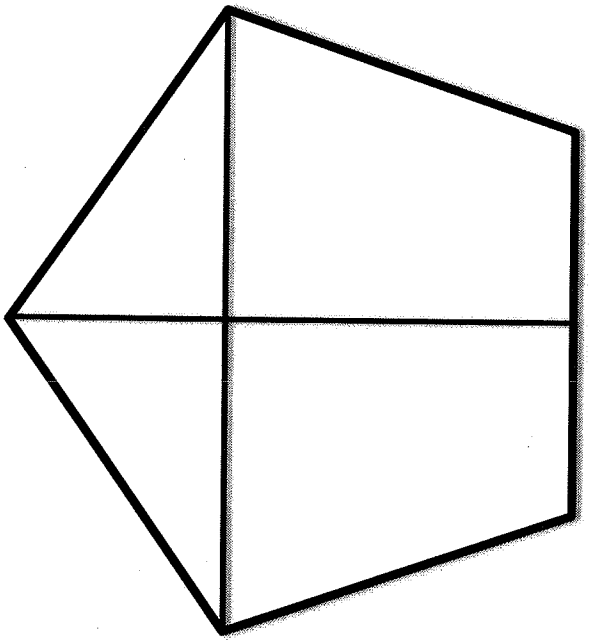
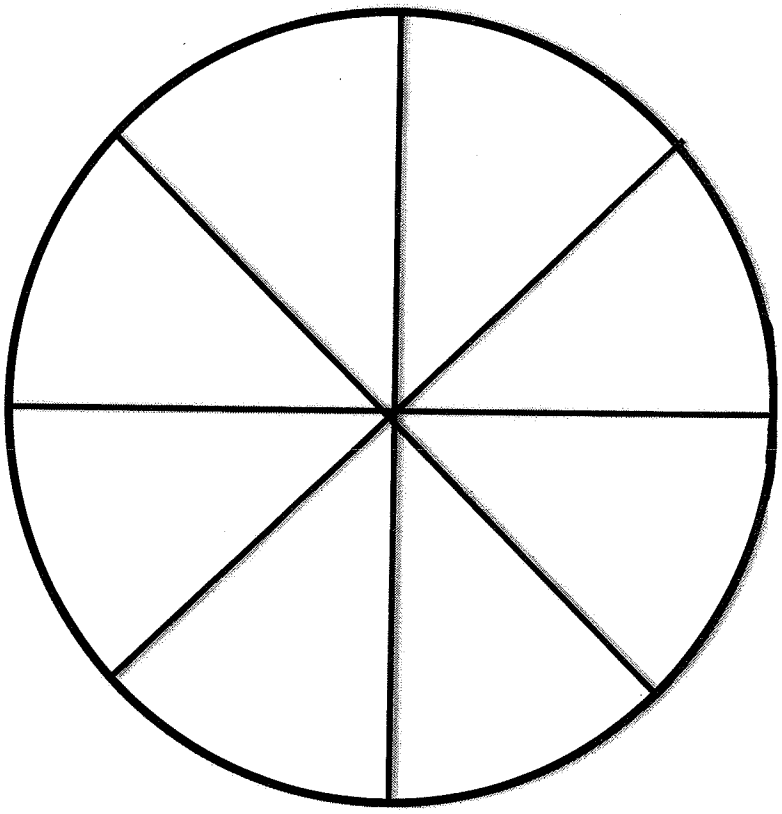
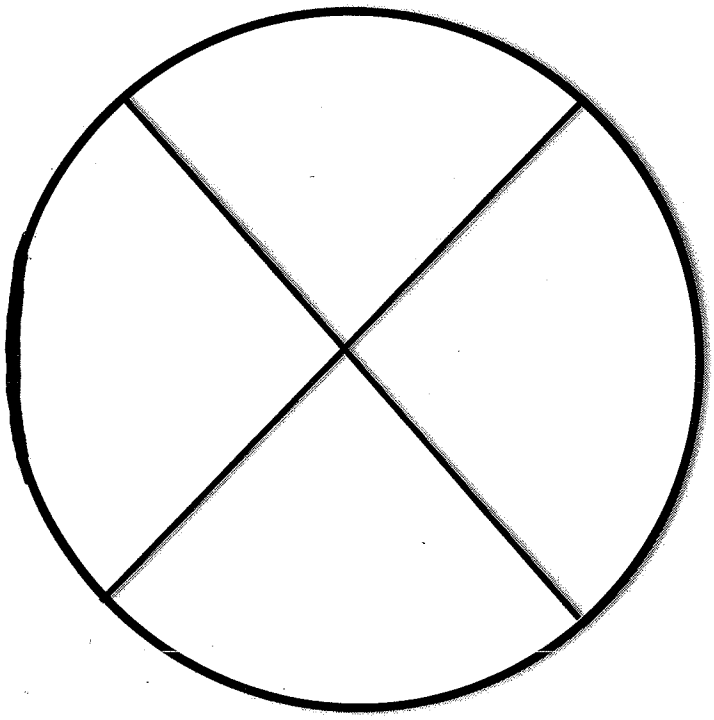
