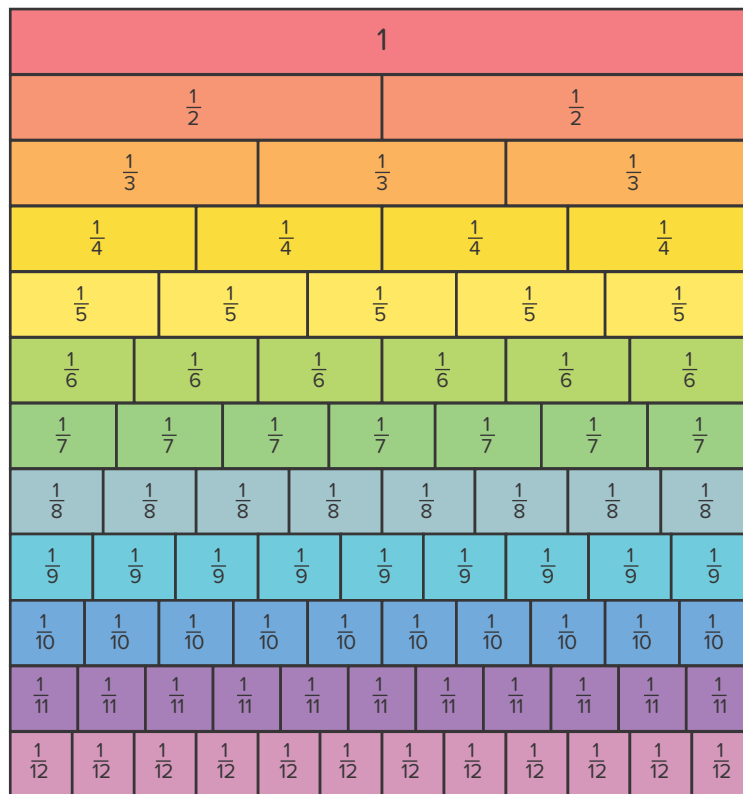
1. How many halves are in 1 whole? Using halves, how would you write 1 whole as a fraction?

2. How many fourths are in 1 whole? Using fourths, how would you write 1 whole as a fraction?

3. How many tenths are in 1 whole? Using tenths, how would you write 1 whole as a fraction?

4. Explain the pattern and why each of the fractions you wrote equals 1 whole.

5. Using what you know, how many 25ths are in 1 whole?

Creating Equivalent Fractions Discuss each model and how to multiply to create equivalent fractions.

The fraction $\frac{1}{2}$ is represented in the model.
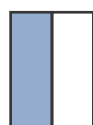
When we multiply $\frac{1}{2}$ by $\frac{2}{2}$, the model looks like this. Although the fraction is now $\frac{2}{4}$, it is still $\frac{1}{2}$ of the whole. Fractions can be expressed in many ways and still be equivalent.

If we multiply $\frac{1}{2}$ by $\frac{3}{3}$, the model looks like this. The product has the same value $\left(\frac{1}{2}\right)$, but is now called $\frac{3}{6}$.
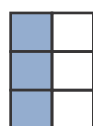
This is the power of the Identity Property of Multiplication. It allows us to make equivalent fractions. We can use the Identity Property of Multiplication to create equivalent fractions so we can add and subtract fractions with unlike denominators.

CONNECT

Riddle Me This Use the clues to solve the riddle.

Like all fractions, this is an important fraction with limitless equivalencies. You can use the Identity Property of Multiplication to create new names for it. Two of its equivalent fractions are: $\frac{6}{18}$ and $\frac{10}{30}$. Both the numerator and denominator are less than 5. What fraction is it? Explain how you know.

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

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Different Numbers, Same Value

Learning Target

- I can multiply and divide to create equivalent fractions.

ACCESS

Error Analysis Analyze the student's work and answer. Identify what the student did correctly and incorrectly, and then try to solve the problem correctly.

Diaa was asked to find an equivalent fraction and wrote the following:

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

Therefore, $\frac{4}{5}$ is equivalent to $\frac{1}{2}$.

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

BUILD

Multiplying to Create Equivalent Fractions Follow your teacher's directions to solve the problems.

1. How many ways can you show 1 (one whole) as a fraction? Write as many as you can in the time allowed.

Generate at least 5 equivalent fractions for each fraction.

2. $\frac{2}{3}$; _____ ; _____ ; _____ ; _____ ; _____

3. _____ ; $\frac{2}{4}$; _____ ; _____ ; _____ ; _____

4. $\frac{3}{5}$; _____ ; _____ ; _____ ; _____ ; _____

5. _____ ; _____ ; $\frac{3}{9}$; _____ ; _____ ; _____

Dividing to Create Equivalent Fractions Follow your teacher's directions to solve the problems.

1. $\frac{15}{20}$ is equivalent to $\frac{3}{4}$. How can you use division to prove it?

Determine whether each fraction pair is equivalent. If it is, write "true." If it is not, write "false."

2. $\frac{2}{3} = \frac{6}{9}$ _____

3. $\frac{7}{8} = \frac{2}{3}$ _____

4. $\frac{3}{5} = \frac{6}{8}$ _____

5. $\frac{6}{10} = \frac{2}{5}$ _____

6. $\frac{2}{8} = \frac{1}{4}$ _____

7. $\frac{9}{12} = \frac{2}{4}$ _____

8. $\frac{3}{8} = \frac{1}{6}$ _____

9. $\frac{1}{3} = \frac{4}{12}$ _____

CONNECT

Omar's Om Ali Omar made a pan of Om Ali, his favorite dessert. The pan contains 12 equal servings. Omar shares 3 servings with his friend Heba. What is the simplest form of the fraction of the Om Ali Omar gave his friend?

Om Ali

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 15
Many Missing Multiples

Learning Target

- I can explain the relationship between <mark>multiples</mark> and equivalent fractions.

ACCESS

Which Is Not a Multiple? Circle the number that is not a multiple of the given number.

1. **3:**   6   9   12   14   15

2. **2:**   4   7   8   10   12

3. **4:**   8   12   16   22   24

4. **5:**   10   17   20   25

5. **6:**   12   16   24

BUILD

What Is the Missing Multiple? Work with a partner to identify the missing numerator or denominator for the equivalent fractions.

1. $\dfrac{3}{4} = \dfrac{\square}{12}$

2. $\dfrac{5}{15} = \dfrac{15}{\square}$

3. $\dfrac{20}{25} = \dfrac{\square}{5}$

Find the missing numerator or denominator to make the fractions equivalent. Record what factor you multiplied or divided by. An example is shown.

$\dfrac{2}{5} = \dfrac{}{20}$

4. $\dfrac{5}{7} = \dfrac{\square}{21}$

5. $\dfrac{2}{9} = \dfrac{10}{\square}$

6. $\dfrac{12}{18} = \dfrac{4}{\square}$

7. $\dfrac{10}{70} = \dfrac{\square}{7}$

8. $\dfrac{7}{13} = \dfrac{21}{\square}$

9. Heba had two cakes that were the same size. She cut the first cake into 6 pieces and frosted 2 of the pieces with chocolate. She cut the second cake into 18 pieces. If she wanted to frost the same fraction of the second cake with chocolate, how many pieces should she frost? How do you know? Draw a fraction model if necessary.

Different Kinds of Cookies

10. Nabil had 9 cookies. $\dfrac{2}{3}$ of them were chocolate chip. How many cookies were chocolate chip? $\left(\text{Hint: } \dfrac{2}{3} = \dfrac{?}{9} \right)$

CONNECT

Nadia's Cake Nadia owns a bakery. She made a cake and decorated it as shown.
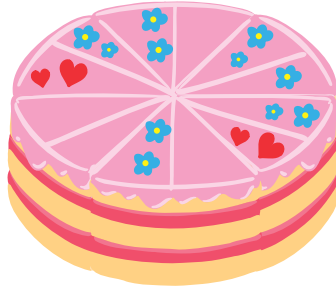
There are 12 equal pieces total: 6 pieces have flowers, 4 are plain with no decorations, and the other 2 have something else.

Answer the questions based on Nadia's cake.

1. One-half of the customers want pieces with flowers. What fraction of the cake will they eat? How many pieces?

2. One-third of the customers want pieces with no decorations. What fraction of the cake will they eat? How many pieces?

3. What fraction of the cake is left?

4. If Nadia cuts all the pieces that are left into two, what fraction is now left?

Photo Credit: David Fuentes Prieto / Shutterstock.com

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 16
Multiplying by a Whole

Learning Target

- I can multiply a fraction by a whole number.

ACCESS

Doggy, Doggy, Where Is Your Bone?
Discuss the story problem that follows with your Shoulder Partner. Work together and use a bar model to solve the problem. Then, write an addition and a multiplication sentence.

Omar has 6 dogs. Each dog chews 2 bones a day. How many bones does Omar need each day to give his dogs?

Pack of Dogs

Bar Model:

Addition sentence: _____

Multiplication sentence: _____

BUILD

Same Answer, Different Operation Solve the problems. Show your work.

1. Two of Omar's dogs are at the vet. He has 6 bones in his bag for his evening dog walk. Shade the boxes to show how many bones Omar will give to the dogs that are with him.

2. Represent your shaded bar model as a fraction.

3. Decompose $\frac{4}{6}$ as the sum of unit fractions.

4. Express $\frac{4}{6}$ using multiplication.

5. Draw a bar model and write an addition and multiplication sentence for $\frac{2}{5}$.

   Bar model:

   Addition sentence: _____

   Multiplication sentence: _____

6. Draw a bar model and write an addition and multiplication sentence for $\frac{5}{8}$.

   Bar model:

   Addition sentence: _____

   Multiplication sentence: _____

Puzzle Mania

Your teacher will give you a puzzle card. When your teacher gives the signal, make a completed puzzle by finding classmates with the same fraction representation.

CONNECT

Writing About Math Reflect on your learning and answer the questions. Use examples to support your thinking.

- What do you notice about the factors and product when you multiply a fraction by a whole number?

- How is this different from multiplying a whole number by a whole number?

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 17

Real-World Fraction Connection

Learning Target

- I can solve story problems involving fractions.

ACCESS

Adding and Subtracting Fractions Solve the problems. Show your work.

1. $\dfrac{1}{5} + \dfrac{2}{5} + \dfrac{1}{5} =$ _____

2. $\dfrac{3}{8} + \dfrac{1}{8} + \dfrac{3}{8} =$ _____

3. $\dfrac{5}{12} + \dfrac{2}{12} + \dfrac{6}{12} =$ _____

4. $\dfrac{6}{9} - \dfrac{5}{9} =$ _____

5. $\dfrac{12}{15} - \dfrac{5}{15} =$ _____

6. $1 - \dfrac{2}{5} =$ _____

BUILD

Fraction Story Problems Use the Steps to Solving Story Problems to solve the problems. Show your work.

1. Heba is making pancake batter. The recipe calls for $\dfrac{5}{8}$ of a jug of milk, and she only has $\dfrac{2}{8}$ of a jug of milk. How much more milk does Heba need to make the pancake batter?

What do I know? _____

_____

_____

Solve:

2. Kareem runs to train for the big race. On Monday he runs $\frac{4}{2}$ kilometer, on Wednesday he runs $\frac{1}{2}$ kilometer, and on Friday he runs $\frac{6}{2}$ kilometer. How many kilometers did Kareem run in all?

What do I know? _____

_____

_____

Solve:

3. Samira and her family are celebrating her birthday with cake. They cut the cake into 8 equal slices. If Samira, her mom, her dad, and her brother each have 1 slice of the cake, what fraction of the cake is left?

What do I know? _____

_____

_____

Solve:

4. Over the course of a week, Adam drank $1\frac{3}{4}$ liters of juice and Omar drank $1\frac{7}{8}$ liters of juice. Who drank more?

What do I know? _____

_____

_____

Solve:

Find Your Match Your teacher will give you a story problem card. Record the story problem on your card and solve.

My story problem:

What do I know?

Solve:

Now, share your story problem and solution with a partner. Record and solve your partner's story problem.

My partner's story problem:

What do I know?

Solve:

CONNECT

Create Your Own Problem Write and solve your own fraction addition or subtraction story problem. Use one of the expressions provided or create your own.

Sample expressions: $2\frac{2}{7} + 1\frac{5}{7}$ $\qquad\qquad 3\frac{7}{10} - 1\frac{8}{10}$

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Theme 3 | Fractions, Decimals, and Proportional Relationships

Unit 10
Decimals
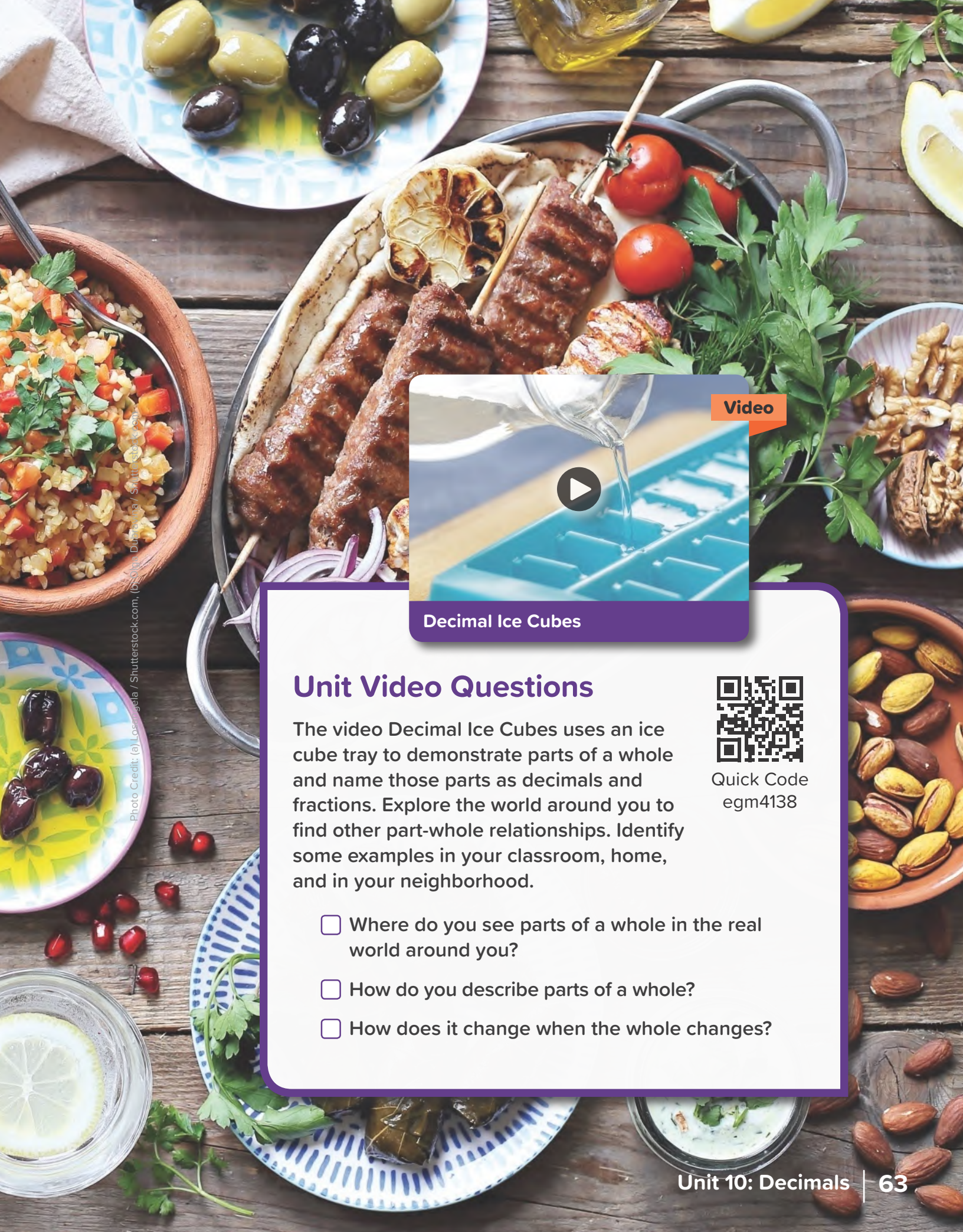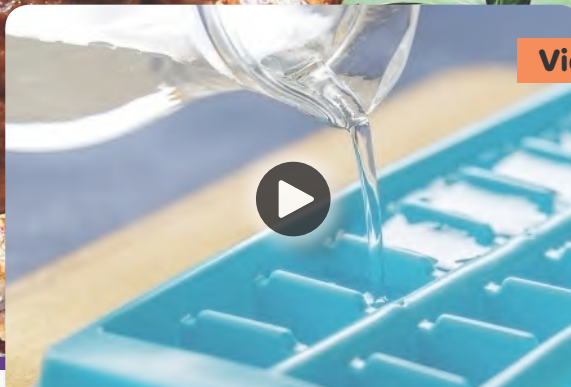
Video

Decimal Ice Cubes

Unit Video Questions

The video Decimal Ice Cubes uses an ice cube tray to demonstrate parts of a whole and name those parts as decimals and fractions. Explore the world around you to find other part-whole relationships. Identify some examples in your classroom, home, and in your neighborhood.

