math mark

math activities that reach kids

GRADE 2
Master Fractions

lead4ward®

Acknowledgement

This digital resource consists of high-quality math instructional content originally derived from TeachTransform, a previous lead4ward partnership. lead4ward purchased the TeachTransform assets and is committed to continue to grow and support math educators. TeachTransform's Co-Founder and CEO, Carol Gautier, M.Ed., continues to consult in the ongoing development.

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Master Fractions, Grade 2

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Master Fractions, Grade 2

Content and **Instruction** Extras

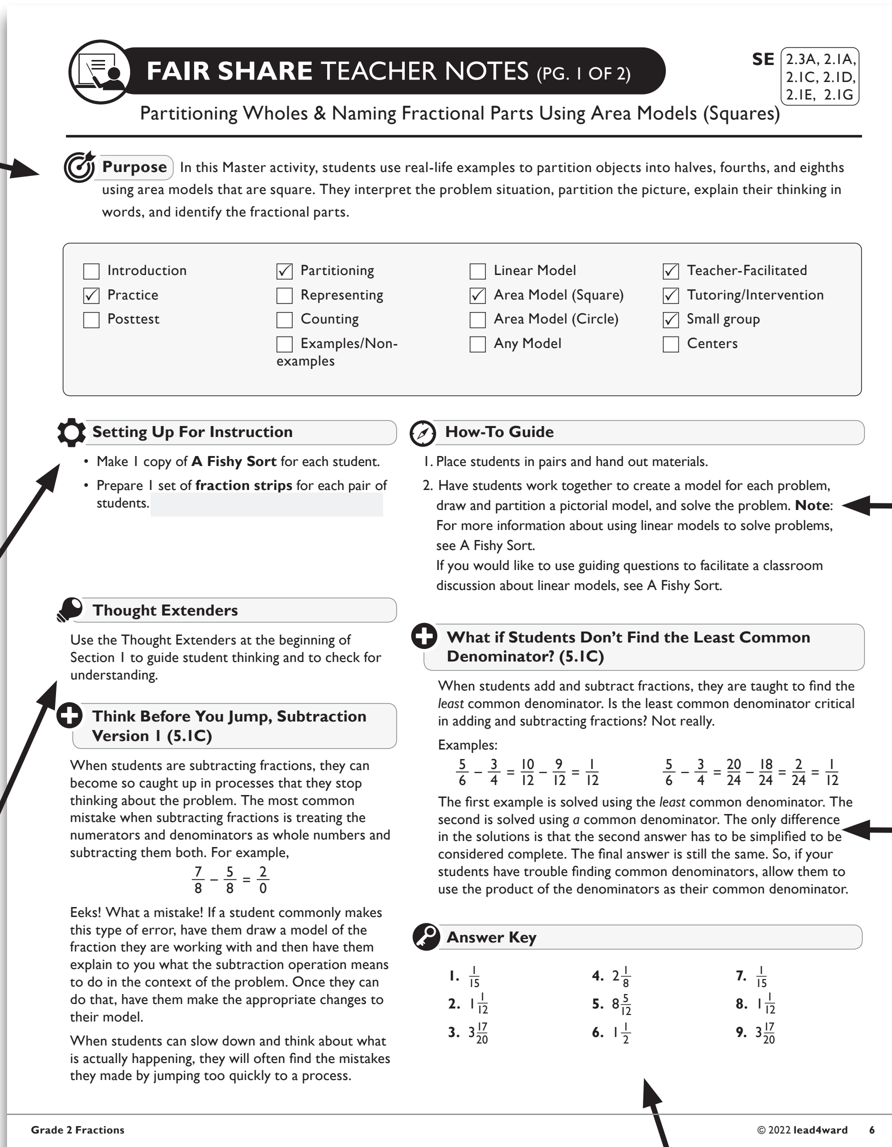
TABLE OF STANDARDS

The activities in this **Master Fractions, Grade 2** book address the following standards.

Where are we going? **Focus Standards**		**Activity**
(2.3)	**Number and operations.** The student applies mathematical process standards to recognize and represent fractional units and communicates how they are used to name parts of a whole. The student is expected to:	
2.3A	partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words	1, 2, 3, 4, 5, 6, 7, 8, 9, 15
2.3B	explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part	11, 12, 13, 14, 15
2.3C	use concrete models to count fractional parts beyond one whole using words and recognize how many parts it takes to equal one whole	16, 17, 18, 19
2.3D	identify examples and non-examples of halves, fourths, and eighths	10, 11, 15

What kind of mathematical thinking will we use? **Process Standards**		**Activity**
(2.1)	**Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	
2.1A	apply mathematics to problems arising in everyday life, society, and the workplace;	1, 3, 4, 5, 8, 9, 12, 13, 14
2.1B	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;	6, 7
2.1C	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;	1, 3, 4, 5, 6, 12, 13, 14, 16, 17, 18, 19
2.1D	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
2.1E	create and use representations to organize, record, and communicate mathematical ideas;	2, 3, 4, 5, 9
2.1F	analyze mathematical relationships to connect and communicate mathematical ideas.	2, 6, 12, 13, 14, 15
2.1G	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	2, 3, 4, 5, 8, 9, 11, 12, 13, 14, 15

TEACHER PAGE AT A GLANCE



FAIR SHARE TEACHER NOTES (PG. 1 OF 2)

SE 2.3A, 2.1A, 2.1C, 2.1D, 2.1E, 2.1G

Partitioning Wholes & Naming Fractional Parts Using Area Models (Squares)

Purpose In this Master activity, students use real-life examples to partition objects into halves, fourths, and eighths using area models that are square. They interpret the problem situation, partition the picture, explain their thinking in words, and identify the fractional parts.

☐ Introduction	☑ Partitioning	☐ Linear Model	☑ Teacher-Facilitated
☑ Practice	☐ Representing	☑ Area Model (Square)	☑ Tutoring/Intervention
☐ Posttest	☐ Counting	☐ Area Model (Circle)	☑ Small group
	☐ Examples/Non-examples	☐ Any Model	☐ Centers

Setting Up For Instruction

- Make 1 copy of **A Fishy Sort** for each student.
- Prepare 1 set of **fraction strips** for each pair of students.

Thought Extenders

Use the Thought Extenders at the beginning of Section 1 to guide student thinking and to check for understanding.

Think Before You Jump, Subtraction Version 1 (5.1C)

When students are subtracting fractions, they can become so caught up in processes that they stop thinking about the problem. The most common mistake when subtracting fractions is treating the numerators and denominators as whole numbers and subtracting them both. For example,

$$\frac{7}{8} - \frac{5}{8} = \frac{2}{0}$$

Eeks! What a mistake! If a student commonly makes this type of error, have them draw a model of the fraction they are working with and then have them explain to you what the subtraction operation means to do in the context of the problem. Once they can do that, have them make the appropriate changes to their model.

When students can slow down and think about what is actually happening, they will often find the mistakes they made by jumping too quickly to a process.

How-To Guide

1. Place students in pairs and hand out materials.
2. Have students work together to create a model for each problem, draw and partition a pictorial model, and solve the problem. **Note**: For more information about using linear models to solve problems, see A Fishy Sort.
If you would like to use guiding questions to facilitate a classroom discussion about linear models, see A Fishy Sort.

What if Students Don't Find the Least Common Denominator? (5.1C)

When students add and subtract fractions, they are taught to find the *least* common denominator. Is the least common denominator critical in adding and subtracting fractions? Not really.

Examples:

$$\frac{5}{6} - \frac{3}{4} = \frac{10}{12} - \frac{9}{12} = \frac{1}{12} \qquad \frac{5}{6} - \frac{3}{4} = \frac{20}{24} - \frac{18}{24} = \frac{2}{24} = \frac{1}{12}$$

The first example is solved using the *least* common denominator. The second is solved using *a* common denominator. The only difference in the solutions is that the second answer has to be simplified to be considered complete. The final answer is still the same. So, if your students have trouble finding common denominators, allow them to use the product of the denominators as their common denominator.

Answer Key

1. $\frac{1}{15}$	4. $2\frac{1}{8}$	7. $\frac{1}{15}$
2. $1\frac{1}{12}$	5. $8\frac{5}{12}$	8. $1\frac{1}{12}$
3. $3\frac{17}{20}$	6. $1\frac{1}{2}$	9. $3\frac{17}{20}$

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Purpose: This is a general description of the activity and why it was created.

Setting Up for Instruction: This is what you'll need before your students arrive. Don't worry! Everything is designed to be done with simple classroom objects.

Thought Extenders: These key questions will get your students thinking about the meat of the math!

How-To Guide: The How-To Guide is a basic rundown to help you motivate the activity. We'll tell you to put the students in groups, or to project problems, or to start a discussion.

Content and Instruction Extras: Nearly every activity in this book contains a helpful note in order to get you going deper into the content and helping your students do the same.

Answer Key: On most activites, the answer key is on a separate page, but, when it's convenient, we've left it on the teacher notes to make it easier for you.

Partitioning Fractions

Section I

Partitioning Fractions (2.3A, 2.3B)

Vertical Alignment

Section I

In 1st grade, fractions are a geometry concept, not a number concept. Students partition figures into equal parts and then identify examples and nonexamples.

Students work with halves and fourths only.

Fractions are written as words, not as numbers.

1.6G Partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words.

1.6H Identify examples and non-examples of halves and fourths.

INTERVENTION

Have students partition geometric figures into equal-size parts. Focus on:

- Number of parts and the name of each part; writing the names in words.
- How many parts make a whole.
- Sizes of parts based on the number of parts in the whole.

In 2nd grade, students partition objects into fractional parts and call them by name. However they do not write the name as a fraction. The emphasis is on understanding what a fraction means, not its numerical representation. Students compare the sizes of fractional parts based on the number of parts the whole has been divided into.
Students work with halves, fourths, and eighths only.

2.3A Partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words.

2.3B Explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fraction parts, the larger the part.

2.3D Identify examples and non-examples of halves, fourths, and eighths.

ACCELERATION

Have students use different models to partition the same fraction. Have them answer questions such as these: How are these models alike? How are they different? What real world situation might this model describe?

In 3rd grade, students understand fractions as a number and use formal fraction notation. They use models to represent fractions and begin to place them with other numbers on a number line. Denominators of 3 and 6 are included along with 2, 4, and 8.

3.3A Represent fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models, including strip diagrams and number lines.

3.3B Determine the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line.

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IT'S ONLY FAIR TEACHER NOTES

SE 2.3A, 2.1A, 2.1C, 2.1D

Explore Fair Shares

Purpose This activity is an exploration of fair sharing. It builds on student understanding from first grade about partitioning objects into equal parts (1.6G) and sets the groundwork for discussions of parts of a whole.

Note: The purpose of this activity is to explore fair sharing. Do not expect students to use formal fraction vocabulary or symbols as they attempt to share the remaining cookies equally. Instead, focus on the question "Did you share the cookies fairly? How do you know?"

☑ Introduction	☐ Representing	☐ Area Model (Square)	☐ Tutoring/Intervention
☐ Practice	☐ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☐ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **It's Only Fair** for each group of students.
- ☐ Other materials:
  - ☐ **Scissors** and **glue** for each group
  - ☐ **Chart paper** or **bulletin board paper**: 1 sheet per group
  - ☐ **Markers**: 1 set per group

How-To Guide

1. Place students in groups of 4 and distribute materials.
2. Have students work together to solve the problem.
3. Once a group believes they have solved the problem (right or wrong), have them record their thinking on their **chart paper**.
4. Have groups present their solutions and explain the way they thought about the problem.

Thought Extenders

- Did you share the cookies fairly?
- How do you know?
- What does fair mean? (*That everyone gets the same amount*)
- Did each child get a whole cookie? More than a whole cookie? More than two whole cookies? More than three whole cookies?

Answer Key

Each child will get $3\frac{1}{2}$ *cookies.*

Note: Students may describe the sharing as "3 whole cookies and part of a cookie." The emphasis here is not on fractional naming or notation, but on the concept that whole objects can be broken down into smaller, equal parts.

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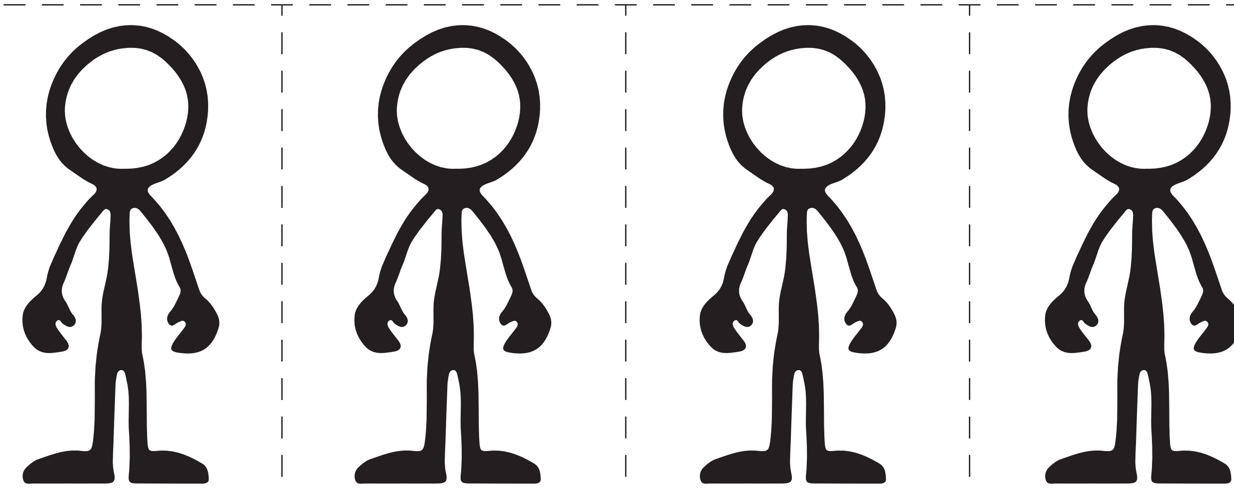
IT'S ONLY FAIR (PG. 1 OF 2)

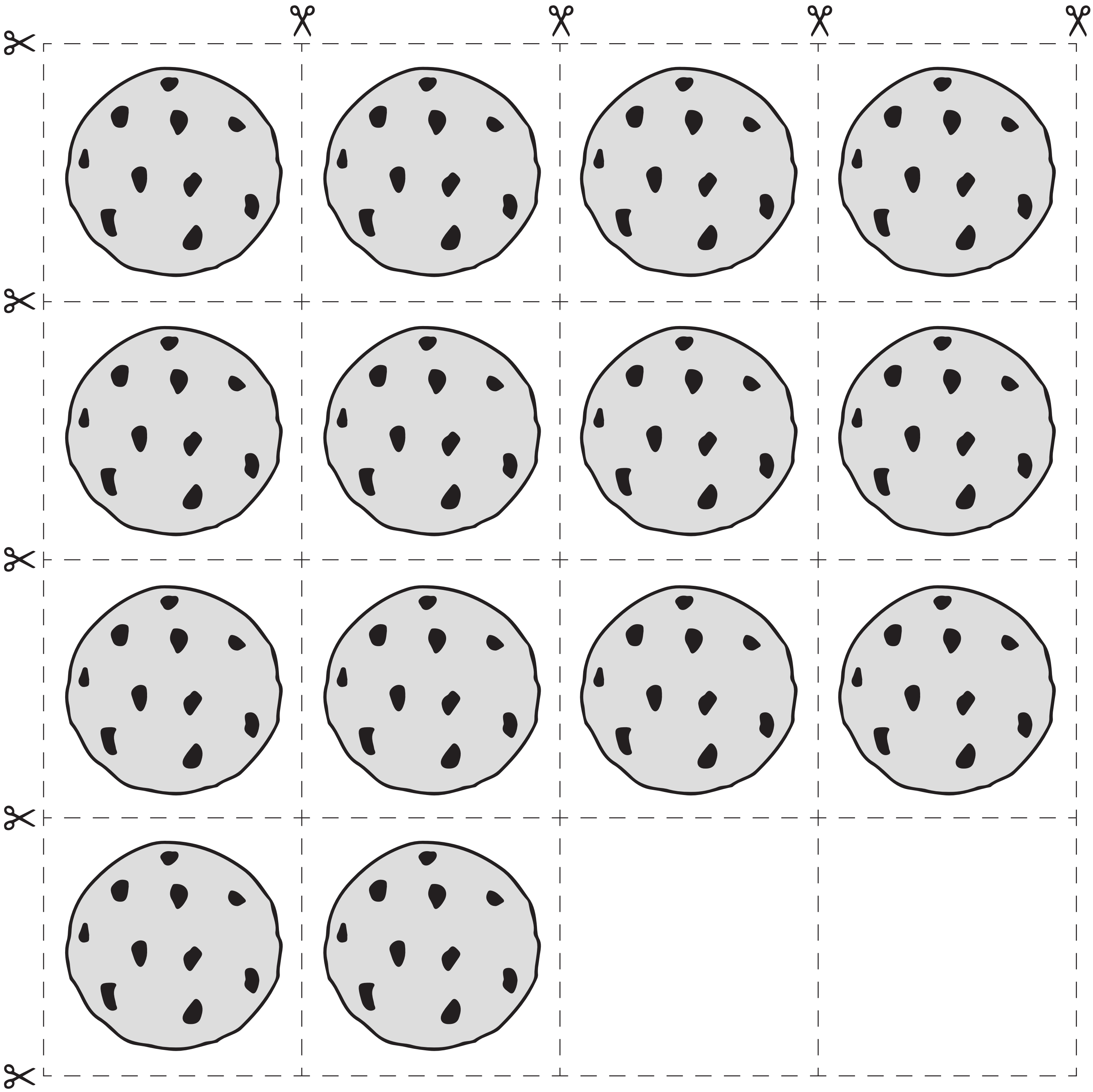
Directions:

1. Cut out the question. Glue it to the top of your chart paper.
2. Cut out the stick figures. Glue them to your chart paper.
3. Cut out the cookies. Use them to solve the problem.

4 children want to share 14 cookies. Each child will get the same amount. Use the cookie pictures to show how many cookies each child will get.



IT'S ONLY FAIR (PG. 2 OF 2)



NAME OF THE GAME TEACHER NOTES (PG. 1 OF 2)

SE 2.3A, 2.1D, 2.1E, 2.1F, 2.1G

Name Fractional Parts

Purpose The goal of this activity is to help students understand how a fractional part gets its name. The name of a fractional part (halves, fourths, eighths) comes from the number of equal pieces it takes to make one whole

Note: Students in Grade 2 write fractions as words, not numbers. The symbolic notation of fractions begins in Grade 3.

☐ Introduction	☐ Representing	☑ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☐ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

☐ Prepare **Name of the Game Example (Halves/Fourths/Eighths)** so they can be projected using your classroom technology.

☐ Make 1 copy of **Name of the Game Fraction Cards** for each pair of students.

☐ Make 1 copy of **Name of the Game Graphic Organizer** for each pair of students.

☐ Other materials:

- ☐ **Scissors** and **glue** for each group
- ☐ **Fraction circles**: 1 set per group

How-To Guide

1. Hand out **fraction circles**.
   - What do we call a circle that hasn't been divided into any smaller parts? *The whole*
   - Find the circle that represents the whole. What color is the whole?
   - Find 2 pieces that make the whole. What name would we give this fractional part? (*halves*) Why? *It takes 2 equal parts to make 1 whole.*
   - How many halves does it take to make 1 whole? *2 halves*
   - Look at **Name of the Game Example (Halves)**. What do we call the circle that hasn't been divided into any smaller parts? *The whole*
   - Look at the other circle. How many parts has it been divided into? Are they equal? *2; yes*
   - Does anyone know the names of these pieces? *Halves*
   - How many halves does it take to make 1 whole? *2 halves*
   - How would we fill in the sentences below the circles? *The whole has been divided into 2 equal parts. These parts are called halves because it takes 2 equal parts to make 1 whole.*
2. Repeat this process for **Name of the Game Example (Fourths)** and **Name of the Game Example (Eighths)**.
3. Post the examples in the classroom so students can use them for reference.
4. Hand out **Name of the Game Fraction Cards**, **Name of the Game Graphic Organizer**, **scissors**, and **glue**.
5. Have students cut out cards and then work together to complete the card sort identifying halves, fourths, and eighths.
6. Encourage students to use the sentence stem from the examples to justify and explain their thinking as they work.

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Idea

Use sentence strips to post the sentence stems from **Name of the Game Examples (Halves/Fourths/Eighths)** in the classroom.

Thought Extenders

- How many parts does it take to make the whole?
- How many equal-size parts has the whole been divided into?
- If a circle has been divided into eighths [halves; fourths], how many equal-size pieces are there?
- What is the name of this part? How do you know?

Meaning of Fractions (2.1D, 2.1E, 2.1F)

One of the most important understandings for children to develop in Grade 2 is that fractions are numbers too! Fractions are quantities and, just like whole numbers, they can be counted in order to find a total value. Just as you can have 2 or 4 of something, you can also have *1-half* or *1-fourth* of something.

There are multiple meanings of fractions. In Grade 2 the focus is on **equal sharing**, **part–whole** relationships, and **measurement**.

The **equal sharing** (division) meaning of fractions is natural to students as they think about how to divide 8 toys equally between 4 friends. Equal sharing understanding begins with discrete quantities (like toys, objects, etc.) and can be extended into an understanding using continuous quantities, such as situations where the whole can be cut into as many pieces as necessary (e.g., 1 pizza shared equally among 4 friends). Sharing tasks are the best way to begin initial discussions about fractions.

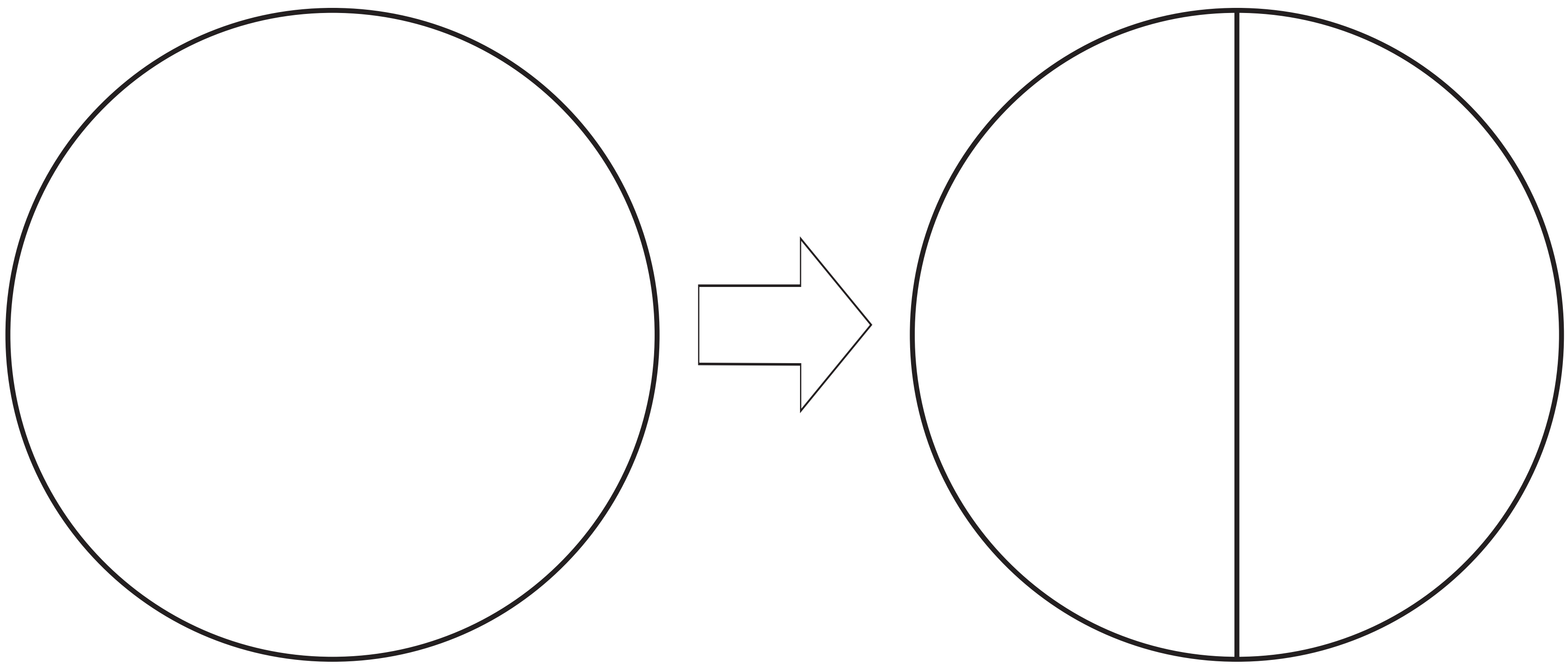
The **part–whole** meaning of fractions is the most common: a whole is partitioned into equal parts, and the fraction indicates the part of that whole. Part–whole relationships can also be used in groups or sets. For example, *1-fourth* of the children are wearing red shorts.

Finally, fractions naturally occur in **measurement** contexts. The most important part of fractions in measurement is making sure to clearly identify what makes up a whole unit. For example, when talking about fractions with time, the whole could be defined as 1 hour. When the minute hand makes 1 full sweep around the clock, 1 hour has passed. Halfway around the clock measures half of that time, or half of an hour, etc. When talking about fractions with linear measurement, identify whether the whole is 1 yard, 1 foot, or 1 inch. Just as a child uses multiple copies of 1 inch to measure an object that is a total of 6 inches long, they can also use multiple copies of halves to measure a distance (i.e., the pencil is *12-halves* long). Measurement provides an excellent context for starting conversations about practical, real-life application of fraction concepts.

What is Partitioning? (2.1D, 2.1F)

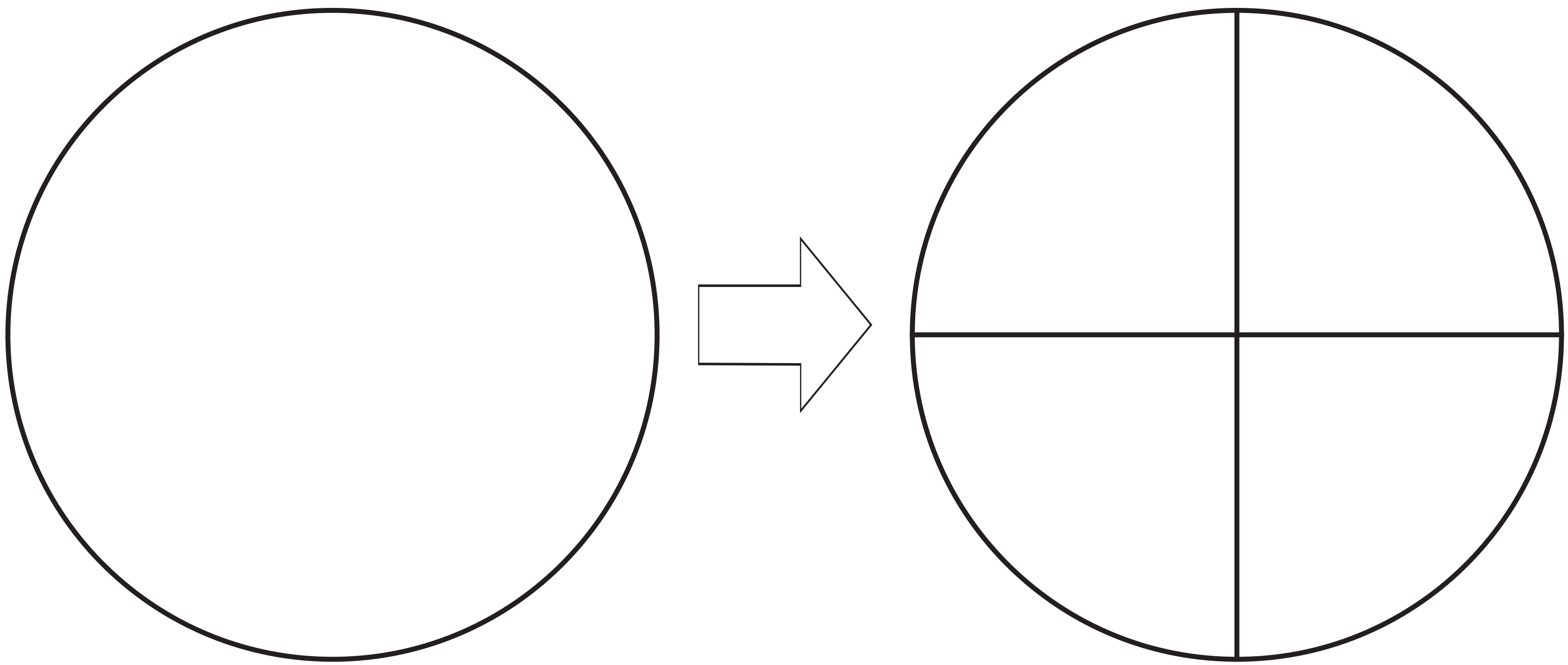
Partitioning is splitting or cutting a quantity equally. Young children partition using whole numbers very early on when they recognize that something hasn't been shared equally between themselves and their friends. In fact, partitioning can simply be thought of as fair sharing. If there are 6 objects and 2 children, each child should get 3 objects. If there is 1 object and 4 children, each child should get 1 of the 4 equal parts, or *1-fourth*. This idea should be spiraled throughout the year so that students are given many opportunities to experience partitioning within different contexts.