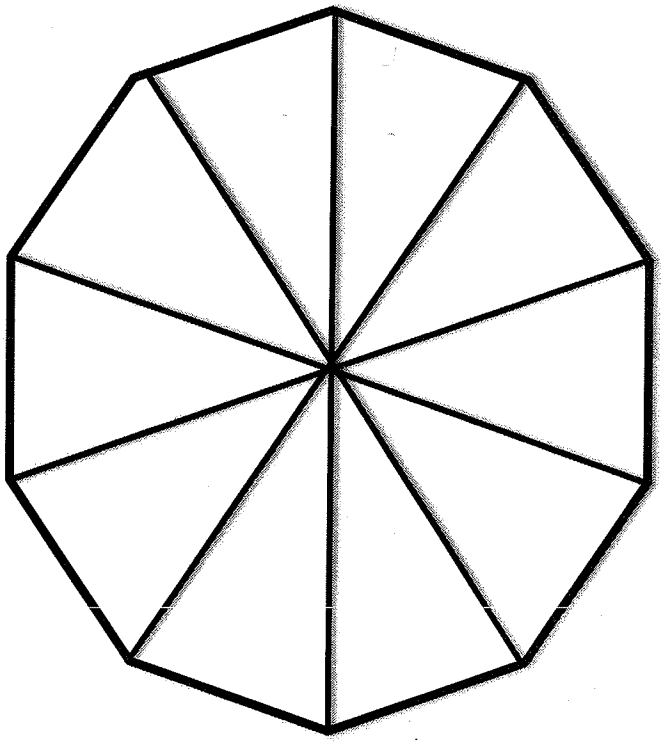
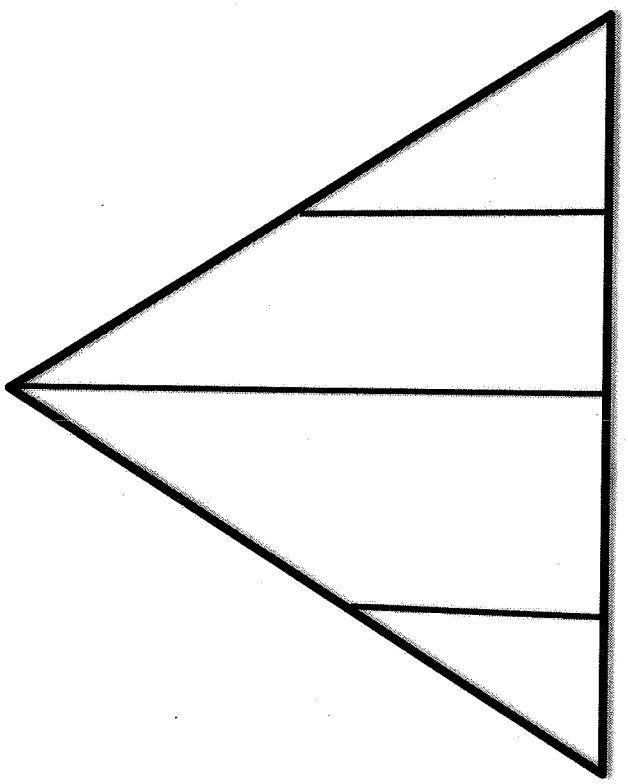
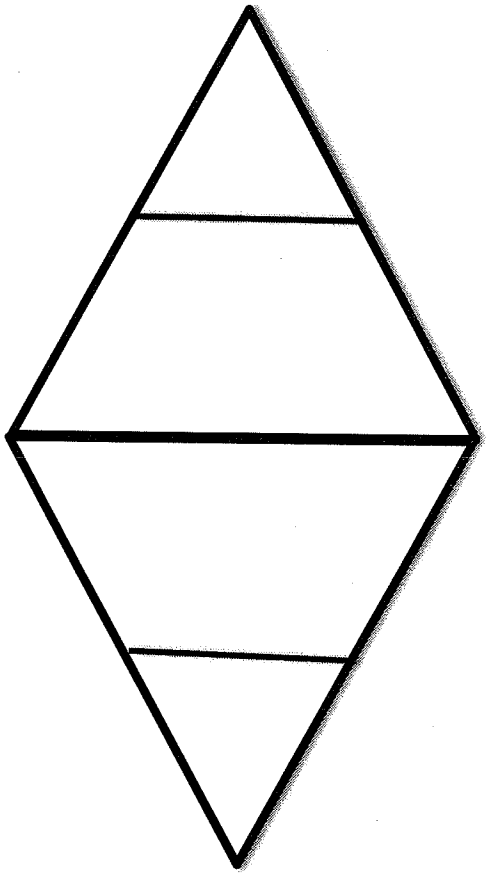