Quick Code
egm4138

☐ Where do you see parts of a whole in the real world around you?

☐ How do you describe parts of a whole?

☐ How does it change when the whole changes?

Defining Decimals

LESSON 1

Let's Explore Decimals

Learning Targets

- I can define **decimal fractions**.
- I can create visual models of **Tenths**.

ACCESS

Number Talk Use mental math to solve the problems. Then, check your answers with your Shoulder Partner.

1. 60 ÷ 10 =

2. 90 ÷ 10 =

3. 300 ÷ 10 =

4. 230 ÷ 10 =

5. 720 ÷ 10 =

6. 1,500 ÷ 10 =

7. 6,700 ÷ 10 =

8. 4,820 ÷ 10 =

9. 700 ÷ 100 =

10. 900 ÷ 100 =

11. 3,100 ÷ 100 =

12. 4,600 ÷ 100 =

13. 8,700 ÷ 100 =

14. 9,900 ÷ 100 =

15. 23,400 ÷ 100 =

BUILD

Break It Apart Follow along with your teacher to fill in the fractions and decimals on the number line.

$\frac{1}{10}$

0   1
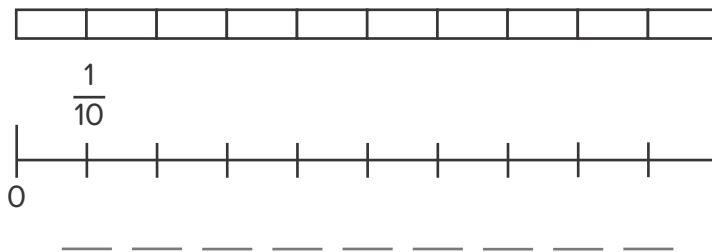
Connect the Parts Record what fraction and decimal are shown.

1.
```
0                                    1
___ ___ ___ ___ ___ ___ ___ ___ ___
```

2.
```
0                                    1
___ ___ ___ ___ ___ ___ ___ ___ ___
```

3.
```
0                                    1
___ ___ ___ ___ ___ ___ ___ ___ ___
```
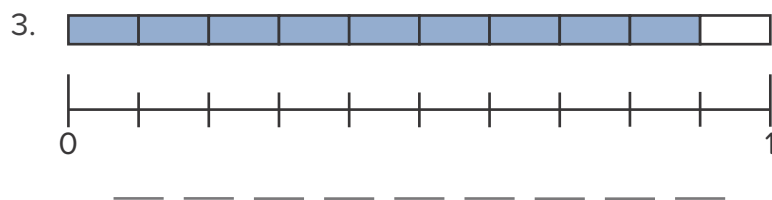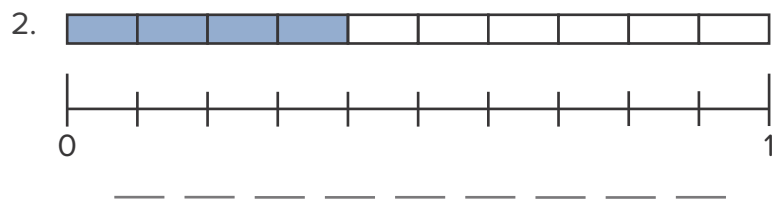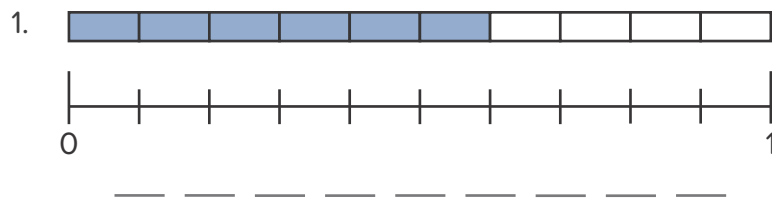
Shade in the model to represent the decimal.

4. 0.7

5. 0.5

6. 0.6
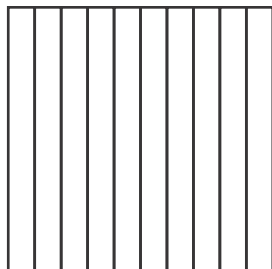
7. 0.2
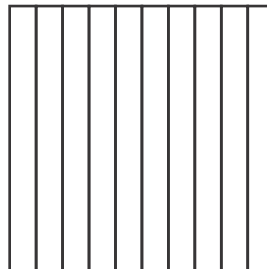
8. 0.9
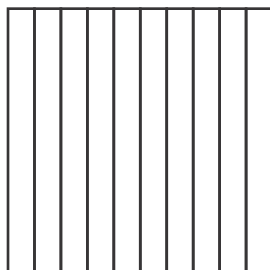
9. Hosam had a 1-meter piece of fabric. Of this piece, 0.2 meter had flowers on it, 0.6 meter was plain blue, and the rest had stars. Color in the strip of Hosam's fabric based on the description.

10. What decimal of Hosam's strip had stars? _____

CONNECT

Writing About Math How is 0.1 (one-tenth) similar to 1 divided by 10?

LESSON 2
The Powerful 10

Learning Target

- I can create visual models of **Hundredths**.

ACCESS

How Much Rice? Read the problem and talk to your Shoulder Partner about who bought the most rice.

> Farid, Hala, and Amir went to the store for their mothers. Each bought some rice. Faria came home and told his mother, "I bought $\frac{8}{10}$ of a **kilogram** for you." Hala came home and said, "When I weighed the rice, the scale said 0.8 kilogram." Amir came home and told his mother, "I bought you 800 grams of rice for dinner."

A Bowl of Rice

Which child brought home the most rice? How do you know?

BUILD

More Cups of Rice Record what decimal is shown.
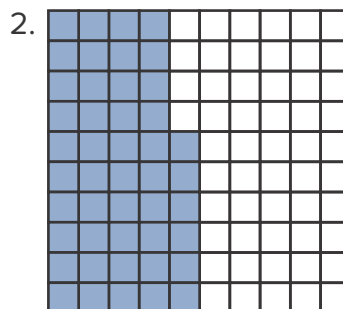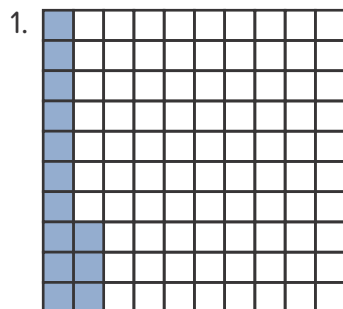
1.

2.

3.

4.
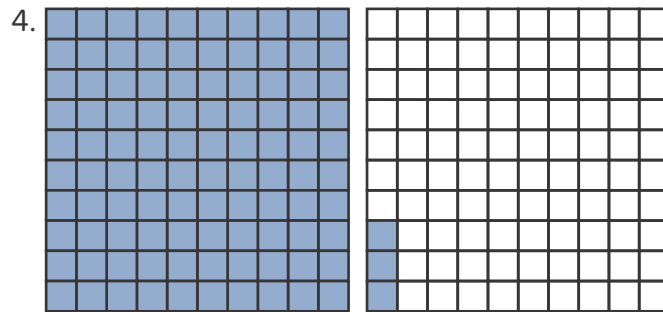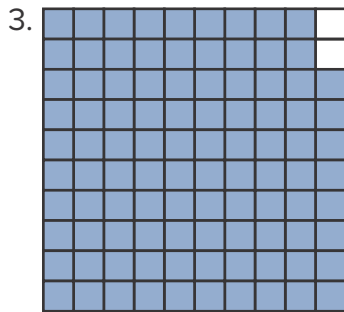
Shade in the grids to show the decimal stated.

5. 0.46

6. 0.72

7. 0.06

8. 1.28
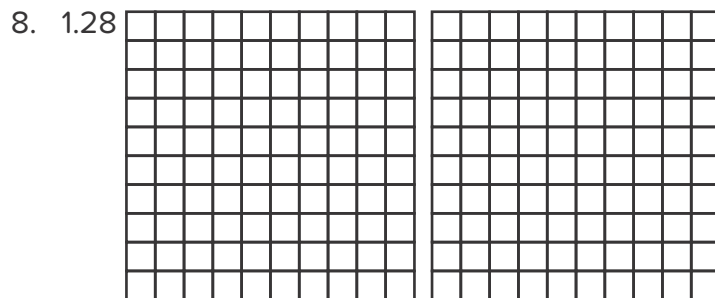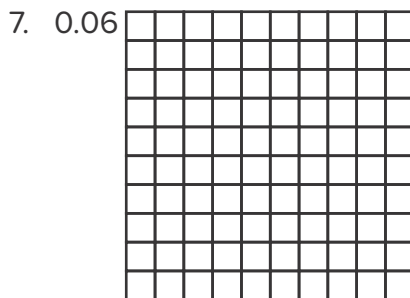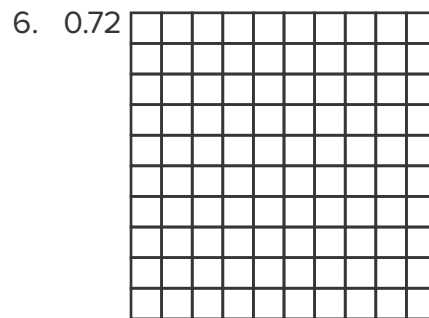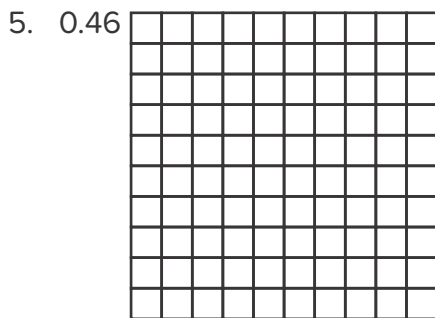
9. Basem had a quilt that his mother bought for him. 0.35 of it was colored blue. 0.4 of it was red. The rest was yellow. Color in the quilt to match the decimals described.
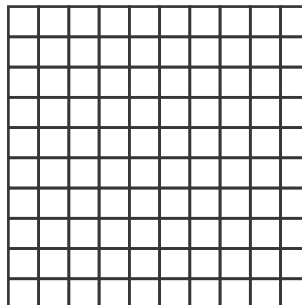
10. What decimal of Basem's quilt was yellow? _____

CONNECT

Groups of Hundredths Aisha was coloring in a Hundredths grid. She colored in 30 squares or 0.30. Adel walked by and said, "Oh, I see you colored in 3 Tenths."

Is Adel correct? How do you know? Color in the grid to check your thinking.
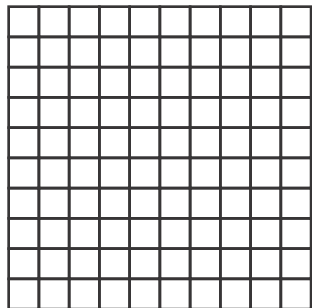
Aisha
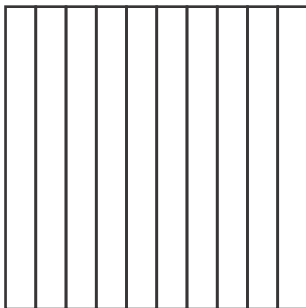
Adel

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

The Value of Place

Learning Targets

- I can name the <mark>place value</mark> of decimals to the Hundredths place.
- I can identify the value of a digit to the Hundredths place.

ACCESS

Mystery Number Solve the problems. Show your work.

1. The number has digits up to the Ten Thousands place. The digit in the Hundreds place is less than 6 and greater than 3 and is prime. The digit in the Thousands place is the product of a number multiplied by itself. It is greater than 1 and less than 5. There is a zero in the Ones place. There are 2 Tens. The value of the Ten Thousands is 3 x 10,000. What is the number?

2. The number has three digits. One of the digits is a whole and the other two are a fraction of a number expressed as a decimal. The number in the Hundredths place makes the Identity Property of Multiplication possible. The number in the Ones place is odd and prime. It is a factor of 9 and 12 but less than 4 and greater than 1. The number in the Tenths place is the only even prime number.

BUILD

See and Say Read the numbers in Items 1–4 with your Shoulder Partner. Make sure you agree on how to say each number. Then, listen to the decimal numbers your teacher reads aloud. Record the digits in the place value chart for items 5–9.
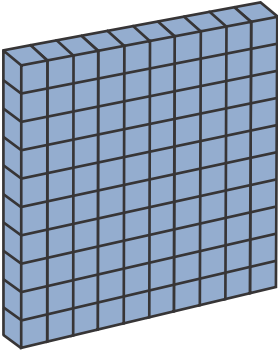
	Ones	•	Tenths	Hundredths
		•		
1.	5	•	6	7
2.	4	•	0	9
3.	3	•	1	1
4.	9	•	5	0
5.		•		
6.		•		
7.		•		
8.		•		
9.		•		

Photo Credit: Elena Veselova / Shutterstock.com

10. Shade the Hundredths grid model to show how 5 Tenths is equivalent to 50 Hundredths.

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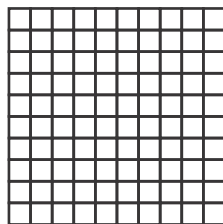
Make and Say

Read the directions for the activity.