NAME OF THE GAME EXAMPLE (HALVES)



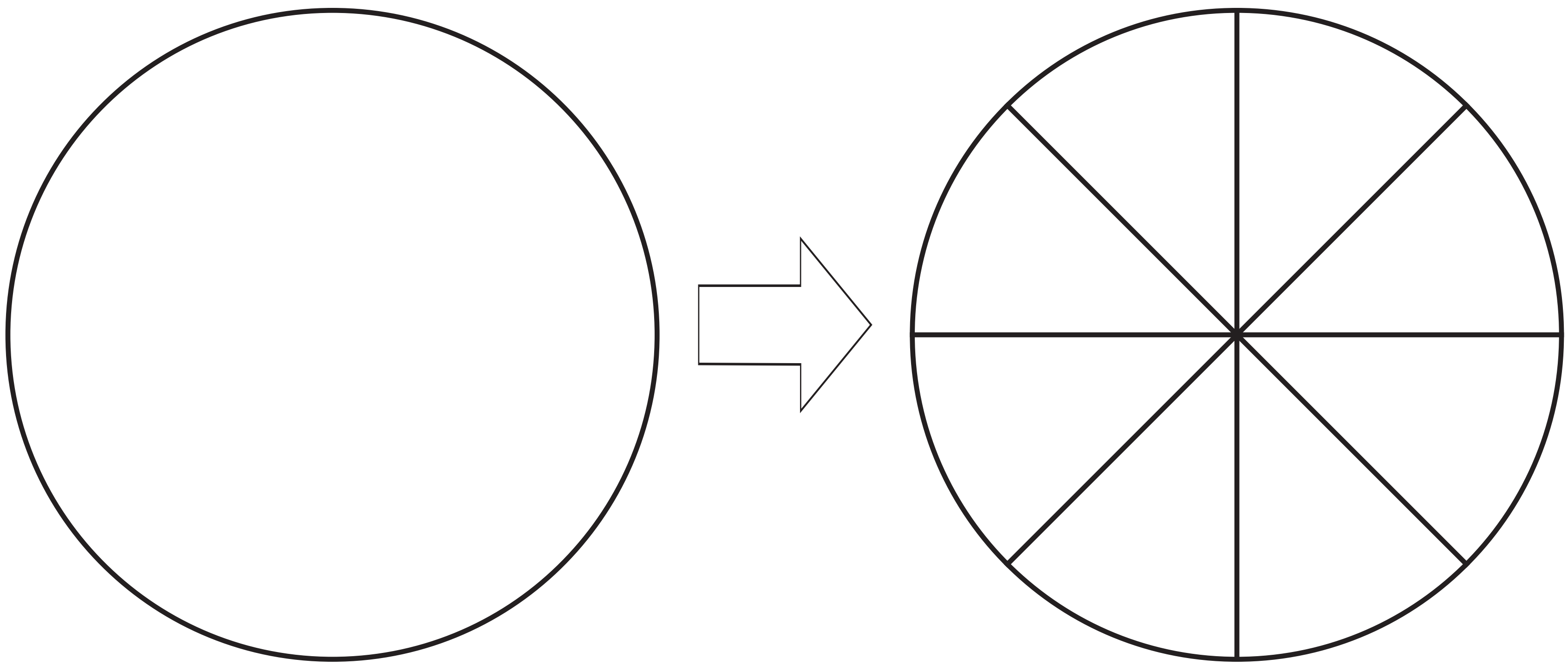
The whole has been divided into ______ equal parts. These parts are called _____________ because it takes ______ equal parts to make ______ whole.

NAME OF THE GAME EXAMPLE (FOURTHS)



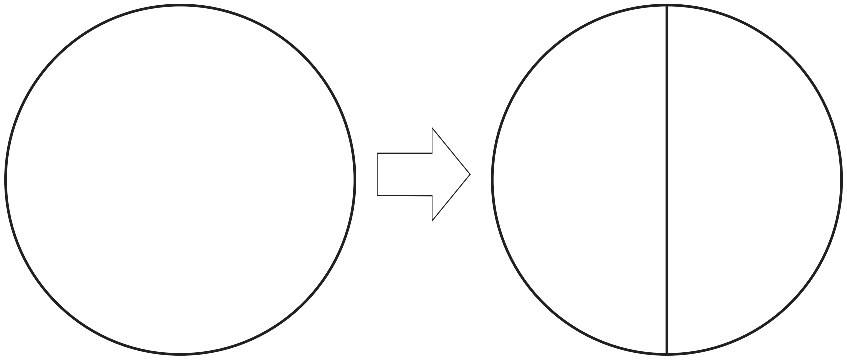
The whole has been divided into ______ equal parts. These parts are called _____________ because it takes ______ equal parts to make ______ whole.

NAME OF THE GAME EXAMPLE (EIGHTHS)

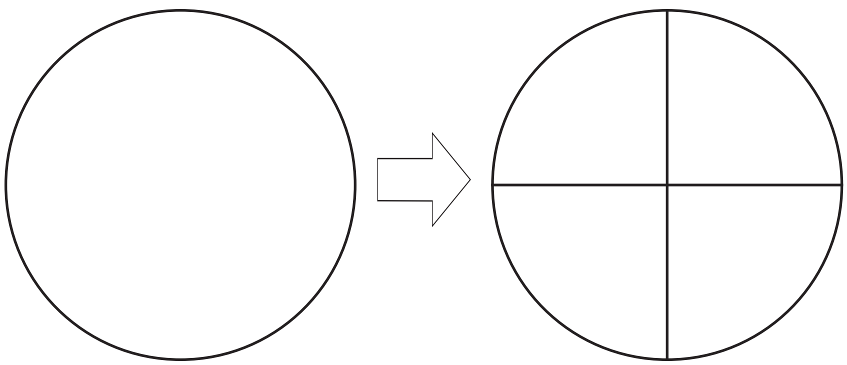


The whole has been divided into ______ equal parts. These parts are called _____________ because it takes ______ equal parts to make ______ whole.

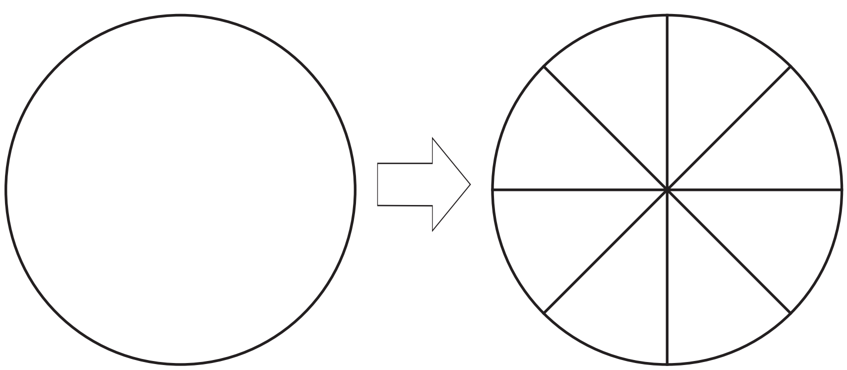
NAME OF THE GAME EXAMPLE ANSWER KEY



The whole has been divided into ___2___ equal parts. These parts are called ___halves___ because it takes ___2___ equal parts to make ___1___ whole.

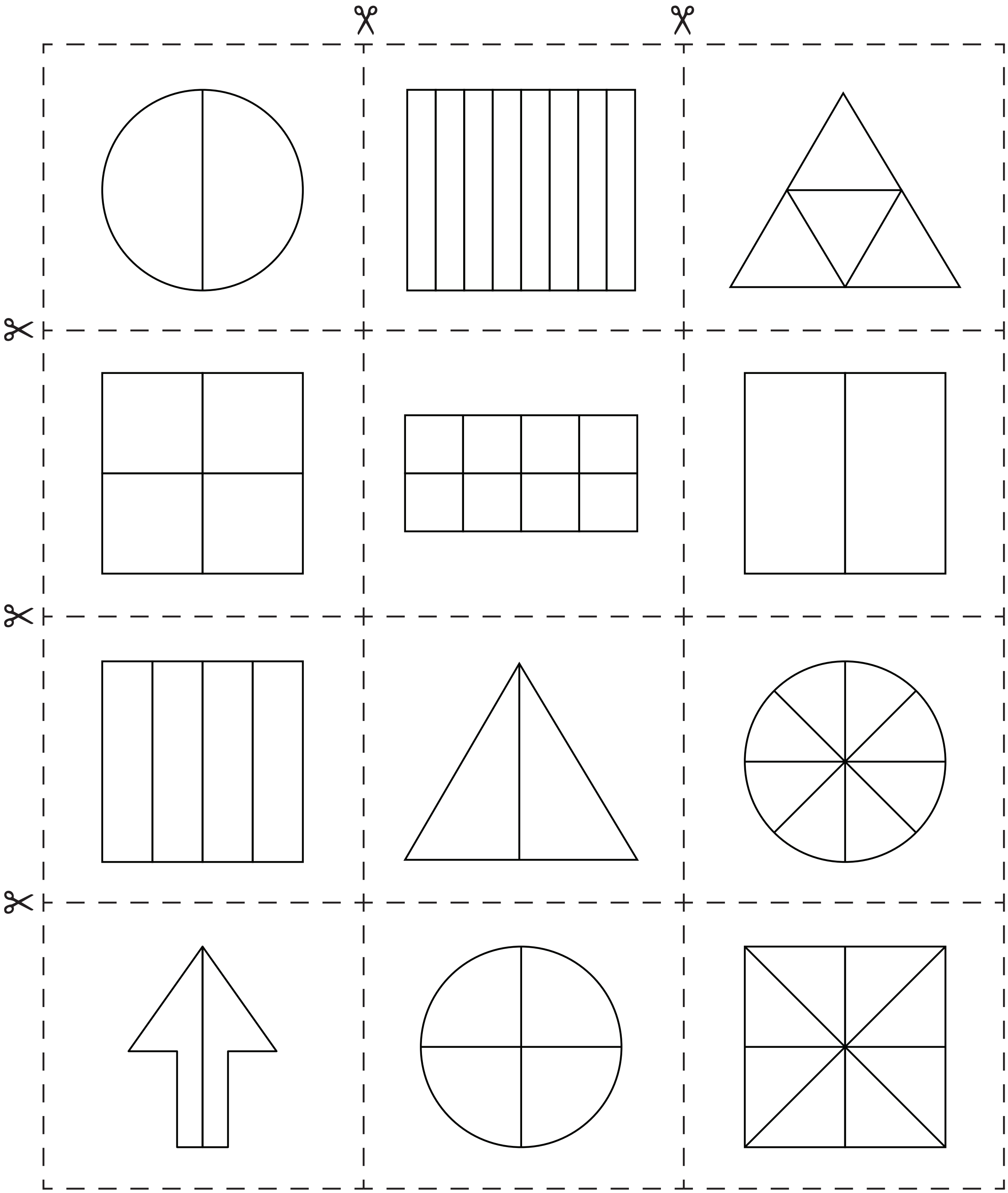


The whole has been divided into ___4___ equal parts. These parts are called ___fourths___ because it takes ___4___ equal parts to make ___1___ whole.



The whole has been divided into ___8___ equal parts. These parts are called ___eighths___ because it takes ___8___ equal parts to make ___1___ whole.

NAME OF THE GAME
FRACTION CARDS



NAME OF THE GAME
GRAPHIC ORGANIZER

Name: ______________________________

Halves	Fourths	Eighths

Journal

Explain how you sorted the cards.

FAIR SHARE TEACHER NOTES (PG. 1 OF 2)

SE 2.3A, 2.1A, 2.1C, 2.1D, 2.1E, 2.1G

Partition Wholes & Naming Fractional Parts Using Area Models (Squares)

Purpose In this activity, students use real-life examples to partition objects into halves, fourths, and eighths using area models that are square. They interpret the problem situation, partition the picture, explain their thinking in words, and identify the fractional parts.

☐ Introduction	☐ Representing	☑ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☐ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☐ Linear Model	☑ Teacher-Facilitated	☑ Challenge!

Setting Up For Instruction

- ☐ Prepare **Fair Share Example** so that it can be projected using your classroom technology.
- ☐ Make 1 copy of **Fair Share** for each pair of students.
- ☐ Make 1 copy of **Fair Share Journal** for each pair of students. Cut in half.
- ☐ Other materials:
  - ☐ (Optional) **Math journals** and **glue sticks**

Thought Extenders

- How many people are mentioned?
- How many objects are mentioned?
- How many pieces will you need to divide the whole into so everyone has the same amount?
- How will you draw a picture to represent your work?
- How will you write it in words?
- What are the fractional parts called? Why?

Idea

You may want to use sentence strips to write the *Explain in Words* and *Name the Parts* sentence stems and post them around the room. This will help students in the future as they justify their reasoning for naming fractional parts.

How-To Guide

1. Put students in pairs and hand out materials.
2. Work through **Fair Share Example** with your students.
   - How many friends are mentioned in the problem? *4*
   - How many sandwiches are mentioned in the problem? *1*
   - How many pieces will I need to cut the sandwich into? *4*
   - Does it matter if they are all the same size? Why? *Yes, they need to be the same size to be shared fairly.*
   - How can I partition (divide) the sandwich fairly? *Answers will vary, but should include a sandwich partitioned equally into 4 parts.*
   - Ask students to divide the sandwich into 4 equal-size pieces. It is likely that students will partition the sandwich in different ways. Have several students demonstrate their methods to the whole class.
   - How can I explain this in words? *I cut the sandwich into 4 equal parts because I wanted to share it fairly between 4 people.*
   - What are each of these parts called? Why? *These parts are called fourths because it takes 4 equal parts to make 1 whole.*
3. Have students work through the rest of the problems with their partners.
4. Have students respond individually to the journal prompt.

   (Optional) Have students glue their responses into their **math journals**.

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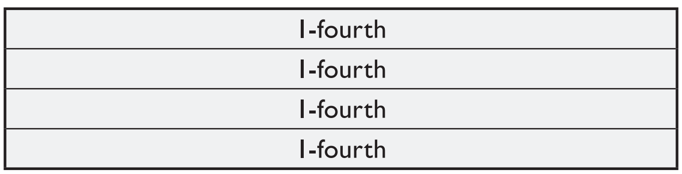
Understanding Regular Polygon Models for Fractions (2.1C, 2.1D 2.1E, 2.1G)

A polygon is considered regular when all angles and all sides are equal. Examples include equilateral triangles, squares, and stop signs (regular octagons).

TEKS 2.3A asks students to partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words. For this reason, it is important to start with models that are easy to draw and easy to partition. Because they are easier to draw, regular polygons such as squares and rectangles are often used when fraction instruction is just beginning. However, students in Grade 2 will need exposure to a wide variety of fraction models to develop a conceptual understanding of fractional parts. If students are only exposed to 1 or 2 models, their understanding will be limited, and they may develop misconceptions that fractions can only be represented in those 1 or 2 ways.

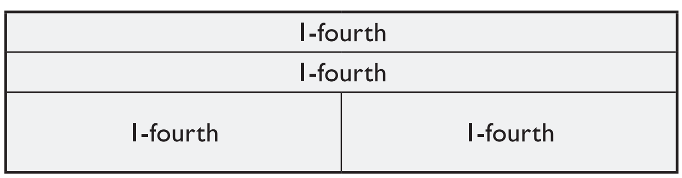
Meaning of *Equal* in Fractions (2.1B, 2.1C, 2.1D, 2.1G)

When fractions are called *equal*, it means that they take up the same amount of space (area) when compared to a same-size whole. The example below shows 2 identical rectangles. Each rectangle is divided into 4 equal-size parts, or fourths, but the fourths are different shapes.



Are all of the fourths equal, even though they are different shapes? Yes, because the same-size wholes are divided into 4 equal-size parts.

The rectangle below is partitioned into fourths in a different way. Each of the fourths is still half of a half.



This is a difficult concept for second graders to grasp. Students will need opportunities to explore this understanding. One way to reinforce this reasoning is to allow students to cut the shapes apart and then find a way to prove the areas are equal.

Another way to say that fractions are equal is to say that they are *equivalent*. Equivalent fractions have the same value (represent the same amount of the whole) even though they have different names. Read more about preparing students to understand equivalence in Springback Jack Shares (PG. 67).

Answer Key

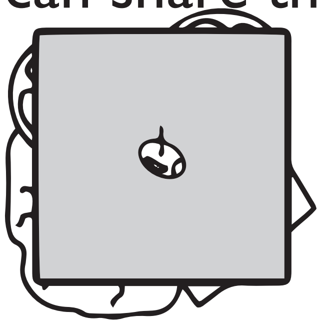
1. They cut the sandwich into *4* equal parts because *they shared it fairly with 4 people*. These parts are called *fourths* because it takes *4* equal parts to make *one* whole.
2. They broke the cracker into *2* equal parts because *they shared it fairly between 2 people*. These parts are called *halves* because it takes *2* equal parts to make *one* whole.
3. They cut the brownies into *8* equal parts because *they shared them fairly with 8 people*. These parts are called *eighths* because it takes *8* equal parts to make *one* whole.
4. ★ They cut each sandwich into *2* equal parts because *there are 2 sandwiches, and if each sandwich is cut into 2 parts, there are 4 parts total to share fairly with 4 people*. These parts are called *halves* because it takes *2* equal parts to make *one* whole. Note: Students may cut the sandwiches in 4 parts with each person getting 2 parts of each sandwich.

FAIR SHARE EXAMPLE

1 Four friends want to share one sandwich.

Partition the Picture

Show how they can share the sandwich fairly.



Explain in Words

The sandwich was divided into ________ equal parts because

Name the Parts

These parts are called ____________ because it takes ____________ equal parts to make _______ whole.

FAIR SHARE (PG. 1 OF 4)

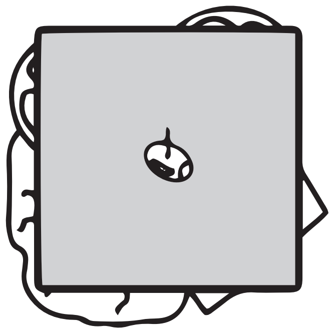
Name: ______________________________

Directions: Partition, explain, and name.

1 Four friends want to share one sandwich.

Partition the Picture

Show how they can share the sandwich fairly.



Explain in Words

The sandwich was divided into ________ equal parts because

Name the Parts

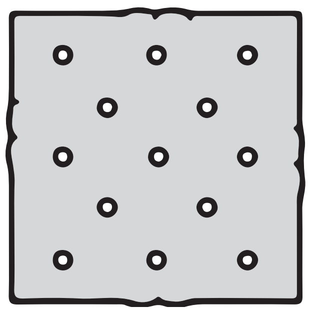
These parts are called ____________________ because it takes ____________ equal parts to make ____________ whole.

Name: ______________________________

2 Jorge and Beth want to share a graham cracker at snack time.

Partition the Picture

Show how they can share the graham cracker fairly.



Explain in Words

The graham cracker was divided into ________ equal parts because

Name the Parts

These parts are called ____________________ because it takes ____________ equal parts to make ____________ whole.

FAIR SHARE (PG. 3 OF 4)

Name: ______________________________

3 Jo Ann and her seven brothers want to share a pan of brownies.

Partition the Picture

Show how they can share the brownies fairly.

Explain in Words

They cut the brownies into ________ equal parts because

Name the Parts

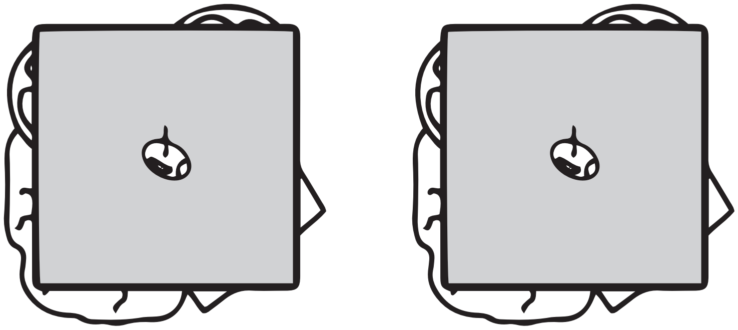
These parts are called ____________________ because it takes ____________ equal parts to make ____________ whole.

Name: ___________________________

★ 4 Four students want to share 2 sandwiches.

Partition the Picture

Show how they can share the sandwiches fairly.



Explain in Words

They cut each sandwich into ________ equal parts because

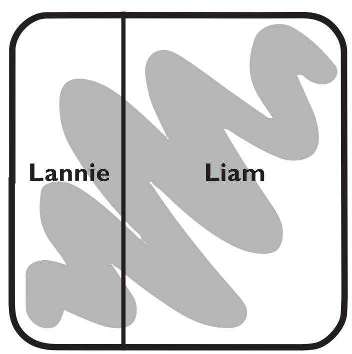
Name the Parts

These parts are called ___________________ because it takes ____________ equal parts to make ____________ whole.

FAIR SHARE JOURNAL

Name: ______________________

Liam wanted to share a piece of toast with his little brother Lannie. The picture below shows how he split the toast.

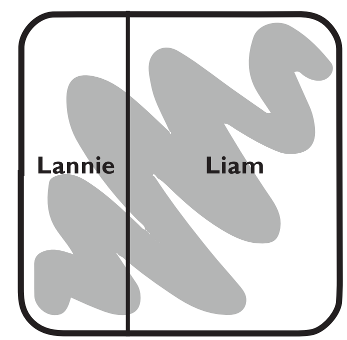


Lannie was upset! Liam didn't understand why. Explain why Lannie didn't feel like he got his fair share.

FAIR SHARE JOURNAL

Name: ______________________

Liam wanted to share a piece of toast with his little brother Lannie. The picture below shows how he split the toast.



Lannie was upset! Liam didn't understand why. Explain why Lannie didn't feel like he got his fair share.

PIECE OF CAKE TEACHER NOTES (PG. 1 OF 2)

SE 2.3A, 2.1A, 2.1C, 2.1D, 2.1E, 2.1G

Partition Wholes & Naming Fractional Parts Using Area Models (Circles)

Purpose In this activity, students use real-life examples to partition objects into halves, fourths, and eighths using area models that are circles. They interpret the problem situation, partition the picture, explain their thinking in words, and identify the fractional parts.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☐ Linear Model	☑ Teacher-Facilitated	☑ Challenge!

Setting Up For Instruction

- ☐ Prepare **Piece of Cake Example** so that it can be projected using your classroom technology.
- ☐ Make 1 copy of **Piece of Cake** for each pair of students.
- ☐ Make 1 copy of **Piece of Cake Journal** for each pair of students. Cut in half.
- ☐ Other materials:
  - ☐ (Optional) **Math journals** and **glue sticks**

Thought Extenders

- How many people are mentioned?
- How many objects are mentioned?
- How many pieces will you need to divide the whole into so everyone has the same amount?
- How will you draw a picture to represent your work?
- How will you write it in words?
- What are the fractional parts called? Why?

How-To Guide

1. Put students in pairs and hand out materials.
2. If you have not modeled these types of problems, work through **Piece of Cake Example** with your students.
   - How many people are mentioned in the problem? *2*
   - How many cakes are mentioned in the problem? *1*
   - How many pieces will I need to cut the cake into? *2*
   - Does it matter if the pieces are all the same size? *Yes, they need to be the same size to be shared fairly.*
   - How can I partition (divide) the cake fairly? *Answers will vary, but should include a cake partitioned equally into 2 parts.*
   - Ask students to divide the cake into 2 equal-size pieces. It is likely that students will draw the partition using different orientations. For example, one student may draw the partition vertically and another may draw it horizontally. Both are correct and are technically the same. However, students may not recognize that both are halves because of the different orientation. Have students demonstrate their methods to the whole class and discuss how orientation does not affect the equal size of the parts. They are still halves.
   - How can I explain this in words? *I cut the cake into 2 equal parts because I wanted to share it fairly between 2 people.*
   - What are each of these parts called? Why? *These parts are called halves because it takes 2 equal parts to make 1 whole.*
3. Have students work through the rest of the problems with their partners.
4. Have students respond individually to the journal prompt.

(Optional) Have students glue their responses into their **math journals**.

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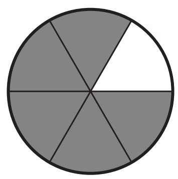
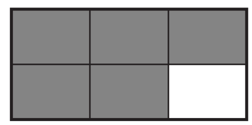
Understanding Area Models for Fractions (2.1C, 2.1D 2.1E, 2.1G)

Fraction models have different shapes that match real-life situations. Each type of model represents a different kind of real-life situation. Area models are used when a space or an object is broken into fractional parts. Some real-life examples of area models include pizza, sandwiches, and floor space. Fraction circles and fraction squares are the typical manipulatives used to represent these ideas.

Let's look at an example of an area model where the whole has been divided into 6 equal parts. This division gives the fraction its name: sixths. In the example below, 5 of the 6 equal parts are shaded to show that 5 of the sixths, or *5-sixths* of the whole is shaded.

Ex. Sam bought a pizza and ate *5-sixths* of it.





Using Word Walls to Support the Academic Vocabulary of Fractional Parts (2.1D, 2.1G)

The student expectations for Grade 2 lay the critical foundation for understanding fractional parts. It is important that students learn the language of fractions and use academic vocabulary when they talk about their work. Include the following words on your word wall and encourage students to use the words in their conversations about fractions.

- whole
- fractional part
- equal-size
- equal parts
- fair shares
- partition (divide, cut, split)
- halves
- fourths
- eighths

Here are some suggestions for getting the most out of your word walls.

- Provide students with sentence stems and allow them to choose words from the word wall to describe the model or picture.
- Create false statements and ask students to make them true. Replace the mistakes with the correct word or words.
- When you ask a question, require students to use words from the word wall in their responses. You can tell them how many words and/or which words you want them to use.
- When you ask a "why" question, have students rehearse their answers with a shoulder partner using word wall words and then come up with a group response. Once all the partners have a response, call on a group for their answer. It's "safer" to provide a group response than it is an individual response.
- Choose 2–3 words from the word wall and have students answer a journal prompt or a ticket-out-the-door using the words.

Answer Key

Student pictures will vary.

1. They cut the cake into *2* equal parts because *they needed to share it fairly with 2 people*. These parts are called *halves* because it takes *2* equal parts to make *one* whole.
2. They cut the cookie into *8* equal parts because *they needed to share it fairly with 8 people*. These parts are called *eighths* because it takes *8* equal parts to make *one* whole.
3. They cut the pizza into *4* equal parts because *they needed to share it fairly with 4 people*. These parts are called *fourths* because it takes *4* equal parts to make *one* whole.
4. ★ They cut each pizza into *4* equal parts because *there are 2 pizzas, and if each pizza is cut into 4 parts, there are 8 parts total to share fairly with 8 people*. These parts are called *fourths* because it takes *4* equal parts to make *one* whole.

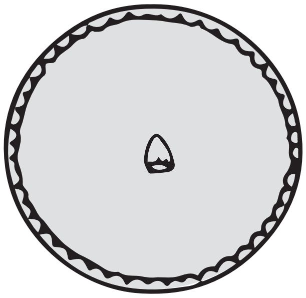
   Note: There is more than one correct answer.

PIECE OF CAKE EXAMPLE

1 A set of twins plans to share a strawberry cake for their birthday.

Partition the Picture

Show how they can share the cake fairly.



Explain in Words

They cut the cake into ________ equal parts because

Name the Parts

These parts are called ____________ because it takes ____________ equal parts to make ________ whole.

PIECE OF CAKE (PG. 1 OF 4)

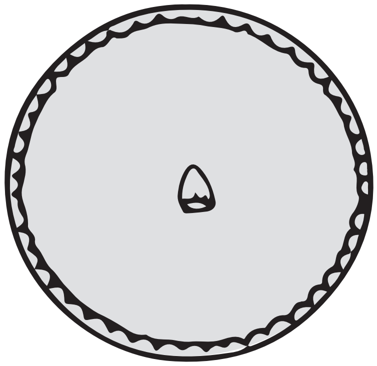
Name: ______________________________

Directions: Partition, explain, and name.

1 A set of twins plans to share a strawberry cake for their birthday.

Partition the Picture

Show how they can share the cake fairly.



Explain in Words

They cut the cake into ________ equal parts because

Name the Parts

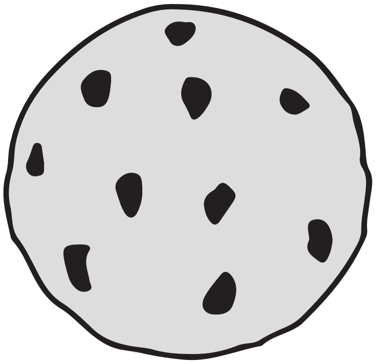
These parts are called ____________________ because it takes ____________ equal parts to make _______________ whole.

Name: ______________________________

2 The 2nd grade cooking class has 8 members. Together they made a giant cookie to share.

Partition the Picture

Show how they can share the giant cookie fairly.



Explain in Words

They cut the cookie into ________ equal parts because

Name the Parts

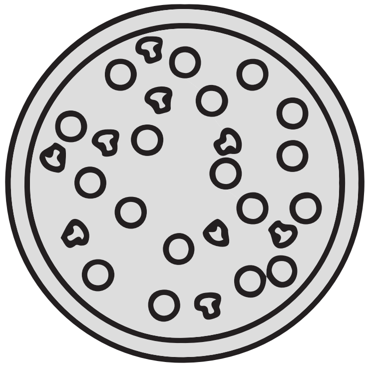
These parts are called ____________________ because it takes ____________ equal parts to make _______________ whole.

Name: ______________________________

3 Desmond and his three friends ordered a pizza.

Partition the Picture

Show how they can share the pizza fairly.



Explain in Words

They cut the pizza into ________ equal parts because

Name the Parts

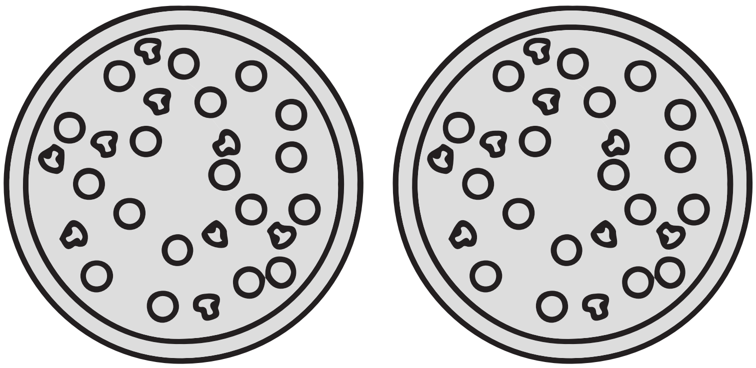
These parts are called ____________________ because it takes ____________ equal parts to make _______________ whole.

Name: ____________________________

4 Desmond invites more friends over and they order one more pizza. Now there are 8 people who want to share 2 pizzas.

Partition the Picture

Show how they can share the pizzas fairly.