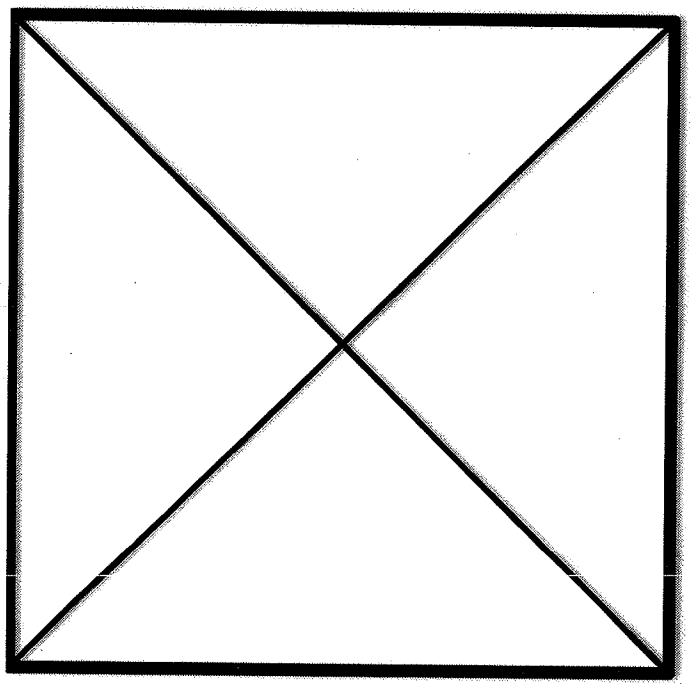


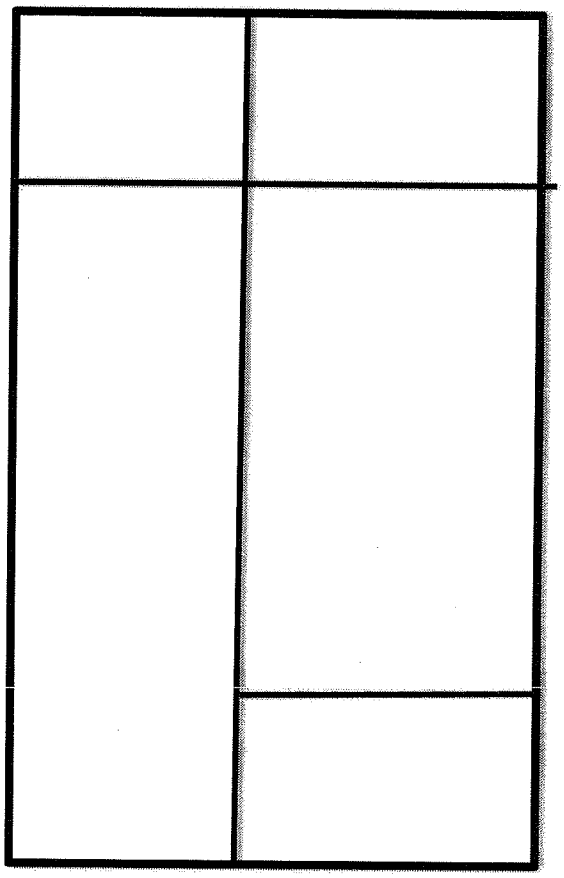


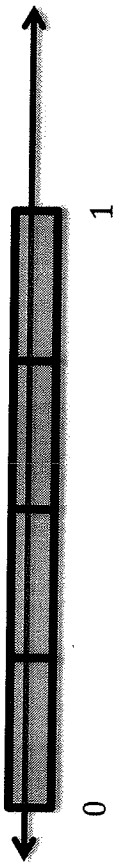


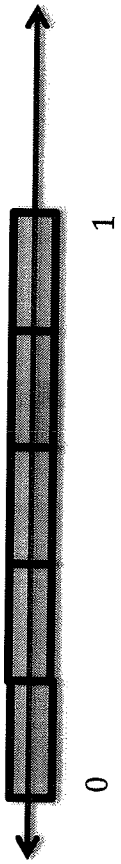


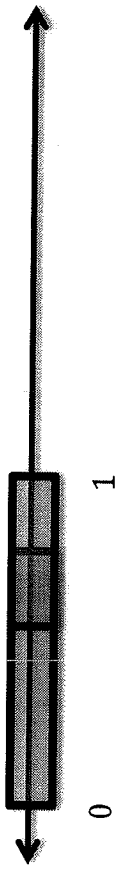


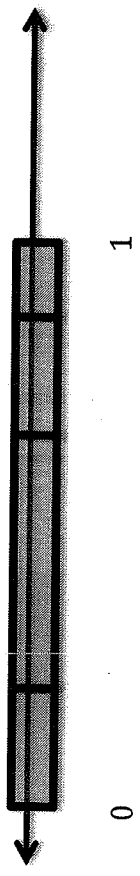





1
0


1
0


1
0

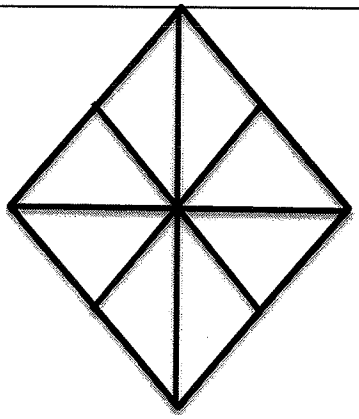

1
0

NAME: _____

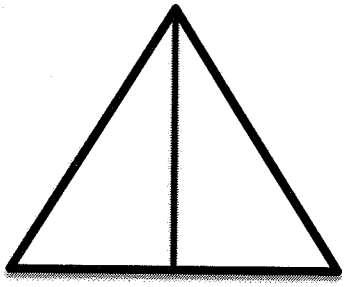
Fractional Parts

Look at each shape. Decide if it is correctly divided into <u>eighths</u>. Write yes or no and then EXPLAIN YOUR ANSWER!

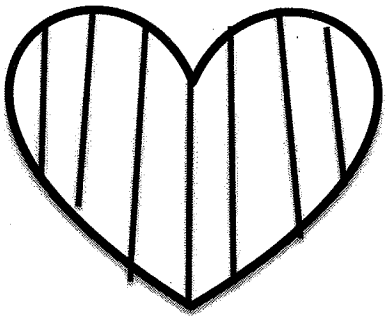
1.