1. Put the two decks of digit cards together. Shuffle them and place them face down in a pile.

2. Turn over three cards.

3. Work together to arrange the cards to make and record as many different numbers as you can by writing the digits in the Ones, Tenths, and Hundredths places.

4. Record each number.

5. Practice saying the numbers with your partner.

Example: We turned over a 5, a 6, and a 9. My partner and I make 5.69, 5.96, 6.59, 6.95, 9.56, and 9.65. Then, we practice reading the numbers together.

1. Cards turned:

   Numbers made:

2. Cards turned:

   Numbers made:

3. Cards turned:

   Numbers made:

4. Cards turned:

   Numbers made:

CONNECT

Writing About Math Use the number to answer the questions: **532.89**

1. What is the value of the 3? _____

2. What digit is in the Hundredths place? _____

3. What is the value of the digit in the Hundreds place? _____

4. What digit is in the Tenths place? _____

5. Why is the value of the digit in the Hundredths place worth less than the digit in the Tenths place if Hundreds are greater than Tens?

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Decimals in Multiple Forms

Learning Target

- I can write decimals to the Hundredths place in standard, word, unit, and **expanded form**.

ACCESS

Error Analysis Analyze the student's work and answer in the space provided. Identify what the student did correctly and incorrectly, and then try to correctly solve the problem.

A student was asked to read the following number: 23.05. The student read it as "twenty-three and five-tenths."

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

Photo Credit: Elena Veselova / Shutterstock.com

BUILD

Naming Decimals Look at the example with your teacher.

Example:
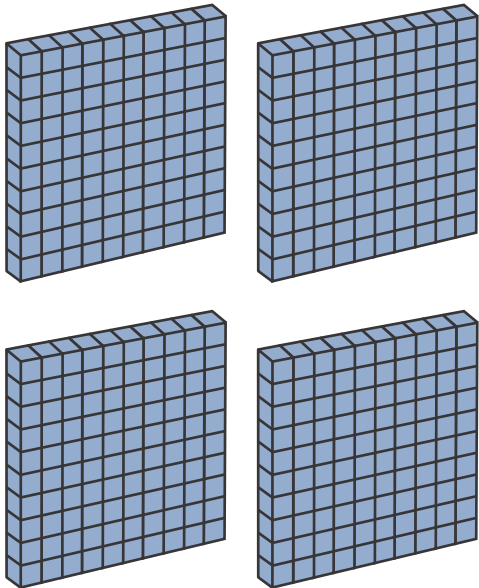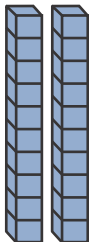
Ones	•	Tenths	Hundredths
	•		
4	•	2	3

Use the example in the chart to help you answer the following problems.

Standard Form	Word Form	Unit Form	Expanded Form
4.23	four and twenty-three hundredths	4 Ones, 2 Tenths, 3 Hundredths	4 + 0.2 + 0.03

Write the numbers in word form.

1. 4.53

   _____

2. 0.48

   _____

3. 2 + 0.1 + 0.03

_____

Write the numbers in unit form.

4. 4.52

_____

5. seven and thirty-four hundredths

_____

6. sixty-nine hundredths

_____

Write the numbers in expanded form.

7. 2.04

_____

8. two and fifty-Hundredths

_____

9. 5 Ones, 6 Tenths, 8 Hundredths

_____

Write the numbers in standard form.

10. 7 Ones, 9 Hundredths

_____

11. 5 + 0.5 + 0.01

_____

12. nine and forty-three Hundredths

_____

Fill in the blanks to match the decimal models.

Example:
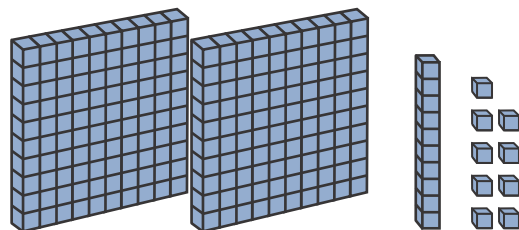
Standard form: 2.19

Word form: two and nineteen hundredths

Unit form: 2 Ones, 1 Tenth, 9 Hundredths

Expanded form: 2 + 0.1 + 0.09
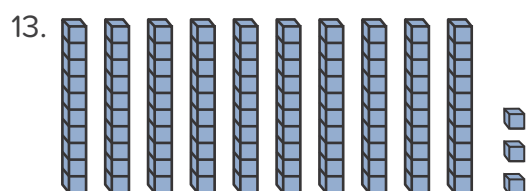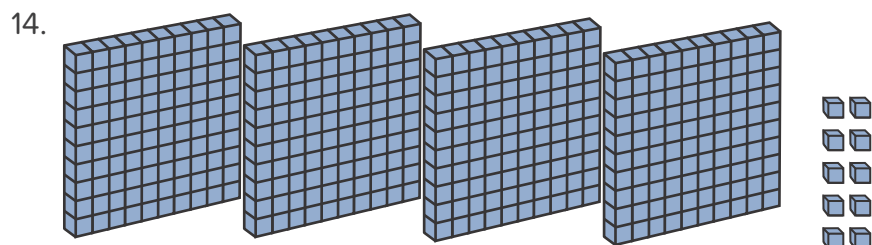
13.

Standard form: _____

Word form: _____

Unit form: _____

Expanded form: _____

14.

Standard form: _____

Word form: _____

Unit form: _____

Expanded form: _____

15.
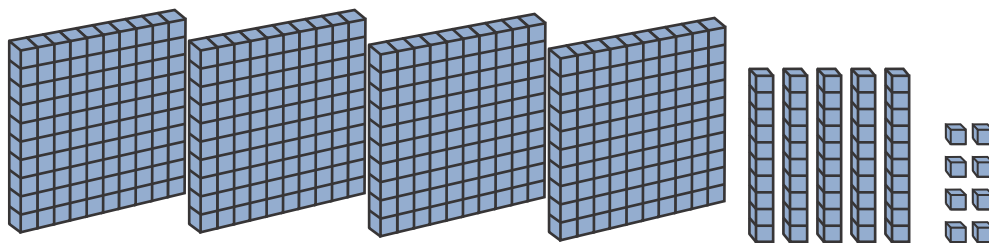
Standard form: _____

Word form: _____

Unit form: _____

Expanded form: _____

CONNECT

Writing About Math When does the digit 0 matter? When is the digit 0 not needed? Use words, numbers, and pictures to support your thinking.

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

Decimals and Fractions

LESSON 5
Same Value, Different Ways

Learning Target

- I can read and write decimals as **fractions**.

ACCESS

Name the Model Express the models in as many different forms as you can.

1.

2.

3.
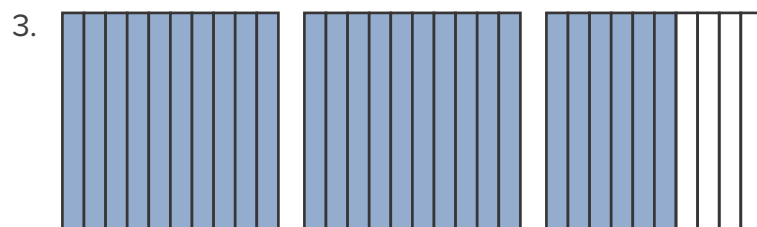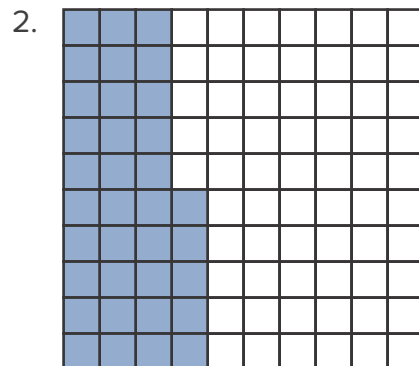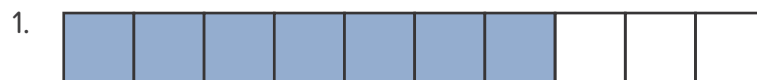
BUILD

A Model Fraction Express each model as a fraction and a decimal.

1.

2.

3.

4.
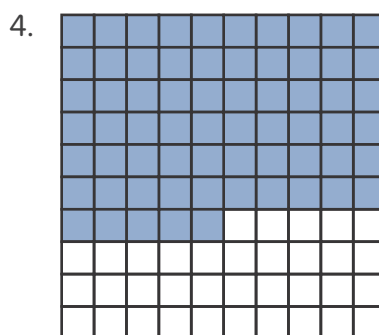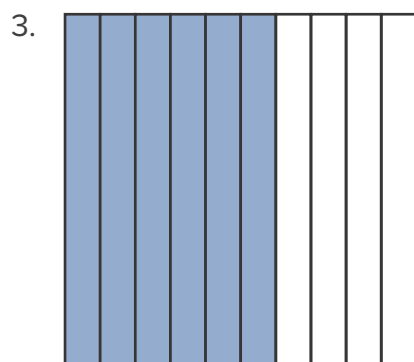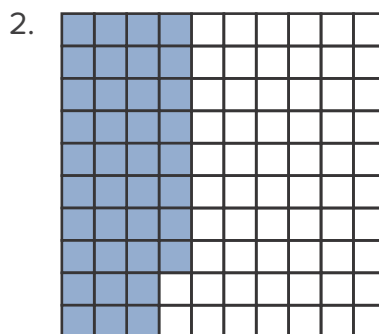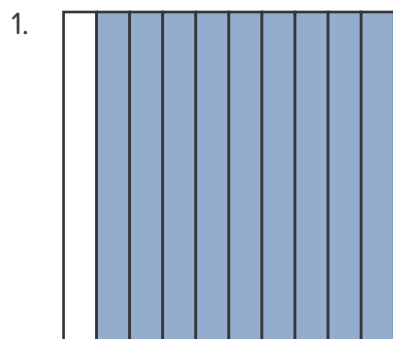
Decimals as Fractions Express the following decimals as fractions.

1. 0.23

2. 0.3

3. 0.02

4. 0.67

Modeling Decimals Create a model for each decimal and write it as a fraction.

1. 2.93
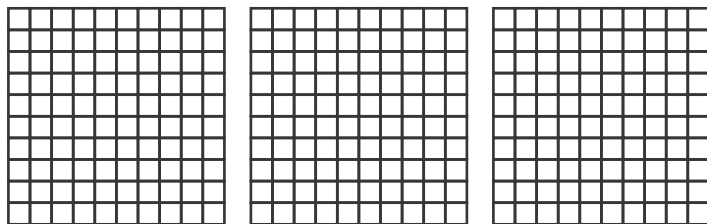
2. Write your answer to the previous item as a fraction. _____

3. 3.04
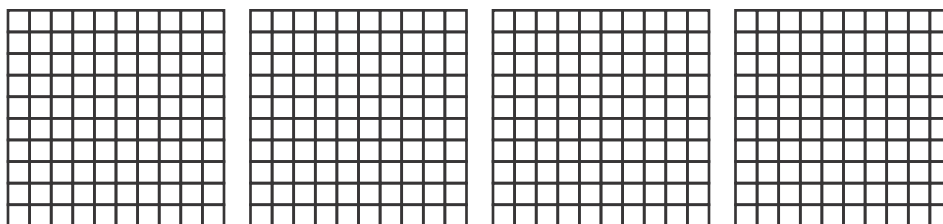
4. Write your answer to the previous item as a fraction. _____

5. 1.32
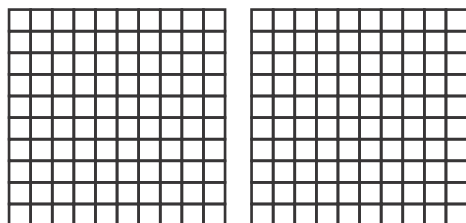
6. Write your answer to the previous item as a fraction. _____

7. 2.74
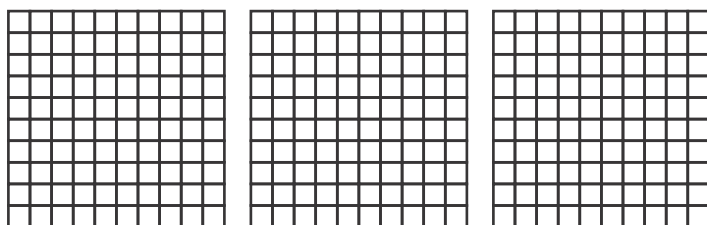
8. Write your answer to the previous item as a fraction. _____

More Decimals as Fractions Express the decimals as fractions.

1. 3.4

2. 10.05

3. 5.97

4. 4.79

CONNECT

Are They Equivalent? A student thinks that $\frac{3}{10}$ is equivalent to $\frac{30}{100}$. Do you agree or disagree? Use the model to explain your thinking.
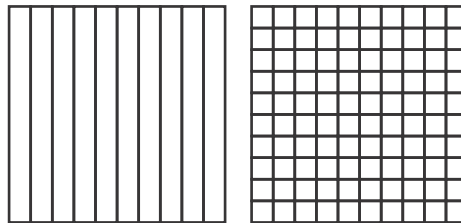
Check Your Understanding

Follow your teacher's instructions to complete this activity.

The Whole Breakdown

Learning Targets

- I can explain the relationship between decimals and fractions.
- I can explain the relationship between decimals or fractions and the whole.

ACCESS

Wholes to Fractions Express both models as fractions, and then answer the question.

1.

2.
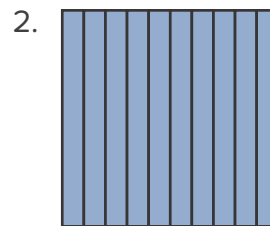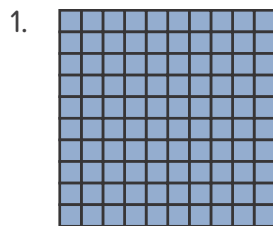
Fraction _____

Fraction _____

3. Are the two fractions equivalent? How do you know?

_____

_____

BUILD

The Whole Deal Decompose the units to represent each number as Tenths and then write the number as a fraction.

1. 1

2. 3

Tenth _____

Tenths _____

In fraction form _____

In fraction form _____

3. 1.5

   Tenths _____

   In fraction form _____

4. 2.3

   Tenths _____

   In fraction form _____

5. 10.8

   Tenths _____

   In fraction form _____

Decompose the units to represent each number as Hundredths and then write the number as a fraction.

6. 1

   Hundredths _____

   In fraction form _____

7. 3

   Hundredths _____

   In fraction form _____

8. 1.5

   Hundredths _____

   In fraction form _____

9. 2.3

   Hundredths _____

   In fraction form _____

10. 10.8

   Hundredths _____

   In fraction form _____

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CONNECT

Writing About Math Summarize what you have learned about decimals so far. Identify any areas where you still need help with decimal skills and concepts.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 7
All Things Equal

Learning Target

- I can create **equivalent** fractions and decimals to the Hundredths place.

