EUREKA MATH™

INTRODUCING EUREKA MATH

Dear Parent,

We're introducing a new mathematics curriculum, called *Eureka Math*.

WHAT IS EUREKA

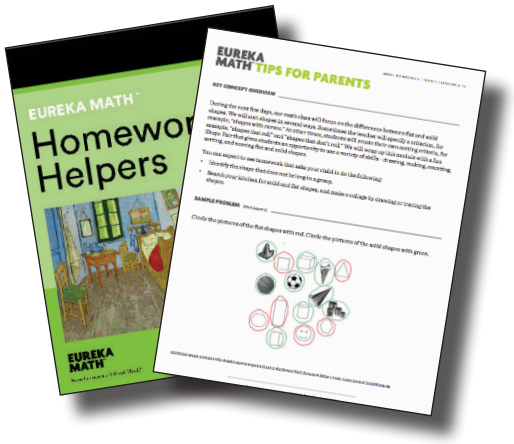
The *Eureka Math* curriculum was created by Great Minds, a nonprofit that brought together teachers and experts to craft a program based on the world's most successful math programs. Eureka was built around the core principle that students need to know more than just what works when solving a problem—they need to understand why it works.

The curriculum goes beyond facts and formulas, teaching students to think about math conceptually. This helps students become not merely literate, but fluent in mathematics.

PARENT RESOURCES

Your involvement in your child's education can have a significant impact on his or her success in school, that's why the teacher-writers who developed the curriculum, also created a suite of parent support resources that will help you support your child at homework time. These resources include:

- **Homework Helpers —** A grade-level resource that provides step-by-step explanations of how to work problems similar to those found in *Eureka Math* homework assignments. There is a Homework Helper to go with every homework assignment in the curriculum.
- **Parent Tip Sheets** – Topic-level tip sheets that explain math strategies and models, provide key vocabulary, sample problems, and links to useful videos.



WHY EUREKA

Eureka has received high ratings from educators and reviewers nationwide. Schools and districts are seeing growth and impressive test scores after just one year of implementation.

Read more about *Eureka Math* success stories at schools and districts across the country at greatminds.org/data.

Déjenos saber si necesita servicios de interpretación y/o traducción.
Cho chúng tôi biết nếu quý vị cần Thông dịch viên/ hay Dịch vụ Thông dịch.
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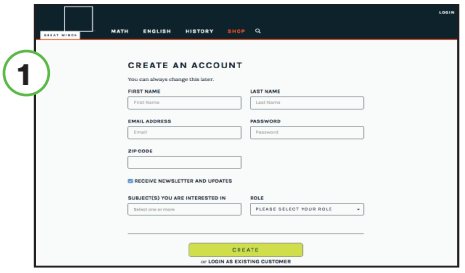
GETTING STARTED

Accessing these free online resources is simple:

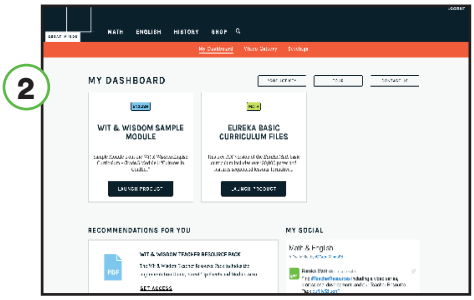
1. CREATE AN ACCOUNT

   Visit GreatMinds.org/signup to sign up for your free parent account. Enter your name, email address, zip code, and select "PARENT" as your role. Then click the "CREATE" button. (Rest assured, your name and contact information will never be sold or shared with outside organizations.)



2. ACCESS YOUR DASHBOARD

   Once you have created an account , you will have access to your personalized dashboard. (This is where you'll access or "launch" digital resources you check out with from the SHOP.)

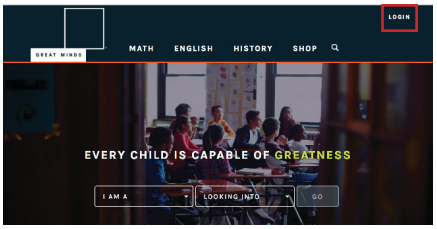


3. VISIT THE SHOP

   To add parent support resources, such as Parent Tip Sheets and Grade Roadmaps, to your Dashboard visit our SHOP at eurmath.link/parent/shop.

ACCESSING YOUR ACCOUNT

To access your account and products the next time you visit GreatMinds.org, select "LOGIN" in the right-hand corner of the site and enter your email and the password you selected when you created your account. Once you've logged in, you will automatically be directed to your Dashboard.



HAVE ANY QUESTIONS?

To learn more about how *Eureka Math* can set your child up for success, call (844) 853-1010 or visit www.eureka.support.

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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

Lessons 1 through 3 introduce multiplication as a faster way than addition to find the total number of objects in **equal groups.**

You can expect to see homework that asks your child to do the following:

- Identify the **number of groups** and the **size of each group** in an **array** (as shown in the sample problem below).
- Write multiplication **equations** using an array.
- **Skip-count** equal groups or rows (in arrays) to find the total number of objects.

SAMPLE PROBLEM *(From Lesson 3)*

There are 3 bananas in each row. How many bananas are there in 4 rows?

a. Number of rows: 4 Size of each row: 3

b. 4 × 3 = 12

c. There are 12 bananas altogether.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Have your child recognize arrays in real-world situations (e.g., a carton of eggs, a pack of water bottles, a cupcake baking pan, a checkerboard).
- Help your child distinguish between the terms *row* and *column*.
- Place various objects into arrays in your daily life, such as crackers on a plate, crayons, or toys that your child may have. Say to your child, "How many rows are there? How many objects are in each row? Let's skip-count the rows to find the total."

TERMS

Equation: A statement that two expressions are equal. For example, $3 \times 4 =$ ___ -or- $3 \times 4 = 12$.

Number of groups: A factor in a multiplication problem that refers to the total number of equal groups.

Size of groups: A factor in a multiplication problem that refers to the number of objects in a group.

Skip-count: To count by a number other than 1; for example, skip-counting by 2s means counting 0, 2, 4, 6, 8, 10, and so on.

MODELS

Array: An arrangement of objects into rows and columns.

Equal Groups

The **number of groups** is 3. The **size of the groups** is 4 apples.

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KEY CONCEPT OVERVIEW

Lessons 4 through 6 introduce division as an unknown factor problem. For example, students learn to think of 12 ÷ 4 as 4 × ___ = 12. This shows the relationship between multiplication and division.

You can expect to see homework that asks your child to do the following:

- Divide objects into equal groups or show how many objects are in a group.
- Solve word problems with unknown factors and find the **quotient**.
- Use and/or draw arrays to illustrate division problems.

SAMPLE PROBLEM *(From Lesson 6)*

Susan washes 18 plates. She then dries and stacks the plates equally into 3 piles. How many plates are in each pile?

18 ÷ 3 = 6

3 × 6 = 18

There are 6 plates in each pile.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Arrange objects around the house into arrays (small snack foods like crackers, fruit snacks, grapes, pretzels). Then write two multiplication and two division facts that the array could represent.
- Encourage your child to practice skip-counting, forward and backward, by twos, threes, fours, fives, and tens (e.g., 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 27, 24, 21, 18, 15, 12, 9, 6, 3, 0).

TERMS

Quotient: The number resulting from the division of two numbers. For example, in $28 \div 4 = 7$, the number 7 is the quotient.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

Lessons 7 through 10 introduce two strategies for solving challenging multiplication problems: the **commutative property** and the **break apart and distribute strategy**.

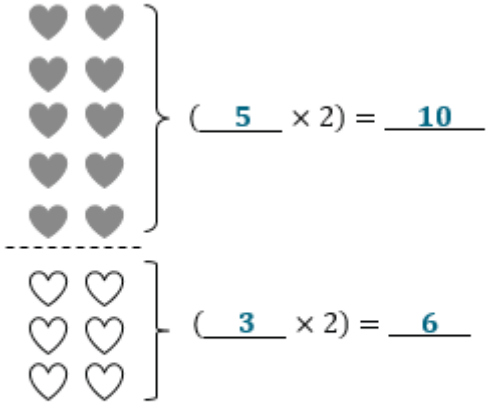
You can expect to see homework that asks your child to do the following:

- Show understanding of the commutative property and the break apart and distribute strategy.
- Solve word problems involving these two strategies.

SAMPLE PROBLEM *(From Lesson 10)*

Use the array to help you fill in the blanks.

$8 \times 2 =$ **16**



(**5** × 2) = **10**

(**3** × 2) = **6**

$(5 \times 2) + (3 \times 2) =$ **10** + **6**

8 × 2 = **16**

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

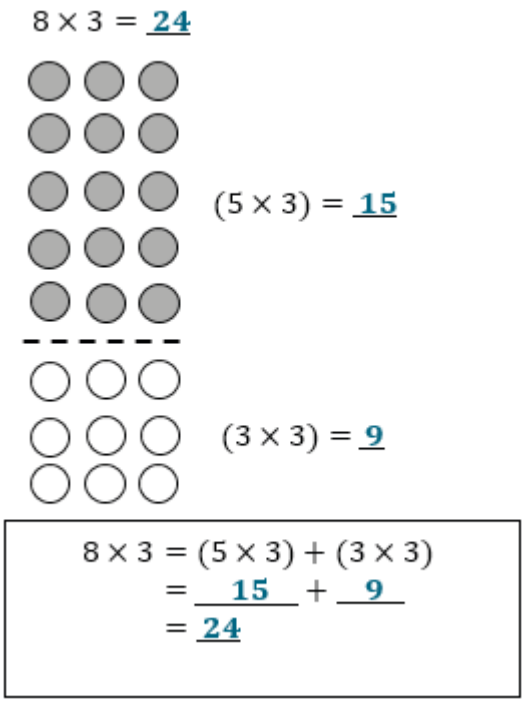
- Ask your child to arrange objects around the house into a large array, like 8 × 3. Then have him break the array into two smaller parts and write a multiplication sentence for each of the parts. For example, he could separate the 8 × 3 into the more manageable parts of (5 × 3) + (3 × 3) in order to solve in a more efficient way. 5 × 3 = 15, 3 × 3 = 9, and 15 + 9 = 24.
- Think of a number that is a multiple of 2, 3, 4, 5, or 10. Say the number to your child. Ask him to write as many multiplication problems as he can think of with that number. For example, say "20," and your child should be able to say 2 × 10 and/or 10 × 2, 1 × 20 and/or 20 × 1, and 4 × 5 and/or 5 × 4. You can also have your child think of the unknown number. For example, "4 times what number makes 20?"

TERMS

Commutative property: This property states that factors can change their order without changing the total. For example, 3 × 4 = 4 × 3.

MODELS

Break Apart and Distribute Strategy: This strategy states that a multiplication expression can be broken into parts that can then be added together.



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KEY CONCEPT OVERVIEW

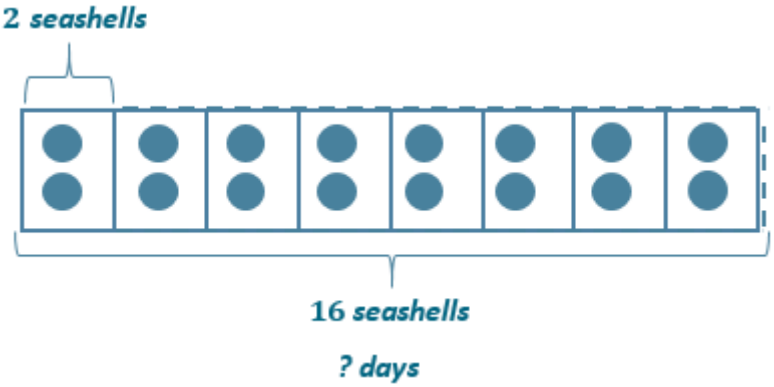
Lessons 11 through 13 focus on solving the two different types of division word problems using **tape diagrams**. In one type of problem, students have to determine the size of the group. In the other type, they need to determine the number of groups.

You can expect to see homework that asks your child to do the following:

- Draw arrays and organize them into tape diagrams, labeling all parts.
- Write related multiplication and division equations, such as $4 \times 3 = 12$ and $12 \div 4 = 3$ or $12 \div 3 = 4$ (depending on whether the group size or the number of groups is unknown).
- Solve word problems involving the two different types of division problems.

SAMPLE PROBLEM *(From Lesson 12)*

Ava finds 2 seashells each day for her collection. How many days will it take Ava to find 16 seashells for her collection?



16 ÷ 2 = 8

It will take Ava 8 days to find 16 seashells.

LEARN MORE by viewing a video about modeling with tape diagrams. Visit eurmath.link/tape-diagrams.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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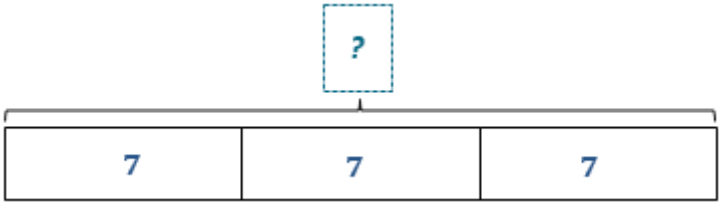
HOW YOU CAN HELP AT HOME

- Practice multiplication with an unknown number while on the go. Take turns answering multiplication questions with a factor of 2 or 3. For example, "2 times what number equals 12?" (6) and "3 times what number equals 24?" (8)
- Encourage your child to divide with tokens of any kind, such as pennies. Give your child, for example, 24 pennies. Then ask her to, "Divide your 24 pennies into 3 equal groups. How many pennies do you have in each group?" (8) "Now divide your 24 pennies in groups of 3. How many equal groups of pennies do you have? (8)
  In both scenarios, the answer is 8 (8 in each group when you have 3 groups and 8 groups when you have 3 in each group). This type of practice will help your child see the difference between representing the unknown group size versus representing the unknown number of groups.
  Note: You can continue the sequence by replacing the 3 in the questions with 2, 4, 6, or 8.