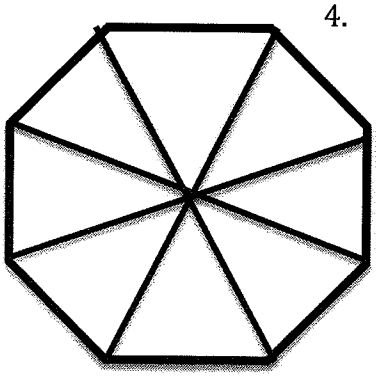
2.



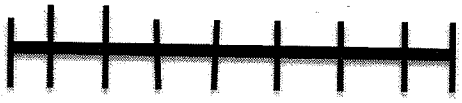
3.



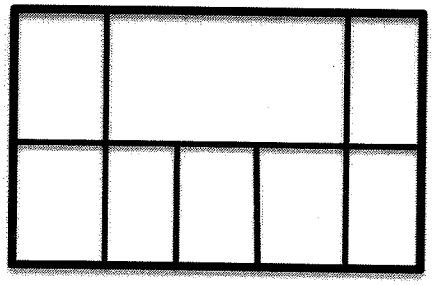
4.



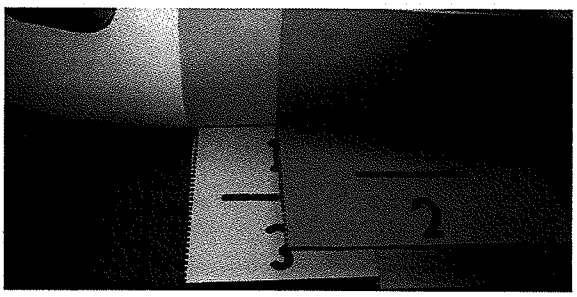
5.



6.



Exploring Fractions



NAME: _____

Date: _____

(Adapted from Georgia Dept of Education Unit 6)

1. Using complete sentences and math words, write 3 observations you and your group made about the Fraction Strips.

   _____

   _____

   _____

   _____

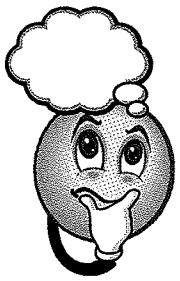
   _____

2. How many fourths does it take to equal the whole?

3. How many halves does it take to equal the whole?

4. What do you think three $\frac{1}{8}$ strips might be called?

5. If you made a $\frac{1}{9}$ fraction strips, how many ninths would it take to make a whole? How do you know?



TIME TO THINK!

6. What would a $\frac{1}{10}$ Fraction Strip look like? Sketch and label the fraction Strip in the space below.

7. Pretend you are having a party for 6 people. For refreshments, you are serving a sub sandwich. In the space below, draw and label what your sub would look like divided equally for six people. Use picture, words, and numbers to explain your reasoning.

NAME: _____

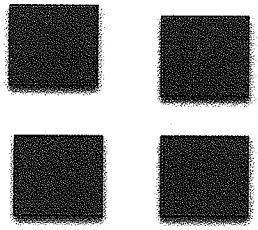
More Than, Less Than, or Equal To One Whole

Look at each set of fractional parts. Decide if it is more than, less than, or equal to one whole. Then, draw a picture or use words and numbers to tell why.

1. These are thirds.

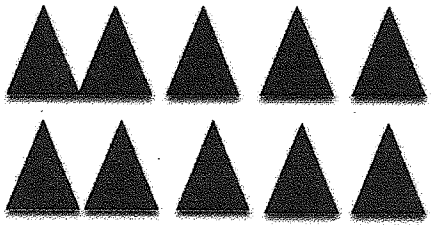
Answer: _____
Why:

1. These are sixths.



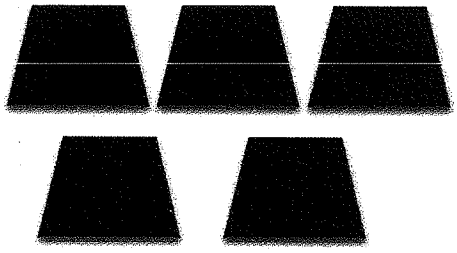
Answer: _____
Why:

1. These are eighths.



Answer: _____
Why:

1. These are fifths.



Answer: _____
Why:

NAME: _____

USING THE FRACTION KIT

Use your fraction kit to answer the following questions:

1. Draw a picture and write a number sentence that shows one way you can make a whole using at least 4 fraction pieces. You must use at least 2 different denominators.

2. When you played Uncover, if you roll a $\frac{1}{4}$, could you remove $3\frac{1}{8}$ pieces? Use words or a picture to tell why or why not.

Yes or No

Why or why not?

3. Write <, >, or = between each pair to make a true statement.

$8 \quad \frac{7}{8} \square \frac{14}{16} \qquad \frac{5}{16} \square \frac{1}{4} \qquad \frac{5}{8} \square \frac{3}{4}$

4. Write a number in the box to make each sentence true. Explain how you know.

$\frac{2}{8} = \frac{\square}{4}$ Explain:

$\frac{3}{4} = \frac{12}{\square}$ Explain:

QUANTILE® RESOURCE

Resource Overview	
Quantile® Measure:	450Q
Skill or Concept:	Represent fractions concretely and symbolically. (QT-N-114) Use benchmark numbers (zero, one-half, one) and models to compare and order fractions. (QT-N-115)
Excerpted from:	**Gourmet Learning** 1937 IH 35 North Suite 105 New Braunfels, TX 78130 **www.gourmetlearning.com** © Gourmet Learning

This resource may be available in other Quantile utilities.