ACCESS

Equivalency Review Circle the equations that show equivalency.

1. $\dfrac{1}{2} = \dfrac{3}{6}$

2. $\dfrac{2}{3} = \dfrac{2}{6}$

3. $\dfrac{8}{10} = \dfrac{4}{10}$

4. $\dfrac{8}{12} = \dfrac{4}{6}$

5. $\dfrac{2}{3} = \dfrac{6}{9}$

6. $\dfrac{4}{8} = \dfrac{0}{4}$

7. $\dfrac{1}{4} = \dfrac{5}{8}$

8. $\dfrac{2}{10} = \dfrac{4}{20}$

9. $\dfrac{5}{10} = \dfrac{1}{2}$

BUILD

Is it the Same? Work with your Shoulder Partner. Create an equivalent model, record its fraction, and write as a decimal fraction.

1.
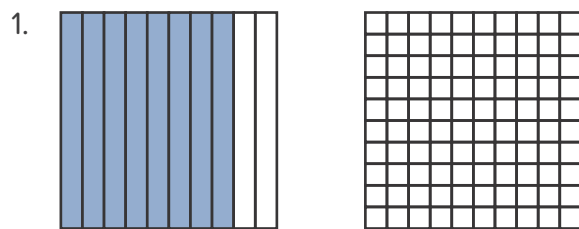
Fraction: $\dfrac{8}{10} =$

Decimal: 0.8 =

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2.
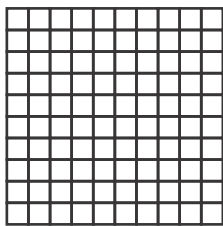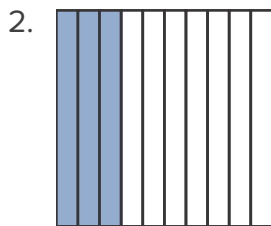
Fraction: $\frac{30}{100}$ = _____

Decimal: 0.30 = _____

3.
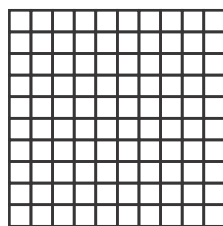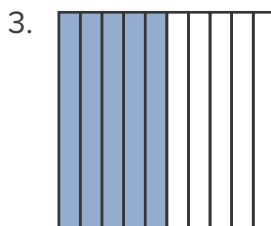
Fraction: $\frac{5}{10}$ = _____

Decimal: 0.5 = _____

Create the Same Record an equivalent fraction and decimal for each problem.

Balancing Rocks

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

Fraction: _____

Decimal: _____

2. $\frac{70}{100}$

Fraction: _____

Decimal: _____

3. $\frac{6}{10}$

   Fraction: ———————

   Decimal: ———————

4. 0.4

   Fraction: ———————

   Decimal: ———————

5. 0.30

   Fraction: ———————

   Decimal: ———————

6. 0.9

   Fraction: ———————

   Decimal: ———————

7. $\frac{10}{10}$

   Fraction: ———————

   Decimal: ———————

8. $1\frac{4}{10}$

   Fraction: ———————

   Decimal: ———————

9. 2.1

   Fraction: ———————

   Decimal: ———————

Fill in the missing denominator or numerator. Circle the fraction that is more than 1 whole.

10. $\frac{20}{100} = \frac{?}{10}$

    ———————

11. $\frac{4}{10} = \frac{40}{?}$

    ———————

12. $\frac{200}{100} = \frac{?}{10}$

    ———————

CONNECT

Writing About Math What strategies do you use to find equivalent fractions and decimals? Use words, numbers, and pictures to express your thinking.

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

Working with Decimals

LESSON 8
Model Comparisons

Learning Target

- I can use models to compare decimals.

ACCESS

Which is More? Talk to your Shoulder Partner about which model is greater. How do you know?

1.

Fraction _____

Decimal _____

How do you know? _____

2.
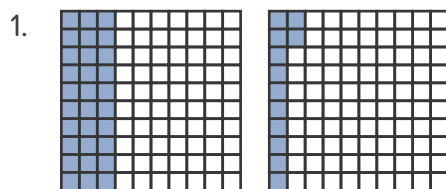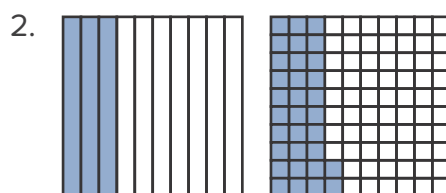
Fraction _____

Decimal _____

How do you know? _____

BUILD

Renaming Review Rename as many of the following problems in the given time by converting fractions to decimals and decimals to fractions.

1. $\frac{2}{10}$ = _____

2. 0.5 = _____

3. $\frac{45}{100}$ = _____

4. 0.45 = _____

5. $\frac{6}{10}$ = _____

6. $\frac{99}{100}$ = _____

7. 0.03 = _____

8. $\frac{78}{100}$ = _____

9. 2.3 = _____

10. 0.90 = _____

11. $\frac{3}{10}$ = _____

12. 0.6 = _____

13. 0.1 = _____

14. 0.11 = _____

15. $\frac{90}{100}$ = _____

16. $\frac{33}{100}$ = _____

17. 1.7 = _____

18. $\frac{47}{100}$ = _____

19. 0.40 = _____

20. $\frac{1}{100}$ = _____

Complete the table.

	Standard Form	Word Form	Fraction Form	Expanded Form
21.	3.2			
22.		Seven and forty-three hundredths		
23.				1 + 0.1 + 0.07
24.			$3\frac{8}{10}$	
25.	0.45			0.4 + 0.05

CONNECT

Writing About Math When comparing decimals in different forms, what strategy did you use to decide which was greater? Use words, numbers, and pictures to explain your thinking.

Photo Credit: Pineapple Studio / Shutterstock.com

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

Not All Digits Are Equal

Learning Target

- I can compare decimals that do not have the same number of digits.

ACCESS

Error Analysis Analyze the student's work and answer in the space provided. Identify what the student did correctly and incorrectly, and then try to correctly solve the problem.

Use models to compare the decimals: 0.07 _____ 0.7

Student's Work:
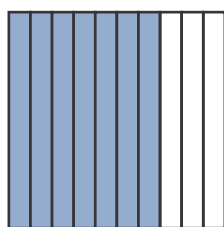
0.07   >   0.7
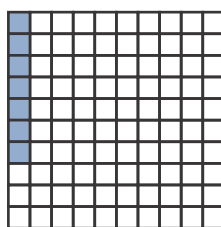
What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

BUILD

Chart and Compare Rewrite the decimals in the chart. Use the symbols >, <, or = to complete the comparison.

1. 0.34 _____ 0.4

Ones	Decimal	Tenths	Hundredths
0	.	3	4
0	.	4	

2. 0.45 _____ 0.04

Ones	Decimal	Tenths	Hundredths
	.		
	.		

3. 0.23 _____ 0.3

Ones	Decimal	Tenths	Hundredths
	.		
	.		

4. 0.54 _____ 0.45

Ones	Decimal	Tenths	Hundredths
	.		
	.		

5. 0.62 _____ 0.26

Ones	Decimal	Tenths	Hundredths
	.		
	.		

6. 0.80 _____ 0.09

Ones	Decimal	Tenths	Hundredths
	.		
	.		

7. 0.73 _____ 0.69

Ones	Decimal	Tenths	Hundredths
	.		
	.		

8. 0.10 _____ 0.1

Ones	Decimal	Tenths	Hundredths
	.		
	.		

9. 0.49 _____ 0.04

Ones	Decimal	Tenths	Hundredths
	.		
	.		

10. 0.27 _____ 0.7

Ones	Decimal	Tenths	Hundredths
	.		
	.		

At the Market Use the table to complete the chart and answer the questions.

Bag of figs	Mangoes	Plums	Pomegranates
1.3 kg	2.01 kg	1.21 kg	2.25 kg

Record the mass of each fruit on the place value chart.

Fruit	Ones	Decimal	Tenths	Hundredths
Figs				
Mangoes				
Plums				
Pomegranates				

1. Which item weighs the least?

   _____

2. Which item weighs the most?

   _____

3. Which items weigh more than the plums?

   _____

4. Which items weigh less than the mango?

_____

Fill in the blanks to make a true statement.

5. _____ > _____

6. _____ < _____

CONNECT

Writing About Math Why is it important to be able to compare decimal amounts? Give an example and explain your thinking.

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 10

Comparing Tenths and Hundredths

Learning Target

- I can compare decimals with fractions that have 10 or 100 as the **denominator**.

ACCESS

Counting by Tenths Follow the directions your teacher provides for counting aloud.

BUILD

Comparing Different Forms Compare the numbers using <, >, or =.

1. $\dfrac{24}{100}$ _____ 0.6

2. $\dfrac{6}{10}$ _____ .34

3. 1.04 _____ 98 Tenths

4. $\dfrac{134}{100}$ _____ 1.03

5. $\dfrac{9}{10}$ _____ 0.89

6. 7 Tenths _____ 0.7

7. 2.07 _____ 2 Ones and 7 Tenths

8. $\dfrac{50}{100}$ _____ 5.00

9. 0.23 _____ $\dfrac{23}{10}$

10. 0.42 _____ $\dfrac{4}{10}$

Mapping My Route Adam is plotting what he passes on the way to school on the number line. Number the line in tenths using fractions (above the line) and decimals (below the line). Then, plot the following on the number line:

- Omar's house: $\dfrac{3}{10}$ kilometer
- Corner Store: 0.8 kilometer
- Street light: $\dfrac{1}{10}$ kilometer

Photo Credit: Pineapple Studio / Shutterstock.com

- Sara's house: 0.6 kilometer
- A brown house: 0.3 kilometer
- A coffee shop: 0.7 kilometer
- A yellow house: $\frac{6}{10}$ kilometer
- A park: 1.0 kilometer

```
0 km                              1 km
├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
Adam's                          School
House
```
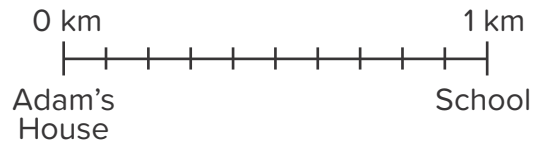
1. Which is further from Adam's house: Sara's house or Omar's?

2. When Adam is walking to school, does he pass the coffee shop or the corner store first?

3. Who lives in the brown house?

4. Who lives in the yellow house?

5. How far is the street light from Omar's house?

CONNECT

Writing About Math Maisa went to the supermarket and saw two bottles of olive oil. The first one contained $\frac{5}{10}$ liters of olive oil, and the second one contained 0.73 liters of olive oil. Which bottle contained more olive oil? How do you know? Use words, numbers, or pictures your thinking.

✓ Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 11
Check the Denominators

Learning Target

- I can use models to add two fractions with related denominators.

ACCESS

Skip Counting by Tenths Listen to the directions your teacher provides. Count aloud with your classmates as directed.

BUILD

Check the Denominators Solve the problems as directed by your teacher.

1. $\dfrac{15}{100} + \dfrac{46}{100} =$ _____

2. $\dfrac{2}{10} + \dfrac{3}{10} + \dfrac{9}{10} =$ _____

3. Talk to your Shoulder Partner about how you would solve the following: $\dfrac{15}{100} + \dfrac{3}{10}.$

Same Units Talk to your Shoulder Partner about how you would solve $\dfrac{15}{100} + \dfrac{3}{10}.$

1. $\dfrac{15}{100}$ + $\dfrac{3}{10} =$
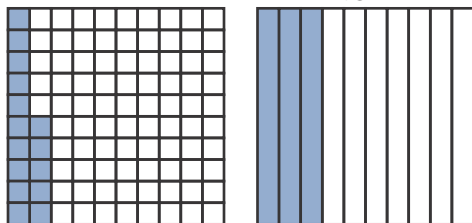
2. $\dfrac{2}{10}$ + $\dfrac{30}{100} =$
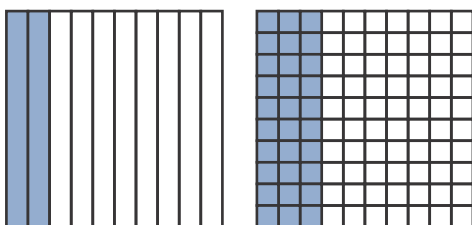
3. $\dfrac{5}{100}$ + $\dfrac{7}{10}$ =
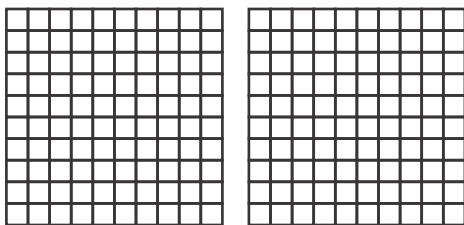
4. $1\dfrac{4}{10}$ + $1\dfrac{32}{100}$ =
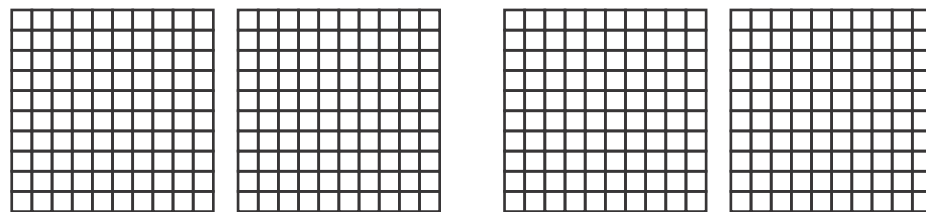
5. $\dfrac{8}{10}$ + $\dfrac{7}{100}$ =
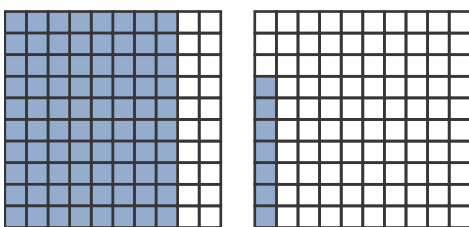
6. $\dfrac{23}{100}$ + $\dfrac{7}{10}$ =
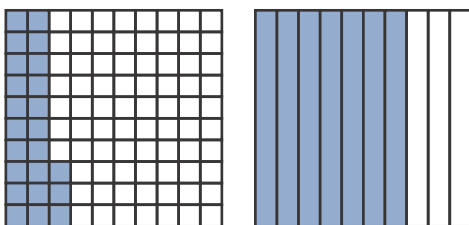
7. $1\dfrac{5}{10}$ + $\dfrac{30}{100}$ =
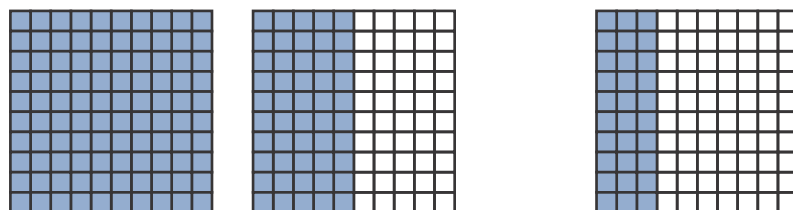
8. Abeer had $\frac{8}{10}$ of a meter of fabric. She went to the store and bought another $\frac{25}{100}$ of a meter. How much fabric did she have in all? Fill in the models to show each fraction and then solve.