MODELS

Tape Diagram: A model that shows part-whole relationships to assist with problem-solving.



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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

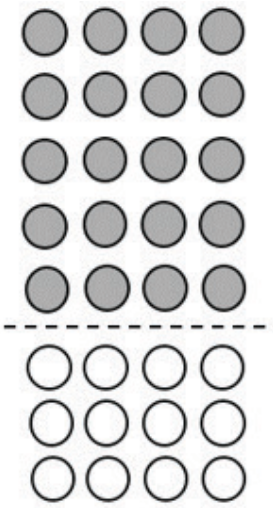
Lessons 14 through 17 focus on solving multiplication and division problems that use units of 4.

You can expect to see homework that asks your child to do the following:

- Draw arrays and organize them into tape diagrams with the known and unknown parts labeled.
- Use the break apart and distribute strategy to solve challenging multiplication problems that use units of 4 (as shown in the sample problem below).
- Solve multiplication and division word problems.

SAMPLE PROBLEM *(From Lesson 16)*

The array below shows one strategy for solving 8 × 4. Explain the strategy using your own words.



$(5 \times 4) =$ **20**

$(3 \times 4) =$ **12**

I split apart the 8 rows of 4 into 5 rows of 4 and 3 rows of 4. I split the array there because my fives facts and my threes facts are easier than my eights facts. I know that 5 × 4 = 20 and 3 × 4 = 12. I can add those products to find that 8 × 4 = 32.

Video Links
LEARN MORE by viewing a video about the break apart and distribute strategy using arrays and number bonds, visit eurmath.link/arrays-numberbonds-1 and eurmath.link/arrays-numberbonds-2

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Continue to practice multiplication and division facts from memory with factors of 2, 3, 4, 5, and 10.
- For the facts that your child struggles with, write each fact on a paper plate (without the answer). With each plate, your child can read the problem, say the answer, and throw the plate across the room like a Frisbee. Your child can also step on the problems and say the answer, laying the plates in a path throughout your home. You can also hang the plates on a wall or staircase, and your child can high-five each plate as he says the answer.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 18 through 21, students apply multiplication and division strategies to solve multi-step word problems.

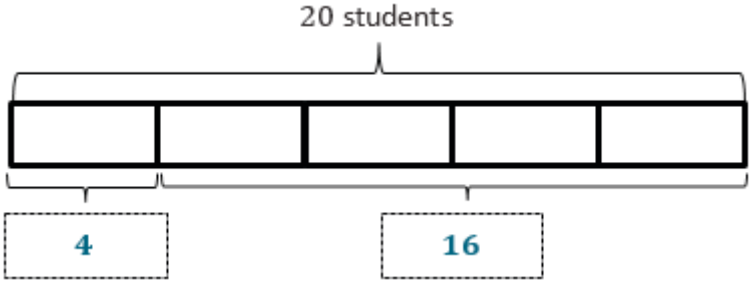
You can expect to see homework that asks your child to do the following:

- Draw arrays, number bonds, and tape diagrams with the known and unknown parts labeled.
- Break apart arrays and number bonds into smaller multiplication and division problems, using the **break apart and distribute strategy**.
- Solve multi-step word problems using addition, subtraction, multiplication, and/or division.

SAMPLE PROBLEM *(From Lesson 20)*

Twenty students are eating lunch at 5 tables. Each table has the same number of students.

a. How many students are sitting at each table?



$$20 \div 5 = 4$$

There are 4 students sitting at each table.

b. How many students are sitting at 4 tables?

$$4 \times 4 = 16$$

There are 16 students sitting at 4 tables.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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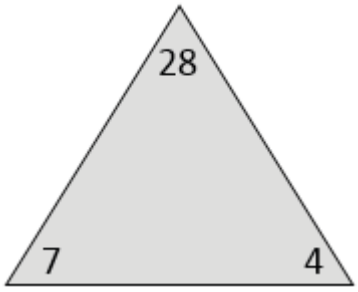
HOW YOU CAN HELP AT HOME

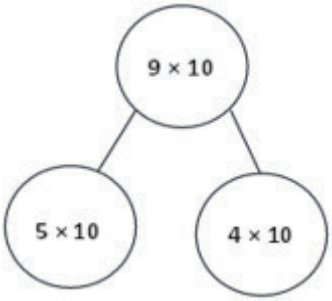
- Continue to practice multiplication and division facts from memory with factors of 2, 3, 4, 5 and 10. Have your child cut several triangles out of paper. Think of a multiplication or division fact. In each triangle, write two factors and their product (one number per corner). Cover one number with your thumb and ask your child to try to figure out what number is hidden. Ask your child to state two multiplication and two division sentences for the numbers on each triangle.



- Write multiplication and division facts that your child is struggling to remember on brightly colored sticky notes with one problem per sticky note. Hide the sticky notes in places where your child will encounter them: the bathroom mirror, inside a cupboard door, on the back of the driver's headrest in the car, etc. Make a scavenger hunt out of it where your child will get something fun for finding all the facts and correctly answering them all.

MODELS

Break Apart and Distribute Strategy: This strategy states that a multiplication expression can be broken into parts that can then be added together.



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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

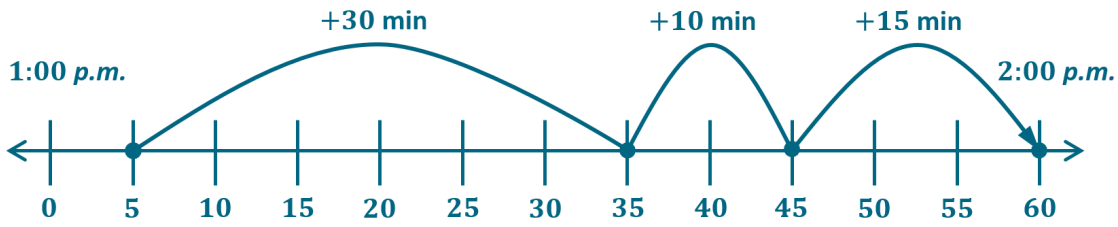
In Lessons 1 through 5, students focus on telling time. Students learn that the **number line** can be used as a tool to help them tell time.

You can expect to see homework that asks your child to do the following:

- **Plot** and label given times on a number line (as shown in the sample problem below).
- Draw hands on a clock for given times.
- Read and write the time to the nearest minute using **analog** and digital clocks.
- Solve word problems involving time.

SAMPLE PROBLEM *(From Lesson 4)*

Luke wants to watch a movie that starts at 1:55 p.m. It takes him 30 minutes to exercise, 10 minutes to take a shower, and 15 minutes to drive to the theater. If Luke starts exercising at 1:05 p.m., can he make it on time for the movie? Explain your reasoning.



No, Luke can't make it on time for the movie. From the number line, I can see that he will be five minutes late.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Encourage your child to practice skip-counting forward and backward by fives (e.g., 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 45, 40, 35, 30, 25, 20, 15, 10, 5, 0).
- Ask your child to tell the time to the nearest minute using a non-digital watch or an analog clock. Play with the clock or watch hands to create different times to tell.
- Record the time your child starts an activity, such as setting the table for dinner or reading, and record the ending time. Ask your child to figure out how many minutes the activity lasted.

TERMS

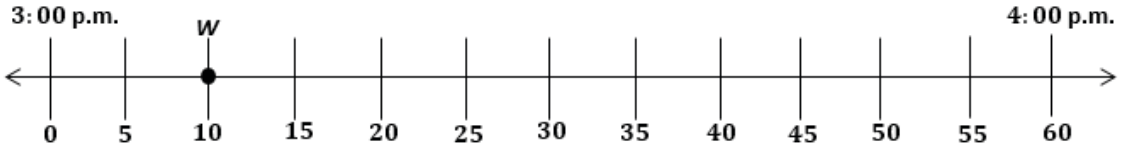
Interval: Time passed or a part on the number line.

Plot: To locate and label a point on the number line.

MODELS

Analog Clock

Number Line: A line on which numbers are marked at equal **intervals**.



3:10 p.m. plotted on the number line

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KEY CONCEPT OVERVIEW

In Lessons 6 through 11, students measure and **estimate** the weights of objects and **liquid volumes**.

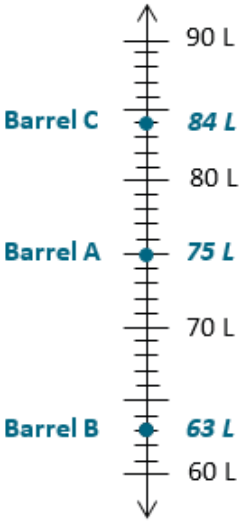
You can expect to see homework that asks your child to do the following:

- Read and write **metric weights** (in grams or kilograms) and liquid volumes (in milliliters or liters).
- Plot **capacities** on a vertical number line (as shown in the sample problem below).
- Solve word problems involving metric weight, liquid volume, and capacity.

SAMPLE PROBLEM *(From Lesson 10)*

Label the number line to show the capacity of the 3 barrels in the chart below.

Barrel A	75 liters
Barrel B	63 liters
Barrel C	84 liters



a. Which barrel has the greatest capacity?

Barrel C has the greatest capacity because it is highest on the number line.

b. Which barrel has the smallest capacity?

Barrel B has the smallest capacity because it is lowest on the number line.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- At the store, ask your child to use the food scale in the produce section. Have him guess the metric weight (in grams or kilograms) before he puts an item on the scale.
- Ask your child to use a 1-cup measure to fill up a liter bottle and then tell you about how many cups are in a liter.
- Send your child on a metric measurement scavenger hunt. Have her go through your pantry and write down quiz questions about metric weights and liquid volumes of packaged goods. She can then quiz the family, asking them to guess how many grams of garbanzo beans there are in a can or how many milliliters there are in a container of chicken stock. The closest guess gets a point. The person who gets to 3 points first wins.

TERMS

Capacity: The amount of liquid that a particular container can hold.

Estimate: Approximation of the value of a quantity or number (e.g., the number 379 can be estimated to be 400).

Liquid volume: The amount of space taken up by a liquid (e.g., the amount of liquid in a measuring cup).

Metric weight: Weight measured in the metric system (e.g., using grams and kilograms).

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

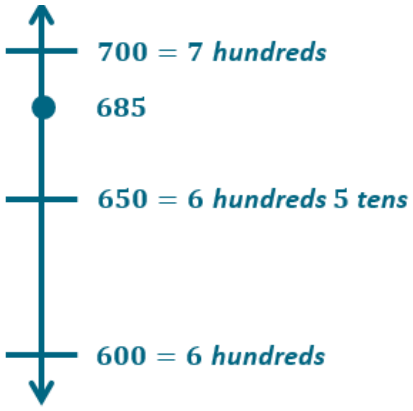
In Lessons 12 through 14, students **round** to the nearest ten or hundred, using a **vertical number line**.

You can expect to see homework that asks your child to do the following:

- Round numbers to the nearest ten or hundred by using a vertical number line.
- Use the symbol ≈ to represent rounded numbers (as shown in the Sample Problem below).
- Solve word problems involving rounding.

SAMPLE PROBLEM *(From Lesson 14)*

There are 685 people at a basketball game. Draw a vertical number line to round the number of people to the nearest hundred.



685 ≈ 700

685 rounded to the nearest hundred is 700
because 685 is more than halfway to the next hundred.

About 700 people are at the basketball game.

To LEARN MORE about rounding using the vertical number line, visit eurmath.link/rounding-vertical-numline.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

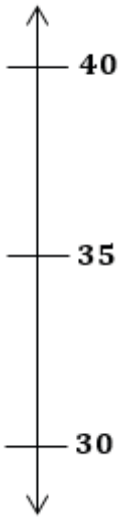
- Ask your child to round everyday measurements to the nearest ten or hundred. For example, after you pump gas, ask your child to round the number of gallons to the nearest ten.
- Challenge your child to list all the numbers that can be rounded to a given multiple of ten. For example, ask, "What numbers can be rounded to 20?" (15, 16, 17, 18, 19, 20, 21, 22, 23, and 24)

TERMS

Round: Replace a number with another of approximately the same value. For example, 73 rounded to the nearest ten is 70.

MODELS

Vertical Number Line



EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

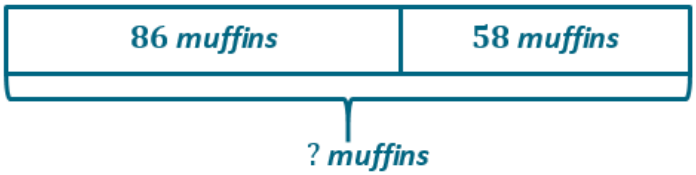
In Lessons 15 through 17, students focus on adding two- and three-digit numbers.

You can expect to see homework that asks your child to do the following:

- Add two- and three-digit numbers.
- Estimate **sums** by rounding (e.g., 29 g + 18 g ≈ 30 g + 20 g = 50 g).
- Solve word problems involving addition by using the **standard algorithm**.

SAMPLE PROBLEM *(From Lesson 16)*

Sue bakes muffins for the school bake sale. After wrapping 86 muffins, she still has 58 muffins left cooling on the table. How many muffins did she bake altogether?



$$\begin{array}{r} 8\ 6 \\ +\ 5\ 8 \\ \hline 1\ 4\ 4 \end{array}$$

Sue baked 144 muffins altogether for the school bake sale.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

- Use a deck of cards (without the 10's or face cards) to practice addition. Have your child turn over two or three cards to create a two- or three-digit number, and then have him turn over two or three more cards to create another number. Ask him to add the two numbers.