For full access to these free utilities, visit www.quantiles.com/tools.aspx.

The Quantile® Framework for Mathematics, developed by educational measurement and research organization MetaMetrics®, comprises more than 500 skills and concepts (called QTaxons) taught from kindergarten through high school. The Quantile Framework depicts the developmental nature of mathematics and the connections between mathematics content across the strands. By matching a student's Quantile measure with the Quantile measure of a mathematical skill or concept, you can determine if the student is ready to learn that skill, needs to learn supporting concepts first, or has already learned it. For more information and to use free Quantile utilities, visit www.Quantiles.com.

MetaMetrics.
1000 Park Forty Plaza Drive, Suite 120, Durham, North Carolina 27713

METAMETRICS®, the METAMETRICS® logo and tagline, QUANTILE®, QUANTILE FRAMEWORK® and the QUANTILE® logo are trademarks of MetaMetrics, Inc., and are registered in the United States and abroad. The names of other companies and products mentioned herein may be the trademarks of their respective owners.

Student Expectation: Students will create a number line for comparing and ordering fractions

Enrichment

Compare Fractional Parts of a Set of Objects

"Hit the Target"

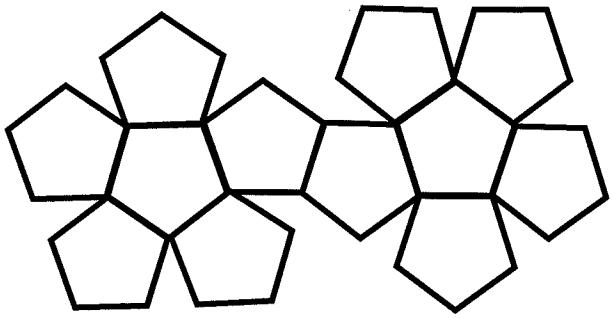
Teacher note: The students will work as a group to create a fraction number line showing common fractions between 0 and 1. Then they will use the number line to play a game comparing fractions. The creation of this number line will reinforce creating fractions, naming fractions and equivalent fractions, as well as comparing.

Group size: whole class to create the number line; groups of 3-4 to play the game

Materials: Instructional Strategy, below and pages 41-42; game directions, page 43; index cards; 2—12-sided number cubes for each group (see pattern provided); 8 distinct colors of markers; tape; construction paper; chalk or dry-erase markers; 14 feet of white or light-colored rope cut into 9 pieces:

or use yarn

Rope 1—5 feet long
Rope 2—2 feet 6 inches long
Rope 3—1 foot 8 inches long
Rope 4—1 foot 3 inches long
Rope 5—1 foot long
Rope 6—10 inches long
Rope 7—7.5 inches long
Rope 8—6 inches long
Rope 9—5 inches long



Before class: Cut the rope into the specified lengths. Draw a target on a large piece of construction paper. If 12-sided number cubes are not available or you choose not to use them, it is possible to make sets of index cards with 1-12 for the students to draw or use playing cards. (Remove the Kings; Jacks are 11, and Queens are 12.)

Directions:

- Use the Instructional Strategy and directions provided to complete Part I of this activity.

Part I: Create the Number Line

Questioning Technique

Instructional Strategy

- Place the first rope, 5 feet long, on the board, stretched out horizontally and secured with tape. Write a 0 on the left end and a 1 on the right end on the board above the rope.
- Select 3 students to bring the 2nd rope to the front. Starting at the far left side of the first rope, place the 2nd rope on top of it. Stretch it straight across. Have one student hold the left side and one hold the right side. Where the right side touches the original rope, color a red mark on the original rope. Then slide the 2nd rope down, align the left end at the red mark, and stretch it again. It should now be at the end of the original rope. Make a red mark at the end of the original rope.

Gourmet Curriculum Press, Inc.©

Student Expectation: Students will create a number line for comparing and ordering fractions

Enrichment

Compare Fractional Parts of a Set of Objects

"Hit the Target"

Directions:

Part I: Create the Number Line—continued

Questioning Technique

Instructional Strategy

Ask: How many parts did we make out of the original rope? (2)

Ask: What fraction should we write on the first red mark? ($\frac{1}{2}$) Write the fraction above the mark on the board.

Say: Explain what the number $\frac{1}{2}$ has to do with this rope. (It is halfway between 0 and 1 on the rope.)

Ask: What fraction should we write on the second red mark? ($\frac{2}{2}$) Write the fraction above the mark on the board.

Say: Explain what the number $\frac{2}{2}$ has to do with this rope. (This is the mark that 2 ropes covered out of 2 parts to the rope; it is at the number 1. 2 divided by 2 is 1.)

(Select 3 students to bring the 3rd rope to the front. Starting at the far left side of the first rope, place the 3rd one on top of it. Stretch it straight across. Have one student hold the left side and one hold the right side. Where the right side touches the original rope, color the mark green. Then slide the rope down, align the left end at the green mark, and stretch it again. Repeat this process until you get to the end of the original rope.)

Ask: How many parts did we make out of the original rope? (3)

Ask: What fraction should we write on the first green mark? ($\frac{1}{3}$) Write the fraction above the mark on the board.