Buying Fabric
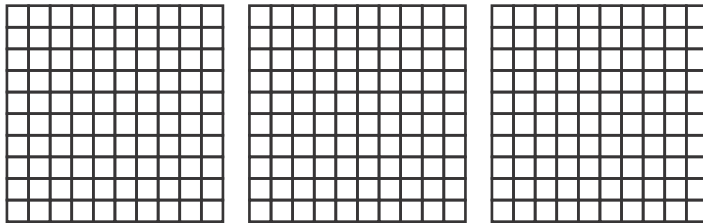
9. Diaa had a water bottle with $\frac{5}{10}$ liter in it. He added it to another bottle that had $\frac{65}{100}$ of a liter. Does he have more than 1 liter? How do you know? Use the models to explain.
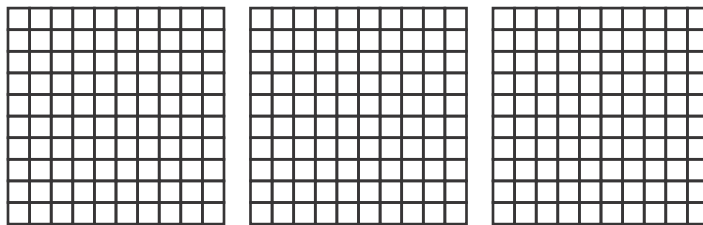
CONNECT

Writing About Math How can you use fraction models to find a common denominator? Use words, numbers, and pictures to support your thinking.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 12
Putting the Pieces Together

Learning Target

- I can add two fractions with related denominators.

ACCESS

Error Analysis Analyze the student's work and answer in the space provided. Identify what the student did correctly and incorrectly, and then try to correctly solve the problem.

Color in the model for the fractions and find the sum

of $\frac{2}{10}$ and $\frac{8}{100}$.

Student's work:
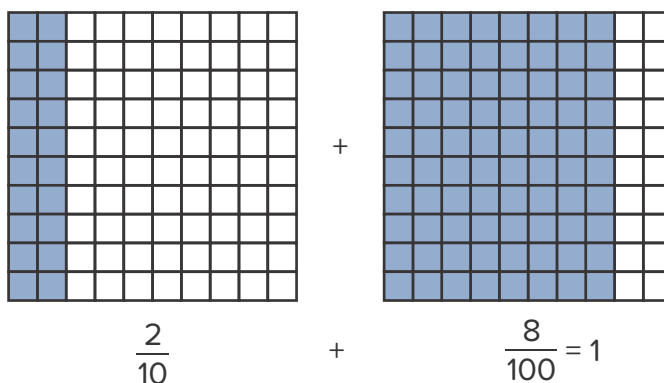
$\frac{2}{10}$ + $\frac{8}{100} = 1$

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Try to solve the problem correctly. Explain your thinking.

BUILD

Model Free Addition Listen to your teacher for directions for the first two problems.

1. $\dfrac{6}{10} + \dfrac{23}{100} =$

   $\dfrac{}{100} + \dfrac{23}{100} = \dfrac{}{100}$

2. $\dfrac{7}{10} + \dfrac{60}{100} =$

   $\dfrac{7}{10} + \dfrac{}{10} = \dfrac{}{10}$

Making Equivalent Fractions Make equivalent fractions and record how you increased or decreased the numerator and the denominator like the example.

Example:

$$\overset{\times 10}{\dfrac{6}{10}} = \underset{\times 10}{\dfrac{60}{100}} \qquad \overset{\div 10}{\dfrac{50}{100}} = \underset{\div 10}{\dfrac{5}{10}}$$

1. $\dfrac{30}{100} = \dfrac{\boxed{}}{10}$

2. $\dfrac{4}{10} = \dfrac{40}{\boxed{}}$

3. $\dfrac{2}{10} = \dfrac{\boxed{}}{100}$

4. $\dfrac{90}{100} = \dfrac{\boxed{}}{10}$

5. $\dfrac{50}{100} = \dfrac{\boxed{}}{10}$

6. $1\dfrac{70}{100} = 1\dfrac{7}{\boxed{}}$

7. $\dfrac{100}{100} = \dfrac{\boxed{}}{10}$

8. $\dfrac{40}{10} = \dfrac{\boxed{}}{100}$

9. $\dfrac{600}{100} = \dfrac{60}{\boxed{}}$

10. $2\dfrac{8}{10} = 2\dfrac{\boxed{}}{100}$

Create your own fraction in Tenths or Hundredths on the left of the equal sign. Then decide on either the numerator or denominator in the equivalent fraction on the right of the equal sign and place a ? for the missing numerator or denominator. Swap with a partner to solve.

11. _____ = _____   12. _____ = _____   13. _____ = _____

14. _____ = _____   15. _____ = _____

HANDS-ON ACTIVITY

Fraction Addition Face-Off

Read the directions and play with a partner until it is time to switch groups.

- Shuffle the cards and give them out to you and your partner, face down, until zero cards remain.

- Each player flips over their top card.

- Players solve the problems on their cards and then compare the sums. The player with the greater sum keeps both the cards. If the sum is greater than 1, record an improper fraction and a mixed number.

- Record your fraction addition problem and the sum for each round in your Student Editions like the example. Circle who had the larger sum.

- The player with the most cards at the end of five rounds is the winner.

- If time permits, play Game 2.

$$\frac{4}{10} + \frac{30}{100} =$$

$$\frac{40}{100} + \frac{30}{100} = \frac{70}{100}$$

Game 1		
Round 1		Largest Sum: Me Partner
Round 2		Largest Sum: Me Partner
Round 3		Largest Sum: Me Partner
Round 4		Largest Sum: Me Partner
Round 5		Largest Sum: Me Partner

Fraction Addition Face-Off

Game 2		
Round 1		Largest Sum: Me Partner
Round 2		Largest Sum: Me Partner
Round 3		Largest Sum: Me Partner
Round 4		Largest Sum: Me Partner
Round 5		Largest Sum: Me Partner

CONNECT

Writing About Math Answer the Essential Question from this unit: What strategies can I use to add fractions with related denominators? Use words, numbers, and pictures to explain your thinking.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Theme 3 | Fractions, Decimals, and Proportional Relationships

Unit 11

Data with Fractions
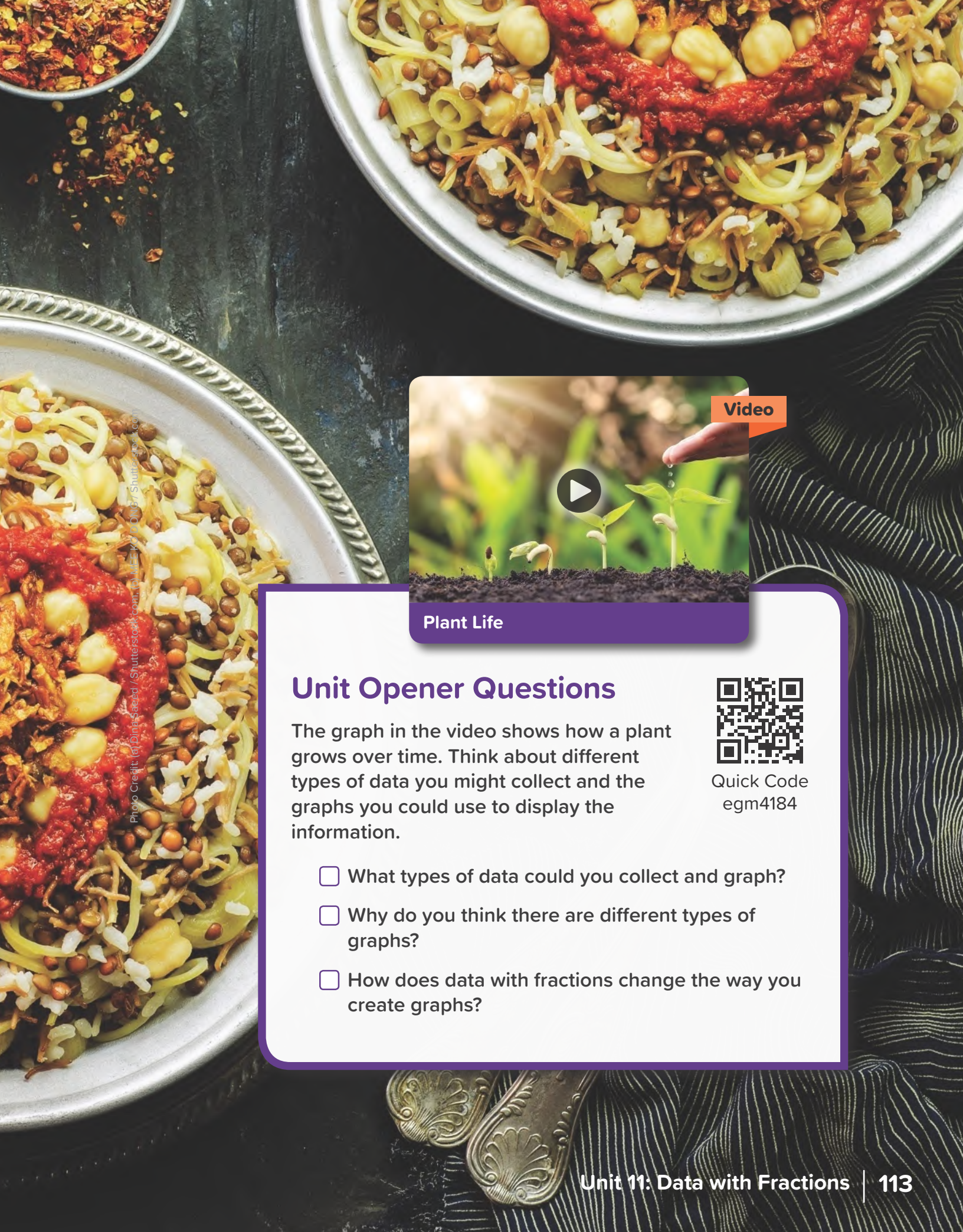
Video

Plant Life

Unit Opener Questions

The graph in the video shows how a plant grows over time. Think about different types of data you might collect and the graphs you could use to display the information.

Quick Code
egm4184

- [ ] What types of data could you collect and graph?

- [ ] Why do you think there are different types of graphs?

- [ ] How does data with fractions change the way you create graphs?

Creating and Analyzing Graphs

LESSON 1
Show Me the Data

Learning Targets

- I can distinguish between different types of graphs.
- I can explain the difference between bar graphs and double bar graphs.
- I can explain when it is appropriate to use double bar graphs.

ACCESS

What Does Not Belong? Look at the three graphs. Discuss with a Shoulder Partner which graph does not belong and why. Be prepared to share your reasoning.

Number of Animals at Home

Key
x = 1 student

Favorite Farm Animals
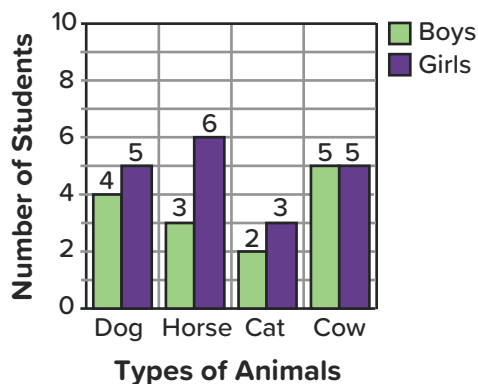
Kinds of Animals We Have at Home
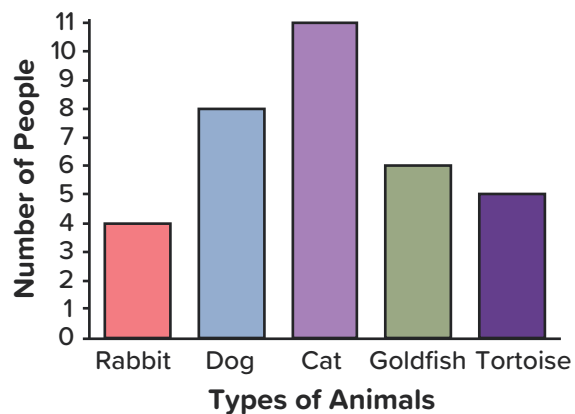
BUILD

Double the Data Review the elements of bar graphs with your teacher. Use the bar graph below to help you.

Favorite Flavors of Ice Cream
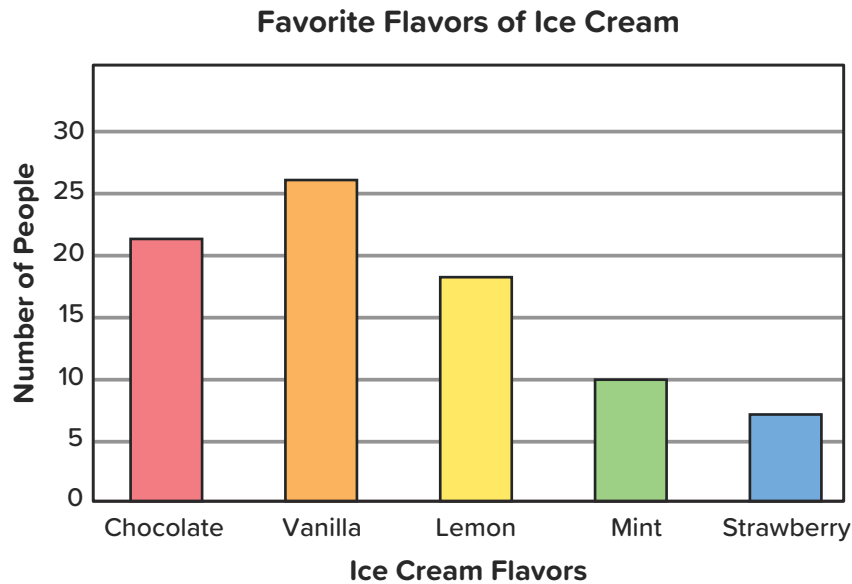
Record two questions that could be answered by this graph.

_____

_____

_____

_____

_____

_____

Ice Cream

Single or Double? Look at each table and the data collected. For each table, decide if the data could be presented in a double bar graph. Record your answer and your reasoning.

Table 1: Minimum and Maximum Monthly Temperatures in Cairo

Month	Minimum	Maximum
January	9	19
February	10	20
March	12	24
April	15	28

1. Could this data be represented in a double bar graph?

    _____

    _____

    _____

Table 2: Favorite Sports

Sport	Number of Students
Soccer	48
Basketball	24
Swimming	32
Gymnastics	12

2. Could this data be represented in a double bar graph?

    _____

    _____

Table 3: Favorite Foods

Food	Boys	Girls
Baklava	25	18
Feteer Meshaltet	17	12
Ful Medames	20	26
Tamiya	11	16

3. Could this data be represented in a double bar graph?

_____

_____

Use the double bar graph to answer the questions about what students in each grade prefer.