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TERMS

Sum: The answer when numbers are added together. For example, in 3 + 2 = 5, the number 5 is the sum.

MODELS

Standard Algorithm for Addition: A standard step-by-step procedure to solve an addition problem. For example, the process of adding vertically with regrouping is the standard algorithm for addition.

$$\begin{array}{r} 59 \text{ kg} \\ +\ 76 \text{ kg} \\ \hline 135 \text{ kg} \end{array}$$
$$\overset{1}{}$$

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

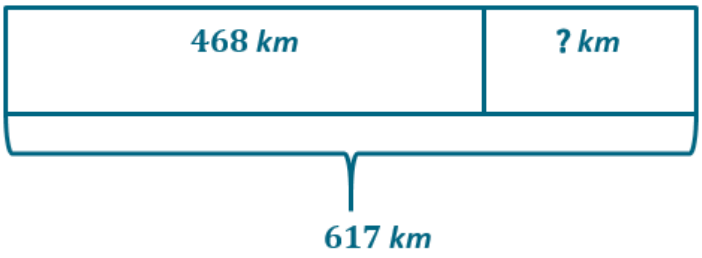
In Lessons 18 through 21, students focus on subtracting two- and three-digit numbers. They learn how to prepare the top number before they subtract (as shown in the Sample Problem below).

You can expect to see homework that asks your child to do the following:

- Add and subtract numbers.
- Estimate **differences** by rounding (e.g., 43 mL – 29 mL ≈ 40 mL – 30 mL = 10 mL).
- Solve word problems involving subtraction or addition by using the **standard algorithm**.

SAMPLE PROBLEM *(From Lesson 19)*

David is driving from Los Angeles to San Francisco. The total distance is 617 kilometers. He has 468 kilometers left to drive. How many kilometers has he driven so far?



$$\begin{array}{r} {}^{}{}^{10}{}^{} \\ 5\ \not{0}\ 17 \\ \not{6}\ \not{1}\ 7 \\ -\ 4\ 6\ 8 \\ \hline 1\ 4\ 9 \end{array}$$

David has driven 149 kilometers so far.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- When you are in the car or on the go, ask your child to solve basic addition or subtraction facts, such as 16 – 7 or 6 + 5. Make a game out of it and score points for correct answers!
- Pour liquid into a liquid measuring cup and ask your child to read the amount of liquid in milliliters or ounces. Then pour out some of the liquid, have your child read the measuring cup again, and ask him to subtract to determine how much liquid you poured out.

TERMS

Difference: The answer when subtracting two numbers. For example, in 5 – 2 = 3, the number 3 is the difference.

MODELS

Standard Algorithm for Subtraction: A standard step-by-step procedure to solve a subtraction problem. For example, the process of subtracting vertically with regrouping is the standard algorithm for subtraction.

$$\begin{array}{rrrr} & & {\scriptstyle 10} & \\ & {\scriptstyle 5} & {\scriptstyle \not{0}} & {\scriptstyle 17} \\ & \not{6} & \not{1} & 7 \\ - & 2 & 4 & 9 \\ \hline & 3 & 6 & 8 \end{array}$$

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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

Lessons 1 and 2 focus on the commutative property. This property helps students recognize, for example, that if they know $3 \times 6 = 18$, then they also know $6 \times 3 = 18$. Lesson 3 introduces the use of a letter to represent unknown values in **equations**.

You can expect to see homework that asks your child to do the following:

- Use **arrays** to write two multiplication facts.
- Match **expressions** that show the commutative property, for example, $3 \times 6 = 6 \times 3$; 3 sixes = 6 threes; 10 twos = 2×10.
- Find the value of the unknown (or letter) in simple equations and in word problems (as shown in the Sample Problem below).

SAMPLE PROBLEM *(From Lesson 3)*

Each equation contains a letter representing the unknown. Find the value of the unknown.

$12 \div 3 = c$	$c =$ 4
$4 \times a = 24$	$a =$ 6

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

- Give your child a blank multiplication chart (ask your child's teacher for one, or search online for a printable), and ask him to fill in as many facts as possible in five minutes. Ask your child what strategies he used to fill in the chart quickly.

×	1	2	3	4	5	6	7	8	9	10
1		2	3							
2		4		8				16		
3						18				
4					20					
5										50
6		12								
7										
8										
9										
10										

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HOW YOU CAN HELP AT HOME *(continued)*

- Play The Product Dice Game with your child.
  1. Player 1 rolls two dice and multiplies those two numbers together. On a piece of paper, write the multiplication equation and the product for that turn, which represents the score.
  2. Pass the dice to Player 2, who does the same.
  3. When the dice return to Player 1, add the product of the new roll to the previous score. The player who reaches 500 first is the winner.

     For example:

     Player 1 Roll 1: $5 \times 4 = 20$

     Player 1 Roll 2: $6 \times 5 = 30$; $20 + 30 = 50$, so Player 1's score is now 50.

     Player 1 Roll 3: $2 \times 3 = 6$; $50 + 6 = 56$, so Player 1's score is now 56.
- Variation: Use one die and a deck of playing cards up to the 10's (no aces or face cards). Roll one die, and then choose one card and multiply the two numbers together. This will help your child practice larger facts.

TERMS

Equation: A statement that two expressions are equal, for example, $3 \times 4 =$ ___ or $3 \times 4 = 12$.

Expression: Any combination of sums, differences, products, or divisions of numbers that evaluates to a number. Expressions do not have an equal sign. For example, $3 + 4$, 3×4, and $12 \div 4$ are all expressions.

MODELS

Array: An arrangement of objects in rows and columns.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

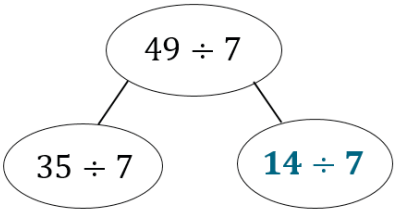
In Lessons 4 through 7, students learn to solve multiplication and division problems that use units of 6 and 7. They will learn to use the 5's to help them solve these problems.

You can expect to see homework that asks your child to do the following:

- Use **number bonds** to help **skip-count** by 6 and 7.
- Use the **break apart and distribute strategy** with **tape diagrams** and number bonds to solve challenging multiplication problems that use units of 6 and 7 (as shown in the Sample Problem below).
- Find the value of the unknown (or letter) in simple equations and in word problems.

SAMPLE PROBLEM *(From Lesson 6)*

Break apart 49 to solve 49 ÷ 7.



$$49 \div 7 = (35 \div 7) + (14 \div 7)$$
$$= 5 + \underline{\quad 2 \quad}$$
$$= \underline{\quad 7 \quad}$$

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

- Continue to practice multiplication facts for 6's and 7's from memory. For example, ask your child a 6-fact such as, "What is 5 × 6 or 5 sixes?" (30) Then say, "Add one more group of 6 to 30. What's 6 × 6 or 6 sixes?" Your child should be able to do the mental math to add 6 to 30, answering "36."
- Use an empty egg carton and a die to make a simple game. In one row of the carton's compartments, use a marker to write the numbers 2, 3, 4, 5, 6, and 7, one number in each

HOW YOU CAN HELP AT HOME *(continued)*

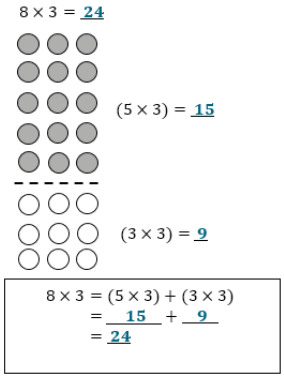
compartment. In the next row, write the numbers in descending order: 7, 6, 5, 4, 3, 2. Toss the die into the egg carton. Have your child multiply the number on the top face of the die by the number written on the compartment in which it landed. For example, in the image shown, your child would solve the problem 6 × 5. Another way to come up with random numbers is to place the die in the egg carton, close it, and shake it.

TERMS

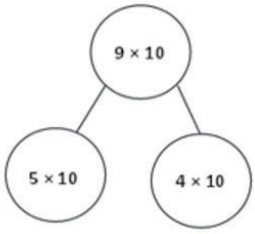
Skip-count/Count-by: To count in equal increments by a number other than 1. For example, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 is skip-counting by twos.

MODELS

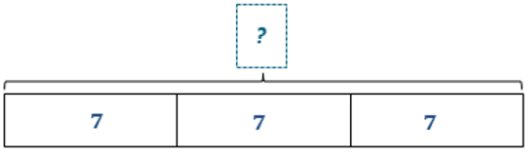
Break Apart and Distribute Strategy



Number Bond: A model that illustrates a part–part–whole relationship.



Tape Diagram: A model used to help make sense of a word problem.



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KEY CONCEPT OVERVIEW

In Lessons 8 through 11, students focus on multiplication and division problems with units up to 8.

You can expect to see homework that asks your child to do the following:

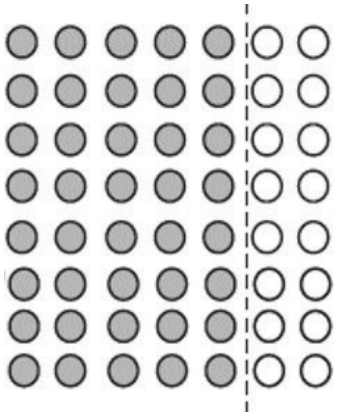
- Use parentheses to group numbers to make an easier problem.
- Use the break apart and distribute strategy to solve multiplication and division problems (as shown in the Sample Problem below).
- Find the value of the unknown (letter) in simple equations and in word problems.

SAMPLE PROBLEM *(From Lesson 10)*

Using the array, fill in the blanks to make the statements true.

$$8 \times 7 = 7 \times 8 = 56$$

$$(8 \times 5) = 40 \qquad (8 \times 2) = 16$$



$$\begin{aligned} 7 \times 8 &= 8 \times (5 + 2) \\ &= (8 \times 5) + (8 \times 2) \\ &= 40 + 16 \\ &= 56 \end{aligned}$$

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Continue to practice multiplication and division, including all facts up to 8's, from memory. Focus on the problems that your child has the most difficulty remembering. Use car rides, shopping trips, or other "in-between" times to have your child exercise her math muscles.
- Write multiplication and division facts on a beach ball, football, volleyball, or soccer ball with a permanent marker. Toss the ball to your child. He must answer the problem under his left thumb before tossing the ball back to you.
- Have your child use cereal, small candies, stickers, or small toys to construct an array that shows a multiplication by 8 problem. Then ask your child to separate the array after the fifth column. Next ask her to write and solve two smaller multiplication problems that would show how many total objects are in the larger array.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

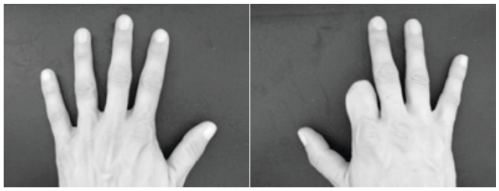
In Lessons 12 through 15, students learn to solve multiplication and division problems with units of 9. They explore the unique patterns that occur in this set of facts to help with recall.

You can expect to see homework that asks your child to do the following:

- Use multiplying by 5 as a strategy to help solve larger problems.
- Find ten more and one less than a number.
- Find the value of the unknown (letter) in simple equations and in word problems.
- Look for patterns in the nines facts.

SAMPLE PROBLEM *(From Lesson 14)*

Sonya figures out the answer to 7 × 9 by putting down her right index finger. (See image.) What is the answer? Explain how to use Sonya's finger strategy.



Sonya is thinking that each finger matches a number from 1 to 10, with 1 on the left and 10 on the right. She puts down her seventh finger to match the 7 in 7 × 9. Then she sees that there are 6 fingers to the left (tens place) and 3 fingers to the right (ones place). The answer is 63.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Continue to practice multiplication and division facts up to multiples of 9 from memory. Focus on the facts that your child has the most difficulty remembering.
- Read children's picture books about multiplication and division with your child. Check for titles online or in your local library or bookstore. Here are some titles to get you started:
  - *7 × 9 = TROUBLE!,* by Claudia Mills and C. Brian Karas
  - *365 Penguins,* by Jean-Luc Fromental and Joëlle Jolivet
  - *Multiplying Menace: The Revenge of Rumpelstiltskin,* by Pam Calvert and Wayne Geehan
  - *Now … for My Next Number! Songs for Multiplying Fun,* by Margaret Park and Sophia Esterman. The book comes with a CD of songs to help children remember math facts.
  - *Breakfast at Danny's Diner: A Book About Multiplication,* by Judith Stamper and Chris Demarest
- Play a memory match game with multiplication and division.
  1. Use note cards or construction paper to make a set of cards. On the cards, write the multiplication and division facts that your child struggles with the most.
  2. Make a second set of cards showing the answers that match the facts.
  3. Mix the two sets of cards together and arrange them all facedown in an array.
  4. Players take turns turning over two cards at a time to see whether the cards match a multiplication or division fact with its correct answer. If no match is made, the cards are turned facedown. If a match is made, the player keeps the two cards. Continue until all the cards in the array have been matched. The player with the most cards at the end of the game is the winner.

  For example, if your child turns over one card that shows 8 × 7 and another showing 63, a match was not made. She must turn the cards facedown because 8 × 7 = 56, not 63. If, however, she turns over a 9 and 63 ÷ 7, she keeps both cards because 9 is the correct answer for the division expression.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 16 through 18, students learn to multiply and divide with units of 0 and 1. While the multiplication and division facts for 0 and 1 tend to be easy for students to recall, they have unique patterns.