Ask: What does the number $\frac{1}{3}$ have to do with this rope? (It is $\frac{1}{3}$ of the way from 0 to 1 on the rope.)

Say: Identify the fraction we should write on the second green mark. ($\frac{2}{3}$) Write the fraction above the mark on the board.

Say: Explain what the number $\frac{2}{3}$ has to do with this rope. (It is $\frac{2}{3}$ of the way between 0 and 1.)

Ask: What fraction should we write on the third green mark? ($\frac{3}{3}$) Write the fraction above the mark on the board. (Write it above the $\frac{2}{2}$ – don't erase one to write the next.)

Say: Describe what the number $\frac{3}{3}$ has to do with the rope. (This is the mark that 3 ropes covered out of 3 parts to the rope. It is at the number 1. It is the whole rope – $\frac{3}{3} = 1$.)

(Repeat this process for the rest of the ropes. Each fraction should be a different color. Fractions such as $\frac{1}{2}$ will be colored over and over and over again. This is fine! Be sure to ask the questions about each mark. If there are equivalent fractions like $\frac{2}{4}$ and $\frac{1}{2}$, write both of the fractions on the board.)

Student Expectation: Students will create a number line for comparing and ordering fractions

Enrichment

Compare Fractional Parts of a Set of Objects

"Hit the Target"

Directions:

Part I: Create the Number Line—continued

Questioning Technique

Instructional Strategy

The fourth rope represents fourths.
The fifth rope represents fifths.
The sixth rope represents sixths.
The seventh rope represents eighths.
The eighth rope represents tenths.
The ninth rope represents twelfths.

Teacher note: Sevenths, ninths, and elevenths were not included due to the fact that the rope is hard to measure, and the fractions are not as easy to use. If you want to extend it to include these divisions, here are the rope lengths you will need:

Sevenths would have a rope that is approximately 8.5 inches long (actually a little more).
Ninths would have a rope that is a little more than 6.6 inches long.
Elevenths would have a rope that is approximately 5.45 inches long (actually a little more).

When you are done making the marks up to twelfths, ask the following questions:

Very important! ↘

Ask: Can someone show me a whole number, number line? (Have one student draw a number line on the board, or if you have one displayed in the class, students can point to it.)

Ask: Where is this new number line we have just created located on this whole number, number line? (Students should realize that these fractions are all located between the numbers 0 and 1.)

Ask: How many other fractions are between the numbers 0 and 1? (Help the students see that there are an infinite number of fractions between these 2 numbers.)

Say: Describe what happens to the size of each rope as the denominator increases. (The size of the rope decreases or gets smaller.)

Ask: What does that mean? (It means that the fraction of the whole unit becomes smaller as the denominator becomes bigger. Compare this to the pizza examples we have used previously. The larger the denominator is, the smaller the size of each piece of pizza.)

Ask: Who can give me an example of an equivalent fraction? (Answers will vary.) Where are they located on our number lines? (where there is more than 1 fractional name for a point)

Ask: Can you identify a pattern within the equivalent fraction denominators? (They are all divisible by the lowest number. For example 2 will go into 4, 6, 8, 10, and 12 for the $\frac{1}{2}$ mark, and 3 will go in to 6 and 12 for the $\frac{1}{3}$ marks.)

Gourmet Curriculum Press, Inc.©

Student Expectation: Students will create a number line for comparing and ordering fractions

Enrichment

Compare Fractional Parts of a Set of Objects

"Hit the Target"

Directions:

Part II: Play the Game

Teacher note: On the number line you created on the board, place a target over one of the fractions. Instruct the class. This is our target fraction.

- Each group of students rolls two 12-sided number cubes, and records the 2 numbers. If the larger number is a 7, 9, or 11, students can roll again until they get a larger number than the first and not a 7, 9, or 11.
- Students will make a fraction by putting the smaller number in the numerator and the larger number in the denominator. (If both of the numbers are the same, that is okay.) They will write this fraction on one side of an index card.
- On the other side, in a complete sentence, students will write whether the target number is greater than, less than, or equal to the fraction their group created.
- Under the sentence, students will write the inequality created with their fraction and the target fraction. For example, if the target fraction is $\frac{9}{10}$, and their group rolled a 1 and a 2, then their card would say:

  On the front side: $\frac{1}{2}$

  On the back side: One-half is less than the target fraction, nine-tenths. $\frac{1}{2} < \frac{9}{10}$
- Have each group pick one student to go to the front of the class and tape the group's card under the number line where it belongs.
- Start at the far left on the number line. Have each group pick one student to go to the front of the class and read the group's sentence. If the class agrees with what has been written, the group will receive one point. If the sentence is incorrect, then the group does not get a point. Help these students to correct their statement.
- The group whose fraction is closest to the target receives a bonus point.
- After every group has read its card, remove all the index cards, and each group will roll the number cubes again. This may be played over and over, and it is different each time. Make sure the students take turns doing the taping and reading, so everyone has a chance to practice.
- You may want to take some time for the students to copy the fraction number line into their notebooks. This is a great tool to use in future classes.

QUANTILE® RESOURCE

Resource Overview

Quantile® Measure:	450Q
Skill or Concept:	Use benchmark numbers (zero, one-half, one) and models to compare and order fractions. (QT-N-115) Using a number line.
Excerpted from:	BRIDGES IN MATHEMATICS K-5

The Math Learning Center
PO Box 12929, Salem, Oregon 97309-0929
www.mathlearningcenter.org
© Math Learning Center

This resource may be available in other Quantile utilities.
For full access to these free utilities, visit www.quantiles.com/tools.aspx.