Table 4: Fruits or Vegetables (Choose only one.)
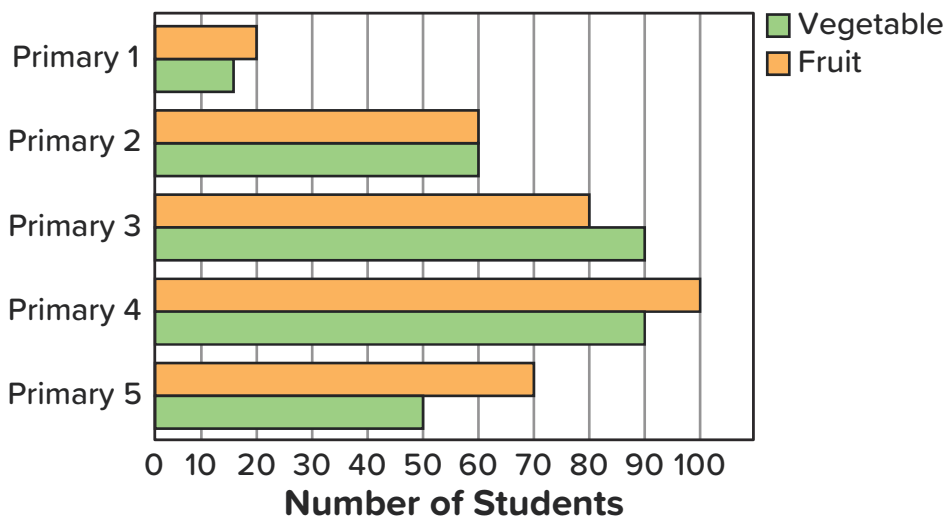
4. Which grade has the same number of students who like fruit and vegetables?

5. Which grade likes vegetables more than fruit?

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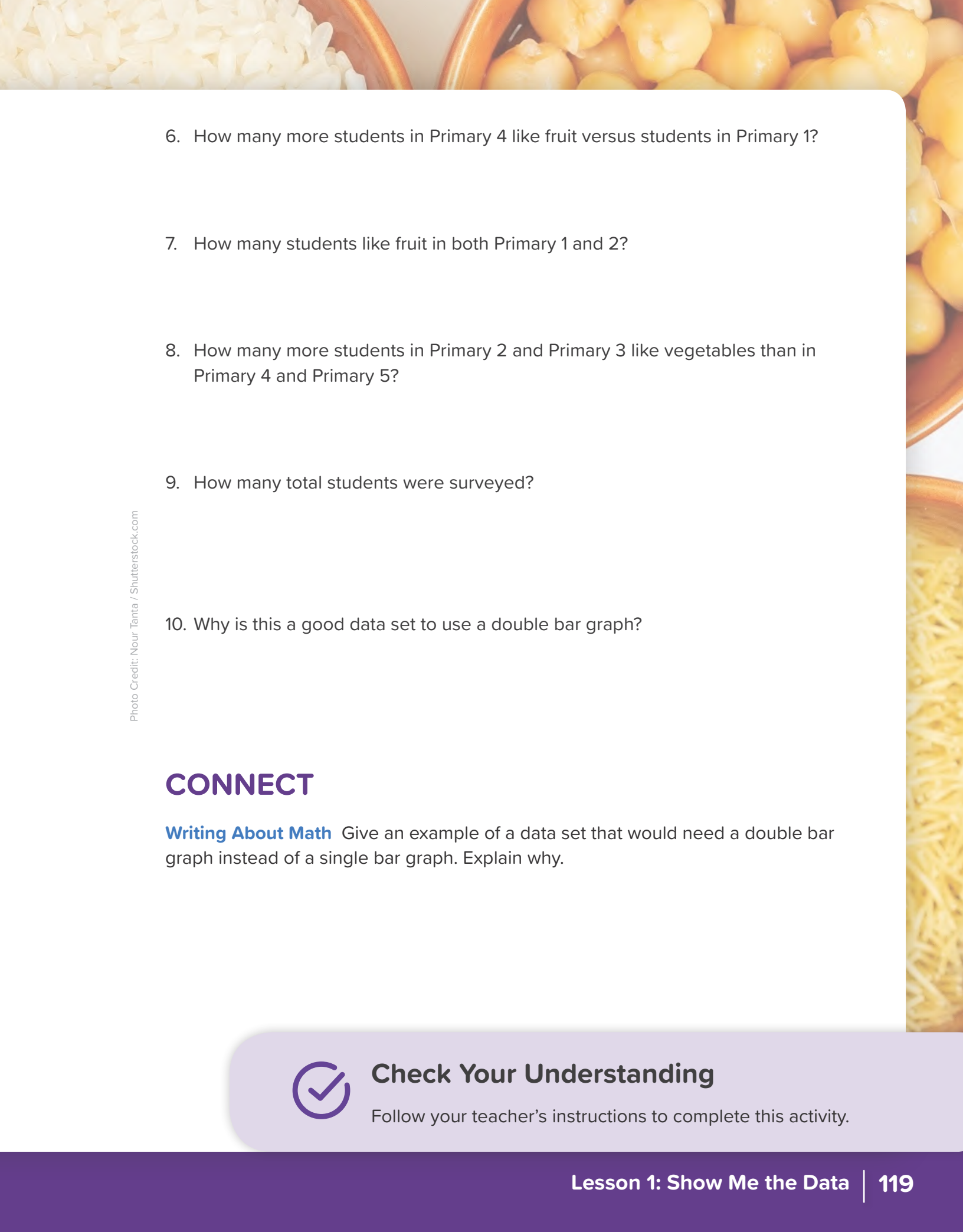
6. How many more students in Primary 4 like fruit versus students in Primary 1?

7. How many students like fruit in both Primary 1 and 2?

8. How many more students in Primary 2 and Primary 3 like vegetables than in Primary 4 and Primary 5?

9. How many total students were surveyed?

10. Why is this a good data set to use a double bar graph?

CONNECT

Writing About Math Give an example of a data set that would need a double bar graph instead of a single bar graph. Explain why.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 2
Plotting Along

Learning Targets

- I can explain why <mark>data</mark> might include fractions.
- I can construct a line plot using data with fractions.
- I can analyze a line plot using data with fractions.

Quick Code
egm4187

ACCESS

Similar and Different Compare the two graphs. Fill in the Venn Diagram to explain how the graphs are similar and different.

Graph 1: Hours Spent Reading in a Week
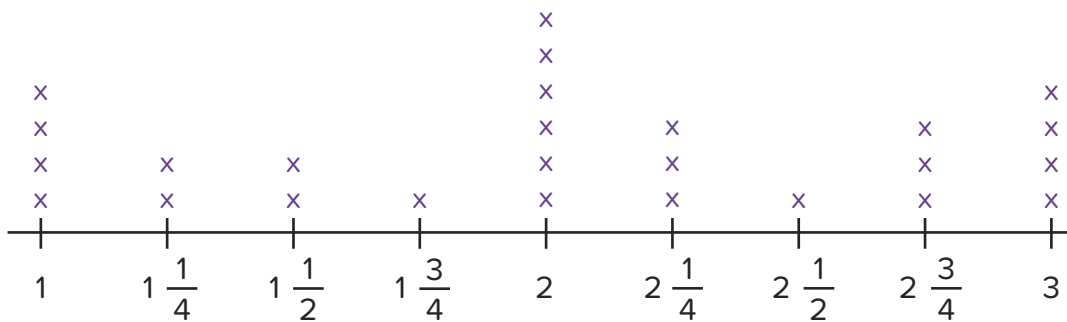
Graph 2: Students' Favorite Book Genres
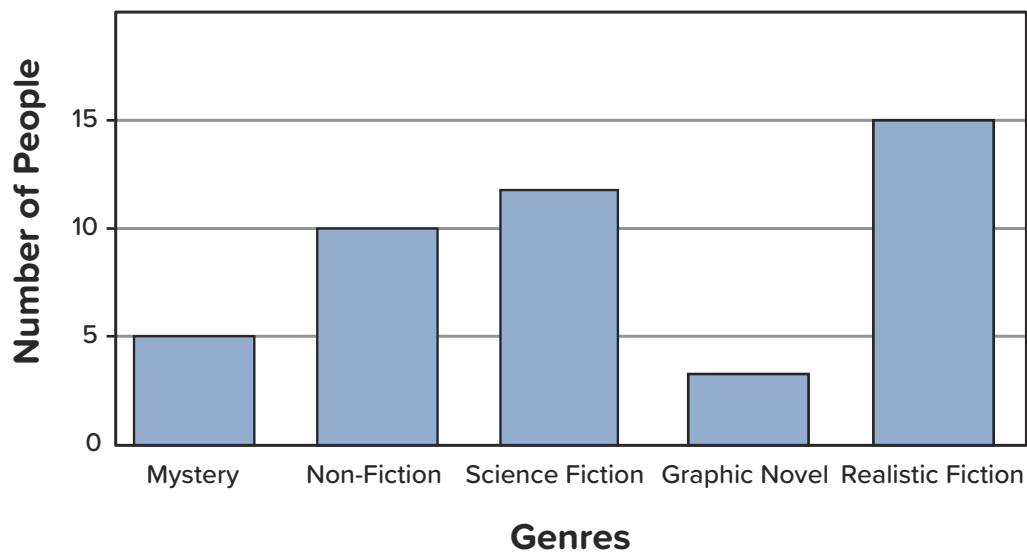
Graph 1   **Graph 2**
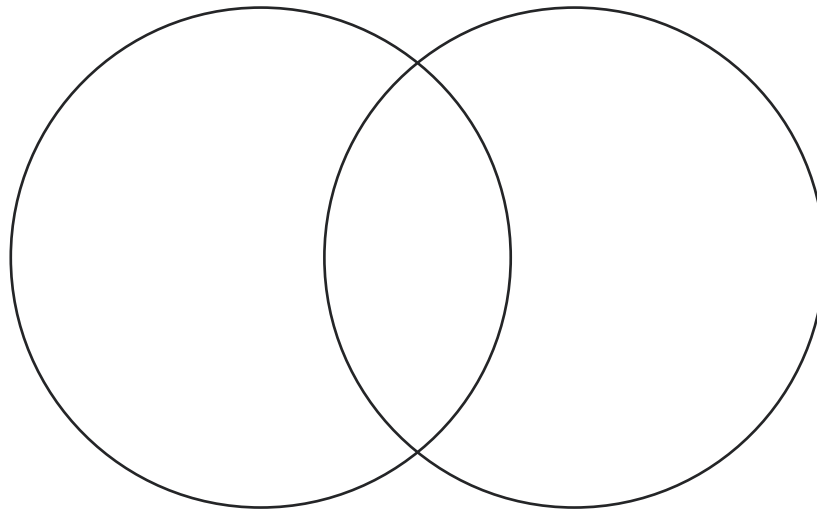
BUILD

Survey Says The titles identify data that could be collected and graphed. Read the titles and answer the questions.

1. Line plots graph frequency of data (how many times each data point appears). Circle the titles that could be plotted on a line plot.

Number of People in Our Families	**Our Heights**
Our Favorite Foods	**Our Shoe Sizes**
Our Favorite Animal	**Distance from Home to School**
Weight of Our School Bags	**Our Favorite Movie**
Minutes Spent Playing Outside	**Our Favorite Free Time Activity**

2. Choose one of the titles you circled in the previous item and draw what the line plot might look like. Use a sheet of paper or graph paper to create your line plot.

Going the Distance These data show the distance from home to school for students. The data are given in kilometers. Create a line plot for the given data. Use your line plot to answer the questions. (Hint: The title is already written. Remember to label your number line and include a key.)

$\frac{3}{5}$ km; $\frac{2}{5}$ km; $\frac{2}{5}$ km; $\frac{5}{5}$ km; $\frac{4}{5}$ km; $\frac{2}{5}$ km; $\frac{4}{5}$ km; $\frac{5}{5}$ km; $\frac{4}{5}$ km; $\frac{4}{5}$ km; $\frac{1}{5}$ km

1. How many students were surveyed? _____

2. What is the shortest distance any student lives from school? _____

3. What is the farthest distance any student lives from school? _____

4. What is the most common distance students live from school? _____

5. What are the least common distances students live from school? _____

6. Write one statement about the data.

CONNECT

Writing About Math Rajaa is graphing the number of students in each grade from Primary 1 through Primary 5. She wants to compare the data. She is uncertain if she should make a bar graph or a line plot. Which do you think would be the best type of graph? Why do you think so?

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Breaking the Bar

Learning Targets

- I can construct a <mark>bar graph</mark> using data with fractions.
- I can analyze a bar graph using data with fractions.
- I can construct a <mark>double bar graph</mark> using data with fractions.
- I can analyze a double bar graph using data with fractions.

ACCESS

Error Analysis Analyze the student's work and answer. Identify what the student did correctly and incorrectly, and then try to correctly solve the problem.

Use the line plot to answer the question, "How many students jumped $\frac{3}{5}$ of a meter or more?"

Standing Broad Jump Distance
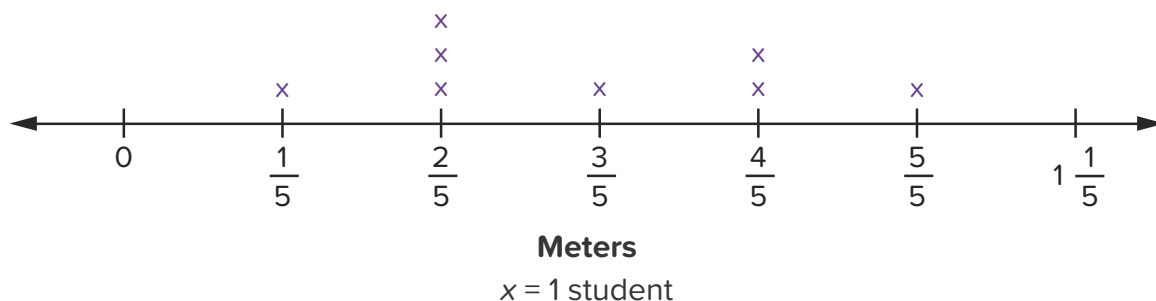
Meters

x = 1 student

Student's response: One student jumped $\frac{3}{5}$ meter.

What did the student do correctly?	What did the student do incorrectly? Why do you think the student made this error?	Solve the problem correctly. Explain your thinking.

BUILD

Rolling, Rolling, Rolling Part 1 Omar and Malek conducted an experiment. They wanted to see how far their friends could roll a heavy ball. They drew a starting line in the dirt and asked six friends to roll a 10 kilograms ball as far as they could from the starting line. They measured the distance in meters to the nearest $\frac{1}{4}$ meter and record their data in a table.