You can expect to see homework that asks your child to do the following:

- Solve multiplication and division facts with units of 0 and 1.
- Look for patterns in multiplication and division facts, using the multiplication table.
- Use the **RDW process** to solve two-step word problems involving addition, subtraction, multiplication, and division.

SAMPLE PROBLEM *(From Lesson 16)*

Matt explains to his little sister what he learned about dividing with zero.

a. What might Matt tell his sister about solving $0 \div 9$? Explain your answer.

If 0 is divided by any number, it is still 0 because the amount you start with is 0 so there is nothing to divide. I can also write a related multiplication fact that is true: $0 \div 9 = 0$ and $0 \times 9 = 0$.

b. What might Matt tell his sister about solving $8 \div 0$? Explain your answer.

If any amount is divided by 0, it doesn't make sense because I cannot divide something into 0 equal groups. I also cannot write a related multiplication fact that is true: $8 \div 0$ does not equal 8 or 0, because 8×0 does not equal 8 and 0×0 does not equal 8.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Continue to practice all multiplication and division facts from 0 to 9 from memory. Practice with games or with blank multiplication tables. Use a timer to see how quickly your child can fill in a blank multiplication table.
- Make Fact Towers. Get a box of small paper cups. On the outside of every cup, write a multiplication or division fact. On the inside of every cup, write the answer. Stack the cups and have your child pull the top cup from the stack and solve the problem written on it. If your child answers correctly, place the cup upside down on the table; if not, place the cup on the bottom of the stack. Arrange cups with correct answers to form a pyramid. (See images.) Keep going until all the cups are part of the pyramid. See how tall your child can make the pyramid!

TERMS

RDW process: A three-step process used in solving word problems. RDW stands for Read, Draw, Write: Read the problem for understanding; Draw a model (e.g., a tape diagram) to help make sense of the problem; Write an equation and a statement of the answer.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 19 through 21, students apply knowledge of multiplication facts to multiplying with multiples of ten. For example, if students know $4 \times 6 = 24$, then they know $4 \times 60 = 240$ because 60 is ten times larger than 6.

You can expect to see homework that asks your child to do the following:

- Use **place value disks** and a place value chart to solve multiplication problems.
- Place parentheses around numbers to group multiplication problems to make an easier problem. (See Sample Problem.)
- Solve word problems that require multiplying with multiples of ten.

SAMPLE PROBLEM *(From Lesson 20)*

Place ( ) in the equation to find the related fact.

$$3 \times 30 = 3 \times (3 \times 10)$$

$$= (3 \times 3) \times 10$$

$$= \underline{\ 9\ } \times 10$$

$$= \underline{\ 90\ }$$

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

- Play the Double Dice game with your child.
  1. You will need two dice and a piece of paper.
  2. The first player rolls one die and multiplies the number rolled by 10. The player then multiplies this answer by the number rolled with the second die. This final product is the player's score for this turn.

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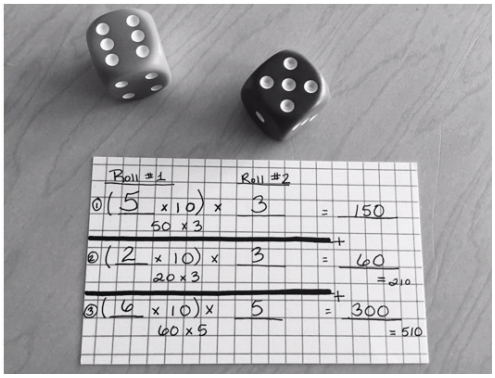
HOW YOU CAN HELP AT HOME *(continued)*

For example, if your child's first roll is a 6, he writes $6 \times 10 = 60$. When he rolls the second die, he gets a 5. He then multiplies the 60 by 5 to get 300, which is his score for that turn. Play multiple rounds, taking turns with your child. (See image at right.)



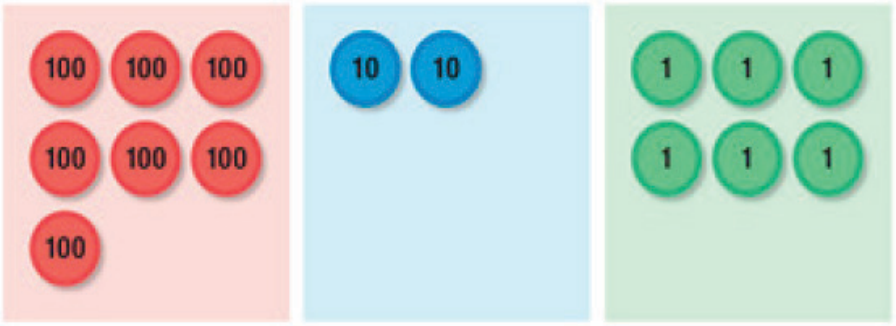
3. Use the paper to record calculations and keep track of each player's scores. Keep a running total of each player's score, adding the score for each round to the previous total.
4. The first player to break 1,000 is the winner!

NOTE: Since the Double Dice game limits players to factors up to 6, you may want to try this variation that offers practice with factors up to 9.

- Instead of using two dice, use one die and playing cards with numbers 2 through 9 only. Shuffle the cards and place them facedown in a stack.
- Roll the die and multiply the number rolled by 10. Then draw one playing card. Multiply the previous result by the number on the playing card. This final number is the score for the turn.
- Set the winning score higher because you are playing with larger factors. For example, say the first player to break 5,000 is the winner.

MODELS

Place Value Disks



EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

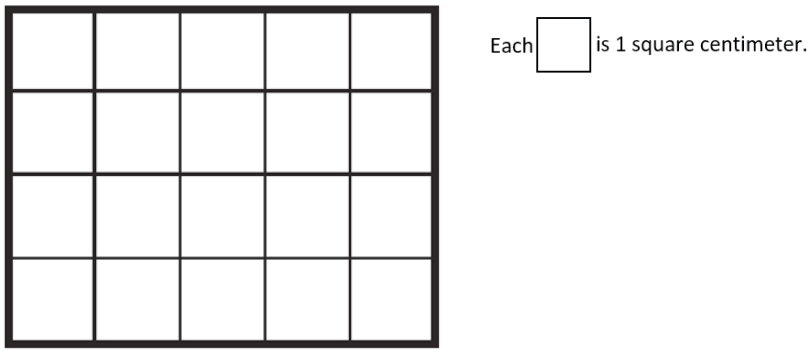
In Lessons 1 through 4, students learn about the concept of **area**. Students work with tiles and put shapes together to make a larger shape.

You can expect to see homework that asks your child to do the following:

- Count the number of shapes (e.g., triangles, squares, **rhombuses**, **trapezoids**) it takes to cover other shapes.
- Find the area of a shape by counting square units.
- Label the side lengths of rectangles based on the number of square tiles shown.

SAMPLE PROBLEM *(From Lesson 4)*

Saffron says that the side length of the rectangle below is 4 centimeters. Kevin says the side length is 5 centimeters. Who is correct? Explain how you know.



Side length can be measured on any side of the rectangle—top, bottom, right, or left—so both Kevin and Saffron are correct. Kevin is correct because he has counted 5 tiles on the top and bottom. Saffron is also correct because she has counted 4 tiles on the right and left.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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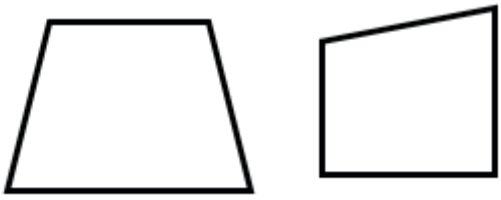
HOW YOU CAN HELP AT HOME

- Give your child a pad of square sticky notes and let her practice tiling the area of rectangular surfaces, such as a place mat, a kitchen cupboard, the top of a small table or desk, or a window. How many sticky notes can fit without any gaps or overlaps? Find out by counting the sticky notes! Try this with different sizes of square sticky notes, and talk about why the number of sticky notes is different for the same objects.
- Choose an even number (e.g., 24). Ask your child to use graph paper to cut out different rectangles that have the same area (e.g., rectangles with the dimensions 1×24, 2×12, 3×8, and 4×6). Look at the rectangles with your child and talk about why they have the same area even though the shapes look so different. He should explain that the rectangles have the same area because they all have the same number of squares inside.

TERMS

Area: The amount of space inside a two-dimensional shape.
Rhombus: A four-sided shape with all sides equal in length and two pairs of parallel sides. See examples below.

Trapezoid: A four-sided shape with at least one pair of parallel sides. See examples below.



EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

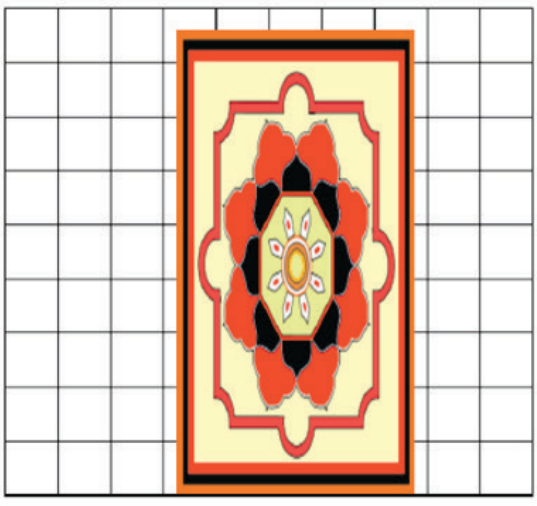
In Lessons 5 through 8, students build rectangles by using square tiles and learn to connect their previous understanding of multiplication to the concept of area.

You can expect to see homework that asks your child to do the following:

- Skip-count to find the unknown area and write multiplication sentences that describe an array.
- Find the unknown side length when given an area and one side length of a rectangle.
- Complete an array or determine the number of tiles hidden by an object.
- Determine an area, using only multiplication.

SAMPLE PROBLEM *(From Lesson 6)*

The tile floor in Brandon's living room has a rug on it as shown below. How many square tiles are on the floor, including the tiles under the rug?



Brandon's floor is a rectangular array of tiles. There are 9 rows of tiles and there are 10 tiles in each row. I can skip-count by tens 9 times: 10, 20, 30, 40, 50, 60, 70, 80, 90. I can also multiply 10 × 9 to find that there are 90 square tiles on the floor, including the tiles I cannot see under the rug.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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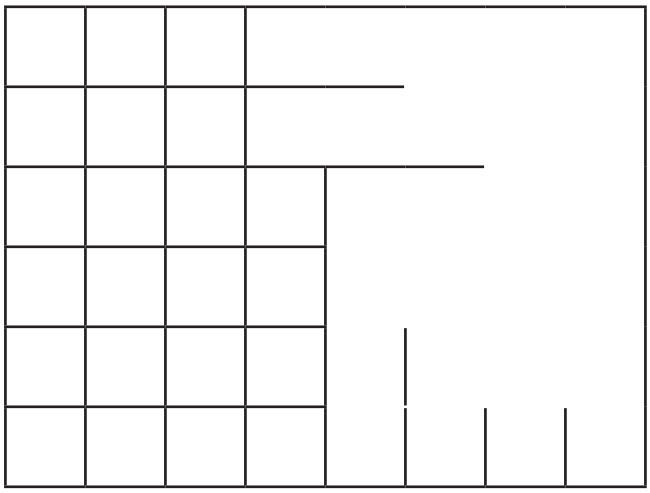
HOW YOU CAN HELP AT HOME

- Cut out a rectangle from a piece of graph paper. (You can find free printable graph paper online.) Use sticky notes to cover up part of the rectangle. Ask your child to find the area of the entire rectangle without removing the sticky note.
- If you have a floor at home with square tiles, use painter's tape to mark off a rectangular area. Cover part of it with a towel or rug. Ask your child to find out how many tiles are in the taped-off area without moving the towel or rug.
- Draw a rectangle on paper. Use a ruler to begin drawing rows and columns inside the rectangle to create a grid of squares, as shown below, but do not complete it. Ask your child to complete the grid. Talk about strategies that would work to complete the array.



EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

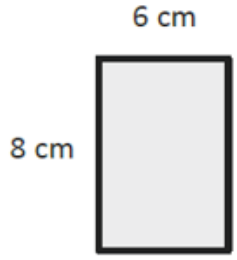
In Lessons 9 through 11, students continue to work with areas of rectangles.

You can expect to see homework that asks your child to do the following:

- Break apart rectangles and reconnect the pieces to form new rectangles, showing that the areas are still the same.
- Use the break apart and distribute strategy to find the area of large rectangles.
- Use multiplication to show how areas of rectangles are the same even though the side lengths are different.

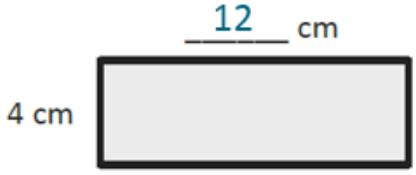
SAMPLE PROBLEM *(From Lesson 11)*

The rectangles below have the same area. Move the parentheses to find the unknown side lengths. Solve.