Explain in Words

They cut each pizza into ________ equal parts because

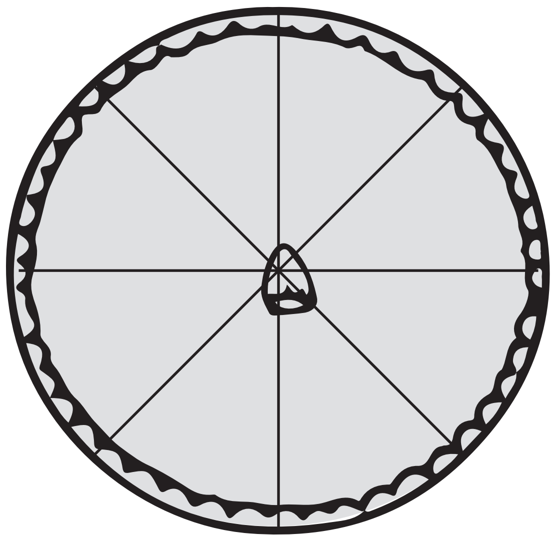
Name the Parts

These parts are called ____________________ because it takes ____________ equal parts to make _______________ whole.

PIECE OF CAKE JOURNAL

Name: ____________________

Adeline went to the bakery. She ordered a beautiful cake for herself and her seven close friends. She cut the cake as shown below.

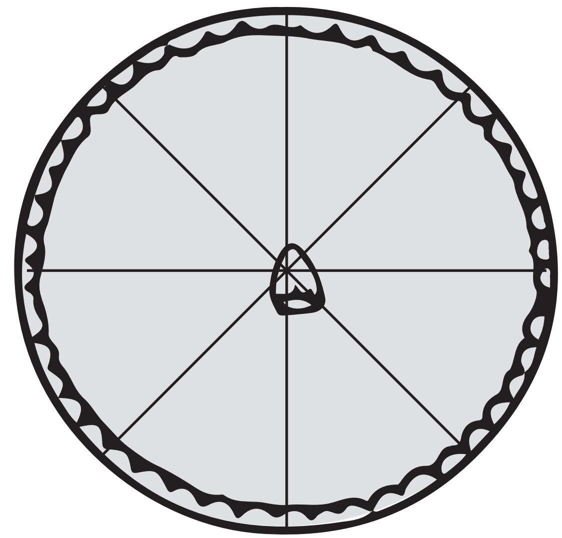


Did she share it fairly? Explain how you know.

PIECE OF CAKE JOURNAL

Name: ____________________

Adeline went to the bakery. She ordered a beautiful cake for herself and her seven close friends. She cut the cake as shown below.



Did she share it fairly? Explain how you know.

SE 2.3A, 2.1A, 2.1C, 2.1D, 2.1E, 2.1G

PICTURES, WORDS, NAMES TEACHER NOTES

Partition Wholes & Naming Fractional Parts Using Linear Models

Purpose In this activity, students use real-life examples to partition objects into halves, fourths, and eighths using linear models. They interpret the problem situation, partition the object, explain their thinking in words, and identify the fractional parts.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☐ Area Model (Circle)	☑ Small group
☐ Posttest	☑ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☑ Linear Model	☑ Teacher-Facilitated	☑ Challenge!

Setting Up For Instruction

- ☐ Prepare **Pictures, Words, Names Example** so that it can be projected using your classroom technology.
- ☐ Make 1 copy of **Pictures, Words, Names** for each pair of students.
- ☐ Make 1 copy of **Pictures, Words, Names Journal** for each pair of students. Cut in half.
- ☐ Other materials:
  - ☐ (Optional) **Math journals** and **glue sticks**

Thought Extenders

- How many people are mentioned?
- How many objects are mentioned?
- How many pieces will you need to divide the whole into so everyone has the same amount?
- How will you draw a picture to represent your work?
- How will you write it in words?
- What are the fractional parts called? Why?

How-To Guide

1. Put students in pairs and hand out materials.
2. If you have not modeled these types of problems, work through **Pictures, Words, Names Example** with your students.
   - How many people are mentioned in the problem? *8*
   - How many granola bars are mentioned in the problem? *1*
   - How many pieces will I need to cut the granola bar into? *8*
   - Does it matter if the pieces are all the same size? *Yes, they need to be the same size to be shared fairly.*
   - How can I partition (divide) the granola bar fairly? *Answers will vary, but should include a granola bar partitioned equally into 8 parts.*
   - Ask students to divide the granola bar into 8 equal-size pieces. It is likely that students will partition the granola bars in different ways. Have students demonstrate their methods to the whole class.
   - How can I explain this in words? *I cut the granola bar into 8 equal parts because I wanted to share it fairly between 8 people.*
   - What are each of these parts called? Why? *These parts are called eighths because it takes 8 equal parts to make 1 whole.*
3. Have students work through the rest of the problems with their partners.
4. Have students respond individually to the journal prompt.

(Optional) Have students glue their responses into their **math journals**.

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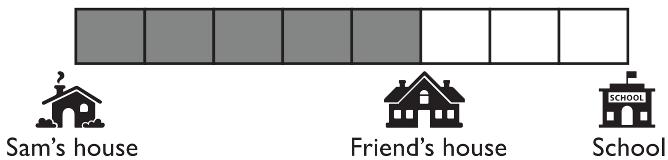
Understanding Linear Models for Fractions (2.1A, 2.1C, 2.1D, 2.1G)

Fraction models have different shapes that match real-life situations. Each type of model represents a different kind of real-life situation. Linear models are used when a length or distance is broken into fractional parts. Some real-life examples include the distance from home to school, or the length of a ribbon. Appropriate linear models for Grade 2 include strip diagrams, Cuisenaire rods, and line segments. These models provide teachers with flexibility because any length can represent the whole.

In the example below, the distance from home to school has been partitioned into 8 equal parts. This division gives the fraction its name: eighths. 5 of the 8 equal parts are shaded to show how far Sam must walk in order to meet up with his friend. Sam walks 5 of the eighths, or a total distance of *5-eighths*, to meet his friend.

Ex. Sam walked a distance of *5-eighths* to get from home to his friend's house.



Strip diagrams are commonly used to represent these ideas in Grade 2.

Creating & Using Strip Diagrams (2.1C, 2.1G)

Strip diagrams (paper strips) are commonly used as a linear model for fractional parts. Students use them to represent fractional parts by folding the strips into equal parts to represent halves, fourths and eighths. Strip diagrams can be created simply by cutting paper into strips. The length and width of the strips can vary but keeping the strips (the whole) the same length will allow students to compare the sizes of fractional parts. They will easily be able to see that the more parts the whole has been divided into, the smaller the parts and the fewer parts the whole has been divided into, the larger the parts. Connecting the notion of fewer parts to larger pieces and more parts to smaller pieces is difficult for most second graders. They will need many and varied opportunities to explore this concept.

Strip diagrams can be easily glued into a math journal where students can then write about their representations. (Hint: Make your strips to fit your journal pages!)

Answer Key

Student pictures will vary.

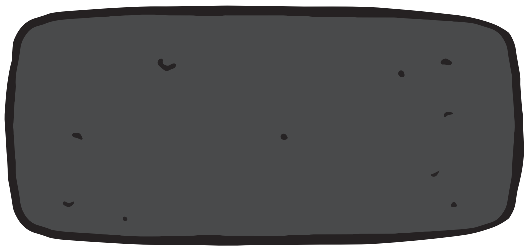
1. They cut the granola bar into *8* equal parts because *they needed to share it fairly with 8 people*. These parts are called *eighths* because it takes *8* equal parts to make *one* whole.
2. They split the stick of gum into *4* equal parts because *they needed to share it fairly with 4 people*. These parts are called *fourths* because it takes *4* equal parts to make *one* whole.
3. They cut the candy bar into *2* equal parts because *they needed to share it fairly with 2 people*. These parts are called *halves* because it takes *2* equal parts to make *one* whole.
4. ★ They cut each candy bar into *2* equal parts because *there are three candy bars, and if each one is cut into 2 parts, there are 6 parts total to share fairly with 6 people*. These parts are called *halves* because it takes *2* equal parts to make *one* whole. Note: There is more than one correct answer.

PICTURES, WORDS, NAMES EXAMPLE

1 Mira had one granola bar in her lunch. She shared it with her seven closest friends.

Partition the Picture

Show how they can share the granola bar fairly.



Explain in Words

They cut the granola bar into ________ equal parts because

Name the Parts

These parts are called ____________ because it takes ____________ equal parts to make ________ whole.

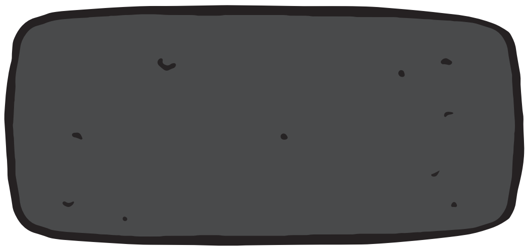
 Name: ______________________

Directions: Partition, explain, and name.

1 Mira had one granola bar in her lunch. She shared it with her seven closest friends.

Partition the Picture

Show how they can share the granola bar fairly.



Explain in Words

They cut the granola bar into ________ equal parts because

Name the Parts

These parts are called ____________________ because it takes ____________ equal parts to make ____________ whole.

Name: ____________________

2 Neesa and her three sisters wanted a stick of gum, but there was only one stick left.

Partition the Picture

Show how they can share the stick of gum fairly.

Explain in Words

They split the stick of gum into _______ equal parts because

Name the Parts

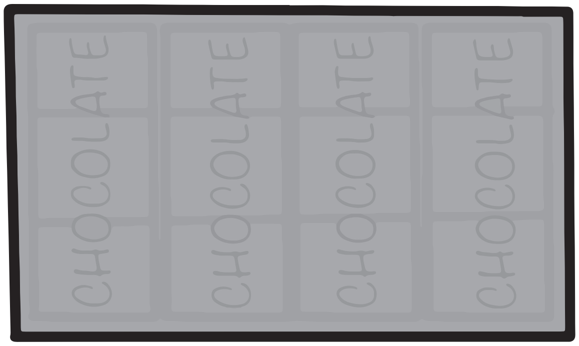
These parts are called ________________ because it takes __________ equal parts to make __________ whole.

 Name: ____________________

3 Samuel and Seiji bought a candy bar for $1.00.

Partition the Picture

Show how they can share the candy bar fairly.



Explain in Words

They cut the candy bar into ________ equal parts because

Name the Parts

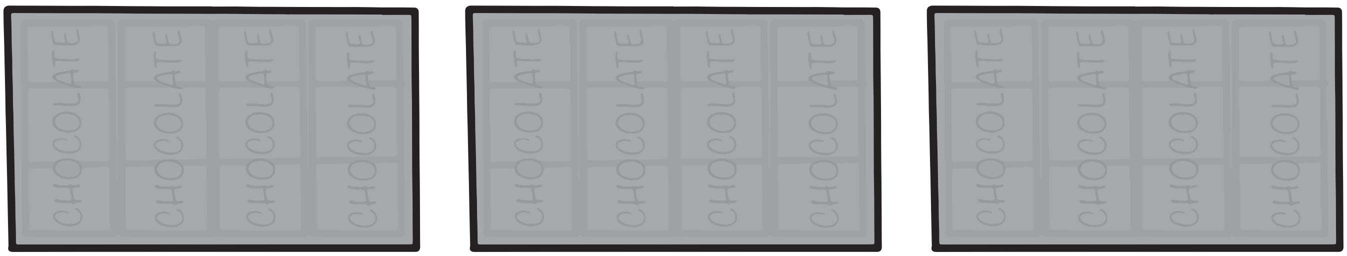
These parts are called __________________ because it takes ____________ equal parts to make ____________ whole.

 Name: ____________________

4 Samuel bought 3 candy bars because he liked them so much. He wanted to share the candy bars with 5 of his friends.

Partition the Picture

Show how they can share the candy bars fairly.



Explain in Words

They cut each candy bar into _______ equal parts because

Name the Parts

These parts are called ________________ because it takes __________ equal parts to make __________ whole.

PICTURES, WORDS, NAMES JOURNAL

Name: ____________________

While visiting Earth, Xanadu the Alien found a tasty worm. He wanted to share it with three of his alien friends.

Draw a picture to show how Xanadu and his three friends could share the worm fairly.

What is the name of your fractional part? __________

How do you know?

PICTURES, WORDS, NAMES JOURNAL

Name: ____________________

While visiting Earth, Xanadu the Alien found a tasty worm. He wanted to share it with three of his alien friends.

Draw a picture to show how Xanadu and his three friends could share the worm fairly.

What is the name of your fractional part? __________

How do you know?

SE 2.3A, 2.1B, 2.1C, 2.1D, 2.1F

Use Cuisenaire Rods to Identify Fractional Parts & Wholes

Purpose In this activity, students use Cuisenaire rods to identify and name fractional parts when given the whole. They also identify the whole when given the fractional part.

Note: This activity can be used to create a math center. After working through this activity with your students, write question cards to accompany the Cuisenaire rods and place them in a center. Allow students to explore the Cuisenaire rods and create questions of their own.

★ Extension: Challenge students who understand halves, fourths, and eighths to find other fractional parts such as thirds and sixths. Students do not need to formally identify thirds and sixths. The focus should be on identifying equal-size fractional parts.

☐ Introduction	☑ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☐ Area Model (Circle)	☐ Small group
☐ Posttest	☑ Examples/Non-examples	☐ Any Model	☑ Centers
☐ Partitioning	☑ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **How Do You Know? Journal** for each pair of students. Cut in half.
- ☐ Other materials:
  - ☐ **Cuisenaire rods**: 1 set per student pair.
    Note: If you have never used Cuisenaire rods, read the *Modeling Fractions with Cuisenaire Rods* (PG. 49).
  - ☐ **Colored pencils**: 1 box per student
  - ☐ (Optional) **Math journals** and **glue sticks**

Thought Extenders

- How many parts is the whole broken into? How do you know?
- If a whole is broken into _______ [halves; fourths; eighths], how many parts has the whole been partitioned into?
- If _______ represents the whole, what are some different ways to partition 1 whole?
- How many parts does it take to make 1 whole?
- How many more parts do you need to make 1 whole?
- What does partition mean?
- If _______ represents 1-fourth, how can you find 1 whole?

Answer Key

1. *White; it takes 2 equal whites to make 1 red.*
2. *Purple; it takes 2 equal reds to make 1 purple.*
3. *Brown; it takes 4 equal reds to make 1 brown.*

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How-To Guide

1. Put students in pairs or groups and hand out materials.
2. Facilitate a discussion using the questions below and have students work together to answer each question.

   Some of the questions below include non-examples. Non-examples are just as important as examples when verifying that students understand fractional parts. Having students identify non-examples and explain their reasoning is an easy way to informally assess their understanding and to build rigor.

   Determining Halves. Ask students to pull an orange rod from the set of Cuisenaire rods.

   - If the orange rod is 1 whole, what color rods represent halves? *Yellow*
   - How do you know the yellow rods are halves? *It takes 2 equal yellow rods to make 1 orange rod.*
   - How many halves does it take to make 1 whole? *2*
   - If yellow is 1 whole, what color rods represent halves? *There are not 2 equal rods in the set that make 1 yellow rod.*
   - Repeat the process to find halves using different colors (dark green, red) to represent 1 whole.

   Determining Fourths. Ask students to pull a brown rod from the set of Cuisenaire rods.

   - If the brown rod is 1 whole, what color rods represent fourths? *Red*
   - How do you know the red rods are fourths? *It takes 4 equal red rods to make 1 brown rod.*
   - How many fourths does it take to make 1 whole? *4*
   - If dark blue is 1 whole, what color rods represent fourths? *There are not 4 equal rods in the set that make 1 blue rod.*

   Determining Eighths. Ask students to pull a brown rod from the set of Cuisenaire rods.

   - If the brown rod is 1 whole, what color rods represent eighths? *White*
   - How do you know the white rods are eighths? *It takes 8 equal white rods to make 1 brown rod.*
   - How many eighths does it take to make 1 whole? *8*

   Determining the Whole.

   - If the red rods are halves, what color rod represents the whole? *Purple*

     How do you know? *To be called halves, 2 equal parts must make 1 whole. 2 equal red rods make 1 purple rod.*
   - If the white rods are fourths, what color rod represents the whole? *Purple*

     How do you know? *To be called fourths, 4 equal parts must make 1 whole. 4 equal white rods make 1 purple rod.*
   - If lime green rods are fourths, what color rod represents 1 whole? *There is no rod in the set that is the same length as 4 lime green rods.*

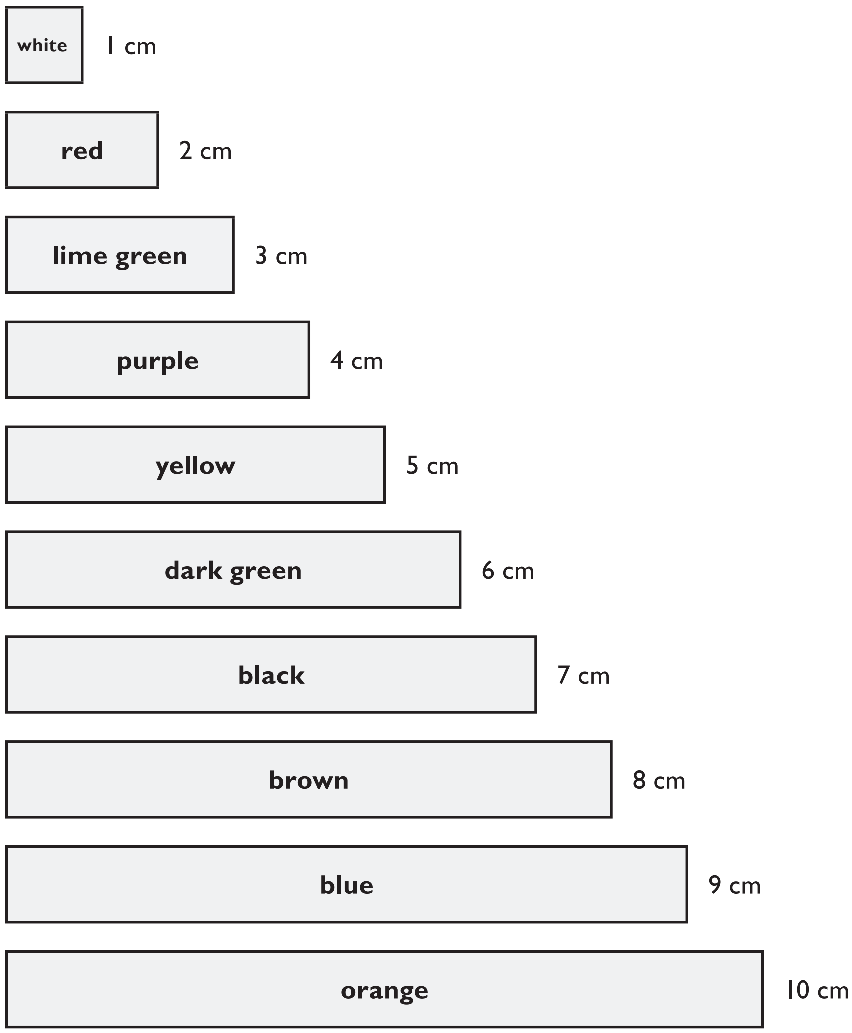
     Note: If a student combines an orange rod and a red rod to make the whole, that is a correct answer. However, Grade 2 students are not expected to do this.
   - If the purple rods are halves, what color rod represents the whole? *Brown*

     How do you know? *To be called halves, 2 equal parts must make 1 whole. 2 equal purple rods make 1 brown rod.*
3. Hand out **How Do You Know? Journal**. Ask students to work independently to model using Cuisenaire rods, draw and color a picture of the model, and explain their thinking.

   (Optional) Have students glue their responses into their **math journals**.

Why Use Cuisenaire Rods? (2.1C, 2.1D, 2.1F)

Cuisenaire rods are linear fraction models. They are the perfect hands-on manipulative for students as they prepare to learn more about the nature of fractions. Cuisenaire rods are a collection of 10 rods, each of a different color and size. The shortest rod (white) is 1 centimeter long and the longest (orange) is 10 centimeters long. The rods in between increase in size by 1 centimeter each.



Students' initial fraction experiences are often limited to area models such as circles and squares. They add to their understanding of fractions when they use models such as Cuisenaire rods and strip diagrams since these models allow them to also think about fractions in terms of length. When Grade 2 students develop these foundational understandings, the transition to understanding fractional parts of a line segment is far more natural and seamless. As a result, students are primed to understand fractions on a number line in Grades 3–5.

Modeling Fractions with Cuisenaire Rods (2.1C, 2.1D, 2.1F)

Cuisenaire rods are an excellent manipulative to help students explore different size wholes. Be sure to give students plenty of experience using rods of different sizes as the whole and asking them to find which color rod could be used to represent a given fractional part. Another option is to give students the fractional part and ask them to find 1 whole.

Example 1: Given the whole, find the fractional part.

If the orange rod represents 1 whole, which color rod would represent halves?

Orange = 1 whole	
Yellow (half)	Yellow (half)

Students need to reason that it would take 2 equal yellow rods to make 1 whole orange rod, so the yellow rods represent halves. Students should also recognize that it takes 2 parts called halves, or 2-halves, to make 1 whole.

Example 2: Given the whole, find the fractional part.

If the brown rod represents 1 whole, which color rod would represent fourths?

Brown = 1 whole			
Red (Fourth)	Red (Fourth)	Red (Fourth)	Red (Fourth)

Students should reason that it would take 4 equal red rods to make 1 whole brown rod, so the red rods represent fourths. Students should also recognize that it takes 4 parts called fourths, or 4-fourths, to make 1 whole.

Example 3: Given the fractional part, find the whole.

If the white rods represent fourths, which color rod would represent 1 whole?

White (fourth)	White (fourth)	White (fourth)	White (fourth)
Purple = 1 whole			

Students need to reason that it takes 4 equal parts to make 1 whole in order for the fraction to be named fourths. Therefore, 4 white rods are needed to figure out the length of 1 whole. 4 equal white rods, or 4-fourths, make 1 whole purple rod, making purple the whole.

Cuisenaire rods lay the groundwork for understanding fractional parts of a line segment. Cuisenaire rods help students see that they should be counting the spaces on the line segment, not the hash marks. Activity Parts & Points will give students the opportunity to extend their understanding of linear models as they transition from paper fraction strips to line segments.

For a virtual set of Cuisenaire rods, visit ***tinyurl.com/TransformRods***.

HOW DO YOU KNOW? JOURNAL

Name: ____________________

Directions: Model. Then draw and color your answer. Explain your answer in words.

1. If red is the whole, which color rod is half? How do you know?

2. If red is half, which color rod is the whole? How do you know?

3. If red is fourths, which color rod is the whole? How do you know?

HOW DO YOU KNOW? JOURNAL

Name: ____________________

Directions: Model. Then draw and color your answer. Explain your answer in words.

1. If red is the whole, which color rod is half? How do you know?

2. If red is half, which color rod is the whole? How do you know?

3. If red is fourths, which color rod is the whole? How do you know?

PARTS & POINTS TEACHER NOTES (PG. 1 OF 3)

Fractional Parts of Strips & Line Segments

Purpose In this activity, students will represent fractional parts using fraction strips and then extend their understanding of linear models for fractions to the line. This learning sets the foundation for identifying fractions on a number line.

☐ Introduction	☑ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☐ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☐ Partitioning	☑ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Prepare **Parts & Points Example** so that it can be projected using classroom technology.
- ☐ Make 1 copy of **Parts & Points Fraction Strips** for each student.
- ☐ Make 1 copy of **Parts & Points** for each student.
- ☐ Other materials:
  - ☐ **Scissors** and **glue** for each student
  - ☐ **Highlighters**: 2 different colors for each group

Thought Extenders

- When you folded the rectangle, how many parts did you make?
- How many parts does it take to make 1 whole?
- How do you know that you have folded fractional parts?

How-To Guide

1. Put students in pairs and hand out materials.
2. Use **Parts & Points Example** to work through Problem #1.
   - Ask students to cut out Fraction Strip 1.
   - Ask students to fold the strip to show halves and draw a line on the crease.
   - How did you fold the strip to show halves? *Fold the strip down the middle.*

     Note: Some students may try to fold the strip horizontally instead of vertically.
   - How do you know that the strip is folded into halves? *There are 2 equal-size parts.*
   - Glue the strip in the box above the line in Problem #1.
   - Use the crease mark on the strip to help you place the hash mark on the line to show halves.
   - How many parts is the line divided into? *2*
   - What do we call these parts and why? *Halves, because it takes 2 equal parts to make the line.*
   - Use 2 different colors to shade the equal parts of the line. Then fill in the statements.
3. Have students work together to complete the remaining problems. For each problem:
   - Cut out the strip and match it to the correct line.
   - Fold the strip to show the fractional parts listed on the problem and draw a line in each crease.
   - Glue the strip in the box above the matching line.
   - Use each crease mark on the strip to help you place hash marks on the line.
   - Highlight each section of the line using alternating colors to show the fractional parts.
   - Complete the statements.

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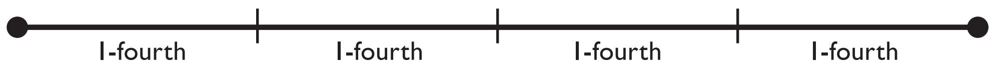
From Strip Diagrams to Number Lines (2.1C, 2.1D, 2.1G)

Linear models such as strip diagrams and Cuisenaire rods provide an excellent bridge to understanding fractional parts on a line segment. Linear models can lead students to understanding fractions on a number line, which is the most abstract of the linear models. Study the progression below.

Grade 2

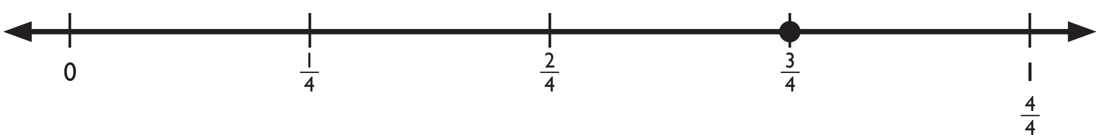
The strip diagram has been divided into 4 equal parts. The name of these parts is *fourths*. It takes *4-fourths* to make 1 whole.



The line segment has been partitioned into 4 equal parts. The name of these parts is *fourths*. It takes *4-fourths* to make 1 whole.

Grade 3

The linear models we use in Grade 2 build the perfect bridge to understanding fractions on a number line in Grade 3. In the example below, each interval still represents *1-fourth* of the whole. However, a number line represents a continuous count of units. In other words, as we count from zero on the number line (*1-fourth, 2-fourths, 3-fourths*), the location of *3-fourths* represents a total distance of 3 units of *1-fourth*.



Why are Linear Models More Difficult Than Area Models? (2.1A, 2.1C, 2.1D 2.1G)

Don't be surprised if students are able to make complete sense of one model for fractions and not another. Many students are more comfortable working with area models because they can easily picture the parts of the whole. Linear models, on the other hand, are often a challenge for second graders. They sometimes struggle with thinking of a length as a whole. They also have difficulty transitioning from seeing fractional parts as areas or regions to seeing them as lengths or measurements.

Don't let student stumbling blocks steer you away from using linear models in your classroom. They are both important and necessary. These models play a vital role in preparing students for work with fractions on a number line in Grade 3 and beyond. (To see how linear models build to the number line, read *Understanding Linear Models for Fractions* in Pictures, Words, Names on PG. 39.)

Watch out for the following misconceptions when partitioning lines in Grade 2.

- Students may ignore the size of the intervals.
- Students may want to count the hash marks rather than the equal spaces between the hash marks.

Simple reminders will help redirect student thinking.

- Fractional parts are equal parts of a whole, even when the whole is a line!
- The equal sections of the line are the fractional parts. We are counting the equal sections of the line, not the hash marks.

You can support students' understanding of linear models by using real-world contexts such as partitioning equal lengths of ribbon or showing equal distances in a relay race. A linear model supports this type of thinking much better than an area model. Providing students with these types of experiences will help them understand that fractional parts can also be lengths or measurements.

Lines & Line Segments (2.1D)

In TEKS 2.3A, students are expected to "partition objects into equal parts." The student expectation doesn't define which objects students are supposed to work with. In the Math TEKS Supporting Information, we get a little more information. The clarification says that "the objects may be one- or two-dimensional in form, such as strips, lines, regular polygons, or circles." The word *line* is problematic.

Technically a line goes on forever in 2 directions. It has no thickness. We usually show a line in geometry like this:

Since the line goes on forever and ever in both directions, it can't be divided into equal parts.

So what does TEA mean by the word *line* in the 2nd grade TEKS? They are using *line* in an informal way, to mean a figure like this one:

A geometry teacher might call this a *line segment*. However, the formal definition of *line segment* does not appear in the Texas student expectations until 4th grade. Therefore, it isn't necessary that we require 2nd graders to know or use the term *line segment*.

What's a 2nd grade teacher to do? For the purposes of this book, we use the formal term *line segment* on the Teacher pages. But on the Student pages, we use the informal meaning of the word *line*. (In some cases, we put points on the ends of the line so that it's easy to see the ends.) If you have 2nd graders who want to call it a line segment, they are correct. Let them call it by its proper name—just don't require it!

Answer Key

1. The strip is divided into *2* equal parts. These parts are called *halves* because *it takes 2 equal parts to make 1 whole*.
2. The strip is divided into *2* equal parts. These parts are called *halves* because *it takes 2 equal parts to make 1 whole*.
3. The strip is divided into *4* equal parts. These parts are called *fourths* because *it takes 4 equal parts to make 1 whole*.
4. The strip is divided into *4* equal parts. These parts are called *fourths* because *it takes 4 equal parts to make 1 whole*.
5. The strip is divided into *8* equal parts. These parts are called *eighths* because *it takes 8 equal parts to make 1 whole*.
6. The strip is divided into *8* equal parts. These parts are called *eighths* because *it takes 8 equal parts to make 1 whole*.

Journal

Compare Problem #3 and Problem #4. Both strips are divided into fourths. The fourths are different sizes. Why?

The wholes are different sizes.