Student	Distance for 10 kg Ball (in m)
Rana	$\frac{3}{4}$ m
Salah	$1\frac{1}{2}$ m
Tahani	$1\frac{1}{4}$ m
Ziad	$2\frac{1}{4}$ m
Farouk	$1\frac{3}{4}$ m
Walid	$2\frac{1}{2}$ m

Create a bar graph that shows Omar and Malek's data. Remember to include all the elements of a bar graph.
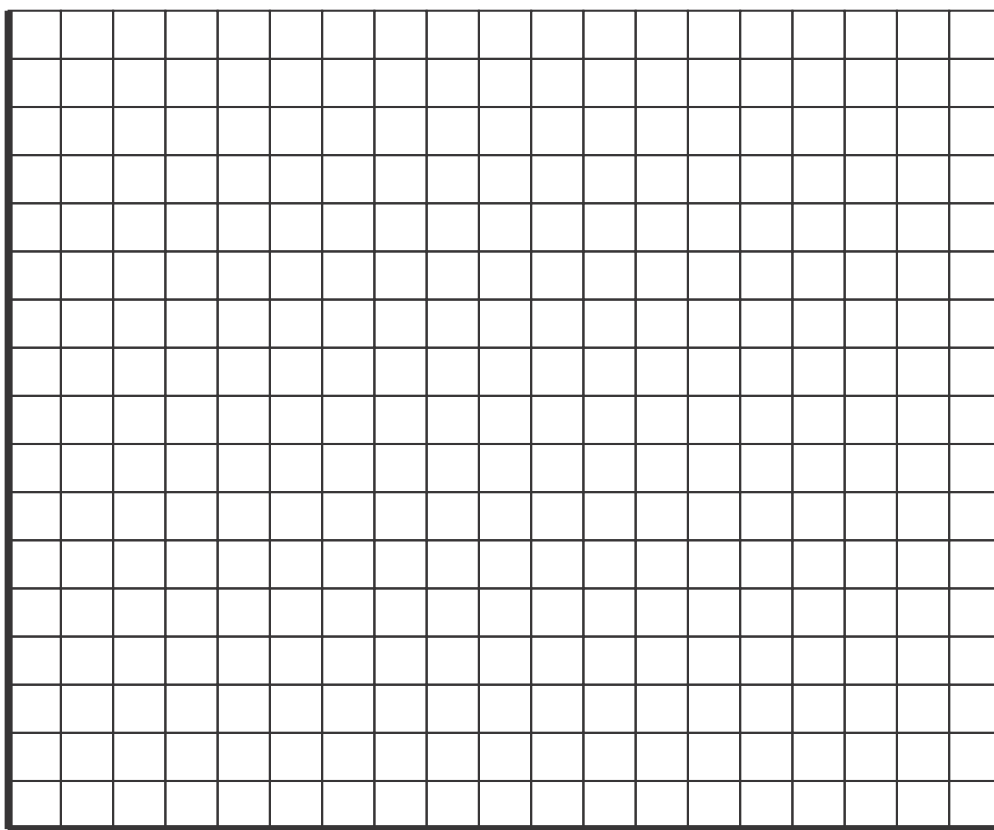
Now, write two questions about the bar graph you created and then answer them.

Question 1:

Question 2:
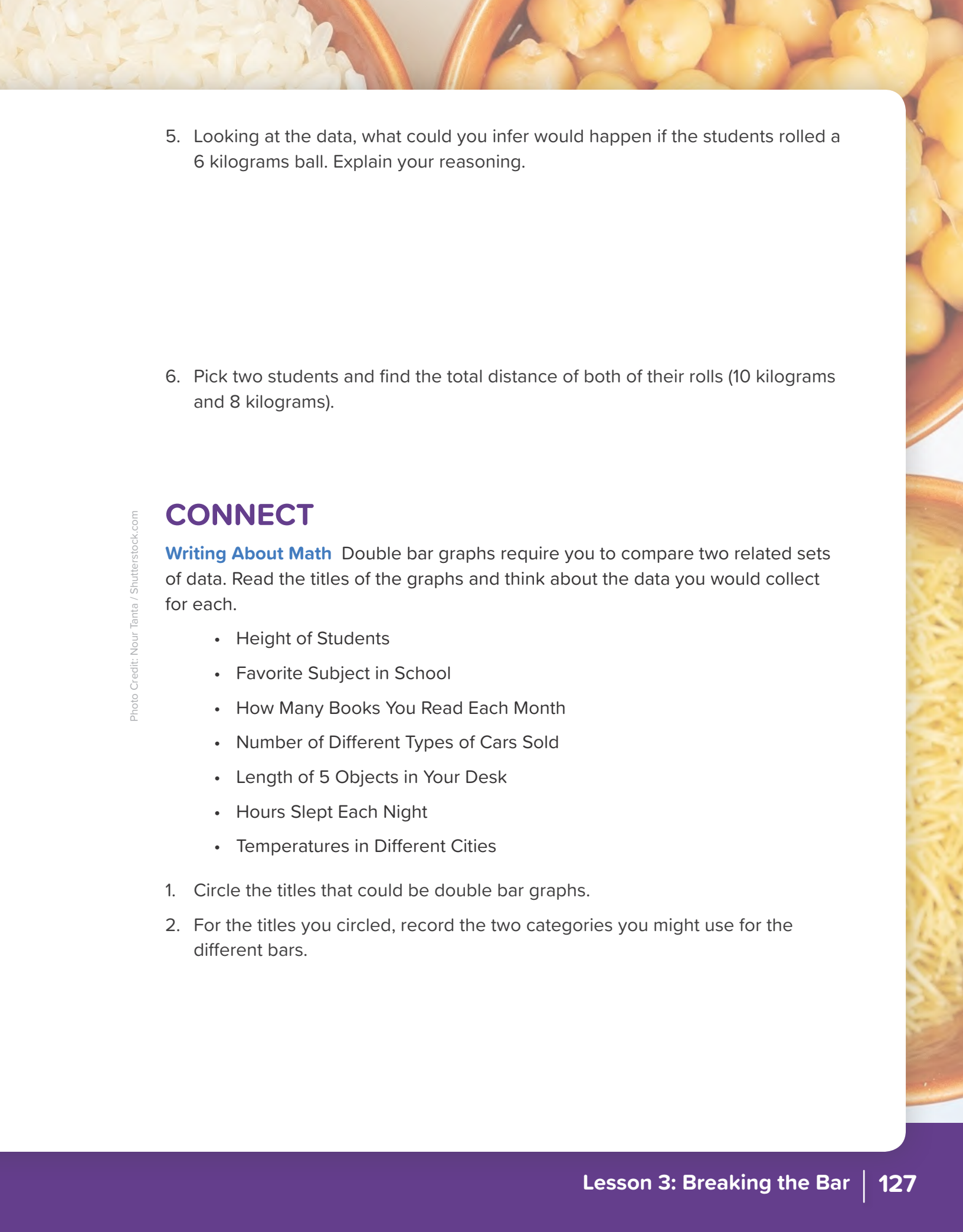
Rolling, Rolling, Rolling Part 2 Omar and Malek decided to see how far the same students could roll an 8-kilogram ball and compare the data they collect to the data for the 10-kilogram ball.

Student	Distance for 10 kg Ball (in m)	Distance for 8 kg Ball (in m)
Rana	$\frac{3}{4}$ m	$1\frac{1}{4}$ m
Salah	$1\frac{1}{2}$ m	2 m
Tahani	$1\frac{1}{4}$ m	2 m
Ziad	$2\frac{1}{4}$ m	$3\frac{1}{2}$ m
Farouk	$1\frac{3}{4}$ m	$2\frac{1}{2}$ m
Walid	$2\frac{1}{2}$ m	$3\frac{1}{4}$ m

1. Add this new data to your graph from Part 1 so that you can compare each student's two rolls.

When finished, answer the following questions about the double bar graph data.

2. Which students rolled the 8 kilograms ball exact $\frac{1}{2}$ a meter farther than they rolled the 10 kilograms ball?

3. Which student had the biggest difference between their 10 kilograms ball roll and their 8 kilograms ball roll?

4. What is the sum of Ziad and Farouk's 8 kilograms rolls?

5. Looking at the data, what could you infer would happen if the students rolled a 6 kilograms ball. Explain your reasoning.

6. Pick two students and find the total distance of both of their rolls (10 kilograms and 8 kilograms).

CONNECT

Writing About Math Double bar graphs require you to compare two related sets of data. Read the titles of the graphs and think about the data you would collect for each.

- Height of Students
- Favorite Subject in School
- How Many Books You Read Each Month
- Number of Different Types of Cars Sold
- Length of 5 Objects in Your Desk
- Hours Slept Each Night
- Temperatures in Different Cities

1. Circle the titles that could be double bar graphs.

2. For the titles you circled, record the two categories you might use for the different bars.

LESSON 4
Data About Us

Learning Targets

- I can select the most appropriate graph to display a set of data.
- I can construct an appropriate graph to display a set of data.
- I can analyze a graph to interpret the data.

ACCESS

Taking the Tally Record the information, tallies, and totals collected by your class.

Our Favorite Foods

Type of Food	Tally Mark	Total

BUILD

Graph Sort Your teacher will give you some Graph Sorting Cards. Decide which type of graph is best for each card. Glue the cards in the appropriate columns.

Bar Graph	Double Bar Graph	Line Plot

Real-World Application Use your table to answer the following questions.

1. What data from your life could you record on a bar graph?

2. What data from your life could you record on a double bar graph?

3. What data from your life could you record on a line plot?

Classy Graphs Work with your teacher to collect data from your group and record it in the tables.

Our Favorite Colors				
Colors	**Tally Marks**		**Total**	
	Boys	**Girls**	**Boys**	**Girls**
Black				
White				
Red				
Orange				
Yellow				
Blue				
Green				
Purple				
Pink				

How We Get to School		
Mode of Transportation	**Tally**	**Total**
Bus		
Walk		
Car		
Other		

Number of Siblings		
Number	**Tally**	**Total**
0		
1		
2		
3		
4		
5		
6+		

Measure your pencil to the nearest $\frac{1}{2}$ cm.

Length of Pencil		
Measurement (to the nearest $\frac{1}{2}$ cm)	**Tally**	**Total**
$4\frac{1}{2}$		
$5\frac{1}{2}$		
$6\frac{1}{2}$		
$7\frac{1}{2}$		
$8\frac{1}{2}$		
$9\frac{1}{2}$		
$10\frac{1}{2}$		
$11\frac{1}{2}$		
$12\frac{1}{2}$		
$13\frac{1}{2}$		
$14\frac{1}{2}$		
$15\frac{1}{2}$		
$16\frac{1}{2}$		

CONNECT

Writing About Math Write an answer to each Essential Question.

1. How does the data affect the type of graph I should use?

2. How does analyzing graphs help me better understand data? Use pictures, words, or numbers to explain your thinking.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

LESSON 5
Graphing the Class

Learning Target

- I can ask and answer questions about fractional data in a graph.

ACCESS

Plot It Out Look at the data and think about what scale you will use. How will you organize the fraction data? Where will your number line begin and end? Create a line plot for the data.

$$1\frac{1}{2} \text{ km}; 2\frac{3}{4} \text{ km}; 3 \text{ km}; 2\frac{3}{4} \text{ km}; 2\frac{1}{2} \text{ km}; 2\frac{3}{4} \text{ km};$$

$$3\frac{3}{4} \text{ km}; 3 \text{ km}; 3\frac{1}{2} \text{ km}; 2\frac{1}{2} \text{ km}; 3\frac{1}{2} \text{ km}; 1 \text{ km}$$

BUILD

Display the Data List four essential elements of graphs.

Your teacher will give you some paper. Create your own graph based on the data you collected in the previous lesson.

Create Questions Write two questions that can be answered by analyzing the data in your graph.

CONNECT

Analyze the Data Share your graph with another person and see if they can answer the questions you created. Repeat with another student if time allows.

Check Your Understanding

Follow your teacher's instructions to complete this activity.

Primary 4 Resources

- **Glossary**

—— **A** ——

a.m.
A time between 12:00 midnight and 12:00 noon.

acute angle
An angle with a measure less than 90°.

acute triangle
A triangle with no angle measuring 90° or more.

add
To combine or join together; put together two or more quantities.

addend
Any number being added. In the equation 6 + 8 = 14, six and eight are both addends, 14 is the sum.

additive comparison
Problems that ask how much more (or less) one amount is than another.

Additive Identity Property of 0
When you add zero to a number, the sum is that same number.

algorithm
A step-by-step method for computing.

analyze
To study or examine something in detail.

angle
Two rays that share an endpoint.

angle measure
The measure of the size of an angle. It tells how far one side is turned from the other side. A one degree angle turns through $\frac{1}{360}$ of a full circle.

arc
Part of a circle's curve between any two of its points.

area
The measure, in square units, of the inside of a plane figure.

area model
A model of multiplication that shows each place value product.

array
An arrangement of objects in equal rows.

Associative Property of Addition
Changing the grouping of three or more addends does not change the sum.

Associative Property of Multiplication
Changing the grouping of three or more factors does not change the product.

attribute
A characteristic or property of an object, such as color, shape, size, and so on.

B

bar model
A model that uses bars to represent known and unknown quantities and the relationship between these quantities.

base
Any side of a plane figure. Usually thought of as a side where the figure "sits."

Base Ten numeral form
A common way of writing a number using digits. The value of a numeral depends on where it appears in the number (also known as standard form, such as 12,356).

Base Ten numerals
Any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9. The symbols can represent any amount based on a place value system of grouping by tens (also known as digits).

benchmark
A known size or amount that can be used as a reference to help understand a different size or amount. A benchmark can be used to estimate measurement.

benchmark fractions
Fractions that are commonly used for estimation. A benchmark fraction helps you compare two fractions. One-half, one-third, one-fourth, three-fourths, and two-thirds are all benchmark fractions

—— **C** ——

capacity
The amount of liquid a container can hold.

centimeter (cm)
A metric unit of length equal to $0.01 \left(\frac{1}{100} \right)$ of a meter.

circle
A plane figure with all points the same distance from a fixed point called a center.

classify
To sort into categories or to arrange into groups by attributes.

clockwise
The same direction in which the hands on a clock move.

common
Belonging to or shared by.

common denominator
For two or more fractions, a common denominator is a common multiple of the denominators. Three-fourths and two-fourths have four as a common denominator.

common factor
Any common factor of two or more numbers. Six is a common factor of both 12 and 24.

common multiple
Any common multiple of two or more numbers. Six is a common multiple of both 2 and 3.

common numerator
For two or more fractions, a common numerator is a common multiple of the numerators.

Commutative Property of Addition
Changing the order of the addends does not change the sum.