Area: $8 \times \underline{6} = \underline{48}$

Area: $\underline{48}$ sq cm



Area: $\mathbf{8} \times \mathbf{6} = (4 \times 2) \times 6$

$= 4 \times (2 \times 6)$

$= \underline{4} \times \underline{12}$

$= \underline{48}$

Area: $\underline{48}$ sq cm

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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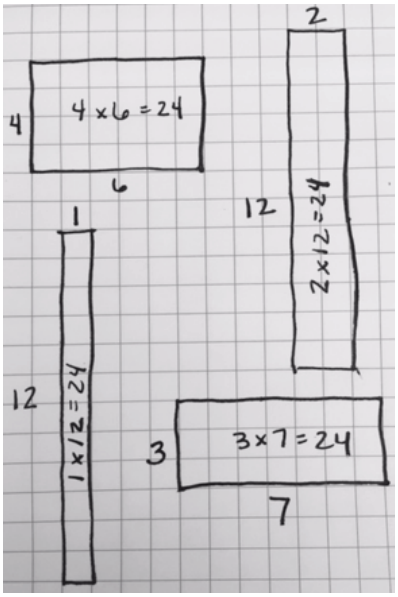
HOW YOU CAN HELP AT HOME

Play the How Many Rectangles? game with your child.

1. Remove the jacks, queens, kings, aces, and jokers from a deck of playing cards, and shuffle the deck.
2. One player chooses either to roll one die and pick one card off the top of the deck of playing cards and multiply the numbers together OR to pick two cards off the top of the deck and multiply the numbers together. The product is the "target area."
3. Players have two minutes to draw as many rectangles as they can with the target area measure from Step 2. For each rectangle, players must label side lengths and write a correct multiplication equation for the target area.
4. Players show each other their rectangles and agree on which ones are correct. Correct drawings receive 5 points. (If players draw the same rectangles, each still receives the points.) Incorrect rectangles receive 0 points.
5. Repeat Steps 1–4. The first player to break 100 points wins the game.

For example, your child rolls a 6 on the die. She then picks a 4 from the deck of playing cards. She multiplies 6 × 4 to get 24. All players now have two minutes to draw all the rectangles they can with an area of 24 square units, labeling the side lengths and writing the area multiplication equations. (See image.) Players receive 5 points for each correct rectangle. For the drawings shown, the player would only receive 10 points because two rectangles are correct (4 × 6 and 2 × 12) and two are not (neither 1 × 12 nor 3 × 7 equals 24).



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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

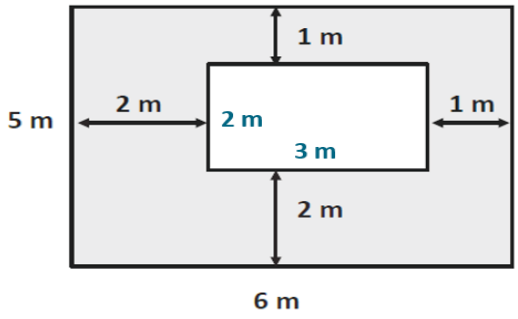
In Lessons 12 through 16, students apply their knowledge of area to real-world situations, such as working with floor plans. Students learn to solve word problems about area by using strategies they learned during their study of multiplication and division.

You can expect to see homework that asks your child to do the following:

- Solve word problems about area concepts.
- Find the area of a shaded region when a rectangular piece is cut out of a larger rectangle.
- Find the total area of combined rectangles when given the dimensions of some of the side lengths.
- Use a ruler to measure side lengths of rectangles, and then calculate the area.

SAMPLE PROBLEM *(From Lesson 14)*

The figure below shows a small rectangle within a big rectangle. Find the area of the shaded part of the figure.



The area of the large rectangle: **5 m × 6 m = 30 sq m**

The area of the small rectangle: **2 m × 3 m = 6 sq m**

I can subtract the areas of the two rectangles. The area of the shaded part is 24 square meters since 30 – 6 = 24.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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HOW YOU CAN HELP AT HOME

- Have your child trace the rectangles from the homework in Lessons 13 and 14 onto a separate piece of paper and cut them out. Then your child can physically manipulate them to form the images on the homework page. The physical manipulation of shapes often helps students better understand the joining or separating of the areas. It can also be a good strategy to act out word problems in Lesson 12.
- Give your child some graph paper. (You can find free graph paper online to print, or ask your child's teacher for some.) Ask your child to design a public place of her choice by using rectangles drawn to scale. She might choose to design a skate park, a mall, a community garden, or whatever else sparks her imagination. Help your child determine the side lengths of the rectangles and calculate the area of the design.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 1 through 4, students learn how to **partition** a line or shape into equal parts. They create displays of **unit fractions** (e.g., $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$) by using items such as paper strips, clay, cups of water, paper circles and rectangles, and yarn.

You can expect to see homework that asks your child to do the following:

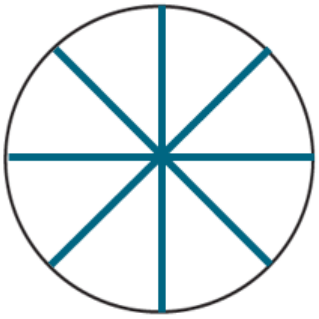
- Represent unit fractions in multiple ways (e.g., with circles, beakers, paper strips, or rectangles).
- Understand and represent objects that are "cut" into equal parts.
- Label the **fractional unit** on objects based on the number of equal cuts and identify how many parts are shaded.

SAMPLE PROBLEM *(From Lesson 3)*

Each shape is one whole. Estimate to divide each into equal parts by using a different fractional unit. Write the name of the fractional unit below the shape.

Thirds

Sixths



Eighths

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HOW YOU CAN HELP AT HOME

- Chocolate bars are always fun and motivating for kids! Get a chocolate bar that has 12 sections. Ask your child to break up the chocolate bar and display it in different ways, such as halves, thirds, fourths, or sixths.
- Tape a string across a doorway so your child can reach it. Make sure the string is taut and parallel with the floor (not slanted). Using the door frame as the endpoints of the string, ask your child to show where to partition the string with clothespins to create different fractional units such as halves, thirds, fourths, sixths, eighths, or tenths. (Miniature clothespins can be found at hobby stores.) Alternatively, your child can thread O-shaped cereal or beads on the string before you tape the string to the door frame and then slide the beads or cereal into place based on fractional units you suggest.

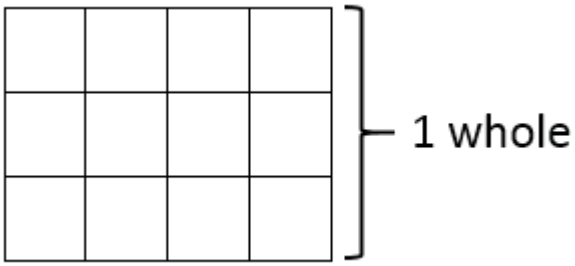
TERMS

Fractional unit: The number of parts in a whole, written in word form (e.g., halves, thirds, fourths, sixths, eighths).

Unit fractions: Fractions with a numerator of 1. For example, $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ are all unit fractions.

MODELS

Partition: To divide or "cut up" a whole into equal parts.



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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

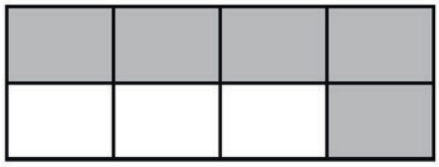
In Lessons 5 through 9, students continue to work with equal parts of a whole. They use **number bonds** to learn that any **non-unit fraction** is created by a series of unit fractions (e.g., 3 fourths is three copies of 1 fourth). Students also receive an introduction to fractions greater than one whole.

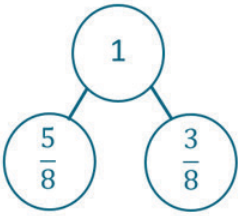
You can expect to see homework that asks your child to do the following:

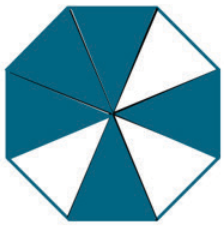
- Identify the equal parts in **unit form** and **fraction form** in an image.
- Partition objects into equal parts and draw number bonds to match the images.
- Identify the number of shaded parts as well as the number of unshaded parts.

SAMPLE PROBLEM *(From Lesson 8)*

Show a number bond that represents the shaded and unshaded parts in the rectangle shown below. Draw a different visual model that the same number bond could represent.







In the number bond, $\frac{5}{8}$ represents the shaded part in one whole.

The $\frac{3}{8}$ represents the unshaded part.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

- Ask your child to break apart a chocolate bar that has an even number of equal sections and display it in different ways, such as halves, thirds, fourths, and sixths. Ask him to show you different non-unit fractional amounts, such as $\frac{2}{6}, \frac{2}{3}, \frac{3}{4}, \frac{2}{4}$, and $\frac{5}{6}$. By adding a second chocolate bar, your child can create fractions larger than one whole, such as $\frac{11}{6}, \frac{5}{3}$, and $\frac{5}{4}$.

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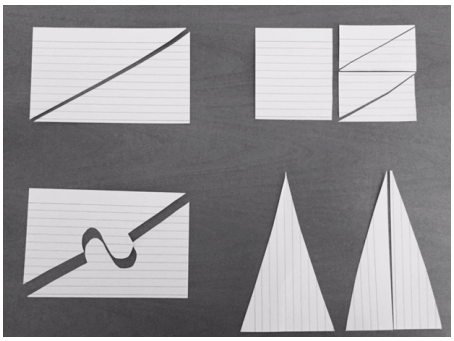
HOW YOU CAN HELP AT HOME

- Get a package of index cards and work with your child to see how many different "halves" you can cut out of the index cards. Challenge each other to get creative and defend why the images you create are (or are not) halves! Repeat this for other fractional units, such as thirds, fourths, sixths, and eighths.



TERMS

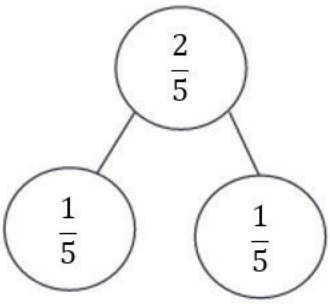
Fraction form: A number written in the form of a fraction, for example, $\frac{1}{2}$ or $\frac{19}{8}$.

Non-unit fraction: A fraction with a numerator other than 1. For example, $\frac{3}{4}$, $\frac{9}{8}$ and $\frac{2}{6}$ are all non-unit fractions.

Unit form: A number expressed in terms of its fractional unit. For example, 1 half, 2 thirds, and 4 fifths are all numbers written in unit form.

MODELS

Number Bond: A model that demonstrates a part–part–whole relationship.



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EUREKA MATH™ TIPS FOR PARENTS

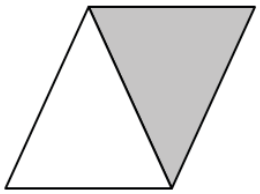
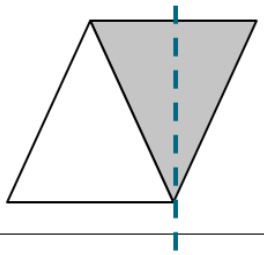
KEY CONCEPT OVERVIEW

In Lessons 10 through 13, students reason with and compare unit fractions based on the same whole.

You can expect to see homework that asks your child to do the following:

- Compare unit fractions (fractions with a 1 in the numerator) by using fraction strips.
- Partition the same objects into different unit fractions and write a true comparison statement.
- Complete the drawing of a larger shape that represents one whole, when given the shape of a unit fraction.
- Identify a shaded part in different ways depending on what is defined as one whole. (See Sample Problem.)

SAMPLE PROBLEM *(From Lesson 13)*

The shape represents 1 whole. Write a unit fraction to describe the shaded part.	The shaded part represents 1 whole. Divide 1 whole to show the same unit fraction you wrote in part (a).
a.  $\frac{1}{2}$	b. 

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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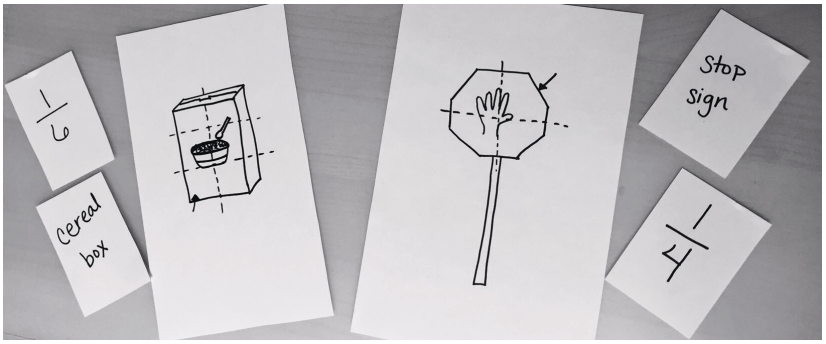
HOW YOU CAN HELP AT HOME

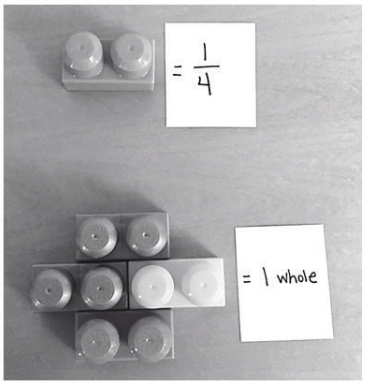
- Play Guess My Fraction Drawing with your child.
  1. Write the following five unit fractions on index cards, one fraction per card: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$. Place the cards facedown in a pile.
  2. On a second set of five cards, write the names of the following five objects: a volleyball, a stop sign, a cereal box, a rectangular TV screen, and a computer keyboard. You might also come up with other objects that can easily be divided into fractions. Place the cards facedown in another pile.