PARTS & POINTS EXAMPLE

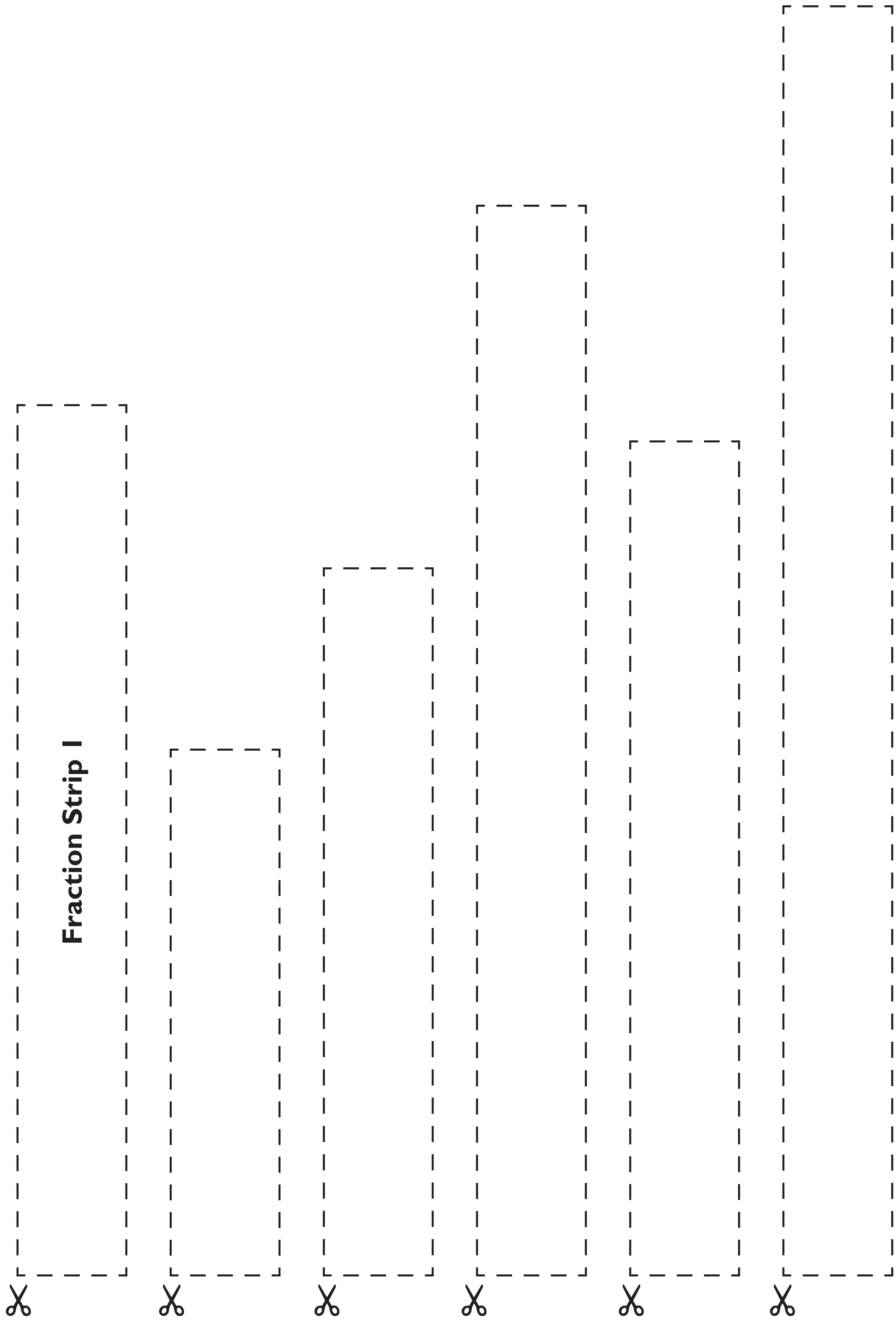
Directions: Match the strips to the rectangles. Then fold them. Draw a line on the folds and mark the lines to match.

1

Show **halves.**

The strip is divided into ____________ equal parts. These parts are called ________________ ____________ because ____.

PARTS & POINTS FRACTION STRIPS



PARTS & POINTS (PG. 1 OF 3)

Name: ______________________

Directions: Match the strips to the rectangles. Then fold them. Draw a line on the folds and mark the lines to match.

1

Show **halves.**

The strip is divided into ______________ equal parts. These parts are called ____________ because ________
____.

2

Show **halves.**

The strip is divided into ______________ equal parts. These parts are called ____________ because ________
____.

PARTS & POINTS (PG. 2 OF 3)

Name: ____________________

3

Show **fourths.**

The strip is divided into ____________ equal parts. These parts are called ____________ because ____________

____.

4

Show **fourths.**

The strip is divided into ____________ equal parts. These parts are called ____________ because ____________

____.

PARTS & POINTS (PG. 3 OF 3)

Name: ____________________

5

Show **eighths.**

The strip is divided into ______________ equal parts. These parts are called ____________ because __________ ____.

6

Show **eighths.**

The strip is divided into ______________ equal parts. These parts are called ____________ because __________ ____.

Journal

Compare Problem #3 and Problem #4. Both strips are divided into fourths. The fourths are different sizes. Why?

LINES, WORDS, & PARTS TEACHER NOTES (PG. 1 OF 2)

SE: 2.3A, 2.1A, 2.1D, 2.1G

Partition Line Segments

Purpose In this activity, students partition line segments into fractional parts and explain their thinking.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☐ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☑ Centers
☑ Partitioning	☑ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **Lines, Words, & Parts** for each student.
- ☐ Make 1 copy of **Lines, Words, & Parts Journal** for each pair of students. Cut in half.
- ☐ Other materials:
  - ☐ **Highlighters**: 2 different colors for each student pair
  - ☐ (Optional) **Math journals** and **glue sticks**

How-To Guide

1. Put students in pairs and hand out materials.
2. Have students work together to solve the problems.
3. Have students respond individually to the journal prompt.
   (Optional) Have students glue their responses into their **math journals**.

Thought Extenders

- When you divided the line, how many parts did you make?
- How many parts does it take to make 1 whole?
- How do you know that you have divided the line into fractional parts?

Answer Key

1. The race was divided into _4_ equal parts because _there were 4 runners, and each ran the same distance_. These parts are called _fourths_ because it takes _4_ equal parts to make _one_ whole.
2. They split the rope into _8_ equal parts because _there were 8 students and each student painted the same amount of the rope_. These parts are called _eighths_ because it takes _8_ equal parts to make _one_ whole.
3. They divided the distance into _2_ equal parts because _each sister got to ride the bike the same distance (halfway)_. These parts are called _halves_ because it takes _2_ equal parts to make _one_ whole.
4. They cut the ribbon into _4_ equal parts because _they needed to share fairly with 4 people_. These parts are called _fourths_ because it takes _4_ equal parts to make _one_ whole.

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Why Don't We Use Fraction Symbols in 2nd Grade? (2.1D, 2.1G)

For many elementary and middle school students, fraction concepts are difficult to understand. Many students lack the fraction foundations necessary to understand the math they are expected to do with fractions in the upper grades. As a result, students use rules and processes incorrectly because they don't understand when to apply the rules and processes. This misunderstanding often begins with fraction notation.

By focusing on the conceptual development of fractional parts in Grade 2, we set the course for future success! In 2nd grade, students learn what fractional parts are. They learn the language and vocabulary of fractions and become fluent in defining, identifying, naming, and counting fractional parts. Students gain exposure to, and experience with, a wide variety of models including area models and linear models so that they see fractions in a variety of ways and begin to compare the relative sizes of fractional parts. With sufficient time and appropriate experiences, Grade 2 students speak fluently about fractional parts, and deeply understand the meaning of fractions.

Since the goal is to make sense of fractions in Grade 2, there is no need to complicate matters by throwing fraction symbolism into the mix. For this reason, writing the symbolic notation of fractions using numbers is reserved for discussion and implementation in Grade 3.

Taking time to develop the conceptual understanding of fractions will pay big dividends in the future!

Partitioning Line Segments (2.1B, 2.1C)

When students solve a fraction problem they must first identify the whole and then partition the whole into the required number of equal parts. For line segments, identifying the fractional parts can be challenging. Many students count the hashmarks when they should count the spaces between the hashmarks.

Here are some strategies to avoid developing this misconception:

- Highlight the spaces between the hashmarks using alternating colors.
- Have students slide their finger along the line between the hashmarks when identifying the fractional parts.

 Name: ______________________

Directions: Partition, explain, and name.

1 Darius and his three friends ran a relay race. They each ran the same distance.

Partition the Line

Use the line below to show the part of the race each person ran.

Explain in Words

The race was divided into _______ equal parts because

Name the Parts

These parts are called _________________ because it takes ___________ equal parts to make ___________ whole.

 Name: ______________________

2 Each team in art class got one rope from the teacher. Each of the 8 students on the team painted the same amount of the rope.

Partition the Line

Use the line below to show how much of the rope each student painted.

Explain in Words

They split the rope into ________ equal parts because

Name the Parts

These parts are called ____________________ because it takes ____________ equal parts to make ____________ whole.

 Name: ____________________

3 Alaina and her sister share a bike. Each sister gets to ride the bike halfway to school.

Partition the Line

Use the line below to show how the sisters share the bike on the way to school.

Explain in Words

They divided the distance into _______ equal parts because

Name the Parts

These parts are called _______________ because it takes __________ equal parts to make __________ whole.

4 Jessica, Raymond, Ahmed, and Johanna are wrapping presents. They have one long piece of ribbon to share.

Partition the Line

If they each get the same amount of ribbon, use the picture below to show how they shared it fairly.

Explain in Words

They cut the ribbon into _______ equal parts because

Name the Parts

These parts are called __________________ because it takes ____________ equal parts to make ____________ whole.

LINES, WORDS, & PARTS JOURNAL

Name: ______________________

Pretend you have a garden shaped like a rectangle. You have three friends who want to help you plant flowers in it. Use the picture below to show how you could give everyone a fair share of the garden. Then show a non-example of fair sharing using the second picture.

Fair Shares—Example	**Fair Shares—Non-Example**

Explain

Why does the first picture show fair shares?

What are these fractional parts called and why?

LINES, WORDS, & PARTS JOURNAL

Name: ______________________

Pretend you have a garden shaped like a rectangle. You have three friends who want to help you plant flowers in it. Use the picture below to show how you could give everyone a fair share of the garden. Then show a non-example of fair sharing using the second picture.

Fair Shares—Example	**Fair Shares—Non-Example**

Explain

Why does the first picture show fair shares?

What are these fractional parts called and why?

SPRINGBACK JACK SHARES TEACHER NOTES (PG. 1 OF 2)

Partition Wholes & Naming Fractional Parts Using All Models

Purpose In this activity, students use a story ("The Sharing Pirate") with Springback Jack to partition objects into halves, fourths, and eighths using a variety of models. They interpret the problem situation, partition the object, explain their thnking in words, and identify the fractional part.

Note: You may wish to read the story with your students prior to working the problems to ensure that everyone understands the context.

☐ Introduction	☐ Representing	☑ Area Model (Square)	☐ Tutoring/Intervention
☑ Practice	☐ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☑ Linear Model	☐ Teacher-Facilitated	☑ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **Springback Jack Shares** for each pair of students.
- ☐ Make 1 copy of **Springback Jack Shares Journal** for every 2 students and cut it in half.
- ☐ (Optional) Make 1 copy of **Springback Jack Shares PG. 1** so that it can be projected using classroom technology.
- ☐ Other materials:
  - ☐ (Optional) **Fraction manipulatives**
  - ☐ (Optional) **Math journals** and **glue sticks**

How-To Guide

1. Put students in pairs and hand out **Springback Jack Shares**.
2. If you have not modeled these types of problems, work through **Springback Jack Shares PG. 1** with your students.
3. Have students work through the problems with their partners.
4. When the partners have finished the problems, hand out **Springback Jack Shares Journal** for students to complete independently.
   (Optional) Have students glue their responses into their **math journals**.

Answer Key

1. *Models should be partitioned into 4 equal parts.*
   I divided the models into _4_ equal parts because _they needed to share the cookie fairly with 4 people_. These parts are called _fourths_ because it takes _4_ equal parts to make _one_ whole.
2. *Models should be partitioned into 8 equal parts.*
   I divided the models into _8_ equal parts because _they needed to share the pizza fairly with 8 people_. These parts are called _eighths_ because it takes _8_ equal parts to make _one_ whole.
3. *Models should be partitioned into 2 equal parts.*
   I divided the models into _2_ equal parts because _they needed to share the chocolate bar fairly with 2 people_. These parts are called _halves_ because it takes _2_ equal parts to make _one_ whole.
4. *Each model should be partitioned into either 2 or 4 equal parts.*
   I divided the models into _2_ equal parts because _there are 2 licorice ropes, and if each one is cut into 2 parts, there are 4 parts total to share fairly with 4 people_. These parts are called _halves_ because it takes _2_ equal parts to make _one_ whole

   or

   I divided the models into _4_ equal parts because _there are 4 people, and if each licorice rope is cut into 4 parts, each person will get 2 pieces_. These parts are called _fourths_ because it takes _4_ equal parts to make _one_ whole.

Thought Extenders

- How many people are mentioned?
- How many objects are mentioned?
- How many pieces will you need to divide the whole into so everyone has the same amount?
- How will you draw a picture to represent your work?
- How will you write it in words?
- What are the fractional parts called? Why?

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SPRINGBACK JACK SHARES TEACHER NOTES (PG. 2 OF 2)

Talking About Equivalent Fractions Without Teaching Equivalent Fractions (2.1B, 2.1D, 2.1G)

In Grade 3 students are introduced to equivalent fractions. Equivalent fractions have the same value, even though they have different names. They occupy the same area and are represented by the same point on a number line.

In Grade 2, as students are partitioning shapes into equal shares to represents halves, fourths, and eighths, they will naturally recognize that there are fractions that are equal in size but have different names. For instance, they may notice that *2-fourths* takes up the same amount of space as *1-half* when referencing the same whole.

Figure A

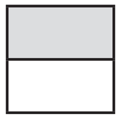
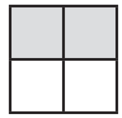


Figure B



We can use this opportunity to talk about why this is the case without officially teaching equivalency. How? These questions and answers are based on the figures above.

- What name can be given to the fractional parts in Figure A? *Halves*

  How many of the parts are shaded? *1-half, or one of the halves, is shaded.*
- What name can we give to the fractional parts in Figure B? *Fourths*

  Count to find out how many parts are shaded. *1-fourth, 2-fourths; 2-fourths are shaded, or 2 of the fourths are shaded.*
- What do you notice about 1-half and 2-fourths? *They are the same size, or take up the same amount of space.*
- Why do you think 1-half is the same size as 2-fourths? Give students the opportunity to wrestle with this question. Listen for reasoning such as:
  - *Figure B was cut into more equal pieces and that gave the fractional part a new name.*
  - *Even though they have different names, they are still the same amount of the whole.*

Put simply, we can introduce the notion of equivalence through discussion without actually teaching equivalent fractions. In this example, we see that when the number of parts of the whole doubles (from 2 to 4 pieces), the number of shaded pieces also doubles (from 1 to 2 pieces). We could also say that in Figure B the whole has twice as many pieces as Figure A and twice as many pieces in the shaded region.

Eventually, students will learn numerical methods to tell if fractions are equivalent. However, first we use models along with good discussions to help students understand why the fractions are equivalent. When students have these opportunities for discussions now, they'll be better able to develop a conceptually based algorithm for themselves in later grades.

Evaluating Resources for Partitioning

As you look for more resources for partitioning practice, use the questions below to analyze an activity before deciding to use it with your students.

- Does the activity only partition into 2, 4, or 8 pieces? Since 2nd graders are only required to work with these fractional parts, they need not do activities with other fractional parts. Most activities will also include 3, 6, and 12 pieces. Be sure to work the problems before you have your students work them.
- Does the activity require students to use concrete models? Does it provide pictorial models? Grade 2 students need to work with both. Be sure the activity has one or the other—or both!
- Does the activity provide a variety of models so that students partition both area models (e.g., circles, squares, etc.) and linear models (e.g., Cuisenaire rods, paper fraction strips, line segments)?
- Does the activity require students to write fractions using numbers? Because 2nd graders do not use fraction notation or the words *numerator* and *denominator*, be sure that the activity does not require students to write their answers using the symbolic notation of fractions.

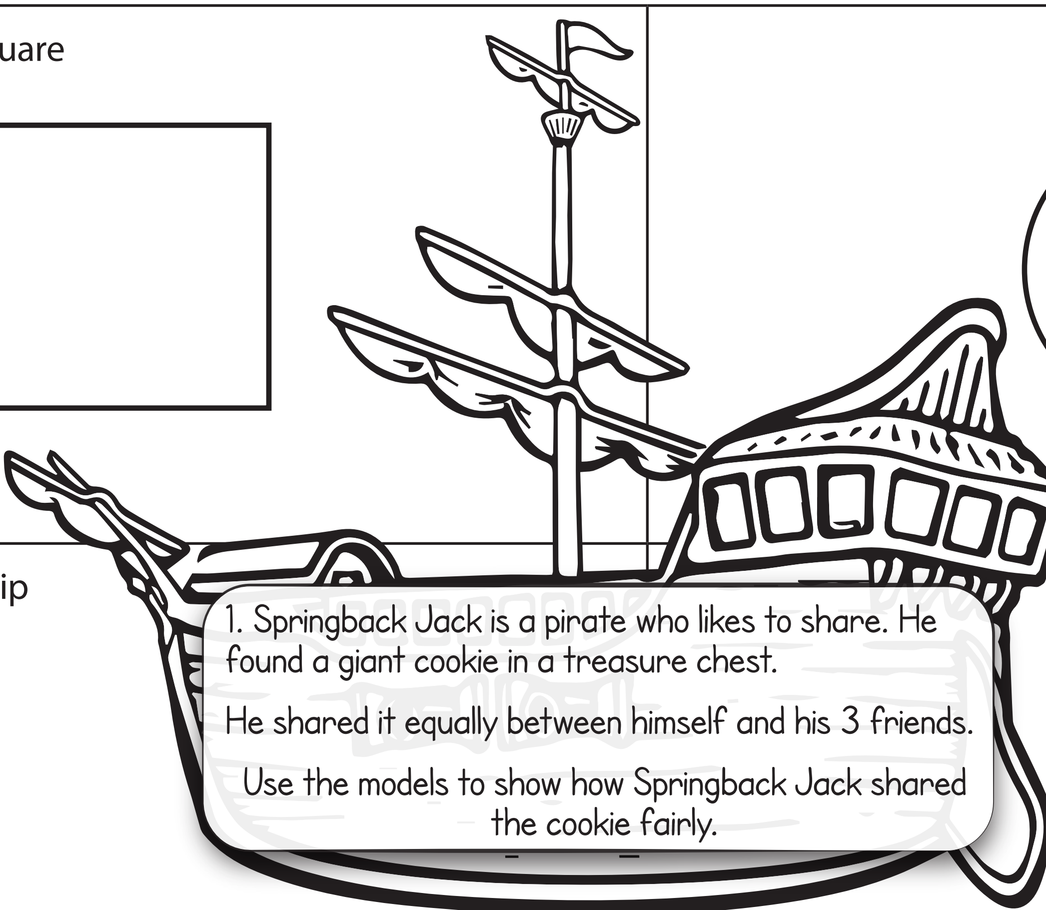
SPRINGBACK JACK SHARES (PG. 1 OF 4)

Name: ______________________________

Directions: 1. Read the problem and choose a model to solve it.
2. Then partition the other models the same way.
3. Explain your thinking in words.

Square

Circle



1. Springback Jack is a pirate who likes to share. He found a giant cookie in a treasure chest.

He shared it equally between himself and his 3 friends.

Use the models to show how Springback Jack shared the cookie fairly.

Strip

Line

I divided the models into ___________ equal parts because

Explain

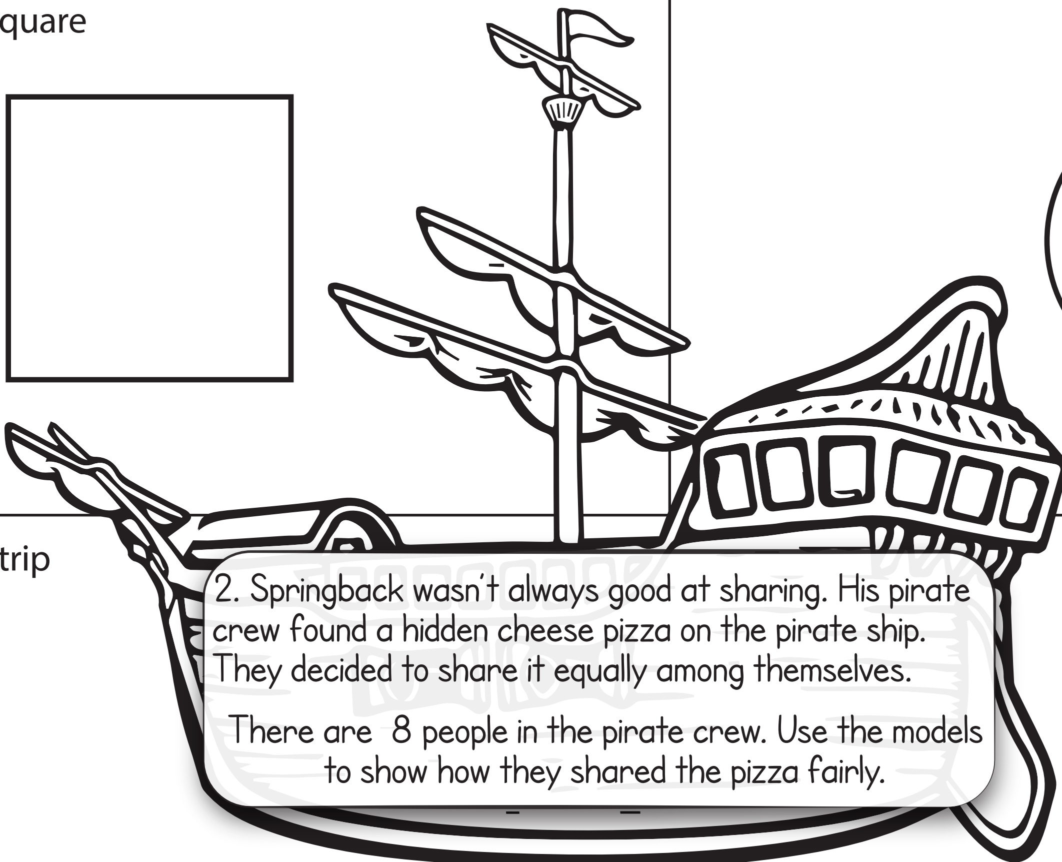
These parts are called _________ because it takes ________________ equal parts to make _________ whole.

Explain

Name: ____________________________

Square

Circle



2. Springback wasn't always good at sharing. His pirate crew found a hidden cheese pizza on the pirate ship. They decided to share it equally among themselves.

There are 8 people in the pirate crew. Use the models to show how they shared the pizza fairly.

Strip

Line

I divided the models into ___________ equal parts because

Explain

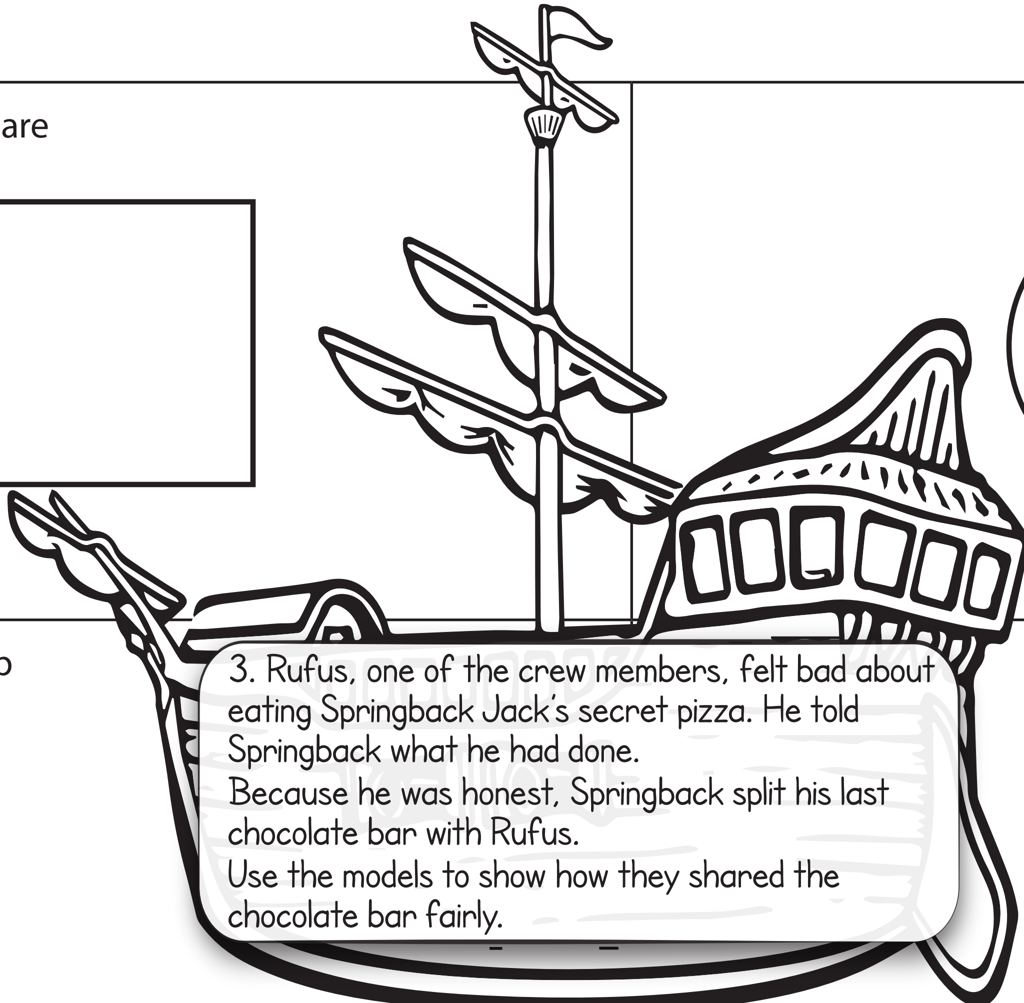
These parts are called _________ because it takes ________________ equal parts to make _________ whole.

Explain

Name: ______________________________

Square

Circle



3. Rufus, one of the crew members, felt bad about eating Springback Jack's secret pizza. He told Springback what he had done.
Because he was honest, Springback split his last chocolate bar with Rufus.
Use the models to show how they shared the chocolate bar fairly.

Strip

Line

I divided the models into ___________ equal parts because

Explain

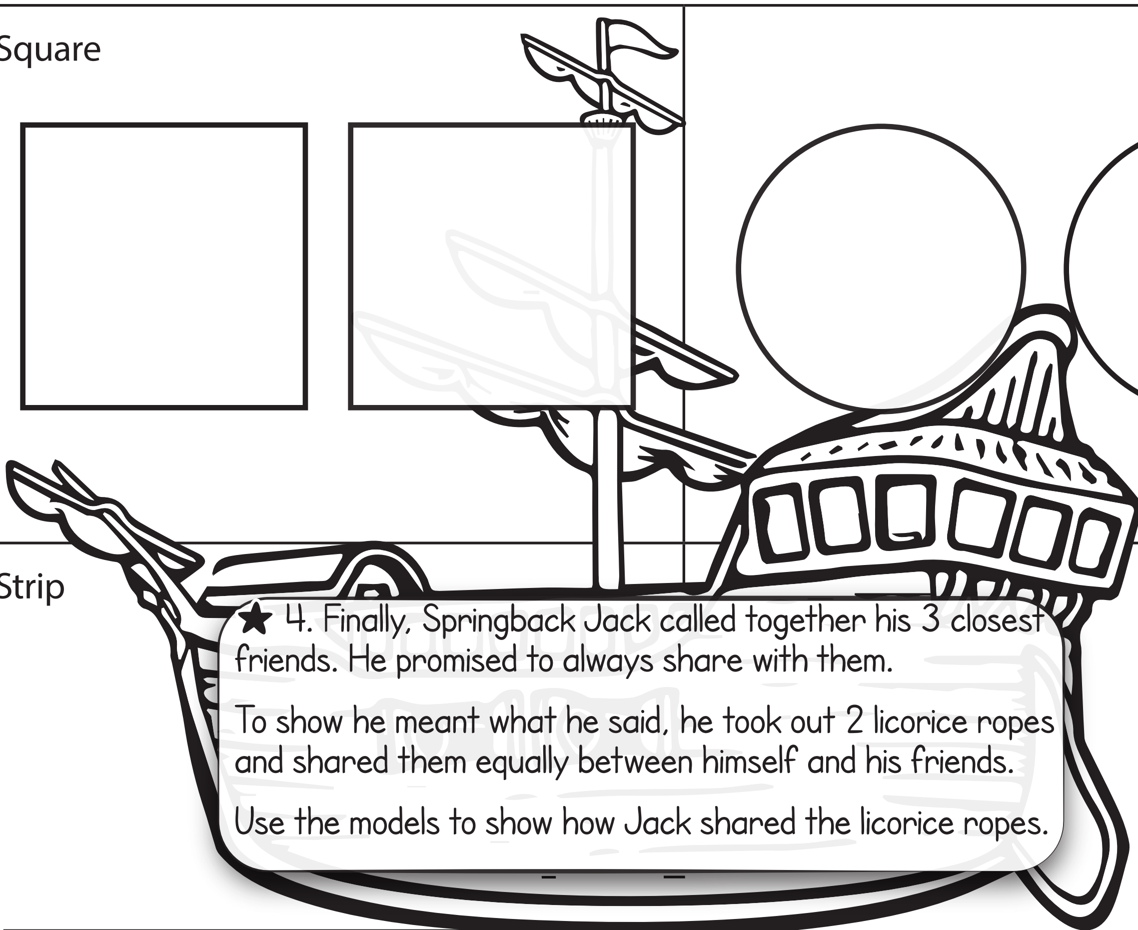
These parts are called _________ because it takes _________________ equal parts to make _________ whole.

Explain

Name: ______________________________

Square

Circle



★ 4. Finally, Springback Jack called together his 3 closest friends. He promised to always share with them.

To show he meant what he said, he took out 2 licorice ropes and shared them equally between himself and his friends.

Use the models to show how Jack shared the licorice ropes.