The Quantile® Framework for Mathematics, developed by educational measurement and research organization MetaMetrics®, comprises more than 500 skills and concepts (called QTaxons) taught from kindergarten through high school. The Quantile Framework depicts the developmental nature of mathematics and the connections between mathematics content across the strands. By matching a student's Quantile measure with the Quantile measure of a mathematical skill or concept, you can determine if the student is ready to learn that skill, needs to learn supporting concepts first, or has already learned it. For more information and to use free Quantile utilities, visit www.Quantiles.com.

MetaMetrics.
1000 Park Forty Plaza Drive, Suite 120, Durham, North Carolina 27713

METAMETRICS®, the METAMETRICS® logo and tagline, QUANTILE®, QUANTILE FRAMEWORK® and the QUANTILE® logo are trademarks of MetaMetrics, Inc., and are registered in the United States and abroad. The names of other companies and products mentioned herein may be the trademarks of their respective owners.

Set A5 ★ Activity 1

ACTIVITY

Fractions on a Double Number Line

Overview

Students create a double number line marked with 0 and 1 on one side, and fractions on the other. Then they name and locate points along the line, including ½, ¼, and ¾.

Skills & Concepts

★ represent fractions as distances on a number line

★ solve problems that involve comparing and ordering fractions by using models

★ identify equivalent fractions using models, including the number line

★ add common fractions with like denominators

You'll need

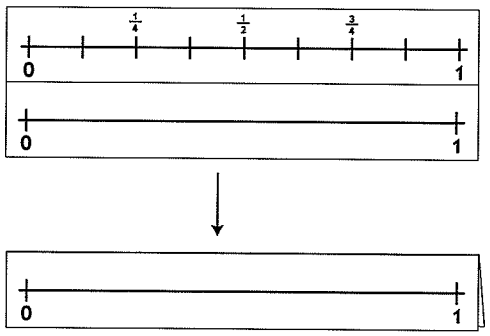
★ Double Number Line (page A5.4, run a half-class set on cardstock, cut in half)

★ scissors

★ a paperclip for each student

Instructions for Fractions on a Double Number Line

1. Give each student a copy of the Double Number Line. Ask them to cut it out along the heavy lines and fold it in half lengthwise.



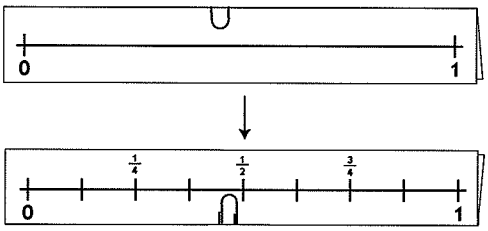
2. Ask students to pair-share any mathematical observations they can make about their Double Number Lines, and then ask volunteers to share their thinking with the class.

Students *It looks kind of like a ruler.*
It's like a giant inch or something, with 0 at one end and 1 at the other.
There are fractions on the other side: ¼, ½, and ¾.
Some of the marks don't have any numbers.
The mark in the middle says ½. That's because it's halfway between the 0 and the 1.
When you turn it over, the numbers are still right-side up, but there's only a 0 and a 1.

© The Math Learning Center

Activity 1 Fractions on a Double Number Line (cont.)

3. Give students each a paperclip, and ask them to slide the clip down over the fold. Working with the side marked only with 0 and 1, have them slide the paperclip along the fold until they think they've gone exactly halfway. Then have them flip the line over to check. Did the clip land on the mark labeled with the fraction 1/2?



Lateva *Almost! I almost got it exactly. I'm going to turn it over and try again to see if I can get the paperclip to land right on the 1/2 mark.*

Give students a minute to experiment. Can they develop strategies for getting the paperclip to land exactly on the 1/2 mark without peeking? Then ask them to slide their paperclip one-fourth of the way along the unmarked line. Can they come up with some strategies for getting the clip to land on or very near the mark labeled with 1/4?

Thayne *I just moved my clip what I thought was halfway down the line and then cut that in half. I got pretty close.*

4. Now talk with students about the marks that haven't yet been labeled with fractions. How would they label some of those marks? Give them a few moments to pair-share ideas and then call on volunteers to share their thinking with the class. Encourage them to explain their thinking.

Olivia *It should say 1/8 on that first mark.*

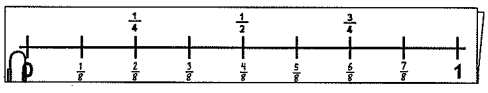
Teacher *How are you thinking about that, Olivia?*

Olivia *Well, the line is divided into 8 parts, right? So each one is one-eighth.*

Hector *We said the next one would be 2/8 because that's the same as 1/4, plus what Olivia said. It goes 1/8, 2/8, 3/8, 4/8, and you just keep going that way.*

Twilight *You could also put 2/4 right under where it says 1/2, because 2/4 comes between 1/4 and 3/4.*

5. After some discussion, make a sketch of the line on the board and work with input from the class to label each of the marks. Then have students label each of the marks on their own number lines.



6. Now ask them to turn their number line back over to the unmarked side. Challenge them to slide their paperclip three-fourths of the way along the line, and then ask them to check the other side. How close did they come to hitting the mark labeled 3/4? Ask them to share some of their strategies.