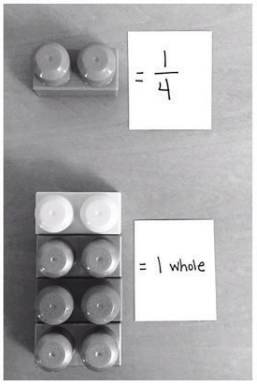


  3. The first player chooses one card from the fraction pile and one card from the object pile, keeping both cards hidden from the other player(s). The first player then attempts to draw just the unit fraction of that object (e.g., $\frac{1}{4}$). The other player(s) try to guess what the object is and what fraction is being depicted. (See image above.)
  4. The player who guesses correctly scores 1 point. The next player repeats Step 3. Continue taking turns until someone reaches 10 points.

     Place used cards face up, in separate object and fraction piles, off to the side. When all the cards have been used, shuffle each pile, turn them facedown, and keep playing! There will be new combinations.

- Use building blocks or snap block sets. Designate one block to represent a particular unit fraction, and ask your child to build one whole by using other same-sized blocks. For example, show your child a block and say, "This is $\frac{1}{4}$. Let's build what one whole could look like!" You can make several different representations. (See images at right.) Discuss why your representations are correct.





  You can also play the game the other way. Build something simple to represent one whole by using several same-sized blocks, and tell your child, "This is one whole. How many equal-sized units did I use? What fraction is each block?" Let your child then build something to represent one whole for you to guess what unit fraction was used.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 14 through 19, students learn to place and compare fractions on the number line.

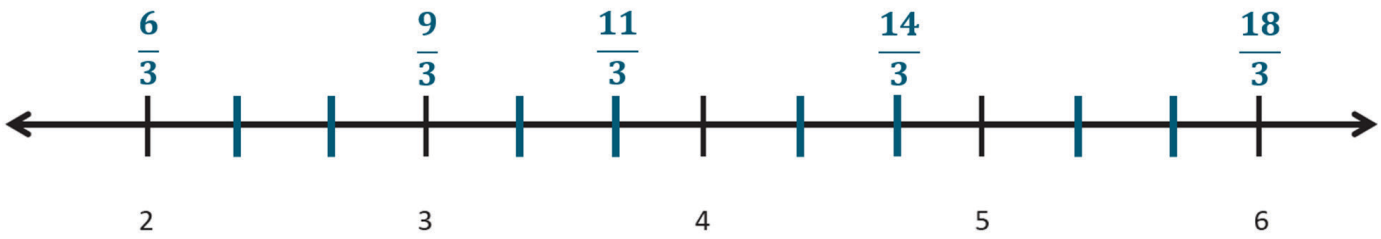
You can expect to see homework that asks your child to do the following:

- Locate and label fractions on a number line.
- Identify the location of whole numbers on the number line and rename those whole numbers in fraction form (e.g., $1 = \frac{3}{3}$, $2 = \frac{6}{3}$, $3 = \frac{9}{3}$).
- Use number lines as tools to compare fractions by reasoning about the distance of the fraction from zero and from other fractions.

SAMPLE PROBLEM *(From Lesson 17)*

Locate and label the following fractions on the number line.

$$\frac{6}{3}, \frac{18}{3}, \frac{9}{3}, \frac{11}{3}, \frac{14}{3}$$



To LEARN MORE by viewing a video about the importance of students learning about fractions on the number line, visit eurmath.link/fractions-are-numbers.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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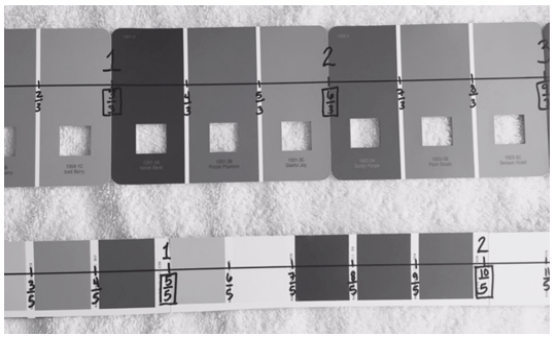
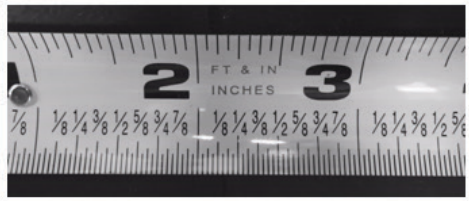
HOW YOU CAN HELP AT HOME

- Collect a few free paint sample strips from a hardware store and tape several of the same size and style together, end to end. Ask your child to use a permanent marker and a straight edge to draw a number line across the paint samples. Each paint sample strip represents a whole number and each change of color on the card represents the next fraction. (See image below.) Have your child mark off and label fractions and draw boxes around fractions that are equivalent to whole numbers.



- Let your child play with a tape measure and have a discussion about what is labeled between the numbers. Not all tape measures are labeled the same way, so consider taking a trip to the hardware store to examine different tape measures. Talk about which fractions appear on the tape measure and why.



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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

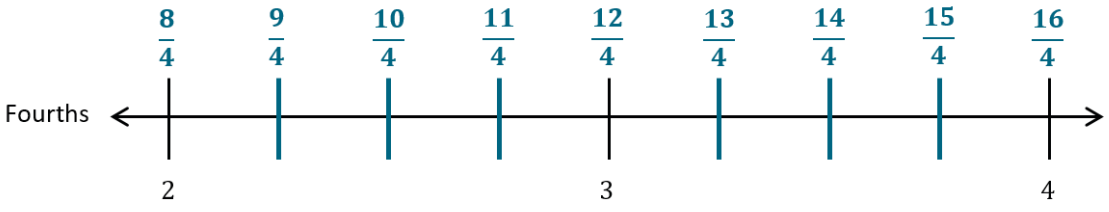
In Lessons 20 through 27, students learn to recognize and create **equivalent fractions**, including fractions that are greater than 1 whole (e.g., $\frac{5}{4} = \frac{10}{8}$). They also continue to write whole numbers as fractions.

You can expect to see homework that asks your child to do the following:

- Use drawings and number lines to determine whether two fractional amounts are equivalent.
- Complete written fractions to make equivalent statements (e.g., $\frac{1}{2} = \frac{2}{4}$).
- Write equivalent fractions on a number line, including fractions equal to whole numbers (e.g., $1 = \frac{4}{4}$).
- Relate number bonds to number lines to show fractional units.

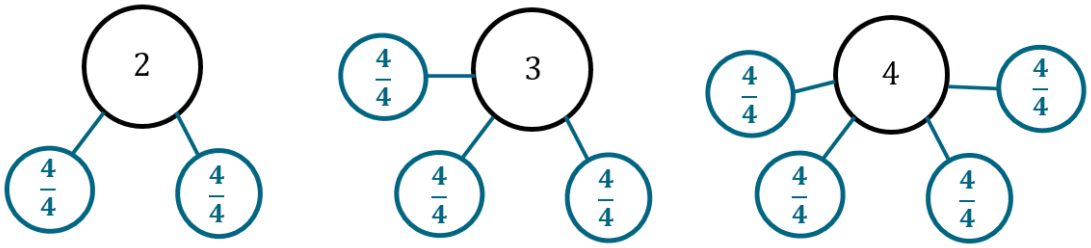
SAMPLE PROBLEM *(From Lesson 26)*

Partition the number line to show the fractional units. Then draw number bonds, using copies of 1 whole for the circled whole numbers.



$2 = \underline{8}$ fourths $\quad 3 = \underline{12}$ fourths $\quad 4 = \underline{16}$ fourths

$2 = \frac{8}{4} \quad 3 = \frac{12}{4} \quad 4 = \frac{16}{4}$



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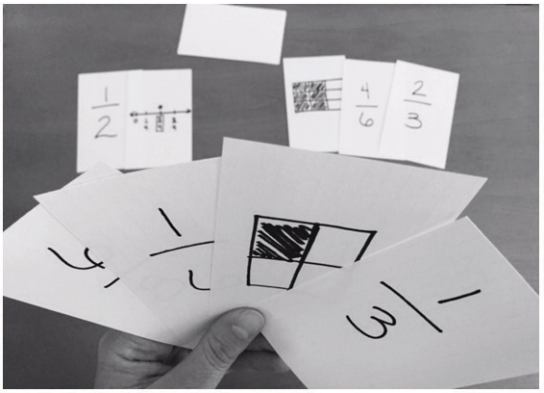
HOW YOU CAN HELP AT HOME

Play the Equivalent Fractions Go Fish game with your child.

1. Make a set of 40 to 60 fraction cards by using index cards or construction paper and a marker. For every fraction card you make, make at least one other card showing an equivalent fraction. You can draw pictures to represent fractions, write fractions in number form, write fractions on a number line, or choose another representation.
2. Mix the cards and deal 6 to each player. Place the rest facedown in a stack between the players as the draw pile.
3. Players examine their cards, keeping them hidden, to see if any make an equivalent match. For example, a card with $\frac{1}{2}$ written on it and another card showing a square divided into four equal parts with two of them shaded is a match. Players lay their matching pairs face up in front of them for everyone to see.
4. Using fractional language, players take turns asking each other for matching cards. For example, if you want to match a card that represents $\frac{1}{3}$, you say, "Do you have any one-thirds?" If the player you ask has a card matching the fraction you request, he must hand it over, and you lay down the match. You then take another turn, continuing until you do not find a match. If the player you ask does not have a card matching the requested fraction, he says, "Go fish!" You must take one card from the top of the draw pile. If you can make a match with the new card, you lay down the match and take another turn. If not, you keep the new card in your hand. Play then goes to the next person.
5. The first player to match all of the cards in her hand wins the game!



TERMS

Equivalent fractions: Fractions that have the same value (e.g., $\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$).

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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 28 through 30, students compare fractions. They focus on fractions that have the same numerator (top number), using models that they are already familiar with (e.g., fraction strips, number lines, and shapes).

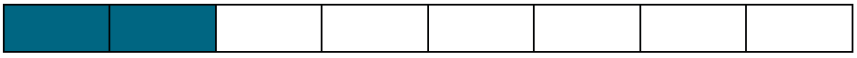
You can expect to see homework that asks your child to do the following:

- Shade and compare fractional amounts on models and number lines.
- Draw a model to compare fractions in word problems.
- Precisely partition a whole into equal parts by using a number line method to create a set of fraction strips.

SAMPLE PROBLEM *(From Lesson 28)*

Shade the models to compare the fractions.

2 fourths 

2 eighths 

Which is larger, 2 fourths or 2 eighths? Why? Use words to explain.

2 fourths is larger than 2 eighths because the more times you cut the whole, the smaller the pieces get. The number of pieces shaded is the same, but the sizes of the pieces are different. Eighths are much smaller than fourths.

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HOW YOU CAN HELP AT HOME

- Give your child some measuring cups, several bowls that are exactly the same size, and a pitcher of water. Ask questions like, "What contains more water, 2 one-third cups or 2 one-fourth cups?" Have your child fill the measuring cups with water and then pour the water into the bowls to compare the amounts of water side by side. Talk about why one bowl has more water even though your child added 2 units of water to both bowls.
- Invite your child to watch you chop vegetables or fruit while you are preparing a meal. Talk about fractions while you work. For example, if you are cutting up two carrots that are the same size, cut one into fourths and the other into sixths, and ask whether 3 fourths or 3 sixths is more.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

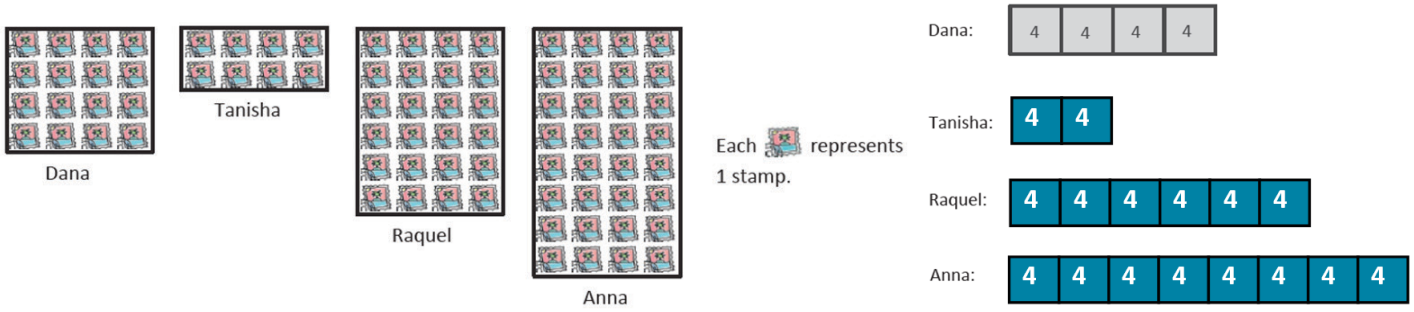
In Lessons 1 through 4, students work with charts and graphs to draw conclusions about data.

You can expect to see homework that asks your child to do the following:

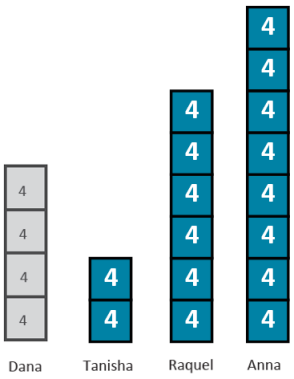
- Use a **tally chart** to complete a **picture graph**.
- Construct vertical tape diagrams.
- Create a **scaled bar graph** with given data (such as those from a tally chart) and answer questions about the data.
- Solve one- and two-step problems by using data displayed in a graph.

SAMPLE PROBLEMS *(From Lesson 2)*

1. Find the total number of stamps each student has. Draw tape diagrams with a unit size of 4 to show the number of stamps for each student. The first one (Dana) has been done for you.