Strip

Line

I divided the models into ___________ equal parts because

Explain

These parts are called _________ because it takes ________________ equal parts to make _________ whole.

Explain

SPRINGBACK JACK SHARES JOURNAL

Name: ____________________________

Springback Jack loves to share, but he is still learning about fractions. Pretend Springback Jack asks you this question:

How do halves, fourths, and eighths get their names?

How would you answer him? Draw an example to help him understand how fractional parts get their names. Then write your explanation in words.

Example:

Explanation:

SPRINGBACK JACK SHARES JOURNAL

Name: ____________________________

Springback Jack loves to share, but he is still learning about fractions. Pretend Springback Jack asks you this question:

How do halves, fourths, and eighths get their names?

How would you answer him? Draw an example to help him understand how fractional parts get their names. Then write your explanation in words.

Example:

Explanation:

SET AN EXAMPLE TEACHER NOTES

SE 2.3D, 2.1D

Identify Examples & Non-examples of Halves, Fourths, & Eighths

Purpose In this activity, students classify and sort partitioned figures into examples and non-examples of halves, fourths, and eighths.

☐ Introduction	☐ Representing	☑ Area Model (Square)	☐ Tutoring/Intervention
☑ Practice	☐ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☑ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☑ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Prepare **Set an Example Example** so it can be projected using your classroom technology.
- ☐ Make 1 copy of **Set an Example Cards** for each pair of students.
- ☐ Make 1 copy of **Set an Example Graphic Organizer** for each pair of students.
- ☐ Other materials:
  - ☐ **Scissors** and **glue sticks** for each student pair

How-To Guide

1. Work through **Set an Example Example** with students.
   - What do you notice about these 2 figures? *They are the same size and shape; they are both rectangles; they both have 4 parts.*
   - Which of these figures is an example of fourths? Why? *Figure A, because the 4 parts are the same size.*
   - Why is Figure B a non-example of fourths? *Because even though it is partitioned into 4 parts, they are not equal. Fractional parts must be equal.*
2. Put students in pairs and hand out materials.
3. Have students work with their partners to cut **Set an Example Cards** and glue them into the correct section of **Set an Example Graphic Organizer**.

Thought Extenders

- What makes this shape an example/non-example?
- Is the figure partitioned into equal-size parts or are the parts different sizes?
- Why do we call these halves [fourths, eighths]?
- How many equal parts does it take to make one whole?

Other Ways to Use Card Sets (2.1D, 2.1G)

Put your card sets to work for you! Think about ways you could repurpose the card sets you have so that students have multiple opportunities to interface with the cards and the math practice they provide. For example, the Set an Example Cards could be used in several ways.

1. **Card Sorts**. Think of different ways to do a sort.
   a. Students sort the cards into examples and non-examples of fractional parts.
   b. Students sort the cards into examples and non-examples of halves, fourths, and eighths.
2. **Flashcards**. Think of different questions you want students to answer.
   a. For each card, students tell if the card is an example or non-example of a fractional part. If it's an example, they name the part.
   b. True or False. Teacher identifies a card as an example of halves, fourths, or eighths (e.g., shows a card divided into fourths and says that they are eighths). Students explain why the teacher's statement is true or false.
3. **Concentration**. Make 2 sets of **Set an Example Cards**. Students turn the cards face down, and then turn over 2 at a time, looking for matches. Make a T-Chart and have students sort matches into examples and non-examples.
4. **Make Your Own**. Have students make a set of example and non-example cards using different shapes and ways of partitioning. Use student-generated cards to repeat ideas #1–3.

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Figure A

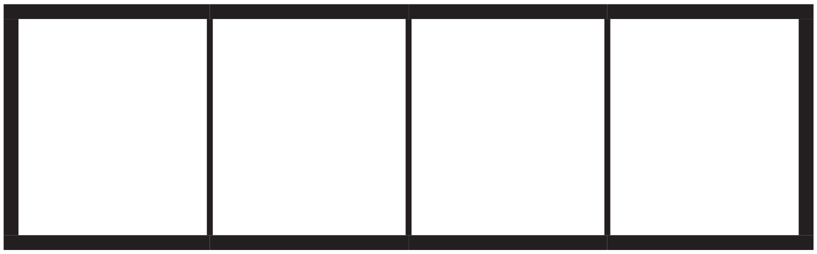
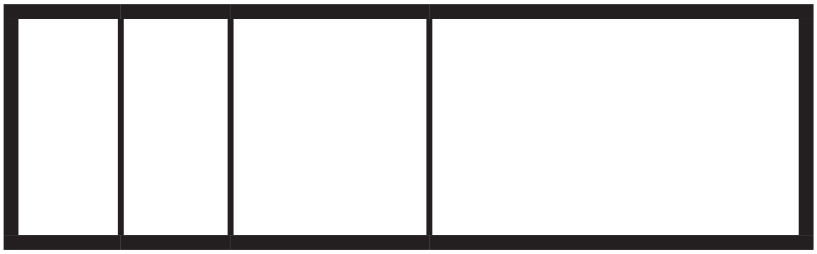


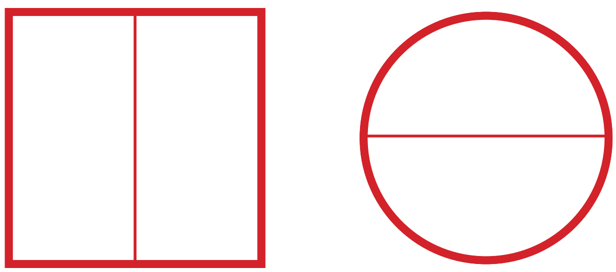
Figure B



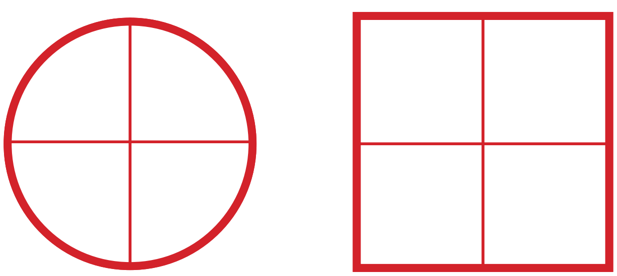
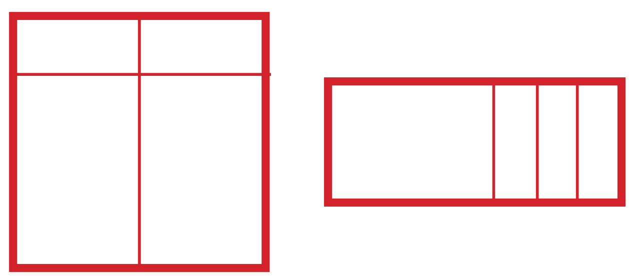
SET AN EXAMPLE GRAPHIC ORGANIZER ANSWER KEY

Directions: 1. Cut out the Set an Example Cards.
2. Sort the cards according to the number of parts.
3. Then sort each pile into examples and non-examples of halves, fourths, and eighths.
4. Glue the cards onto your graphic organizer.
Note: *Student answers will vary. Some students may say, for example, that a circle divided into fourths is a non-example of halves. They are correct.*

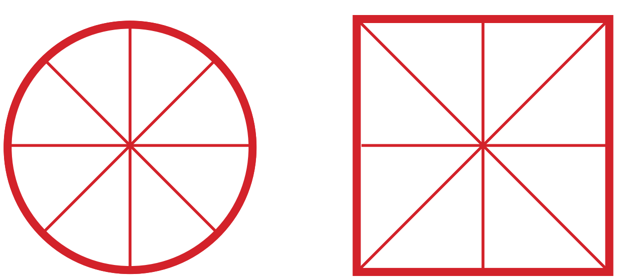
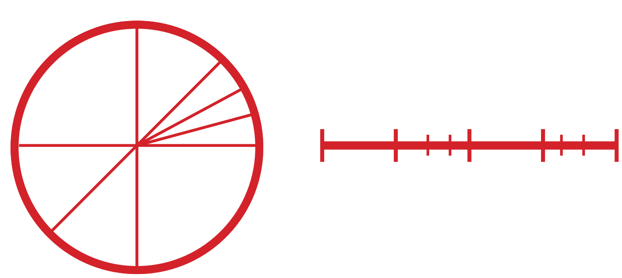
Halves

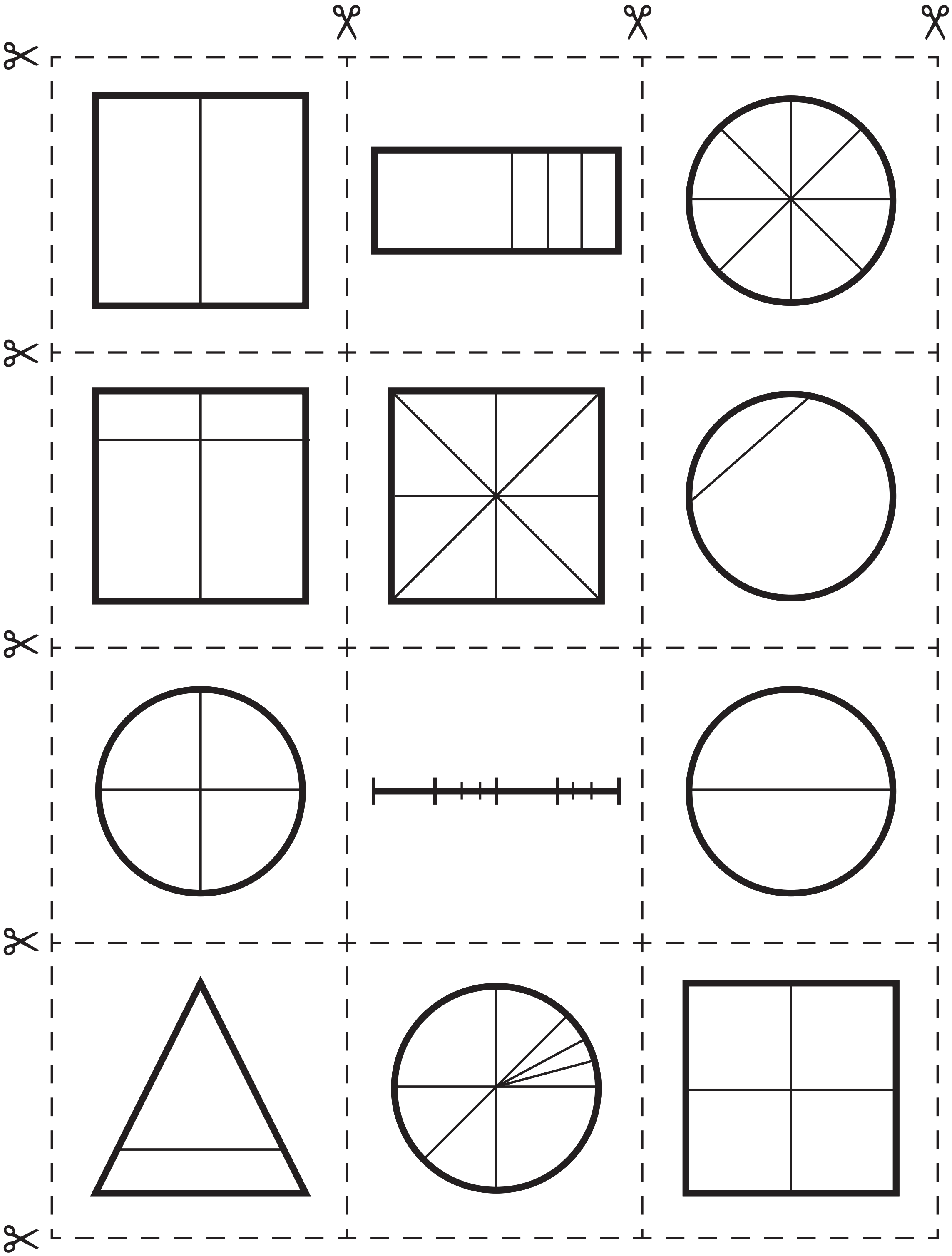
Examples	Non-examples
	

Fourths

Examples	Non-examples
	

Eighths

Examples	Non-examples
	



SET AN EXAMPLE
GRAPHIC ORGANIZER

Name: ______________________________

Directions: 1. Cut out the Set an Example Cards.
2. Sort the cards according to the number of parts.
3. Then sort each pile into examples and non-examples of halves, fourths, and eighths.
4. Glue the cards onto your graphic organizer.

Halves	
Examples	**Non-examples**

Fourths	
Examples	**Non-examples**

Eighths	
Examples	**Non-examples**

WHAT'S IN A NAME? TEACHER NOTES (PG. 1 OF 2)

SE 2.3B, 2.3D, 2.1D, 2.1G

Identify Examples of Fourths & Eighths

Purpose In this activity, students identify examples of fourths and eighths. They will create and explore fractional parts that have equal areas, but whose shapes are not congruent.

Note: Teachers may choose to pre-cut the What's in a Name? Models for each group.

☑ Introduction	☐ Representing	☑ Area Model (Rectangle)	☐ Tutoring/Intervention
☐ Practice	☐ Counting	☐ Area Model (Circle)	☐ Small group
☐ Posttest	☑ Examples/Non-examples	☐ Any Model	☐ Centers
☐ Partitioning	☐ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Copy 1 set of **What's in a Name? Models Fourths** and **What's in a Name? Models Eighths** for each group of 4 students.
- ☐ Copy either **What's in a Name? Journal 1** or **Journal 2** for each student. Use the remaining journal the next day as a follow-up.
- ☐ Other materials:
  - ☐ **Scissors**: 1 pair per student

How-To Guide

1. Distribute **scissors** and **What's in a Name? Models Fourths** to each group.
2. Have groups work together to cut out the parts for each whole.
3. After the parts are cut, have students put them back together to form the original wholes by laying them on the table.
4. Facilitate a classroom conversation.
   - What is the same about each of the wholes at your table? *They have all been divided into 4 equal parts.*
   - What is different about each of the wholes at your table? *The parts for each whole are different shapes.*
   - What name would you give the fractional parts for each whole? *Fourths*
   - The fractional parts for each whole are different shapes. How can they all be called fourths? *Because each whole is made of 4 equal-size parts, even though they are different shapes.*
5. Remind students of the size and shape of the whole. Next, ask students to find ways to rearrange the fractional parts at their table to remake the whole. The whole must contain 2 or more different shapes and be the same size as the original.
6. Facilitate a classroom conversation.
   - What is the same about each of the wholes you created? *They are all made of 4 parts.*
   - What is different about each of the wholes you created? *The parts within each whole are different shapes.*
   - Are the parts equal? *Yes*

     Note: Some students may not realize that the parts are equal in size even though they are not congruent shapes. If necessary, allow students to overlay, or cut the parts to prove their equality.
   - What name would you give the fractional parts of each whole? *Fourths*
   - Why would the fractional parts have the same name? *Because even though the whole is made of different shaped parts, the parts are still fourths of the whole. If it takes 4 equal-size parts to make 1 whole, the parts are called fourths.*
7. Repeat this process using **What's in a Name? Models Eighths**.
8. Distribute **What's in a Name? Journal 1** or **Journal 2** to each student and have them work independently to complete it.
9. Have students share their journal page with a partner.
10. On the next day, have students complete the remaining journal activity.

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WHAT'S IN A NAME? TEACHER NOTES (PG. 2 OF 2)

Thought Extenders

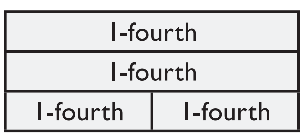
- What are the names of the fractional parts?
- How many fractional parts has the whole been divided into?
- How can you rearrange the fractional parts so that they make a whole?
- Do all the fractional parts have to be the same shape?
- Can fractional parts have different shapes and still have the same name?

Examples and Non-Examples of Fractional Parts (2.1D, 2.1G)

Fractional parts are defined as equal shares of a whole or set. In Grade 2, identifying examples and non-examples provides students the opportunity to justify their thinking about halves, fourths, and eighths. The ability to recognize examples and non-examples of fractional parts is based on the foundational understanding of how the part gets its name. Students must understand that the name of a fractional part comes from the number of equal parts it takes to make 1 whole. If 2 equal parts make 1 whole, the fractional parts are called halves. If 4 equal parts make 1 whole, the fractional parts are called fourths, etc.

Students may not realize that equal-size parts do not necessarily have to be the same shape. According to the Grade 2 Mathematics TEKS Supporting Information provided by the Texas Education Agency, "examples of halves, fourths, and eighths may be shown to have equal areas but not have congruent parts." (**www.texasgateway.org/resource/mathematics-teks-supporting-information**) In other words, students need experience with fractional parts that are equal in size, but are not the same shape.

Example:

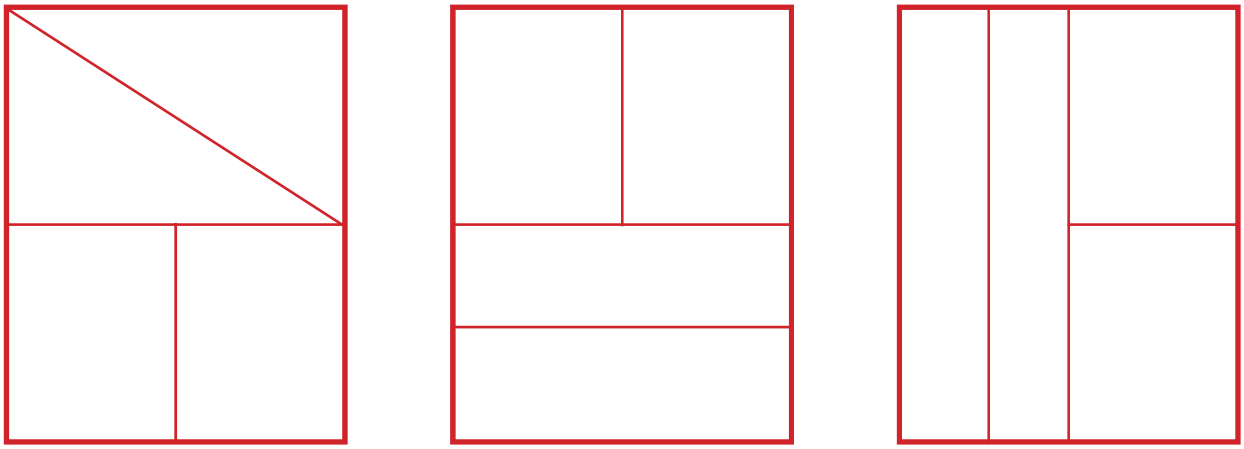


What's in a Name? is designed to help students explore this understanding.

WHAT'S IN A NAME? ANSWER KEY

Master Models Fourths

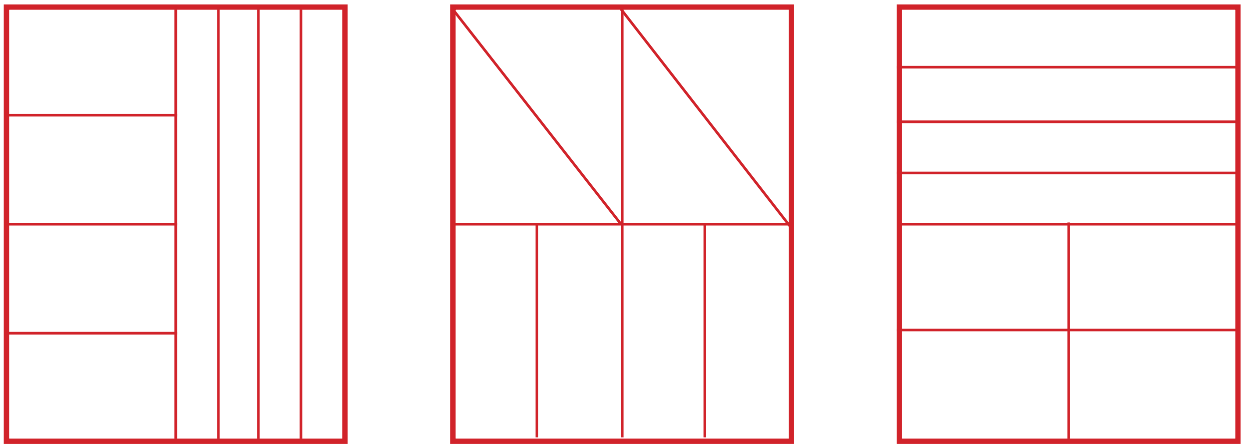
Possible solutions include:



Accept any configuration where the whole is the same size as the original.

Master Models Eighths

Possible solutions include:



Accept any configuration where the whole is the same size as the original.

WHAT'S IN A NAME? JOURNAL 1 ANSWER KEY

Name: ______________________

Draw a picture of one of the wholes you created to show fourths or eighths.

Drawings will vary.

Use the word bank to complete the following statements.

one	**size**	**shape**	**fourths**	**eighths**
	eight	**four**	**equal**	

A fractional part gets its name from the number of __equal__ parts it takes to make __1__ whole.

This whole is divided into __(4 or 8)__ equal-size parts, so the fractional part is called __(fourths or eighths)__.

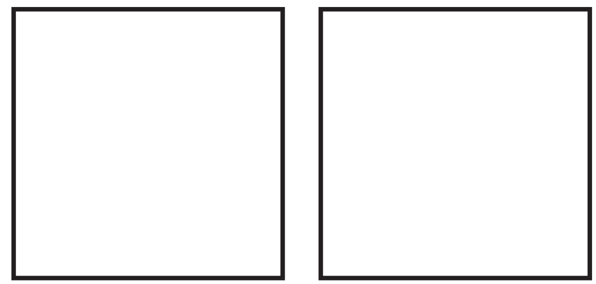
Even though the parts are not the same __shape__, they are the same __size__.

WHAT'S IN A NAME? JOURNAL 2 ANSWER KEY

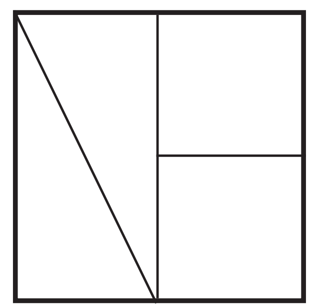
Name: ______________________

Partition the squares. Show eighths in two different ways.

Answers will vary.

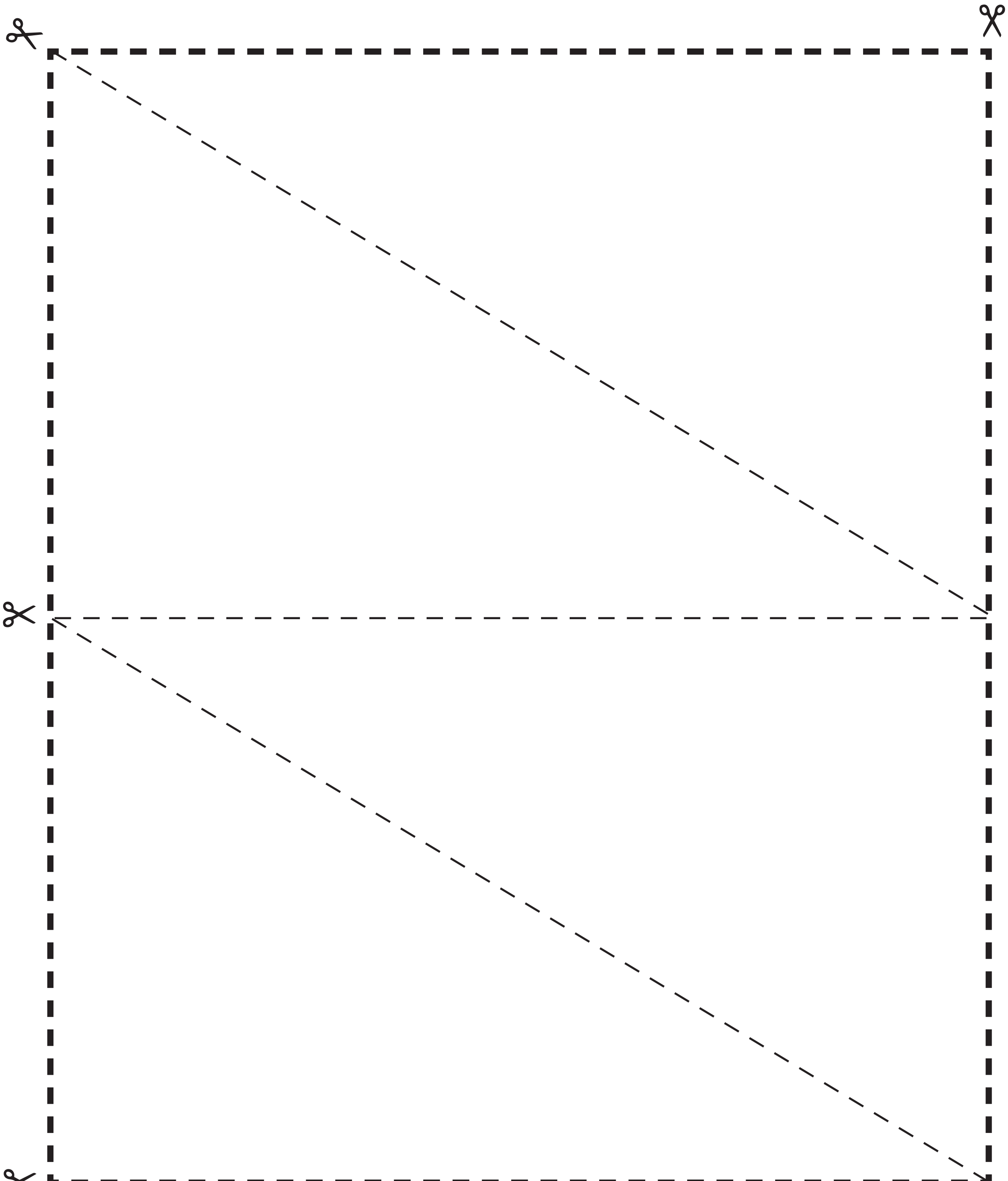


Mariah said that the square below was divided into fourths. Is she right? __yes__

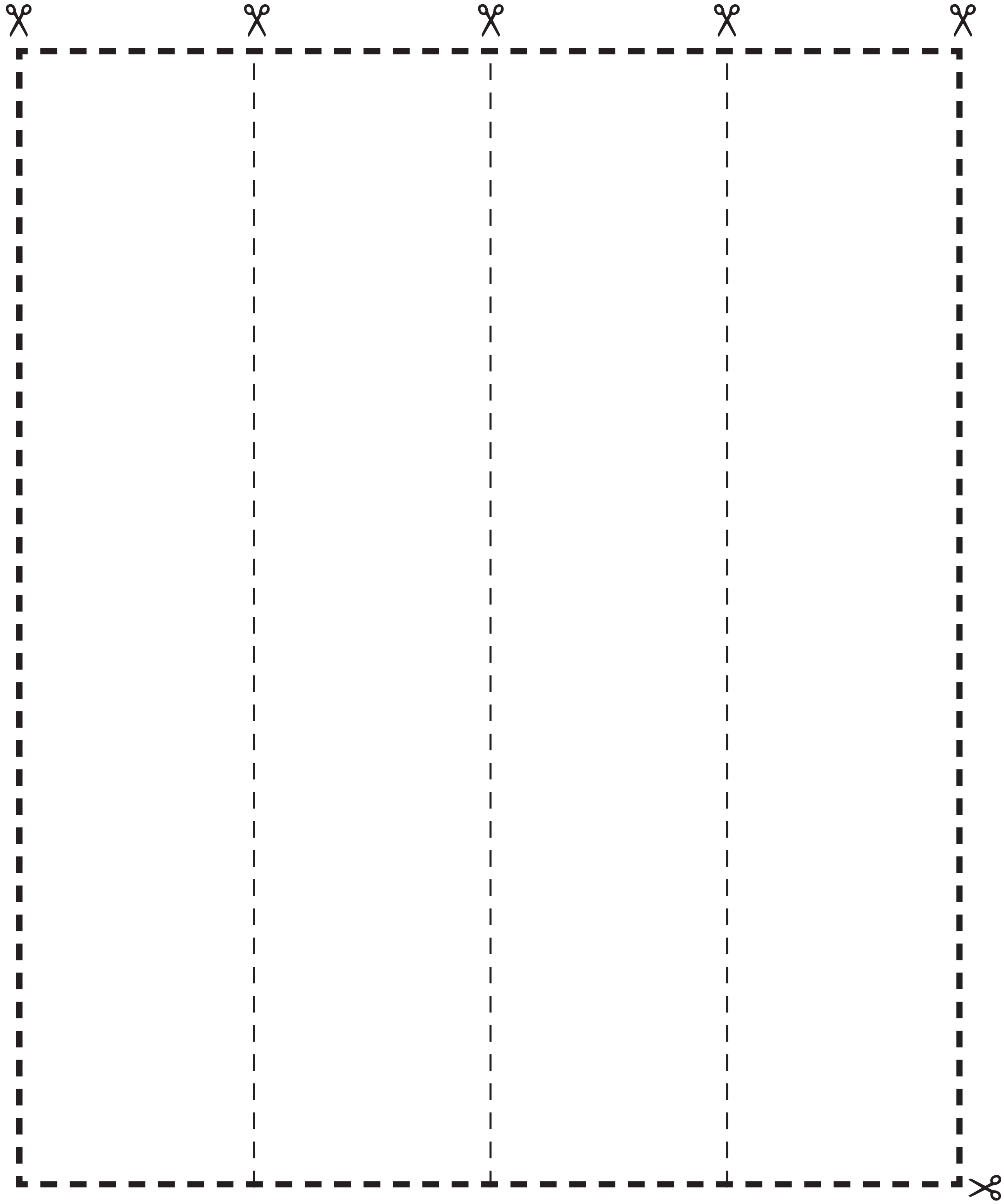


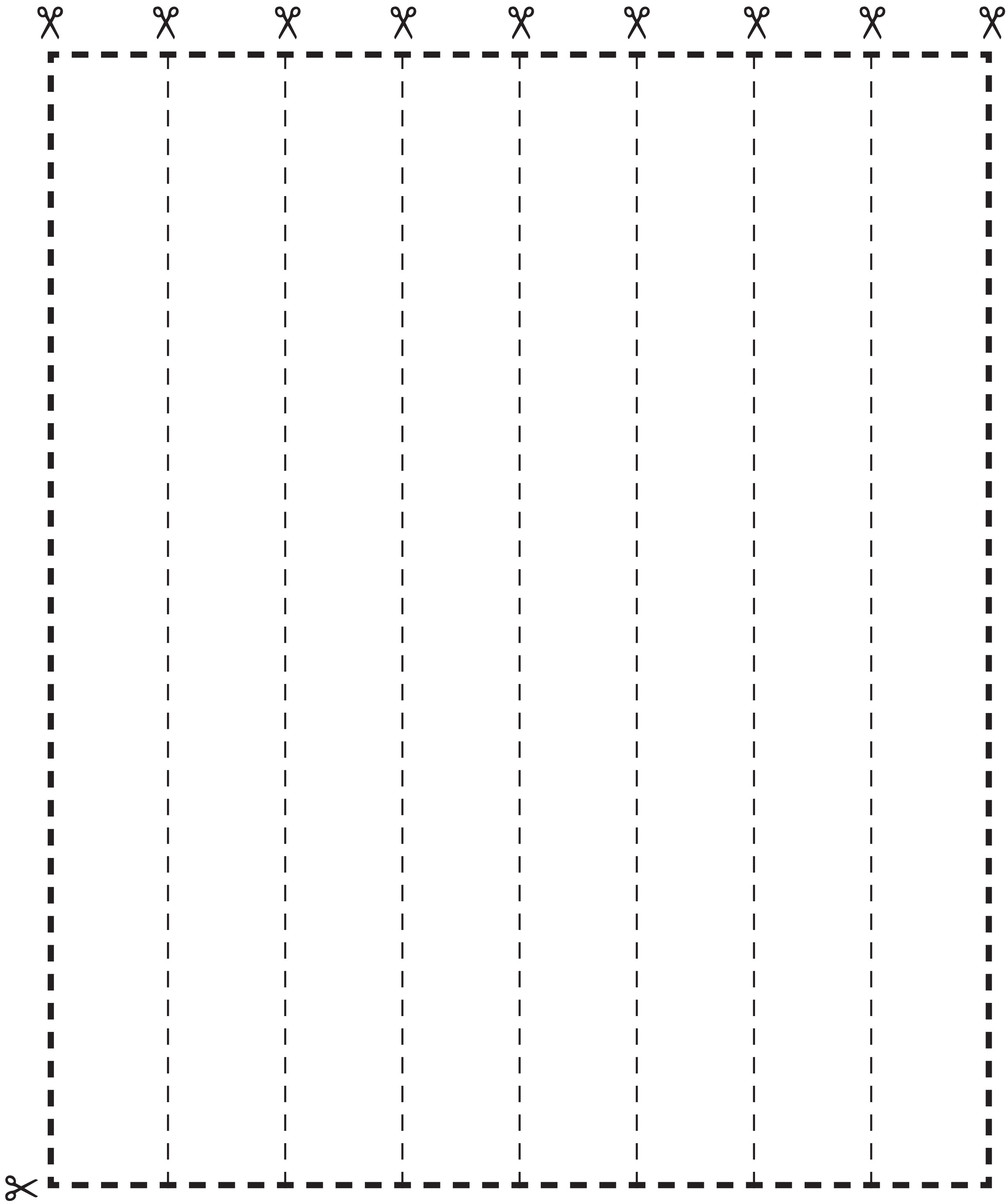
Explain:

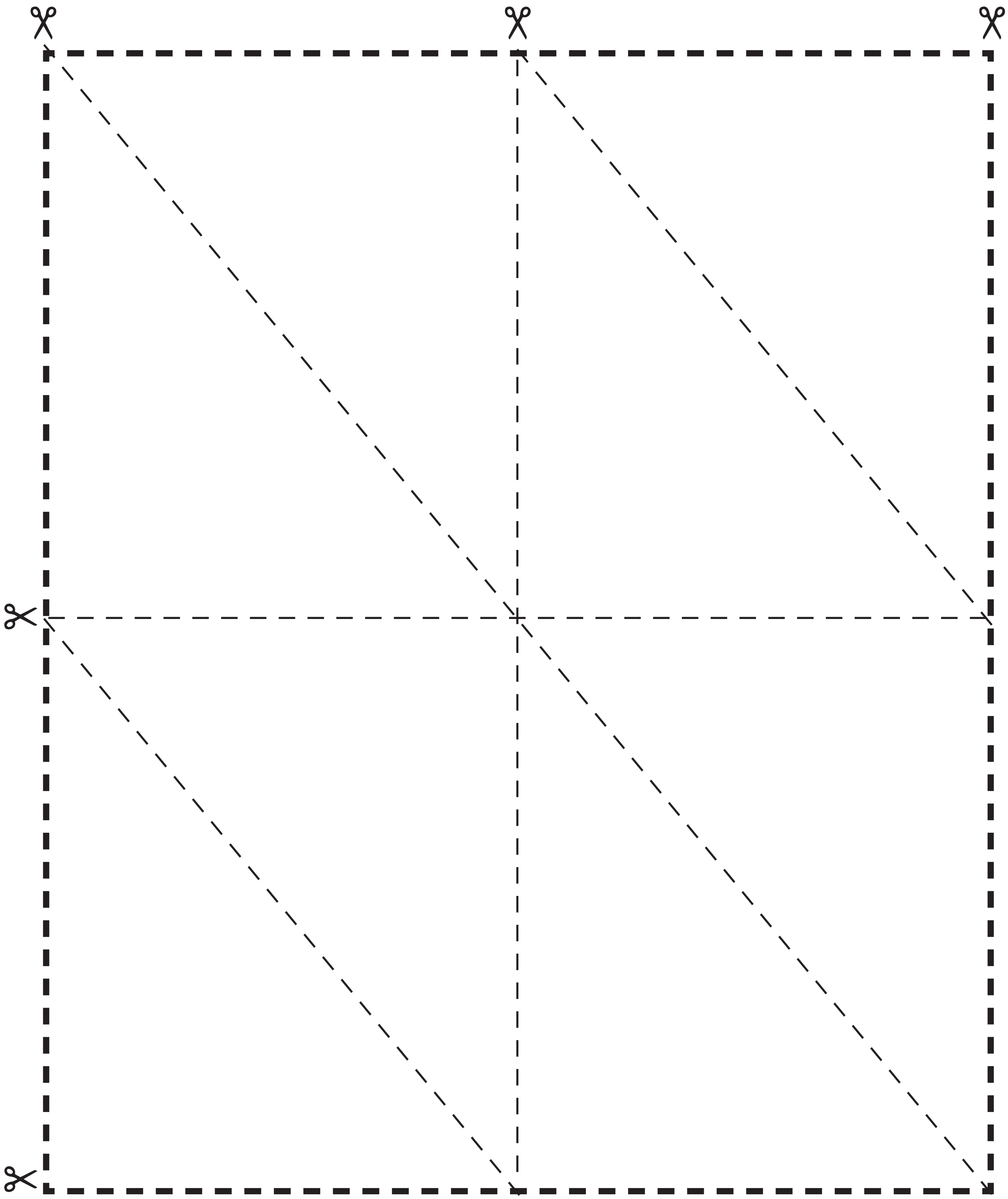
The square is divided in half down the middle. Each of the halves has been divided into 2 equal parts. This means that the 4 pieces are called fourths.



WHAT'S IN A NAME? MASTER MODELS FOURTHS (PG. 3 OF 4)







WHAT'S IN A NAME? JOURNAL 1

Name: ______________________________

Draw a picture of one of the wholes you created to show fourths or eighths.

Use the word bank to complete the following statements.

one	**size**	**shape**	**fourths**	**eighths**
	eight	**four**	**equal**	

A fractional part gets its name from the number of __________parts it takes to make _____ _______ whole.

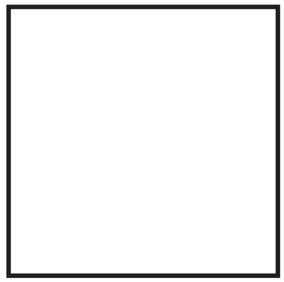
This whole is divided into ____________________ equal-size parts, so the fractional part is called ________________________________.

Even though the parts are not the same ____________, they are the same ______________.

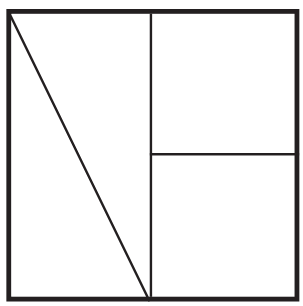
WHAT'S IN A NAME? JOURNAL 2

Name: ______________________________

Partition the squares. Show eighths in two different ways.



Mariah said that the square below was divided into fourths. Is she right? _______________



Explain:

I PREDICT TEACHER NOTES

Compare the Sizes of Fractional Parts

SE 2.3B, 2.1A, 2.1C, 2.1D, 2.1F, 2.1G

Purpose In this activity, students predict which fractional parts will be the largest and the smallest when given a whole piece of playdough to partition. The goal is for students to discover that the fewer fractional parts there are, the larger the parts, and the more fractional parts there are, the smaller the parts.

Note: This activity is meant to engage students in thinking about representing fractions. It is not intended to be graded. Instead, it sets the stage for the learning that is to come.

☑ Introduction	☐ Representing	☐ Area Model (Square)	☐ Tutoring/Intervention
☐ Practice	☐ Counting	☐ Area Model (Circle)	☐ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☑ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **I Predict Work Mat** for each student.
- ☐ Make 1 copy of **I Predict Recording Sheet** for each student.
- ☐ Other materials:
  - ☐ **Playdough**: 1 container for each student
  - ☐ **Straight edge** such as ruler: 1 for each student

How-To Guide

1. Place students in groups of 3–4 and distribute materials.
2. Have students independently answer the **I Predict** questions on **I Predict Recording Sheet** and then discuss their answers as a group.

   Note: Answers may vary. Students do not need to agree at this point. Explain to students that they will explore these questions during the next part of the activity to see whether their predictions are correct.
3. Have students divide the playdough so that each student gets an equal share. Then have each student divide their piece of the playdough into 4 equal pieces.
4. Explain to students that they will be using their playdough to create fractional parts such as halves, fourths, and eighths.
5. Ask students to roll each of their pieces of playdough so that they make 4 ropes that are the same size.
6. Have students place 1 rope on the work mat in the quadrant labeled *One Whole* and then draw the whole on **I Predict Recording Sheet**.
7. Next, ask students to partition 1 of the ropes into halves. Have students place the 2 halves on the work mat in the *Halves* quadrant and then draw the halves on **I Predict Recording Sheet**.
8. Repeat this process for the *Fourths* and *Eighths* quadrants.
9. Once students have demonstrated and drawn each type of fractional part, have them complete the **Reflect** questions on **I Predict Recording Sheet**. Facilitate a classroom discussion where students share and explain their findings.

Thought Extenders

- Which fractional parts were the largest? Why?
- Which fractional parts were the smallest? Why?
- How does the name of a fractional part help you know how large or small it is?
- Can you think of a situation in real life where if you divide something into more pieces, the pieces get smaller?

Answer Key

Predict

Answers will vary.

Reflect

5. *halves*
6. *eighths*
7. *Answers will vary.*
8. *The whole is divided into more pieces.*

Write

The __*more/fewer*__ fractional parts there are, the __*smaller/larger*__ the parts will be.

Back to the Table of **Contents** Table of **Standards**

I PREDICT WORK MAT

One Whole	Halves
Fourths	**Eighths**

I PREDICT RECORDING SHEET (PG. 1 OF 2)

Name: ____________________

Directions: Complete each section.

PREDICT

1. Which fractional parts will be the largest? (Circle one.)

halves   fourths   eighths

2. Why? The ____________________ will be the largest because ________________

____

3. Which fractional parts will be the smallest? (Circle one.)

halves   fourths   eighths

4. Why? The ____________________ will be the smallest because ______________

____

MAKE AND DRAW

Whole	Halves
Fourths	**Eighths**

Name: ____________________

REFLECT

5. Which fractional parts were the largest? (Circle one.)

halves fourths eighths

6. Which fractional parts were the smallest? (Circle one.)

halves fourths eighths

7. Were your predictions correct? (Circle one.) yes no

8. Explain why eighths are smaller than fourths.

WRITE

Word Bank			
larger	smaller	more	fewer

The ______________ fractional parts there are, the ______________ the parts will be.

The ______________ fractional parts there are, the ______________ the parts will be.

SMALLER OR LARGER? TEACHER NOTES

SE 2.3B, 2.1A, 2.1C, 2.1D, 2.1F, 2.1G

Compare the Sizes of Fractional Parts

Purpose In this activity, students will investigate the size of fractional parts using strip diagrams. The goal is for students to understand and be able to explain why the fewer the fractional parts there are, the larger the parts, and the more fractional parts there are, the smaller the parts.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☐ Area Model (Circle)	☐ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☑ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **Smaller or Larger? Partner Page** for each pair of students.
- ☐ Make 1 copy of **Smaller or Larger? (Student 1)** for half of your students.
- ☐ Make 1 copy of **Smaller or Larger? (Student 2)** for the other half of your students.
- ☐ Other materials:
  - ☐ **Scissors** for each student
  - ☐ **Glue sticks**: 1 for each student pair
  - ☐ (Optional) **Math journals**

Importance of Using the Proper Name of a Fraction When Counting (2.1G)

Read the following numbers out loud.

thir**teen** **twenty**-three **eighty**-three

Notice the parts in bold. The parts in bold give us important information about the size of the number. 13, 23, and 83 are completely different numbers. We know which *3* we are talking about because of the number of tens attached to it.

Now read these numbers below.

three-**eighths** three-**fourths** three-**halves**

Notice the parts in bold. The parts in bold are the names of the fractions. They give us important information about the size of the fractional parts. $\frac{3}{8}$, $\frac{3}{4}$, and, $\frac{3}{2}$ are completely different numbers. We know which *3* we are talking about because of the name of the fraction attached to it.

When students are counting fractions, be sure they use the whole name of the fraction, so they will be clear what number they are talking about. In other words, students should count using fraction language: *1-fourth, 2-fourths, 3-fourths* and not simply *1, 2, 3*. As students learn what a fraction is, saying the proper name every time helps solidify the meaning of a fraction and its place in our number system.

Thought Extenders

- Which fractional parts were the largest? Why?
- Which fractional parts were the smallest? Why?
- How does the name of a fractional part help you know how large or small it is?
- Can you think of a situation in real life where if you divide something into more pieces, the pieces get smaller?
- Can you think of a situation in real life where if you divide something into fewer pieces, the pieces get larger?

How-To Guide

1. Put students in pairs and hand out materials. Make sure each pair has a copy of **Smaller or Larger? (Student 1)** and **Smaller or Larger? (Student 2)**.
2. Ask students to work together to cut out the strips from **Smaller or Larger? (Student 1)** and **Smaller or Larger? (Student 2)**, and glue them on the **Smaller or Larger? Partner Page**. Then have students work together to fill in the blanks.
3. When the partners are finished, ask each student to work individually to answer the journal question at the bottom of **Smaller or Larger? (Student 1)** and **Smaller or Larger? (Student 2).** (Optional) Have students glue their responses into their **math journals**.

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SMALLER OR LARGER? ANSWER KEY

MASTER PARTNER PAGE

1	**Student 1**: Fourths are ___smaller___ than halves.
	Student 2: A whole that is divided into fourths has ___more___ fractional parts than a whole that is divided into halves.
2	**Student 1**: Halves are ___larger___ than eighths.
	Student 2: A whole that is divided into halves has ___fewer___ fractional parts than a whole that is divided into eighths.
3	**Student 1**: A whole that is divided into halves has ___fewer___ fractional parts than a whole that is divided into fourths.
	Student 2: Halves are ___larger___ than fourths.
4	**Student 1**: A whole that is divided into eighths has ___more___ fractional parts than a whole that is divided into fourths.
	Student 2: Eighths are ___smaller___ than fourths.

Journal 1 (Student 1)

Directions: Answer the question. Draw a picture to show your thinking.

Kathy's cookie was cut into eighths. Karla's cookie was cut into fourths. Whose pieces were larger? Draw a picture and explain your answer.

Pictures will vary. Look for reasoning such as this: Kathy's cookie was cut into smaller pieces. The whole was cut into 8 pieces/more pieces, so the pieces were smaller. Karla's cookie was cut into larger pieces because it was cut into 4 pieces/fewer pieces.

Journal 2 (Student 2)

Directions: Answer the question. Draw a picture to show your thinking.

Carl's cupcake was cut into fourths. Craig's cupcake was cut into halves. Whose pieces were larger? Draw a picture and explain your answer.

Pictures will vary. Look for reasoning such as this: Carl's cupcake was cut into smaller pieces. The whole was cut into 4 pieces/more pieces, so the pieces were smaller. Craig's cupcake was cut into larger pieces because it was cut into 2 pieces/fewer pieces.

SMALLER OR LARGER? (STUDENT 1)

Directions: 1. Cut out the strips and fold them. Draw a line on the fold.
2. Glue the strips on the **Partner Page** and answer the questions.
3. Answer the journal question.

Strip 1: Fold into fourths.

Strip 2: Fold into halves.

Strip 3: Fold into halves.

Strip 4: Fold into eighths.

Journal (Student 1)

Name: ____________________________

Directions: Answer the question. Draw a picture to show your thinking.

Kathy's cookie was cut into eighths. Karla's cookie was cut into fourths. Whose pieces were larger? Draw a picture and explain your answer.

SMALLER OR LARGER? (STUDENT 2)

Directions: 1. Cut out the strips and fold them. Draw a line on the fold.
2. Glue the strips on the **Partner Page** and answer the questions.
3. Answer the journal question.

Strip 1: Fold into halves.

Strip 2: Fold into eighths.

Strip 3: Fold into fourths.

Strip 4: Fold into fourths.

Journal (Student 2)

Name: ______________________________

Directions: Answer the question. Draw a picture to show your thinking.

Carl's cupcake was cut into fourths. Craig's cupcake was cut into halves. Whose pieces were larger? Draw a picture and explain your answer.

SMALLER OR LARGER?
PARTNER PAGE (PG. 1 OF 2)

Student 1: ______________________________

Student 2: ______________________________

Directions: Glue the folded strips. Then compare the size of the fractional parts and fill in the blanks. Use the word bank to help you.

Word Bank			
more	fewer	larger	smaller

Strip 1

Fourths

Halves

Student 1: Fourths are ____________________________ than halves.

Student 2: A whole that is divided into fourths has ________________________ fractional parts than a whole that is divided into halves.

Strip 2

Halves

Eighths

Student 1: Halves are ____________________________ than eighths.

Student 2: A whole that is divided into halves has ________________________ fractional parts than a whole that is divided into eighths.

SMALLER OR LARGER?
PARTNER PAGE (PG. 2 OF 2)

Student 1: ______________________________

Student 2: ______________________________

Word Bank			
more	fewer	larger	smaller

Strip 3

Halves

Fourths

Student 1: A whole that is divided into halves has ________________________ fractional parts than a whole that is divided into fourths.

Student 2: Halves are ________________________ than fourths.

Strip 4

Eighths

Fourths

Student 1: A whole that is divided into eighths has ___________________________ fractional parts than a whole that is divided into fourths.

Student 2: Eighths are ____________________________ than fourths.

WHICH IS BETTER? TEACHER NOTES

SE 2.3B, 2.1A, 2.1C, 2.1D, 2.1F, 2.1G

Problem Solve with Fractional Parts

Purpose This activity contains 3 problems that are meant to be used in individual stations or centers. Students will solve each problem and draw a picture to explain their thinking.

☐ Introduction	☑ Representing	☑ Area Model (Square)	☑ Tutoring/Intervention
☑ Practice	☐ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☑ Centers
☑ Partitioning	☐ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy each of **Which is Better? Stations 1**, **2**, and **3** for each student. Copy single sided.
- ☐ Place **Which is Better? Stations 1**, **2**, and **3** in the appropriate centers.
- ☐ Other materials:
  - ☐ **Colored pencils**
  - ☐ **Fraction manipulatives**

How-To Guide

During station or center time, have students work in pairs to solve each problem and explain their thinking.

Thought Extenders

- Which fractional parts were the largest? Why?
- Which fractional parts were the smallest? Why?
- How does the name of a fractional part help you know how large or small it is?
- Can you think of a situation in real life where if you divide something into more pieces, the pieces get smaller?
- Can you think of a situation in real life where if you divide something into fewer pieces, the pieces get larger?

Evaluating Resources for Understanding the Magnitude of Fractions (2.1A, 2.1B, 2.1C, 2.1D, 2.1F, 2.1G)

When searching for resources to supplement your teaching of the size of fractional parts, make sure you can answer *yes* to each of the following questions:

- Does the activity only involve halves, fourths, and eighths?
- Does the activity include models?
- Does the activity focus on the size of the fractional piece, not comparing fractions themselves?

Many activities will use formal fraction notation, such as $\frac{1}{2}$. Since 2nd graders in Texas do not use formal fraction notation, activities that are used in Texas classrooms should not include formal fraction notation.

Answer Key

1. *One model should be partitioned into 8 equal parts, and the other into 4 equal parts.*

   Fern got more pizza than Ivy because her pizza was divided into 4 pieces and Ivy's pizza was divided into 8 pieces. Fourths are larger than eighths.
2. *One model should be partitioned into 8 equal parts, and the other into 2 equal parts.*

   It would be better for the cookie cakes to be cut in halves. Halves are larger than eighths.
3. *One model should be partitioned into 4 equal parts, and the other into 2 equal parts.*

   Halves are larger than fourths. Adrienne was agreeing to mow a larger piece of the yard, even though he didn't like to mow.

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WHICH IS BETTER? STATION 1

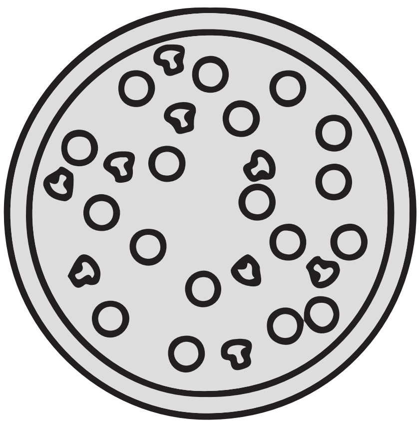
Name: ______________________________

Directions: Partition the circles to solve the problem. Explain your thinking in words.

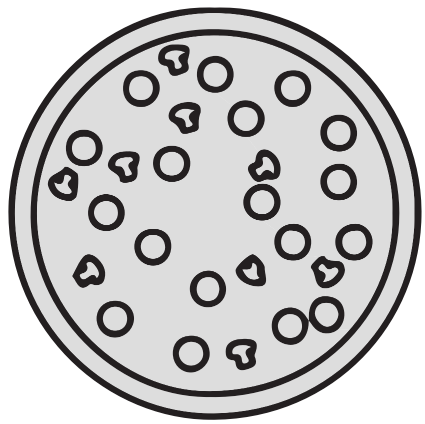
Ivy has 7 brothers and sisters. Fern has 3 brothers and sisters. Both families order the same size pizza.

After dinner that night, Ivy and Fern were talking on the phone. Ivy said that she got more pizza than Fern did. Fern said that he got more pizza than Ivy. Who was right?

Pizza for Ivy's Family



Pizza for Fern's Family



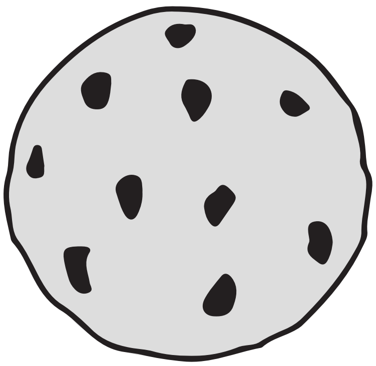
Explain:

Name: ______________________________

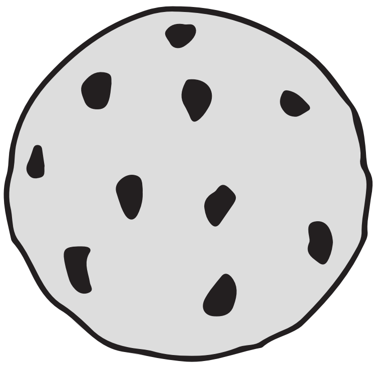
Directions: Partition the circles to solve the problem. Explain your thinking in words.

Gerald's dad ordered 2 cookie cakes for his birthday. He wanted each of Gerald's friends to have one BIG piece of cookie cake. Would it be better for him to cut the cookie cakes into eighths or into halves? Why?

Cookie Cake



Cookie Cake



Explain:

Name: ______________________________

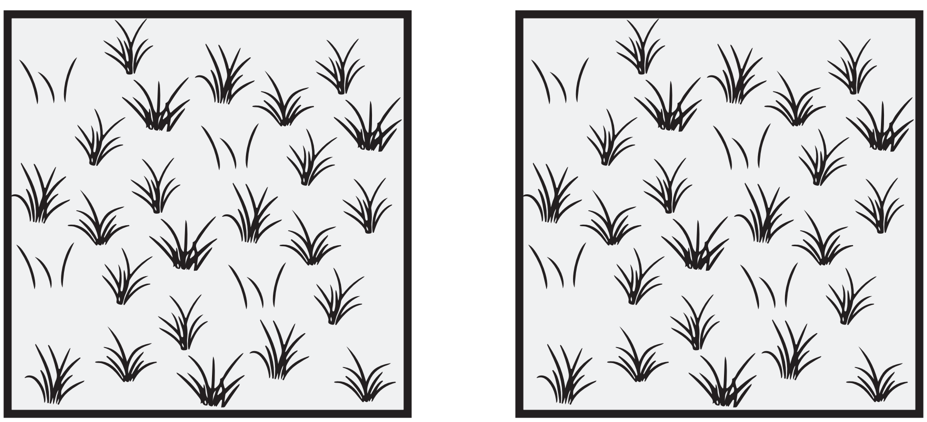
Directions: Use the squares below to help you solve the problem. Explain your thinking in words.

It was Saturday and time to mow the yard. Ugh! Adrienne and his dad did NOT like to mow. His dad said that they would divide the yard into fourths. Adrienne had to mow one of the fourths.

This made Adrienne MAD! He wanted to divide the yard into halves and mow only one of them.

Adrienne's dad laughed and laughed. He agreed that Adrienne only had to mow one of the halves of the yard. Why did Adrienne's dad agree to divide the yard into halves instead of fourths?

Adrienne's Yard



Explain:

CHECKING IN TEACHER NOTES (PG. 1 OF 2)

SE 2.3A, 2.3B, 2.3D, 2.1D, 2.1F, 2.1G

Posttest for Section 1

Purpose This activity provides a quick and easy way for you to determine your students' mastery of the Student Expectations addressed in this section. Problems range from very easy to more complex. Using a short checklist, you will be able to determine the specific kinds of errors students are making so you can plan additional targeted instruction.

☐ Introduction	☑ Representing	☑ Area Model (Square)	☐ Tutoring/Intervention
☐ Practice	☐ Counting	☑ Area Model (Circle)	☐ Small group
☑ Posttest	☑ Examples/Non-examples	☐ Any Model	☐ Centers
☑ Partitioning	☑ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

☐ Make 1 copy of **Checking In** for each student.

How-To Guide

1. Separate desks so that students can work alone.
2. Hand out **Checking In** to each student.
3. Remind students that they can draw pictures.
4. Read each problem aloud to be sure that students understand the problem. Have students work each problem. Be sure they answer all parts of each question. As students are working, circulate around the room. If you see a student who clearly does not understand, ask questions to elicit the misconception(s). Make a notation on his/her paper so that you can remember what the misconception was.

Open-Ended vs. Multiple Choice Problems (2.1G) (1 of 2)

In this age of test-prep teaching, open-ended assessments have given way to multiple choice assessments. In the past, multiple choice tests were only given on state- and national-level assessments. Day-to-day assessment was open-ended, and most often created by the teacher.

What are some benefits of multiple choice tests? They may help to predict how students will do on STAAR. They appear to be easier to grade an open-ended test. On the surface, this makes them attractive.

Let's pause for a minute to consider the more meaningful benefits of open-ended assessments.

When you grade an open-ended test, it's easy to see the kinds of mistakes a student is making and then design intervention specific to that student's needs. Is it an arithmetic error or a conceptual error? An arithmetic error means that a student needs to practice arithmetic and not necessarily the concept that is being assessed. Give the student opportunities to use a fun fact practice app and let them build their fluency—no actual intervention needed. This keeps you, the teacher, from wasting time and energy designing an intervention that the student doesn't actually need. It also saves the student from sitting through something he/she already knows.

It's an entirely different situation when a student makes a conceptual error. For example, do students disregard that fractional parts must be equal in size? Do they understand how the name of the fractional parts relates to the size of the parts? Some students may say that fourths are larger than halves because 4 is larger than 2. Once you've identified a student's consistent conceptual error, you can plan a targeted tutoring session for the needed skill. You get this kind of specific error information much more easily from open-ended assessments since you are looking beyond whether the student got a right or wrong answer.

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Open-Ended vs. Multiple Choice Problems (2.1G) (2 of 2)

Open-ended tests let you see whether a whole-class reteach is necessary instead of a small group reteach. If most of the class is making the same type error, then reteach the whole class. If it's a small group of students making the error, reteach the small group and let the rest of the class practice the skill using more complex problems.

Open-ended tests allow you to give specific feedback to students. As you are grading, you can circle where in the problem-solving process they made their error. When students review their test, they can see exactly where they made the error. That's difficult on a multiple-choice test.

Open-ended tests build grit. Students are responsible for knowing how to work the problems, not for simply choosing an answer.

Open-ended tests provide you a way to know what you teach well and know where you can grow. You can ask for help—that's what professionals do. This helps students learn better and it helps you grow as a teacher.

Finally, you might consider returning assessments to students with feedback ONLY, rather than with a grade. This way, students can focus on the feedback, which is more useful to them than a final score.

As you are creating your assessments, consider making them open-ended. You'll get the information you need to help students push their learning forward.

Arithmetic Errors

A student may understand the concept, but makes an arithmetic error. For example, the student may partition a figure into 3 parts, not 4 parts as called for in the problem. Note that this could also be a reading issue. Question the student to find out if the student did not understand the problem or did not partition the figure into the correct number of parts.