Commutative Property of Multiplication
Changing the order of the factors does not change the product.

compare
To decide if one number is greater than, less than, or equal to.

compatible numbers
Numbers that are easy to compute mentally and are close in value to the actual numbers. Compatible numbers can be used when estimating.

compose
To put together smaller numbers to make larger numbers.

composite number
A number greater than 0 that has more than two different factors.

congruent
Having exactly the same size and shape.

counterclockwise
The opposite direction from the direction that the hands move on a clock.

cup (c)
A customary unit of capacity.
1 cup = about 236.5 milliliters.

customary system
A system of measurement used in the United States. The system includes units for measuring length, capacity, and weight. Nearly everyone else uses the metric system.

—— **D** ——

data
A collection of information gathered for a purpose. Data may be in the form of either words or numbers.

day
The length of time it takes the Earth to make a complete rotation. 24 hours = 1 day.

decimal
A number with one or more digits to the right of a decimal point. In 7.46, forty-six hundredths is the decimal or fraction of the whole.

decimal fraction
A fractional number with a denominator of 10 or a power of 10. It can be written with a decimal point.

decimal notation
Uses digits 0–9 and a decimal point. For example: 23.56 is in decimal notation.

decimal point
A dot (.) separating the whole number from the fraction (parts) in decimal notation.

decimeter (dm)
A metric unit of length.
1 decimeter = 0.1 meter;
10 decimeters = 1 meter. A hand span is about 1 decimeter.

decompose
To separate a number into two or more parts.

degree (angle measure)
A unit for measuring angles. It is based on dividing one complete circle into 360 equal parts. A one degree angle = $\frac{1}{360}$ of a circle.

determine
To decide or settle upon, figure out.

denominator
The quantity below the line in a fraction. It tells how many equal parts are in the whole.

diagonal
A line that goes through vertices of a polygon that are not next to each other.

difference
The amount that remains after one quantity is subtracted from another. The answer in a subtraction problem.

display
To show, exhibit, or demonstrate.

digit
Any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9. (Also known as Base Ten numerals.)

Distributive Property
When one of the factors of a product is a sum, multiplying each addend before adding does not change the product.

divide
To separate into equal groups and find the number in each group or the number of groups. 56 split into 8 equal groups equals seven in each group
$56 \div 8 = 7$

dividend
A number that is divided by another number. 56 is the dividend in the above example.

divisible
A number is divisible by another number if the quotient is a counting number without a remainder.

divisor
The number by which another number is divided. 8 is the divisor in 56 ÷ 8 = 7.

——— **E** ———

elapsed time
The amount of time that has passed (also known as time interval). Six hours elapse between 8:00 am and 2:00 pm.

endpoint
A point at either end of a line segment, or a point at one end of a ray.

equal
Having the same value.
2 feet = 24 inches.

equation
A mathematical sentence with an equal sign. The amount on one side of the equal sign has the same value as the amount on the other side. 4 + 3 = 7

equivalent decimals
Decimals that have the same value. 0.7 = 0.70

equivalent fractions
Fractions that have the same value. $\frac{1}{2} = \frac{2}{4}$

estimate
To find a number close to an exact amount; an estimate tells *about* how much or *about* how many.

expanded form
A way to write numbers that shows the place value of each digit. 263 = 200 + 60 + 3

expression
A mathematical phrase without an equal sign. *n* + 4

F

fact family
A group of related facts that use the same numbers (also known as related facts). Fact family for 3, 5, 15: 3 × 5 = 15; 15 ÷ 5 = 3; 5 × 3 = 15; 15 ÷ 3 = 5

factors
The whole numbers that are multiplied to get a product. 6 × 7 = 42 (6 and 7 are factors.)

factor pairs
A set of two whole numbers that when multiplied will result in a given product. 2 × 3 = 6, 1 × 6 = 6. The factor pairs for 6 are: 2 and 3, 1 and 6.

fluid ounce (fl oz)
A customary unit of capacity. 1 fluid ounce = about 30 milliliters.

foot
A customary unit of length. 1 foot = about 30 centimeters.

formula
A rule that is written as an equation. $A = l \times w$

fraction
A way to describe a part of a whole or a part of a group by using equal parts.

fraction greater than one
A fraction with the numerator greater than the denominator. $\frac{6}{5}$

fraction less than one
A fraction with the numerator less than the denominator. $\frac{5}{6}$

G

gallon (gal)
A customary unit of capacity. 1 gallon = about 3.8 liters.

gram
The standard unit of mass in the metric system. 1,000 grams = 1 kilogram. The mass of a paperclip is about 1 gram.

greater than >
Used to compare two numbers when the first number is larger than the second number.

——— **H** ———

half gallon
A customary unit of capacity.
1 half gallon = about 1.9 liters.

height
A perpendicular line segment from the base to the top of the figure.

hexagon
A polygon with six sides.

horizontal
Parallel to the horizon.
Horizontal lines go from left to right or right to left.

hour (hr)
A unit of time.
1 hour = 60 minutes;
24 hours = 1 day.

Hundreds
The value of a digit that is the third position from the right when describing whole number place value.

hundredth
One of the equal parts when a whole is divided into 100 equal parts.

Hundredths
In the decimal numeration system, Hundredths is the name of the next place to the right of Tenths.

——— **I** ———

identify
Recognize or distinguish, figure out what it is, name it.

Identity Property of Multiplication
The property that states that the product of any number and 1 is that number: $n \times 1 = n$

inch
A customary unit of length.
1 inch = about 2.5 centimeters.

intersecting lines
Lines that cross at a point.

inverse operations
Operations that undo each other. Multiplication and division are inverse operations.
$8 \times 5 = 40$ and $40 \div 5 = 8$

interpret
To explain or tell the meaning of something.

—— **J** ——

justify
To show or prove to be right or reasonable.

—— **K** ——

kilogram (kg)
A metric unit of mass equal to 1,000 grams.
1 kilogram = about 2.2 pounds.

kilometer (km)
A metric unit of length equal to 1,000 meters.

—— **L** ——

length
How long something is. The distance from one point to another. Length is measured in units such as centimeters, meters, and kilometers. One dimension of a 2-dimensional or 3-dimensional figure.

less than <
Used to compare two numbers when the first number is smaller than the second number.

like denominators
Denominators in two or more fractions that are the same.

like numerators
Numerators in two or more fractions that are the same.

line
A set of connected points continuing without end in both directions.

line of symmetry
A line that divides a figure into two congruent halves that are mirror images of each other.

line plot
A diagram showing frequency of data on a number line.

line segment
A part of a line with two endpoints.

line symmetric figures
Figures that can be folded in half and its two parts match exactly.

line symmetry
What a figure has if it can be folded in half and its two parts match exactly.

liter (L)
The basic unit of capacity in the metric system.
1 liter = 1,000 milliliters.

lowest terms
When a fraction is expressed with the fewest possible pieces, it is in lowest terms (also known as simplest form).

—— **M** ——

mass
The amount of matter in an object, usually measured by comparing with an object of known mass. While gravity influences weight, it does not affect mass.

mental math or mental calculation
Calculations that are done in a student's head without pencil and paper, calculators, or other aids.

meter (m)
A standard unit of length in the metric system.

metric system
A system of measurement based on tens. The basic unit of capacity is the liter. The basic unit of length is the meter. The basic unit of mass is the gram.

mile (mi)
A customary unit of length. 1 mile = about 1.6 kilometers.

milliliter (mL)
A metric unit of capacity. 1,000 milliliters = 1 liter. This holds about 10 drops or 1 milliliter.

millimeter
A metric unit of length. 1,000 millimeters = 1 meter.

minute (min)
A unit used to measure a short amount of time. There are 60 minutes in one hour.

mixed number
A number that has a whole number and a fraction.

model or visual model
A picture or representation of a solution, a number, or a concept.

month
A length of time equal to 28, 30, or 31 days. 12 months = 1 year.

multidigit
Having more than one digit (number). Seven (7) is a single digit, whereas seventy-two (72) or seven hundred forty-two (742) are multidigit numbers.

multiple
A product of a given whole number and any other whole number. 12 is a multiple of 3 and 4 because 3 × 4 = 12.

multiplicative comparison
A way to compare quantities using multiplication, as in "This tree is 3 times shorter than that tree."

multiply
The operation of repeated addition of the same number.
$3 \times 5 = 5 + 5 + 5$

— N —

number
The quantity we associate with a numeral. Often used interchangeably with digit and numeral.

number line
A diagram that represents numbers as points on a line.

number names
A way of using words to write a number (also known as word form).

numeral
Represents the idea of a number. The numeral 153 is composed of digits 1, 5, and 3. Often used interchangeably with digit and number.

numerator
The number written above the line in a fraction. It tells how many equal parts are described in the fraction.

— O —

obtuse angle
An angle with a measure greater than 90° but less than 180°.

obtuse triangle
A triangle that contains one angle with a measure greater than 90° (obtuse angle) and two acute angles.

Ones
The value of a digit that is farthest to the right when describing whole number place value.

order
A sequence or arrangement of things.

Order of Operations
A set of rules that tells the order in which to compute.
1. Do operations in parentheses.
2. Multiply and divide in order from left to right.
3. Add and subtract in order from left to right.

ounce (oz)
A customary unit of weight equal to $\frac{1}{16}$ of a pound.
1 ounce = about 28 grams.

— **P** —

p.m.
The time between 12:00 noon and 12:00 midnight.

parallel lines
Lines that are always the same distance apart. They do not intersect.

parallelogram
A quadrilateral with two pairs of parallel and congruent sides.

parentheses
Used in mathematics as grouping symbols for operations. When simplifying an expression, the operations within the parentheses are performed first.

partial product
A method of multiplying in which the value of each digit in a factor is multiplied separately, and then the partial products are added together.

partial quotient
A method of dividing in which multiples of the divisor are subtracted from the dividend, and then the partial quotients are added together.

pattern
A repeating or growing sequence or design. An ordered set of numbers or shapes arranged according to a rule.

perimeter
The distance around the outside of a figure.

period
In a large number, periods are groups of 3 digits separated by commas or by spaces.

perpendicular lines
Two intersecting lines that form right angles.

pint (pt)
A customary unit of capacity. 1 pint = about 0.47 liters.

place value
The value of the place of a digit in a number.

plane figure
A two-dimensional figure.

point
The exact location in space, represented by a dot.

polygon
A closed two-dimensional shape with 3 or more sides.

pound (lb)
A customary unit of weight. 1 pound = about 0.45 kilograms.

prime number
A whole number greater than 1 that has exactly two different factors, 1 and itself.

product
The answer to a multiplication problem. In $6 \times 7 = 42$, 42 is the product, or answer.

protractor
A tool used to measure and draw angles.

— Q —

quadrilateral
A polygon with four sides.

quart (qt)
A customary unit of capacity.
1 quart = about 1 liter.

quotient
The answer to a division problem.

— **R** —

range
The difference between the highest and lowest values.

ray
A part of a line that has one endpoint and goes on forever in one direction.

reasonableness
An answer that is based on good number sense.

rectangle
A quadrilateral with two pairs of congruent, parallel sides and four equal angles.

recognize
Identify (someone or something) from having encountered them before; know again, remember.

regroup
To rearrange numbers into groups of 10 when performing mathematical operations.

regular polygon
A polygon with all sides the same length and all angles the same measure.

related facts (fact family)
Related addition and subtraction facts or related multiplication and division facts. Related facts for 3, 5, 8:
$3 + 5 = 8$; $8 - 5 = 3$; $5 + 3 = 8$;
$8 - 3 = 5$ (also known as fact family).

remainder
The amount left over when one number is divided by another.

repeated subtraction
Subtracting equal groups to find the total amount of groups (also called division).

represent
To show or model.

rhombus
A quadrilateral with all four sides equal in length.

right angle
An angle that measures exactly 90°.

right triangle
A triangle that has one 90° angle.

round a whole number
To identify the nearest Ten, Hundred, Thousand, (and so on) and rename a number so it is easier to mentally add, subtract, multiply, or divide.

rule
Something that happens every time (for example: 2, 5, 8, 11 . . . the rule is +3).

— S —

second (sec)
A unit used to measure a very short amount of time. There are 60 seconds in one minute.

sequence
A set of numbers arranged in a special order or pattern.

simplest form
When a fraction is expressed with the fewest possible pieces, it is in simplest form (also known as lowest terms).

simplify
To express a fraction in simplest form.

sketch
A quick, rough drawing.

specify
Identify clearly and definitely.

square
A parallelogram with four equal angles and four equal sides.

square unit
A unit, such as square centimeter, used to measure area.

standard form
A common or usual way of writing a number using digits. 12,376 is in standard form.

straight angle
An angle that measures exactly 180°.

subtract
An operation that gives the difference between two numbers. Subtraction can be used to compare two numbers, or to find out how much is left after some is taken away.

sum
The answer to an addition problem.

— T —

Tens
The value of a digit that is the second position from the right when describing whole number place value.

tenth
One of the equal parts when a whole is divided into 10 equal parts.

Tenths
In the decimal numeration, tenths is the name of the place to the right of the decimal point.

Thousands
The value of a digit that is the fourth position from the right when describing whole number place value.

time interval
A duration of a segment of time (also known as elapsed time).

ton
A customary unit of weight.
1 ton (T) = 2,000 pounds.
A metric ton, or tonne (t), is a
unit of mass equal to 1,000
kilograms (about 2,200
pounds).

trapezium
A quadrilateral with one pair of
parallel sides and one pair of
sides that are not parallel.

triangle
A polygon with three sides and
three angles.

two-dimensional
Having length and width.

—— **U** ——

unit fraction
A fraction that has 1 as its
numerator. A unit fraction
names 1 equal part of a whole.

unlike denominators
Bottom numbers of a fraction
that are not equal.

unlike numerators
Top numbers of a fraction that
are not equal.

—— **V** ——

variable
A letter or symbol that
represents a number. $5 \times b = 10$
b is a variable worth 2.

Venn diagram
A drawing with circles or rings
to show how sets of objects are
related.

vertex (plural: vertices)
The point at which two line
segments, lines, or rays meet to
form an angle.

vertical
Perpendicular to the horizon.
Vertical lines go up and down.

volume
The number of cubic units it takes to fill a figure.

—— **W** ——

week
There are seven days in a week: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.

weight
The measure of how heavy something is.

whole
All of an object, a group of objects, shape, or quantity.

whole numbers
The numbers 0, 1, 2, 3, and so on, without fractions or decimals.

width
One dimension of a 2-dimensional or 3-dimensional figure.

word form
A way of using words to write a number. The word form of 12,345 is twelve thousand, three hundred forty-five.

—— **Y** ——

yard (yd)
A customary unit of length. 1 yard = about 0.9 meters.

year
The length of time it takes the Earth to revolve around the sun. 12 months = 1 year; 365 days = 1 year; 366 days = 1 leap year.

—— **Z** ——

Zero Property of Multiplication
The product of any number and zero is zero. $8 \times 0 = 0$

Originally stood
146.5 meters

About 453,592,370 kg
of mortar

Primary 4
Student Edition
Math Term 2 • Part 1
Units 9–11

Discovery
EDUCATION™

CCIMD

Egyptian Knowledge Bank
بنك المعرفة المصري

20/30
EGYPT VISION