2. Draw vertical tape diagrams by using the data from Problem 1.



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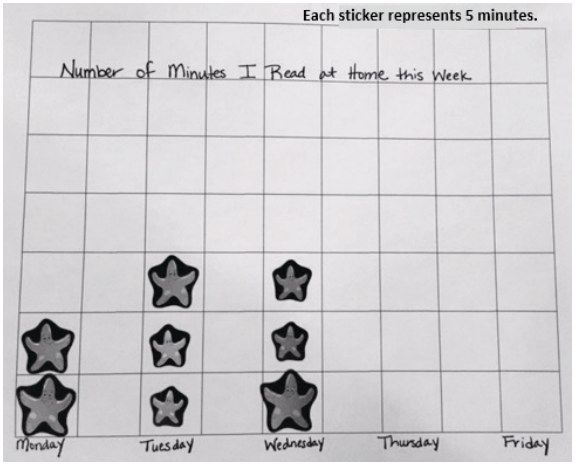
HOW YOU CAN HELP AT HOME

- Help your child create a picture graph to hang on the wall or refrigerator. Ask your child to come up with a daily (or almost daily) activity, such as reading, playing sports, or practicing a musical instrument. Chart the number of minutes, in 5-minute intervals, that your child spends daily on the activity by using stickers on a handmade chart or drawing symbols, such as stars, in the boxes on grid paper.

  For example, your child could chart how many minutes she reads each day at home. (See image at right.) Since each sticker represents 5 minutes, she would put 3 stickers above "Tuesday" to show that she read for 15 minutes that day.



  Variation: Use interlocking blocks to represent a bar graph. Determine the value of each block (e.g., 1 block represents 5 minutes), and stack the blocks to show total time spent. Display the stacks in an area where your child will see them often as a reminder of her accomplishments!

TERMS

Picture graph: A graph showing categorical data with graphics to represent an amount.

MODELS

Scaled Bar Graph: A graph showing categorical data with bars and a number line that counts by a number other than 1.

Tally Chart: A chart that shows the number of times something occurs.

Favorite Pets	
Pets	**Number of Votes**
Cats	~~////~~ /
Turtles	////
Fish	//
Dogs	~~////~~ ///
Lizards	//

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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 5 through 9, students construct and analyze **measurement data**.

You can expect to see homework that asks your child to do the following:

- Use knowledge of fractions to construct **line plots**.
- Analyze measurement data in tables and line plots.
- Estimate measurements to the nearest $\frac{1}{2}$ and $\frac{1}{4}$ units.
- Create a line plot for a given data set and use it to draw conclusions and solve problems.
- Solve problems with data displayed in picture graphs and line plots.

SAMPLE PROBLEM *(From Lesson 8)*

Delilah stops under a silver maple tree and collects leaves. At home, she measures the widths of the leaves to the nearest $\frac{1}{4}$ inch and records the measurements as shown below.

Widths of Silver Maple Tree Leaves (in Inches)				
$5\frac{3}{4}$ ✓	6 ✓	$6\frac{1}{4}$ ✓	6 ✓	$5\frac{3}{4}$ ✓
$6\frac{1}{2}$ ✓	$6\frac{1}{4}$ ✓	$5\frac{1}{2}$ ✓	$5\frac{3}{4}$ ✓	6 ✓
$6\frac{1}{4}$ ✓	6 ✓	6 ✓	$6\frac{1}{2}$ ✓	$6\frac{1}{4}$ ✓
$6\frac{1}{2}$ ✓	$5\frac{3}{4}$ ✓	$6\frac{1}{4}$ ✓	6 ✓	$6\frac{3}{4}$ ✓
6 ✓	$6\frac{1}{4}$ ✓	6 ✓	$5\frac{3}{4}$ ✓	$6\frac{1}{2}$ ✓

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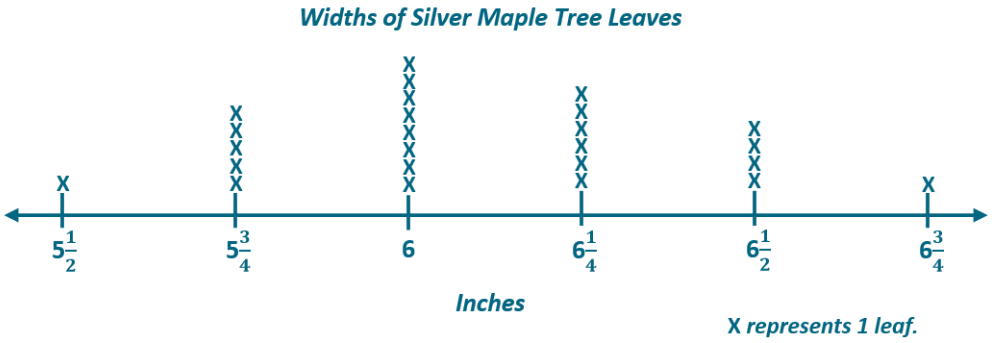
SAMPLE PROBLEM *(continued)*

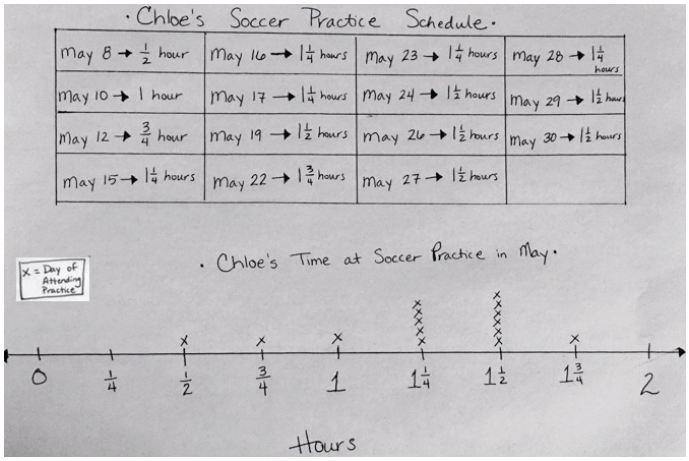
Use the data to create a line plot.



Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

With your child, create a line plot to record the amount of time your child spends on an activity (e.g., doing chores, reading a book, practicing sports or an instrument) each day for one month. Start by making a table or list of the number of hours (rounded to the nearest quarter hour) that your child spends on that activity. Then, draw a number line (such as that shown in the image to the right) and place an X above the amount of time spent on the activity each day. For example, if your child spent 1 hour on the activity, place an X above the 1 on the number line. Be sure to title the line plot, and include a label and a key.



TERMS

Line plot: A display of data on a horizontal number line. (See Sample Problem.)

Measurement data: Data that are collected as a result of measuring an object or action a certain number of times (e.g., the number of minutes of daily piano practice for one month or the height, in inches, for 20 different sunflowers).

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

Lessons 1 through 3 focus on problem solving, where students share and analyze efficient problem-solving strategies.

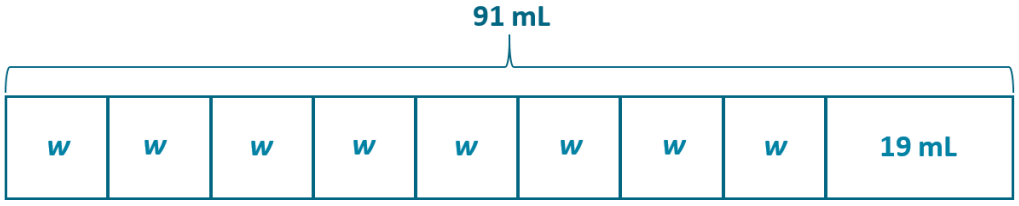
You can expect to see homework that asks your child to do the following:

- Solve a variety of word problems by using the **RDW process**.
- Use a letter to represent the unknown.
- Use addition, subtraction, multiplication, and division to solve multi-step problems.

SAMPLE PROBLEM *(From Lesson 3)*

Use the RDW process to solve the following problem. Use a letter to represent the unknown.

Monica measures 91 milliliters of water into 9 tiny beakers. She measures an equal amount of water into the first 8 beakers. She pours the remaining water into the ninth beaker. It measures 19 milliliters. How many milliliters of water are in each of the first 8 beakers?



$91 - 19 = 72$

$72 \div 8 = w$

$9 = w$

There are 9 milliliters of water in each of the first 8 beakers.

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HOW YOU CAN HELP AT HOME

- Children frequently benefit from acting out problems they are trying to solve. If possible, have your child act out homework problems that are difficult for him to solve. For example, if the problem is about money, use play or real money to physically act out what is happening in the word problem. If the problem is about pouring water into beakers, set out some containers that would simulate the word problem, and let your child pour water into the containers according to what happens in the problem. It may be helpful to take a video of your child acting out the problem and have him watch it many times. After acting out the problem, he may find it easier to work on the drawing and writing parts of the RDW process.

TERMS

RDW process: A three-step process used in solving word problems that requires students to 1) read the problem for understanding, 2) draw a picture or model (e.g., a tape diagram), and 3) write an equation and statement of their answer.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 4 through 9, students learn about the **attributes** of **two-dimensional figures**.

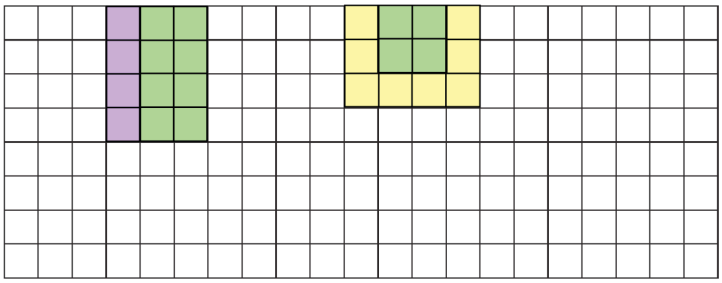
You can expect to see homework that asks your child to do the following:

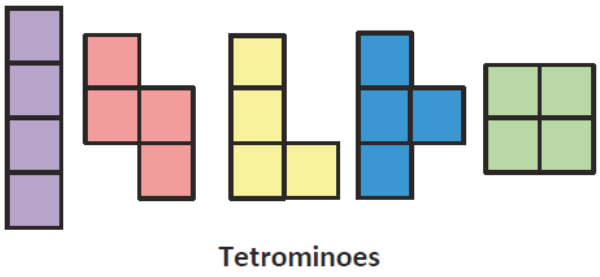
- Given the attributes of **quadrilaterals** and other **polygons** (including **trapezoids**, **rhombuses**, **pentagons**, **hexagons**, and **regular polygons**), determine and draw each, and identify any parallel sides.
- **Compose** polygons by using **tetrominoes** (supplied to students).
- **Decompose** polygons by drawing lines to divide them into specified polygons.
- Compose polygons from **tangram** pieces (supplied to students).

SAMPLE PROBLEM *(From Lesson 7)*

Use tetrominoes to create at least two different rectangles, each with an area of 12 square units.

Next, color the grid below to show how you created the rectangles. You may use the same tetromino more than once.





Tetrominoes

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HOW YOU CAN HELP AT HOME

- Go for a walk around your neighborhood or to a local park or playground, and ask your child to take pictures of different shapes. Try to find shapes that are composed from other shapes. Print out the pictures, or use software to design a slide show of the photos. Have your child add captions to describe the shapes by using the vocabulary she has been learning in school.

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TERMS

Attributes: Characteristics of specific shapes. For example, a rectangle has the attributes of two sets of parallel sides and four 90 degree (right) angles.

Compose/Decompose: To make (compose) or break apart (decompose) a number, figure, or array.

Hexagon: A polygon with six sides. (See Figure 1.)

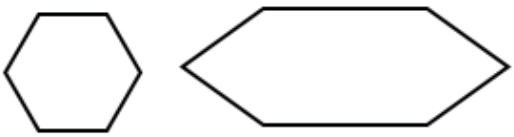


Figure 1

Pentagon: A polygon with five sides. (See Figure 2.)

Polygon: A closed shape with three or more straight sides. For example, triangles, rectangles, pentagons, hexagons, and octagons are all polygons.

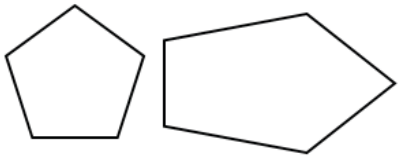


Figure 2

Quadrilateral: Any polygon with four sides. For example, squares, rectangles, trapezoids, rhombuses, and parallelograms are all quadrilaterals.

Regular polygon: A polygon with all sides equal in length and all angles equal in measure. (See Figure 3.)

Figure 3

Rhombus: A quadrilateral with all sides equal in length. (See Figure 4.)

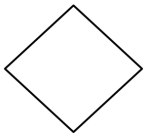


Figure 4

Trapezoid: A quadrilateral with at least one pair of parallel sides. (See Figure 5.)

Two-dimensional figure: A flat figure with length and width. For example, squares, circles, triangles, and hexagons are two-dimensional figures, whereas cones, cubes, and prisms are three-dimensional figures.

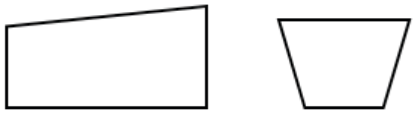
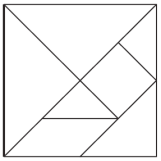


Figure 5

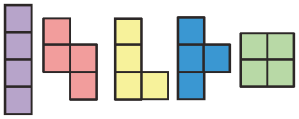
MODELS

Tangrams: A special set of puzzle pieces with five triangles and two quadrilaterals that compose a square.



Tangram

Tetrominoes: Shapes composed of four connected squares so every square shares at least one side with another square.