Interventions

- Teach students to touch each fractional part with their finger as they count the parts.
- Explicitly teach students the meaning of " __________ and 3 friends."

Conceptual Errors

The student doesn't understand the concept. For example, in Problem #5, a student might think that 8 is larger than 4, so eighths must be larger than fourths. In Problem #4, the student might draw 4 lines to partition the ribbon instead of breaking the ribbon into 4 equal-size parts.

Interventions

- Use manipulatives to explore concepts.
- Have the student draw pictures to develop their understanding of the problem and process.
- Ask students to explain their thought process as they solve a problem to pinpoint the conceptual error.

Incomplete Work—Stopped too Soon

The student appears to understand the underlying concept, but simply stops too soon in solving the problem. For example, in Problem #6, the student correctly partitions the granola bars, but does not answer the question.

Interventions

- Build stamina by starting with shorter problems and then progressing to longer, more rigorous problems.
- Explain to the student how their first steps were correct, and work together to identify what they should have done next.

Guessing

The student is unsure about how to solve a problem, so they guess. This is easily identifiable when the work shown by the student (if there is any) does not lead logically to the answer given.

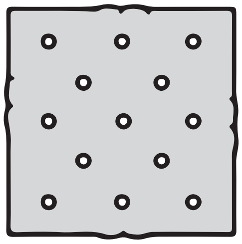
In Problem #4, for example, the student might draw lines to show the cuts in the ribbon. But the lines might not be equally spaced, the ribbon might not be partitioned into 4 parts, or the student might write the number 3.

Guessing often reveals frustration with a lack of conceptual understanding.

Interventions

- Work with the student individually to identify why they guessed.
- Revisit the conceptual interventions to build the student's confidence in their ability to solve problems.

1 Partition the cracker into 4 equal-size pieces.



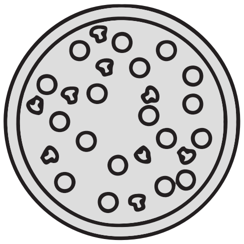
Partitioning will vary. Be sure that the cracker is divided into 4 equal pieces so that each piece represents $\frac{1}{4}$ of the cracker.

2 The coding club ordered a giant cookie that was shaped like a rectangle. Partition the cookie so that all 8 of the club members get the same size piece of cookie. What is the name of each piece of cookie?

halves fourths eighths

Partitioning will vary. Be sure that the cookie is divided into 8 equal pieces so that each piece represents $\frac{1}{8}$ of the cookie.

3 Mike and his best friend are going to share a pizza. Divide the pizza so that each person gets half of the pizza.

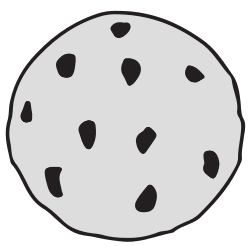


Partitioning will vary. Be sure that the pizza is divided into 2 equal pieces so that each piece is half of the pizza.

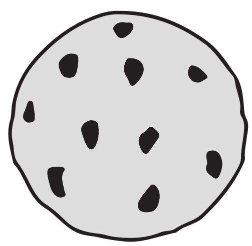
4 Sasha and her 3 friends were wrapping presents. They each needed the same amount of ribbon. Show how Sasha could cut the ribbon so that each person gets the same amount.

Partitioning will vary. Be sure that the line is divided into 4 equal pieces so that each piece is $\frac{1}{4}$ of the line.

5 Meg's cookie was divided into fourths. Marg's cookie was divided into eighths. Partition the cookies. Then circle the name of the girl with the largest pieces of cookie.



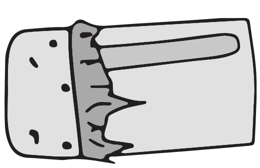
Meg



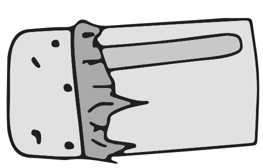
Marg

Partitioning will vary. Meg's cookie should be divided into 4 pieces that are all the same size. Marg's cookie should be divided into 8 pieces that are all the same size. Meg should be circled.

6 Melvin shared his granola bar with 3 friends. Mark shared his granola bar with 7 friends. Partition the granola bars. Then circle the name of the person whose friends got smaller pieces of the granola bar.



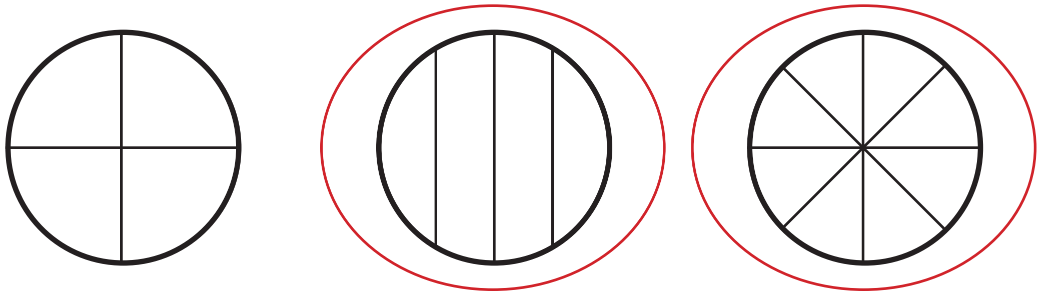
Melvin



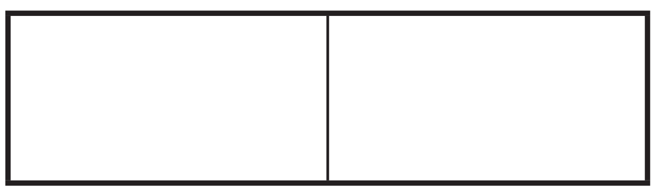
Mark

Partitioning will vary. Be sure that Melvin's granola bar is divided into 4 equal pieces. Be sure that Mark's granola bar is divided into 8 equal pieces. Mark should be circled.

7 Draw a circle around the figures that are NOT partitioned into fourths.

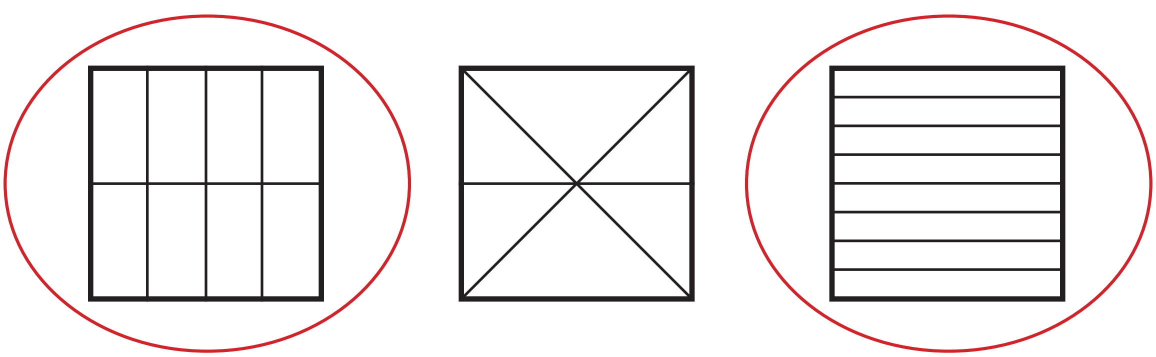


8 The rectangle below has been divided into halves. Put an X in the boxes that help you know each piece is half.



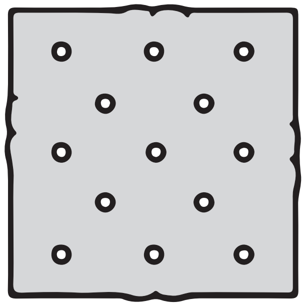
- [x] There are two pieces.
- [x] The pieces are the same size.
- [ ] Each piece is a square.

9 Draw a circle around the figures that are partitioned into eighths.

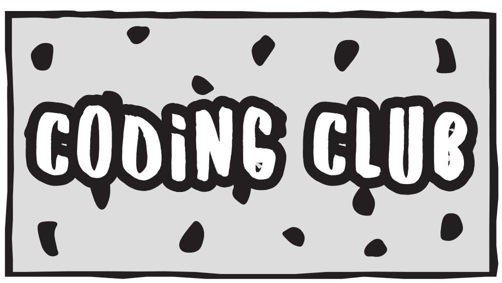


Name: ______________________________

1 Partition the cracker into 4 equal-size pieces.

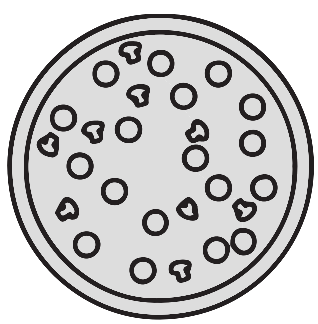


2 The coding club ordered a giant cookie that was shaped like a rectangle. Partition the cookie so that all 8 of the club members get the same size piece of cookie. What is the name of each piece of cookie?



halves   fourths   eighths

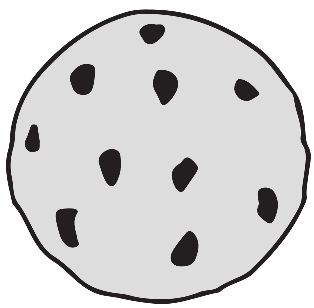
3 Mike and his best friend are going to share a pizza. Divide the pizza so that each person gets half of the pizza.



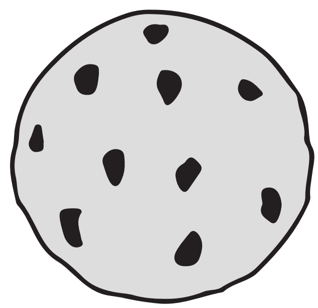
Name: ______________________________

4 Sasha and her 3 friends were wrapping presents. They each needed the same amount of ribbon. Show how Sasha could cut the ribbon so that each person gets the same amount.

5 Meg's cookie was divided into fourths. Marg's cookie was divided into eighths. Partition the cookies. Then circle the name of the girl with the largest pieces of cookie.

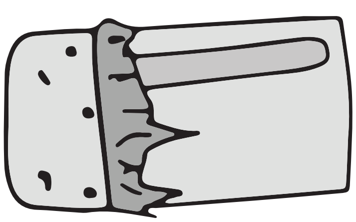


Meg

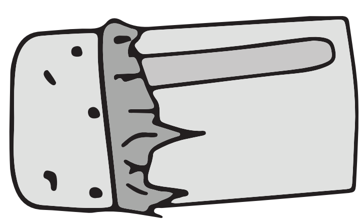


Marg

6 Melvin shared his granola bar with 3 friends. Mark shared his granola bar with 7 friends. Partition the granola bars. Then circle the name of the person whose friends got smaller pieces of the granola bar.



Melvin

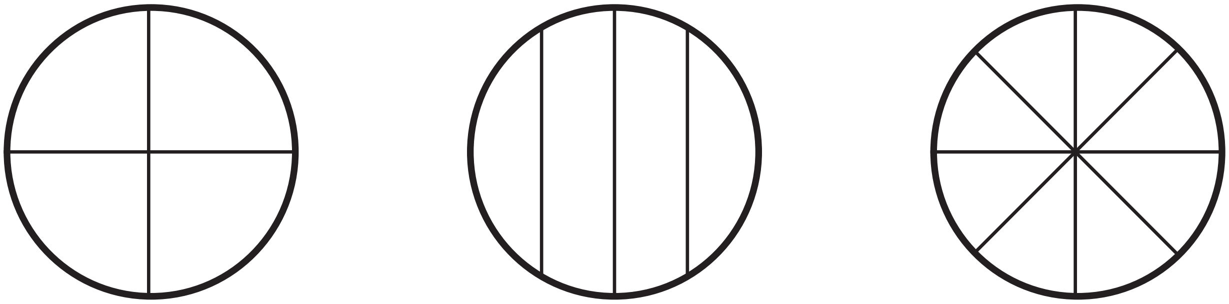


Mark

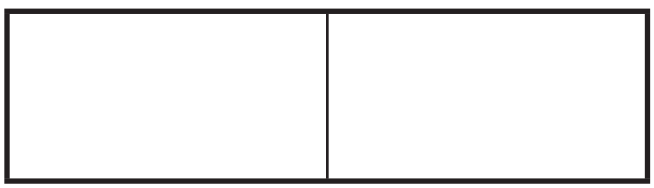
CHECKING IN (PG. 3 OF 3)

Name: ______________________________

7 Draw a circle around the figures that are NOT partitioned into fourths.

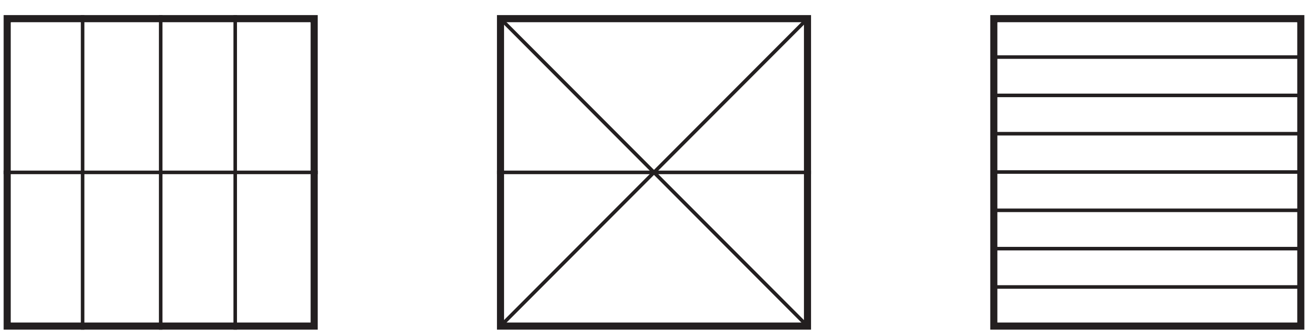


8 The rectangle below has been divided into halves. Put an X in the boxes that help you know each piece is half.



- ☐ There are two pieces.
- ☐ The pieces are the same size.
- ☐ Each piece is a square.

9 Draw a circle around the figures that are partitioned into eighths.



Counting Fractional Parts

Section 2

Counting Fractional Parts (2.3C)

Vertical Alignment

Section 2

In 1st grade, fractions are a geometry concept, not a number concept. Students partition figures into equal parts. They name the parts based on the number of equal-size parts in the whole.

Students are expected to work with halves and fourths only.

Fractions are written as words, not as numbers.

1.6G Partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words.

INTERVENTION

Have students partition geometric figures into equal-size parts. Focus on:

- The number of equal parts to make one whole.
- The number of equal parts in the model or figure.

In 2nd grade, students informally experience unit fractions as they count fractional parts beyond one whole. While counting, be sure that students always say the whole name of the fractional part: 3-fourths, not 3. Focus on the number of parts in the whole and how many more parts it takes to make a whole.

2.3C Use concrete models to count fractional parts beyond one whole using words and recognize how many parts it takes to equal one whole.

ACCELERATION

Have students use different models to create fractions that are larger than 1. Have them answer questions such as these:

- How many fractional parts (fourths, eighths etc.) do you have?
- Do you have more, less, or equal to one whole?
- How many of your fractional parts does it take to make the whole?
- How many wholes could you make?
- Would you have any parts eft over? How many?

In 3rd grade, students represent fractions using concrete and pictorial models, including number lines. They use formal notation to write the names of fractions. Denominators of 3 and 6 are included along with 2, 4, and 8.

3.3A Represent fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models, including strip diagrams and number lines.

3.3B Determine the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line.

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MORE THAN A WHOLE TEACHER NOTES (PG. 1 OF 2)

Count Fractional Parts Up To & Beyond One Whole

Purpose In this activity, students are formally introduced to counting fractional parts. This includes counting fractional parts beyond one whole. Teachers will work with students to make wholes, combine some of the parts to make a fraction, and count the fractional parts.

☑ Introduction	☐ Representing	☐ Area Model (Square)	☑ Tutoring/Intervention
☐ Practice	☑ Counting	☑ Area Model (Circle)	☐ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☐ Centers
☐ Partitioning	☐ Linear Model	☑ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

☐ Gather 1 set of **fraction circles** for each pair of students. You may wish to use the whole, halves, fourths, and eighths only.

Thought Extenders

- How many parts is the whole partitioned into?
- How many parts does it take to make a whole?
- How do you know the name of a fractional part?
- When we count, what do we need to say?
- How many wholes do you have? How many extra pieces do you have?
- How many more pieces do you need to make a whole?

How-To Guide (1 of 2)

1. Place students in pairs and hand out **fraction circles**.
2. Ask students to find the whole. Place 1 whole on the document camera.
3. Ask students to work together to find the fourths (4 equal pieces that make a whole).
   - What is the name of each fractional part? *Fourths*
   - How do you know they are called fourths? *It takes 4 equal parts to make the whole.*
4. Ask 1 group of students to bring 2 of their fourths to the front of the class; ask another group to bring 1 of their fourths. Facilitate a whole class discussion.
   - What is the name of each of these pieces? How do you know? *Fourths; it takes 4 of these equal parts to make a whole.*
   - Ask a student to put the fractional parts together so they begin to make a circle.
   - Let's find out how many fourths we have. To do that we need to count them. When we count, we must use the complete name of the fraction. Let's count the fourths out loud. *1-fourth, 2-fourths, 3-fourths*
   - How many fourths do we have? *3-fourths*
   - Do we have enough to make a whole? How do you know? *No; the circle is incomplete.*

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MORE THAN A WHOLE TEACHER NOTES (PG. 2 OF 2)

How-To Guide (2 of 2)

5. Ask students to work together to find eighths (8 equal pieces that make a whole).
   - What is the name of each fractional part? *Eighths*
   - How do you know they are called eighths? *It takes 8 equal parts to make the whole.*
6. Ask 1 group of students to bring 5 of their eighths to the front of the class and another group to bring 4 of their eighths.
   - What is the name of each of these pieces? How do you know? *Eighths; it takes 8 of these equal parts to make a whole.*
   - Ask a student to put the fractional parts together to make a circle. Explain to students that sometimes you can have more parts than you need to make the whole.
   - How many wholes did you make? *One*
   - Do you have any eighths left over? *Yes, 1-eighth is left over.*
   - Let's count to find out how many eighths we have in all. When we count, we must use the complete name of the fraction. Let's count the eighths out loud. *1-eighth, 2-eighths, 3-eighths…9 eighths*
   - How many eighths do we have? What can this be called? *9-eighths. We can also call this 1 whole and 1-eighth, or 1 and 1-eighth.*
7. Continue this process using these amounts:
   - 4-fourths (This can be called *4-fourths* or *1 whole*.)
   - 6-eighths
   - 3-halves (This can be called *3-halves* or *1 and 1-half*.)
   - 7-fourths (This can be called *7-fourths* or *1 and 3-fourths*.)
   - 10-eighths (This can be called *10-eighths* or *1 and 2-eighths*.)

BITS IN BAGS TEACHER NOTES (PG. 1 OF 2)

SE 2.3C, 2.1C

Count Fractional Parts Up To & Beyond One Whole

Purpose In this activity, students will be given fractional parts. They will find the name of the part and count to find the total number of fractional parts.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☐ Tutoring/Intervention
☑ Practice	☑ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☑ Centers
☐ Partitioning	☐ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Gather 3 **paper lunch sacks** for each group of 3–4 students. (Another option is to make 2 sets of bags and trade the bags between groups.)
- ☐ Gather **fraction circles** for each bag. You may wish to make copies of the fraction circles and laminate them, rather than breaking apart your fraction circles.
- ☐ Bag A: Place 5 halves and 1 whole in the bag. Write "A" on the front of the bag.
- ☐ Bag B: Place 7 fourths and 1 whole in the bag. Write "B" on the front of the bag.
- ☐ Bag C: Place 11 eighths and 1 whole in the bag Write "C" on the front of the bag.
- ☐ Make 1 copy of **Bits in Bags** for each group.

How-To Guide

1. Place students in groups of 3–4. Hand out **Bits in Bags**.
2. Have students work with their groups to complete Part A. Discuss with the whole class.
3. Hand out Bag A. Have students work together to identify the whole, name the fractional parts, count the parts, and complete the Part B, Bag A portion of **Bits in Bags**. When a group has completed the work for Bag A and you have checked it, give them Bag B.
4. Follow the same process with students working together to name and count the fractional parts and fill in **Bits in Bags**.

Place the bags and their recording sheets in a center. Have students rotate through the centers.

Note: This activity was inspired by John Van De Walle's work, *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades K–2*.

Thought Extenders

- How many parts is the whole partitioned into?
- How many parts does it take to make a whole?
- How do you know the name of a fractional part?
- When we count, what do we need to say?
- How many wholes do you have? How many extra pieces do you have?
- How many more pieces do you need to make a whole?

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BITS IN BAGS TEACHER NOTES (PG. 2 OF 2)

What is Iterating? (2.1E)

"To iterate" means to repeat. As 2nd graders work with concrete models and begin to partition objects and figures for themselves, they begin to see that equal parts repeat throughout the whole. Using models allows students to see that 2 equal parts are iterated to make 1 whole, 4 equal parts are iterated to make 1 whole, and so on. Students use iteration to find the number of equal parts it takes to make 1 whole, and from that information they can correctly name the fractional parts.

The iteration of fractions continues to play a significant role in future grade levels.

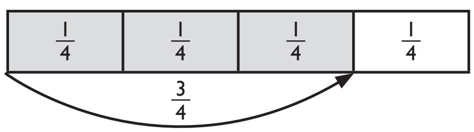
Grades 3–4

<u>Iteration and the Addition of Fractions</u>

Understanding the iteration of fractions helps students understand addition of fractions. If it takes 4 copies of $\frac{1}{4}$ to make the whole, then it stands to reason that we must be able to join them, or add them together, to get the whole.

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{4}{4}\text{, or 1 whole}$$

In the example below, the unit fraction $\frac{1}{4}$ is iterated 3 times to cover the shaded region. If it takes 3 copies of $\frac{1}{4}$ to cover the shaded region, then those 3 parts can be joined to make $\frac{3}{4}$.



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

Grades 3–5

<u>Iteration and Equivalent Fractions</u>

When students begin to look for equivalent fractions they look for a different size part that can be iterated to make the same size part as the original fraction. For example, when given the fraction $\frac{1}{2}$, students will find that 2 equal parts called fourths are repeated to make a fraction equal to $\frac{1}{2}$. Therefore, $\frac{1}{2}$ is equivalent to $\frac{2}{4}$.

<u>Iteration and the Number Line</u>

It is important for students to understand that partitioning a number line into fractional parts means that those parts will iterate throughout the number line.

For example, if we partition a number line into fourths, each section of the line represents *1-fourth*. If we start the count at zero and count 7 sections of the line, we will end at $\frac{7}{4}$. Students should be able to see that $\frac{7}{4}$ correlates to 1 whole and 3 more fourths, or $1\frac{3}{4}$.

<u>Iteration and Mixed Numbers</u>

An iteration of fractions beyond 1 whole leads us to the understanding of mixed numbers. If I have 7 copies of $\frac{1}{4}$, then I can count them to find the total of $\frac{7}{4}$. I can combine 4 of the fourths together to make 1 whole and have 3 of the fourths left over. Therefore, $\frac{7}{4}$ is the same as $1\frac{3}{4}$.

BITS IN BAGS ANSWER KEY

Part A

Directions: Use the words from the Word Bank to complete the sentences.

A fractional part gets its name from the number of ___equal___ parts it takes to make ___one___ whole.

When the whole is divided into 2 equal parts, the parts are called ___halves___.

The name ___eighths___ comes from a whole that has 8 equal parts.

To use the name fourths, the whole must have ___four___ equal parts.

Word Bank	
four	halves
one	fourths
eighths	eight
two	equal

Part B

Directions: Find the whole circle. Use the parts to make a whole. Name the parts. Then count them.

The fractional parts are called ___halves___.

Bag A contains ___5___ - ___halves___.

The fractional parts are called ___fourths___.

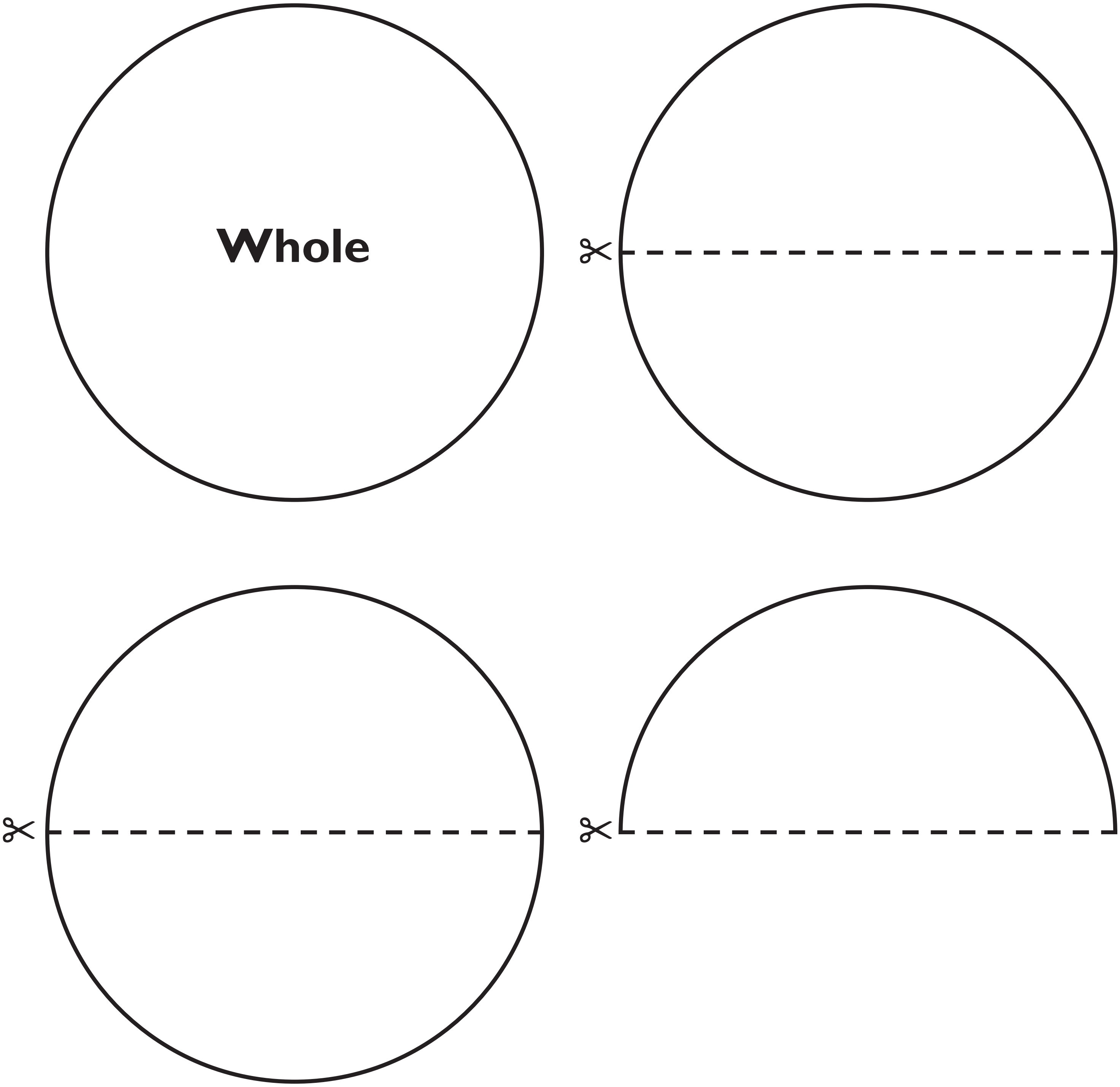
Bag B contains ___7___ - ___fourths___.

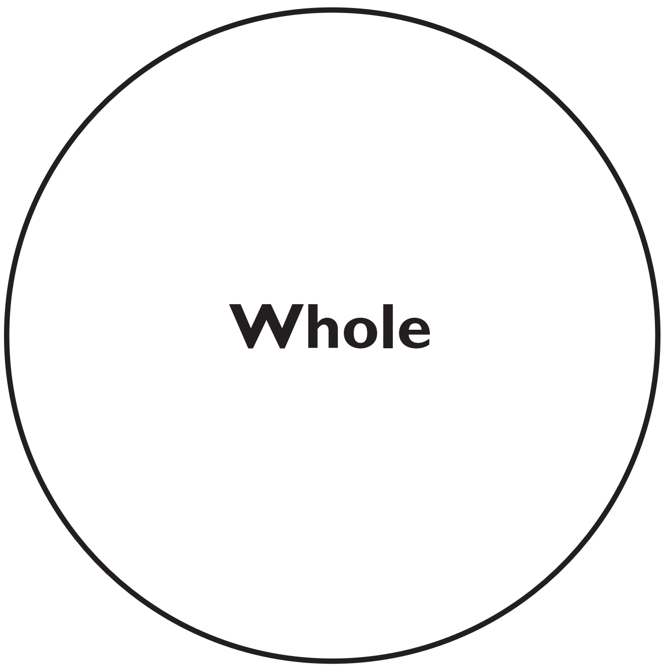
The fractional parts are called ___eighths___.

Bag C contains ___11___ - ___eighths___.

BITS IN BAGS CIRCLE MODELS (BAG A)

Note: You may use these models or use your own fraction circles.

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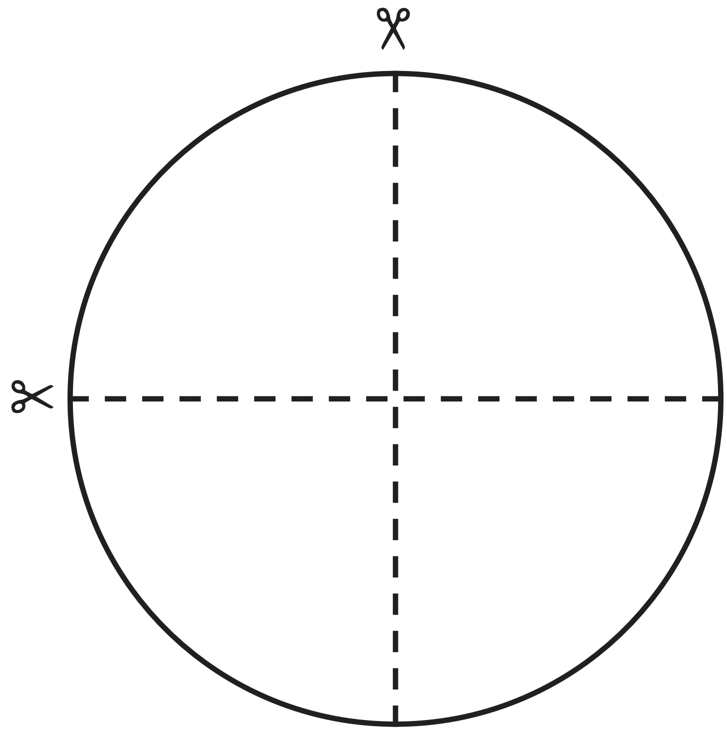
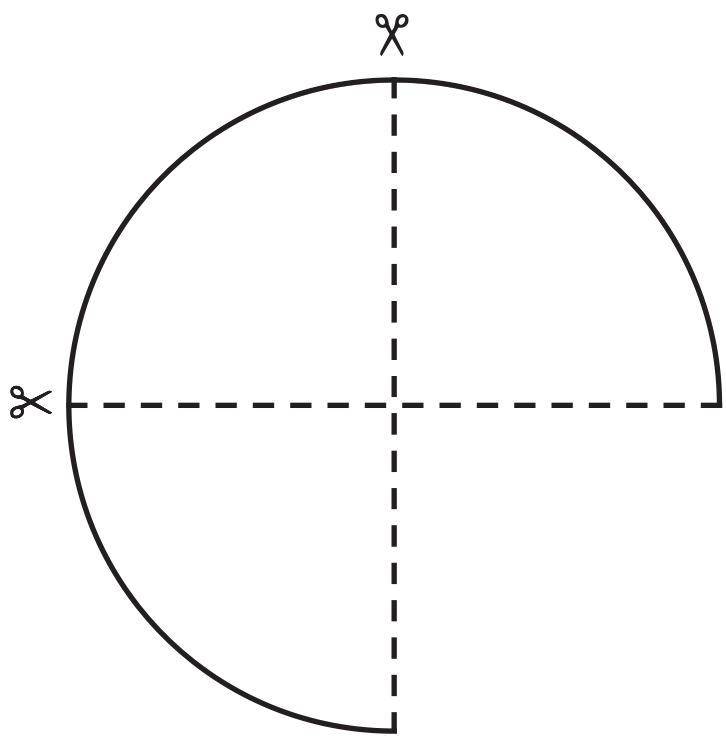
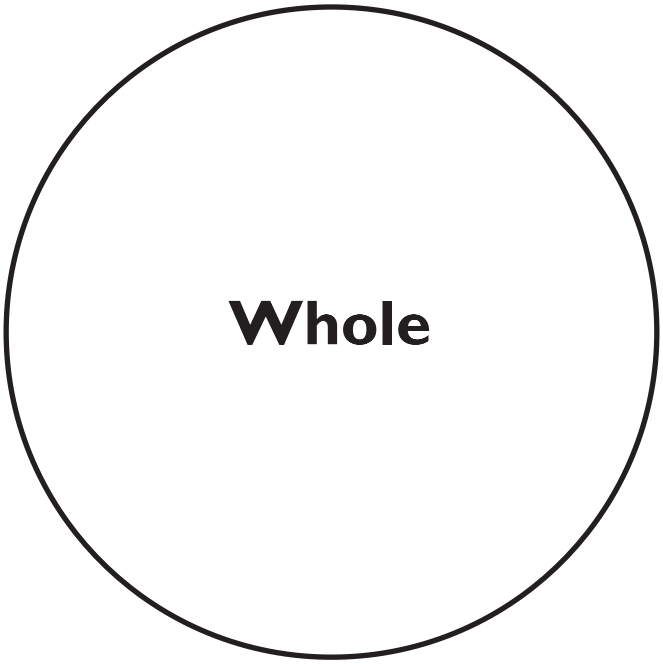
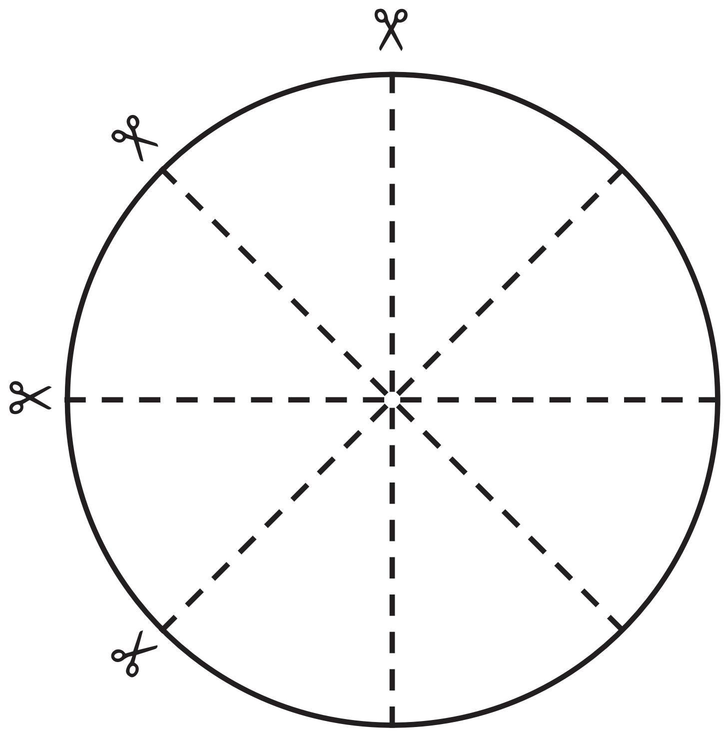
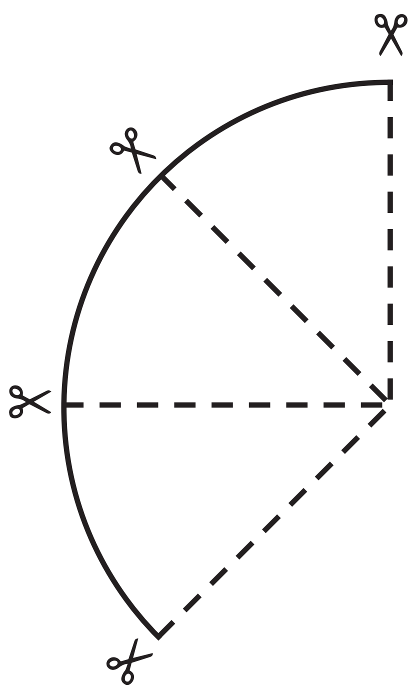




BITS IN BAGS CIRCLE MODELS (BAG C)







BITS IN BAGS

Name: ______________________________

Part A

Directions: Use the words from the Word Bank to complete the sentences.

A fractional part gets its name from the number of ______________ parts it takes to make ________________ whole.

When the whole is divided into 2 equal parts, the parts are called ______________________.

The name ___________ comes from a whole that has 8 equal parts.

To use the name fourths, the whole must have _______ equal parts.

Word Bank	
four	halves
one	fourths
eighths	eight
two	equal

Part B

Directions: Find the whole circle. Use the parts to make a whole. Name the parts. Then count them.

The fractional parts are called ______________________.

Bag A contains ________________ - __________________.

The fractional parts are called ______________________.

Bag B contains ________________ - __________________.

The fractional parts are called ______________________.

Bag C contains ________________ - __________________.

ONE WHOLE? TEACHER NOTES (PG. 1 OF 2)

SE 2.3C, 2.1C

Count Fractional Parts Up To & Beyond One Whole

Purpose This activity contains 3 stations. Given the name of the fractional part, students will work together to count the total number of fractional parts and then determine whether the number of parts is more, less, or equal to one whole.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☐ Tutoring/Intervention
☑ Practice	☑ Counting	☐ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☑ Centers
☐ Partitioning	☑ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Gather 3 **paper lunch sacks**.
- ☐ Gather several sets of **Cuisenaire rods** to place in the bags.
- ☐ Station A:
  - ☐ Label a bag "Station A."
  - ☐ Place 7 red rods in the bag.
  - ☐ Make 1 copy of **One Whole? Station A** for each pair of students.
- ☐ Station B:
  - ☐ Label a bag "Station B."
  - ☐ Place 4 lime green rods in the bag.
  - ☐ Make 1 copy of **One Whole? Station B** for each pair of students.
- ☐ Station C:
  - ☐ Label a bag "Station C."
  - ☐ Place 2 blue rods in the bag.
  - ☐ Make 1 copy of **One Whole? Station C** for each pair of students.
- ☐ Place the materials in each station.

Thought Extenders

- How many parts is the whole partitioned into?
- How many parts does it take to make a whole?
- How do you know the name of a fractional part?
- When we count, what do we need to say?
- How many wholes do you have? How many extra pieces do you have?
- How many more pieces do you need to make a whole?

How-To Guide

1. Assign a pair of students to each station.
2. Have students work together to solve each problem.

Note: You may wish to make more than 1 set of stations so that all students can work on the same type of station at the same time.

Note: This activity was inspired by John Van De Walle's work, Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades K–2.

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ONE WHOLE? TEACHER NOTES (PG. 2 OF 2)

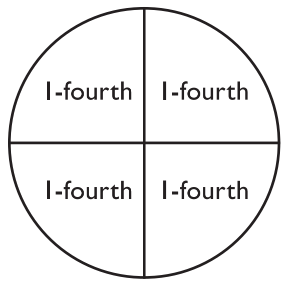
Counting Fractional Parts (2.1F)

As soon as students can accurately name fractional parts, they can also begin to count them. Students practice using the words *halves*, *fourths*, and *eighths* as they speak and count using fraction language.

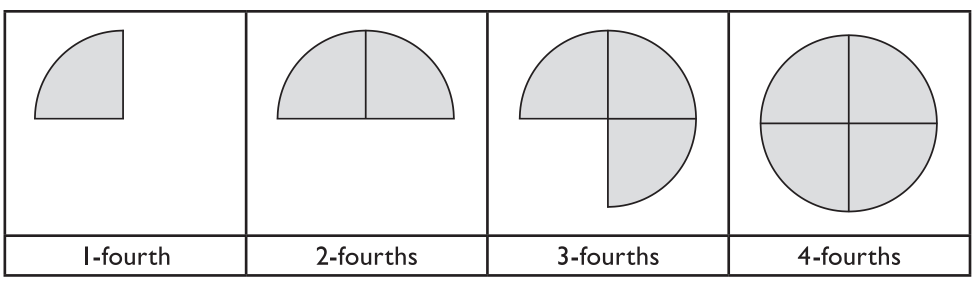
For example: One whole has been divided into 4 equal parts. Students **name** the parts *fourths*. They **count** the parts using fraction language (*1-fourth, 2-fourths, 3-fourths, 4-fourths*). Students see that 4 parts called *fourths*, or *4-fourths,* make 1 whole.

There are several things to remember when counting fractional parts:

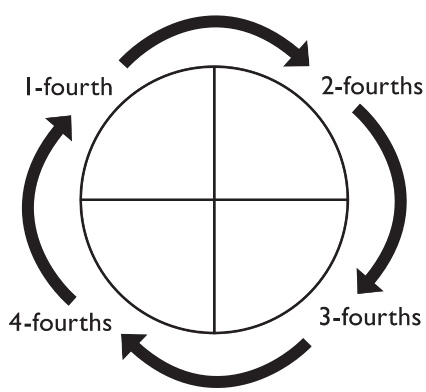
- Fractions are not whole numbers. Therefore, we should not use whole number language (*1, 2, 3, 4*) when we count them!
- When counting fractional parts, each part is a unit fraction, or 1 piece of the whole. The parts are iterated (repeated) throughout the whole. Second graders do not need to know the term *unit fraction*, but they should know that each part of the whole below is *1-fourth*. You can reinforce this by giving students experience with a variety of fractions manipulatives and modeling the **naming** of each part. Point to each fractional part and ask, "What is the name of this part?" Emphasize that the **name** of the part does not change no matter how many parts there are.



- Never name or label the fractional parts with the counting sequence. Otherwise, students will develop a misconception that the piece you are calling *2-fourths* is only 1 piece of the whole. Instead, point to each part as you count using fraction language. You can reinforce this by first showing students fractional pieces and asking how many there are.



Only now are you ready to show the whole and count how many parts the whole has. Point to each part as you count using fraction language.



Consistently modeling and emphasizing the difference between **naming** and **counting** fractional parts helps students develop a deep and accurate understanding of fractional parts that will serve them well in later grades.

ONE WHOLE? ANSWER KEY STATION A

The red rods are eighths.

1. How many eighths make one whole? ____8____
2. Count the eighths in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are ____7____ - eighths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough to make one whole.

It takes __________ equal parts called __________ to make one whole.

B. I have less than one whole.

I need ____1____ more eighth to make one whole.

C. I have more than one whole.

How many wholes can you make? __________

I have __________ - eighths left over.

The red rods are fourths.

1. How many fourths make one whole? ____4____
2. Count the fourths in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are ____7____ - fourths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough parts to make one whole.

It takes __________ equal parts called __________ to make one whole.

B. I have less than one whole.

I need __________ more fourths to make one whole.

C. I have more than one whole.

How many wholes can you make? ____1____

I have ____3____ - fourths left over.

ONE WHOLE? ANSWER KEY STATION B

The lime green rods are fourths.

1. How many fourths make one whole? ___4___
2. Count the fourths in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are ___4___ - fourths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough to make one whole.

It takes ___4___ equal parts called ___fourths___ to make one whole.

B. I have less than one whole.

I need __________ more fourths to make one whole.

C. I have more than one whole.

How many wholes can you make? __________

I have __________ - fourths left over.

The lime green rods are halves.

1. How many halves make one whole? ___2___
2. Count the halves in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are ___4___ - halves in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough parts to make one whole.

It takes __________ equal parts called __________ to make one whole.

B. I have less than one whole.

I need __________ more half to make one whole.

C. I have more than one whole.

How many wholes can you make? ___2___

I have ___0___ - halves left over.

ONE WHOLE? ANSWER KEY STATION C

The blue rods are eighths.

1. How many eighths make one whole? ___8___
2. Count the eighths in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are ___2___ - eighths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough to make one whole.

It takes ________ equal parts called ________ to make one whole.

B. I have less than one whole.

I need ___6___ more eighths to make one whole.

C. I have more than one whole.

How many wholes can you make? ________

I have ________ - eighths left over.

The blue rods are halves.

1. How many halves make one whole? ___2___
2. Count the halves in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are ___2___ - halves in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough parts to make one whole.

It takes ___2___ equal parts called ___halves___ to make one whole.

B. I have less than one whole.

I need ________ more half to make one whole.

C. I have more than one whole.

How many wholes can you make? ________

I have ________ - halves left over.

ONE WHOLE? STATION A

Name: ______________________________

The red rods are eighths.

1. How many eighths make one whole? __________
2. Count the eighths in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are __________ - eighths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough to make one whole.
It takes __________ equal parts called __________ to make one whole.

B. I have less than one whole.
I need __________ more eighth to make one whole.

C. I have more than one whole.
How many wholes can you make? __________
I have __________ - eighths left over.

The red rods are fourths.

1. How many fourths make one whole? __________
2. Count the fourths in your bag. Be sure to use fraction language.
3. Fill in the blank.

There are __________ - fourths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

A. I have just enough parts to make one whole.
It takes __________ equal parts called __________ to make one whole.

B. I have less than one whole.
I need __________ more fourths to make one whole.

C. I have more than one whole.
How many wholes can you make? __________
I have __________ - fourths left over.

ONE WHOLE? STATION B

Name: ______________________________

The lime green rods are fourths.

1. How many fourths make one whole? ___________
2. Count the fourths in your bag. Be sure to use fraction language.
3. Fill in the blank.

   There are ___________ - fourths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

   A. I have just enough to make one whole.
   It takes ___________ equal parts called ____________ to make one whole.

   B. I have less than one whole.
   I need ___________ more fourths to make one whole.

   C. I have more than one whole.
   How many wholes can you make? __________
   I have __________ - fourths left over.

The lime green rods are halves.

1. How many halves make one whole? ___________
2. Count the halves in your bag. Be sure to use fraction language.
3. Fill in the blank.

   There are __________ - halves in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

   A. I have just enough parts to make one whole.
   It takes __________ equal parts called __________ to make one whole.

   B. I have less than one whole.
   I need ___________ more half to make one whole.

   C. I have more than one whole.
   How many wholes can you make? ___________
   I have ___________ - halves left over.

ONE WHOLE? STATION C

Name: ______________________________

The blue rods are eighths.

1. How many eighths make one whole? __________
2. Count the eighths in your bag. Be sure to use fraction language.
3. Fill in the blank.

   There are __________ - eighths in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

   A. I have just enough to make one whole.
   It takes __________ equal parts called __________ to make one whole.

   B. I have less than one whole.
   I need __________ more eighths to make one whole.

   C. I have more than one whole.
   How many wholes can you make? __________
   I have __________ - eighths left over.

The blue rods are halves.

1. How many halves make one whole? __________
2. Count the halves in your bag. Be sure to use fraction language.
3. Fill in the blank.

   There are __________ - halves in the bag.

4. Read statements A, B, and C. Circle the statement that is true and fill in the missing information.

   A. I have just enough parts to make one whole.
   It takes __________ equal parts called ____________ to make one whole.

   B. I have less than one whole.
   I need __________ more half to make one whole.

   C. I have more than one whole.
   How many wholes can you make? __________
   I have __________ - halves left over.

I KNOW TEACHER NOTES

SE 2.3C, 2.1C

Count Fractional Parts Up To & Beyond One Whole

Purpose This activity is a culminating activity for counting fractional parts. Students will be given a picture that shows more than one whole. They will name the fractional parts and count them.

☐ Introduction	☐ Representing	☐ Area Model (Square)	☐ Tutoring/Intervention
☑ Practice	☑ Counting	☑ Area Model (Circle)	☑ Small group
☐ Posttest	☐ Examples/Non-examples	☐ Any Model	☑ Centers
☐ Partitioning	☐ Linear Model	☐ Teacher-Facilitated	☐ Challenge!

Setting Up For Instruction

- ☐ Make 1 copy of **I Know** for each student.

Thought Extenders

- How many parts is the whole partitioned into?
- How many parts does it take to make a whole?
- How do you know the name of a fractional part?
- When we count, what do we need to say?
- How many wholes do you have? How many extra pieces do you have?
- How many more pieces do you need to make a whole?

How-To Guide

1. Place students in pairs and hand out **I Know**
2. Students work together to count the fractional parts and fill in the blanks. Remind students to use proper fraction language when counting the fractional parts.

   Note: This activity contains many of the fractions concepts learned in 2nd grade. Although students may have trouble knowing what to write in the blanks, do not confuse this with lack of understanding of fractions. Instead, allow students some productive struggle time to build grit. Then assist pairs of students as needed to help them understand what to write in the blanks.

Counting Fractional Parts Isn't Just About Counting (2.1B, 2.1F)

There's more to counting than meets the eye! In kindergarten, students count objects to find a total using whole numbers. In Grade 2 students count fractional parts to find a total using fractional parts. Consider the connections below.

Example 1

Joy has 3 cookies. Sam gave her 2 more. How many cookies does Joy have?

A kindergarten student models the problem and then counts to find the total number of cookies (*1, 2, 3, 4, 5*). Eventually, this problem is connected to a number sentence where 3 is joined with 2 to yield an answer of 5. (3 + 2 = 5)

Example 2

Joy has 2 fractional parts in her pile that are called fourths. Sam gave her 3 fourths from his pile. How many fourths does Joy have?

Students in Grade 2 can answer this question by counting to find the total number of fourths (*1-fourth, 2-fourths, 3-fourths, 4-fourths, 5-fourths*). In later grades, this problem is connected to a number sentence where *2-fourths* is joined with *3-fourths* to yield an answer of *5-fourths*. ($\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$) or ($\frac{2}{4} + \frac{3}{4} = \frac{5}{4}$)

Put simply, 2 parts called fourths joined with 3 parts called fourths is a total of 5 parts called fourths.

In both cases, counting to find the total is the precursor to addition.

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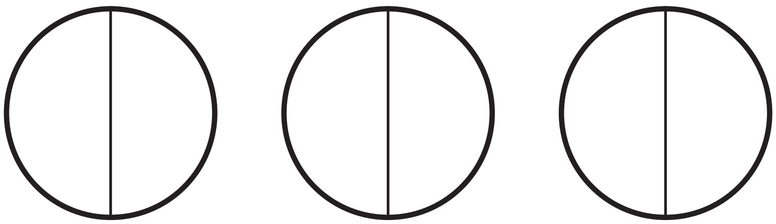
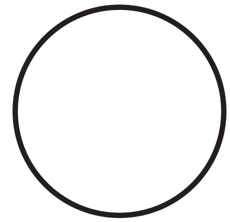
I KNOW ANSWER KEY (PG. 1 OF 2)

Directions: Find the whole. Name the parts and count to find the total.

1





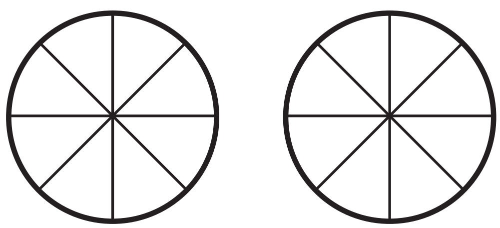
= 1 whole

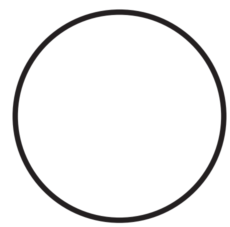
These fractional parts are called halves. I know this because 2 equal parts make 1 whole.

I counted 6-halves.

This is the same as 3 wholes.

2





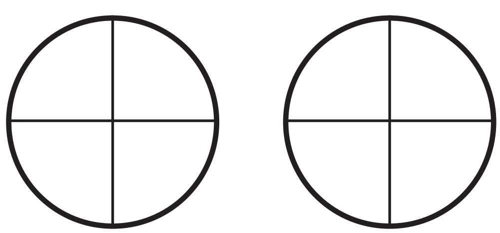
= 1 whole

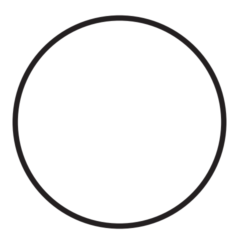
These fractional parts are called eighths. I know this because 8 equal parts make 1 whole.

This picture shows 16-eighths.

This is the same as 2 wholes.

3





= 1 whole

These fractional parts are called fourths.

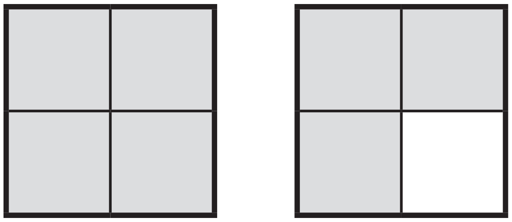
I counted 8-fourths.

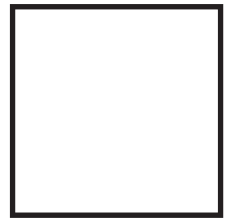
This is the same as 2 wholes.

I KNOW ANSWER KEY (PG. 2 OF 2)

Directions: Find the whole. Name the parts. Count to find the number of shaded parts.

4



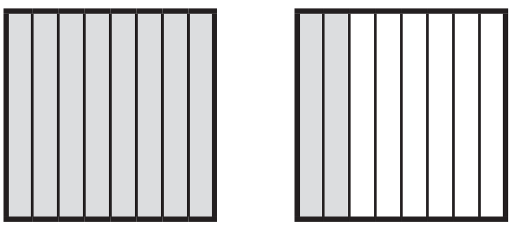
 = 1 whole

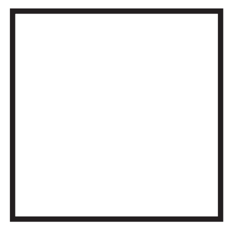
These fractional parts are called fourths. I know this because 4 equal parts make 1 whole.

7 - fourths are shaded.

Can you write this another way? 1 whole and 3 - fourths.

5



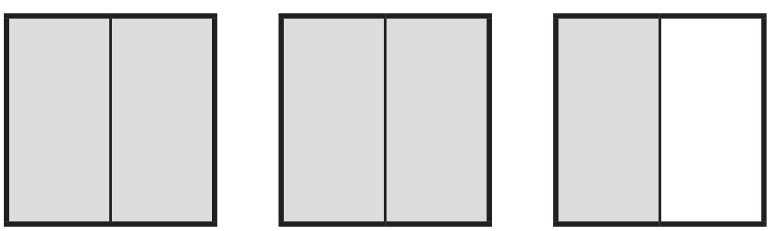
 = 1 whole

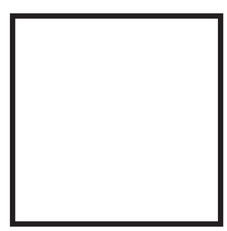
These fractional parts are called eighths. I know this because 8 equal parts make 1 whole.

10 - eighths are shaded.

Can you write this another way? 1 whole and 2 - eighths.

6



 = 1 whole

These fractional parts are called halves. I know this because 2 equal parts make 1 whole.

5 - halves are shaded.

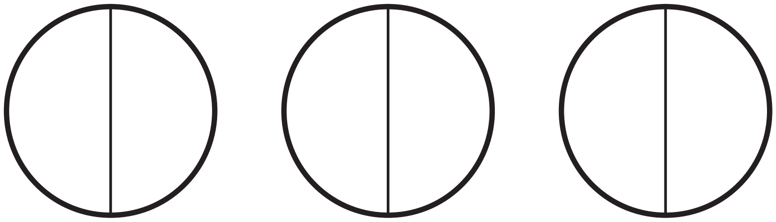
Can you write this another way? 2 wholes and 1 - half.

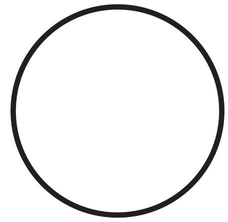
I KNOW (PG. 1 OF 2)

Name: ______________________________

Directions: Find the whole. Name the parts and count to find the total.

1



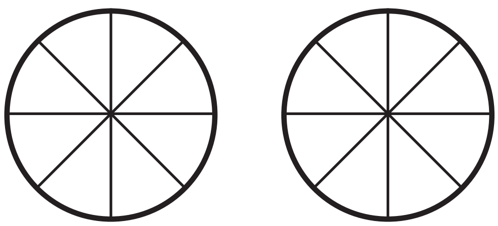
 = 1 whole

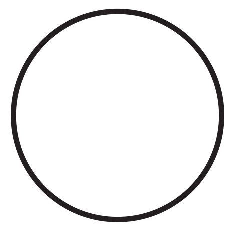
These fractional parts are called ____________. I know this because ________ equal parts make 1 whole.

I counted __________-____________.

This is the same as __________ wholes.

2



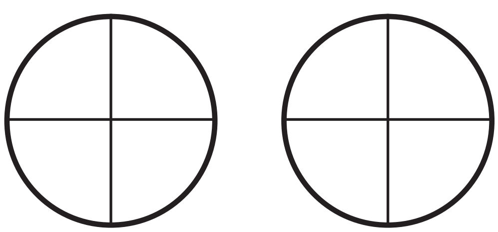
 = 1 whole

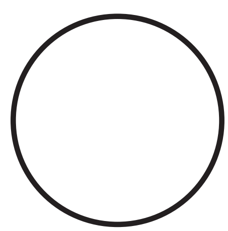
These fractional parts are called ____________. I know this because ________ equal parts make 1 whole.

This picture shows __________-_____________.

This is the same as __________ wholes.

3



 = 1 whole

These fractional parts are called ____________.

I counted __________-_____________.

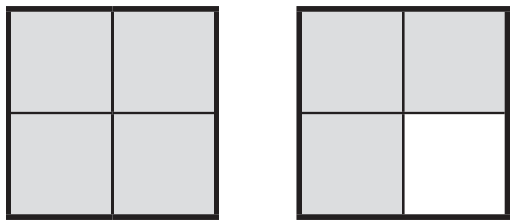
This is the same as ___________ wholes.

I KNOW (PG. 2 OF 2)

Name: ______________________________

Directions: Find the whole. Name the parts. Count to find the number of shaded parts.

4



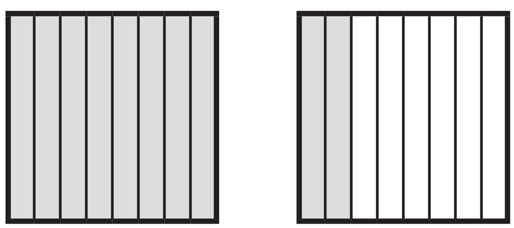
= 1 whole

These fractional parts are called ____________. I know this because ________ equal parts make 1 whole.

____________-______________ are shaded.

Can you write this another way? ___________ whole and ___________ - ______________.

5



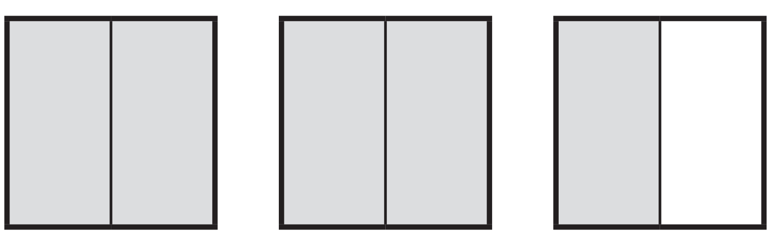
= 1 whole

These fractional parts are called ____________. I know this because ________ equal parts make 1 whole.

_____________-________________ are shaded.

Can you write this another way? ___________ whole and ___________ - ______________.

6



= 1 whole

These fractional parts are called ____________. I know this because ________ equal parts make 1 whole.

_____________-______________ are shaded.

Can you write this another way? ___________ wholes and ___________ - ______________.

Acknowledgement

This digital resource consists of high-quality math instructional content originally derived from TeachTransform, a previous lead4ward partnership. lead4ward purchased the TeachTransform assets and is committed to continue to grow and support math educators. TeachTransform's Co-Founder and CEO, Carol Gautier, M.Ed., continues to consult in the ongoing development.