Tetrominoes

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

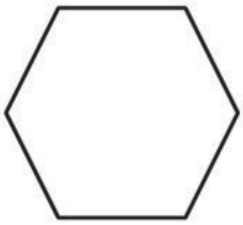
Lessons 10 through 17 focus on **perimeter** and solving real-world problems involving perimeter.

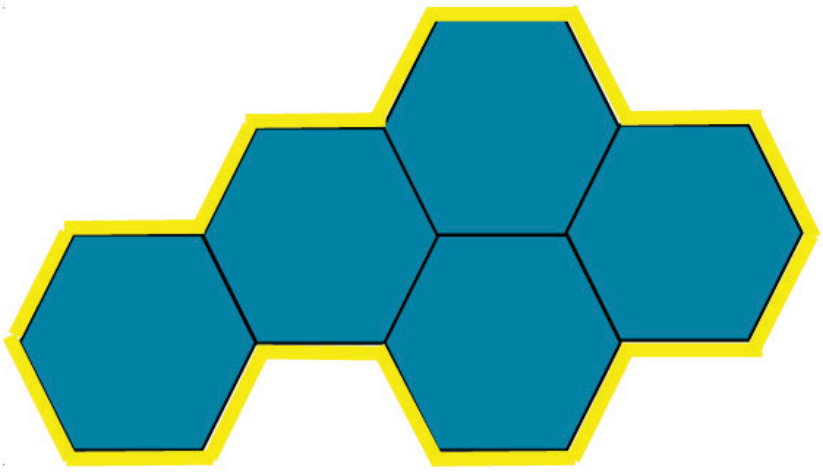
You can expect to see homework that asks your child to do the following:

- Identify perimeter and distinguish it from the area of a shape.
- Trace around shapes to conceptually understand perimeter.
- **Tessellate** to compose larger shapes.
- Measure and label side lengths to calculate the perimeter of given shapes.
- Determine the perimeters of irregular shapes made up of several rectangles and of regular polygons that have unknown measurements.
- Find the perimeter of circular objects at home using string and a ruler.

SAMPLE PROBLEM *(From Lesson 11)*

Tessellate at least five copies of the given hexagon to make a new shape, without gaps or overlaps. Outline the perimeter of your new shape with a highlighter. Shade in the area with a crayon or colored pencil.





Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

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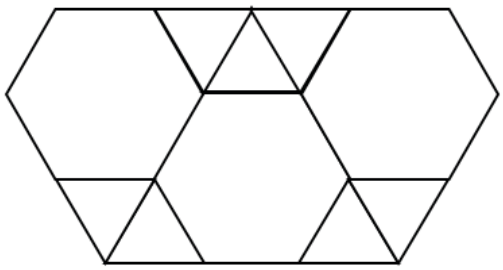
HOW YOU CAN HELP AT HOME

- With your child, use a tape measure to practice measuring the perimeters of objects at home such as a tabletop or desktop, the floor of a small room, or a toy box. Talk about what units are best for measuring different perimeters (e.g., inches to measure a toy box, feet to measure the floor in a room).

TERMS

Perimeter: The outside boundary of a closed shape. It can be measured by finding the sum of the side lengths. For example, a square with a side length of 2 inches has a perimeter of 8 inches because 2 inches + 2 inches + 2 inches + 2 inches = 8 inches.

Tessellate: To tile a surface with repeating shapes without gaps or overlaps. For example, in the image shown below, hexagons and triangles have been tessellated.



EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 18 through 22, students make connections between area and perimeter.

You can expect to see homework that asks your child to do the following:

- Create as many rectangles as possible with a given area or a given perimeter.
- Compare and analyze the perimeters and areas of different rectangles and draw conclusions.
- Create and analyze **line plots** based on the number of rectangles created.

SAMPLE PROBLEM *(From Lesson 22)*

Sumi uses unit square tiles to build 3 different rectangles, each with an area of 32 square units. Does knowing the number of rectangles she built that have an area of 32 square units help her find the number of rectangles she can build that have a perimeter of 32 units? Why or why not?

No, area and perimeter are different measurements, so knowing the number of rectangles she built that have an area of 32 square units does not help Sumi find the number of rectangles she can build that have a perimeter of 32 units.

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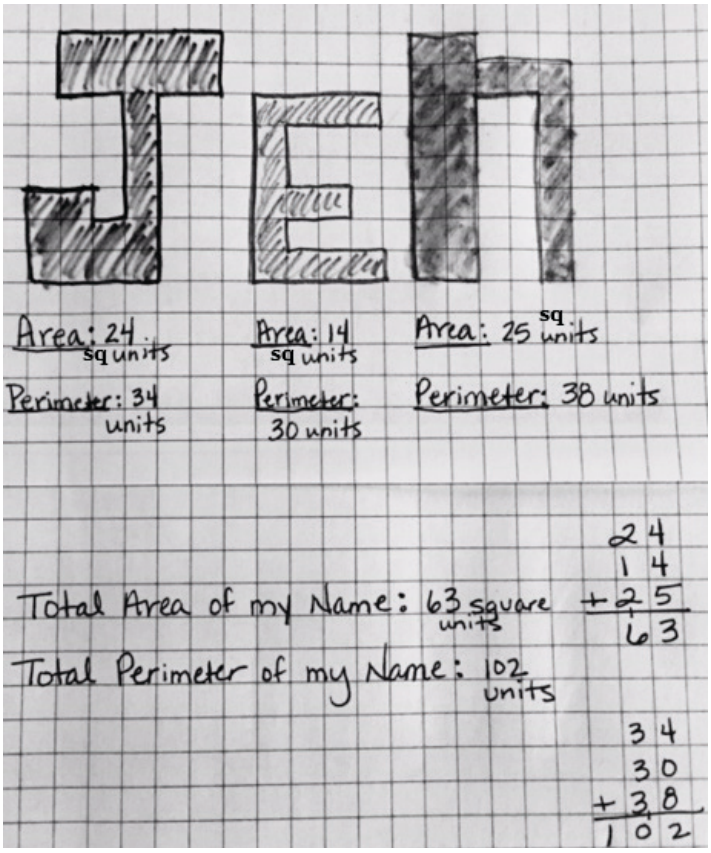
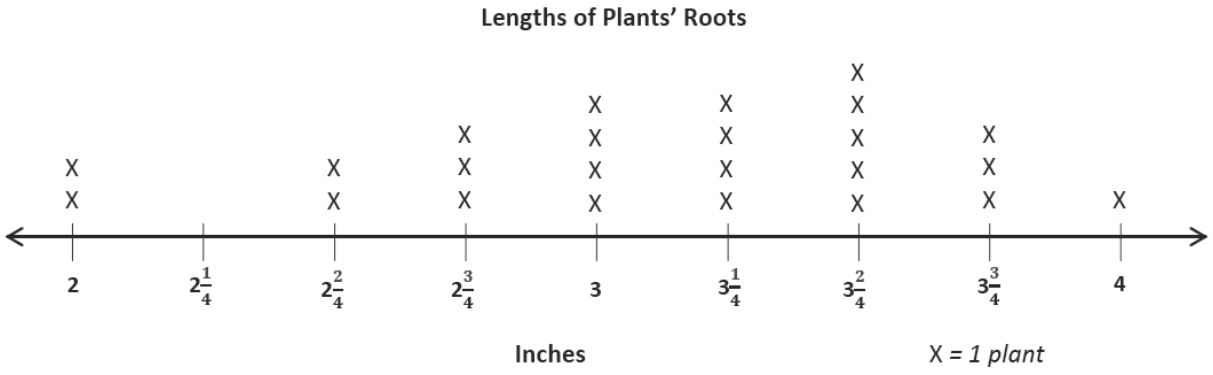
HOW YOU CAN HELP AT HOME

- Ask your child's teacher or search online for printable grid paper. Have your child use crayons or markers to construct her name on the grid paper and find the area and perimeter of each letter. (See image at right.) Then have your child find the total area and perimeter of her name. If your child desires, she can do the rest of the names in your family as well.



MODELS

Line Plot: A display of data on a horizontal number line.



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EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Lessons 23 through 30, students solve real-world problems and complete projects by using the concepts of area and perimeter.

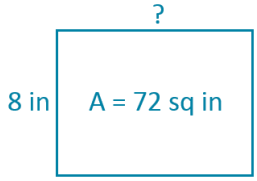
You can expect to see homework that asks your child to do the following:

- Determine the perimeter when given information about a shape.
- Draw different rectangles that have the same perimeter and label the lengths and widths of each.
- Determine both the area and perimeter of a given rectangle when given a drawing or a word problem.

SAMPLE PROBLEM *(From Lesson 28)*

The area of Mason's rectangular painting is 72 square inches. The width of the painting is 8 inches.

a. Estimate to draw Mason's painting, and label the side lengths.



b. What is the length of the painting?

***Length* = 72 sq in ÷ 8 in = 9 in**

The length of the painting is 9 inches.

c. What is the perimeter of Mason's painting?

***Perimeter* = 8 in + 8 in + 9 in + 9 in = 34 in**

The perimeter of Mason's painting is 34 inches.

d. Mason's mom hangs his painting on a wall where she has already hung two of Mason's other paintings. The areas of the other paintings are 64 square inches and 81 square inches. What is the total area of all three paintings that are hanging on the wall?

***Total area* = 64 sq in + 81 sq in + 72 sq in = 217 sq in**

The total area of all three paintings is 217 square inches.

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HOW YOU CAN HELP AT HOME

- Read *Spaghetti and Meatballs for All! A Mathematical Story*, by Marilyn Burns, with your child. (Ask your school librarian or search online for a copy.) Talk about how area and perimeter are important to the story.
- Give your child a tape measure and ask him to find the area and perimeter of the surfaces of objects around the house, such as the top of a desk or table, a computer or TV screen, a cupboard door, a cookie sheet, a window, or a door. Make sure that each of the chosen objects has a rectangular surface. Ask your child to record his findings and talk about which objects have the largest and smallest area and perimeter measurements.

EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

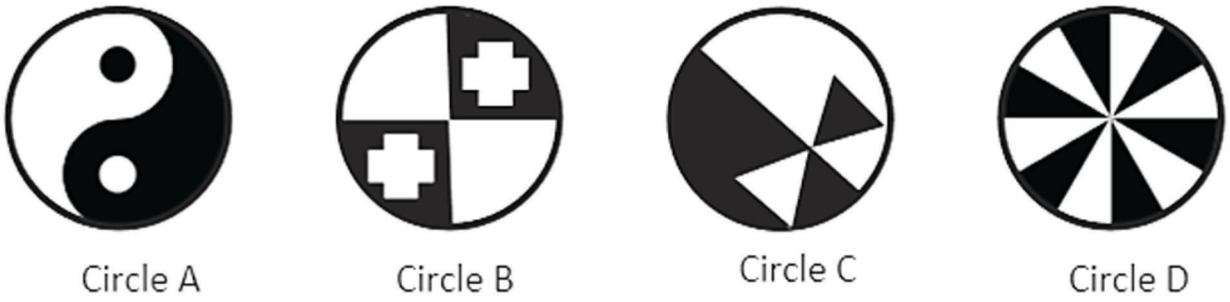
In Lessons 31 through 34, students practice skills and concepts they have learned this year. For example, they practice more with fractions and play games involving multiplication and division. Students also create a booklet of resources they can use to practice during the summer to prepare for Grade 4.

You can expect to see homework that asks your child to do the following:

- Explore some unconventional ways to make one-half.
- Teach family members a game from class.

SAMPLE PROBLEM *(From Lesson 32)*

Julian shades four circles, as shown below. Write the letters of the circles that are about one-half shaded.



A, C, and D.

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HOW YOU CAN HELP AT HOME

- Your child will come home with a copy of two summer math calendars with sample activities that she can do daily to keep up with her math skills. (See table below.) Your child will complete a booklet in class explaining these activities and bring the booklet home for summer vacation. There is one calendar for the first five weeks and another for the second five weeks. Your child can color each activity as she completes it to keep track of how much she practices.

Summer Math Review: Weeks 1–5

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Do jumping jacks as you count by twos from 2 to 20 and back.	Play a game from your Summer Practice booklet.	Use your tangram pieces to make a picture of your summer break.	Time how long it takes you to do a specific chore, like making the bed. See if you can do it faster the next day.	Complete a Sprint.
Week 2	Do squats as you count by threes from 3 to 30 and back.	Play a game from your Summer Practice booklet.	Collect data about your family's or friends' favorite type of music. Show it on a bar graph. What did you discover from your graph?	Read a recipe. What fractions does the recipe use?	Complete a Multiply by Pattern Sheet.
Week 3	Hop on one foot as you count by fours from 4 to 40 and back.	Create a multiplication and/or division math game. Then, play the game with a partner.	Measure the widths of different leaves from the same tree to the nearest quarter inch. Then, draw a line plot of your data. Do you notice a pattern?	Read the weight in grams of different food items in your kitchen. Round the weights to the nearest 10 or 100 grams.	Complete a Sprint.
Week 4	Bounce a ball as you count by 5 minutes to 1 hour and then to the half hour and quarter hours.	Find, draw, and/or create different objects to show one-fourth.	Go on a shape scavenger hunt. Find as many quadrilaterals in your neighborhood or house as you can.	Find the sum and difference of 453 mL and 379 mL.	Complete a Multiply by Pattern Sheet.
Week 5	Do arm swings as you count by sixes from 6 to 60 and back.	Draw and label a floor plan of your house.	Measure the perimeter of the room where you sleep in inches. Then, calculate the area.	Use a stopwatch to measure how fast you can run 50 meters. Do it 3 times. What was your fastest time?	Complete a Sprint.

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