© The Math Learning Center

Activity 1 Fractions on a Double Number Line (cont.)

7. Repeat step 6 with some of the following fractions. (Vary these as needed to meet the needs of your students.)

- $1/8$
- $6/8$
- $3/8$
- $1/4 + 1/4$
- $1/8 + 1/8$

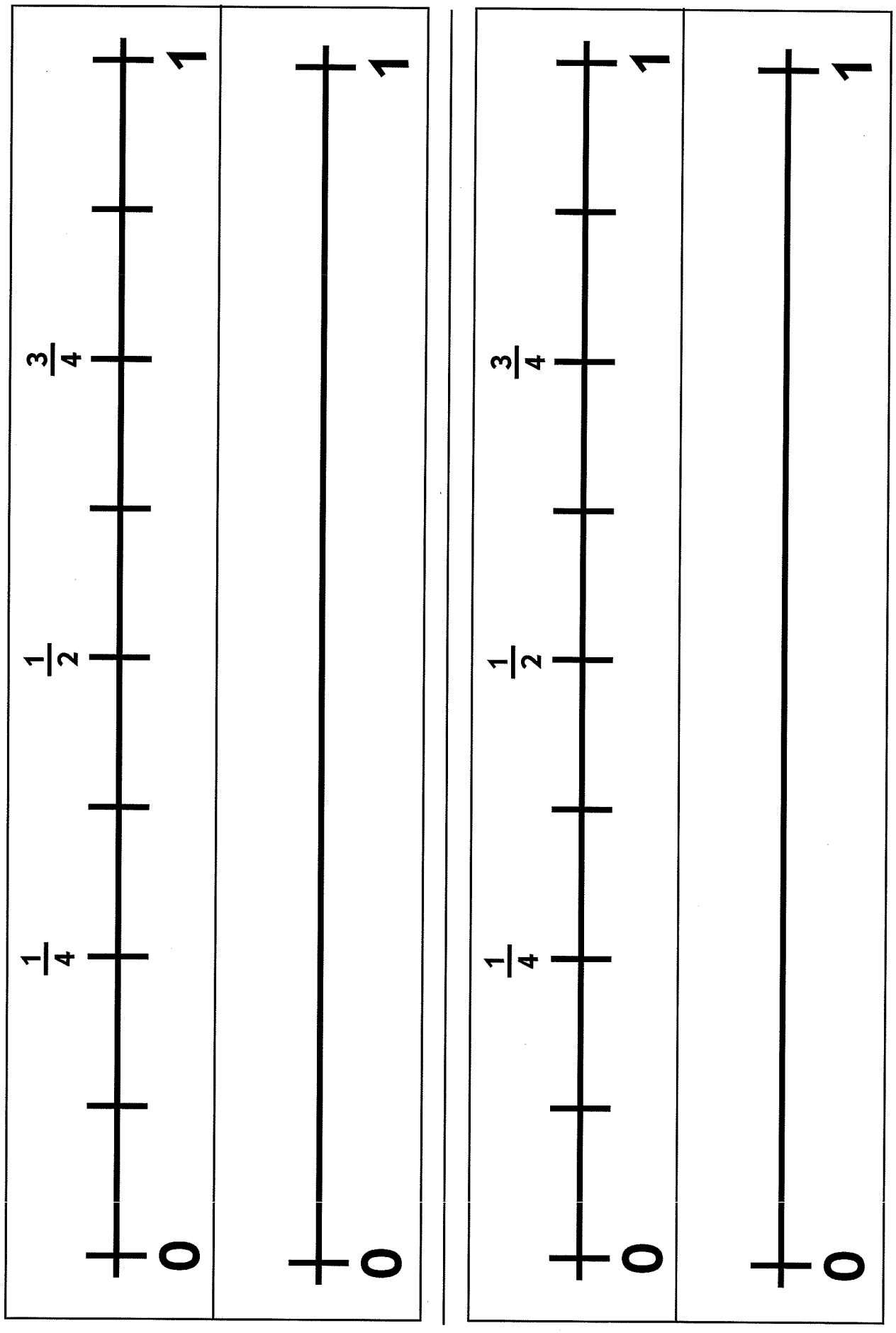
Extensions

- Pose story problems such as the ones below and ask students to enact them by moving their paperclip along the unmarked side of their number line. After each, have them turn their number line over to see how close they came to hitting the mark.
- I ran $1/4$ of a mile. Then I took a rest and ran another $1/4$ of a mile. How far did I go in all?
- I had 1 whole fruit strip. I ate half of it. How much did I have left?
- Sam's brother gave him 1 whole piece of licorice. He ate $1/4$ of it and saved the rest for later. How much did he have left?
- We walked $2/8$ of a mile and then another $1/8$ of a mile. How far did we go in all?

INDEPENDENT WORKSHEET

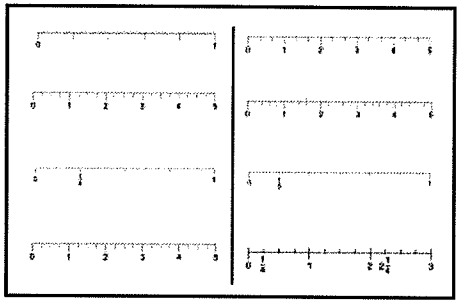
See Set A5 Independent Worksheets 1 and 2 for more practice locating and naming fractions on a number line, including halves and fourths.

© The Math Learning Center



© The Math Learning Center

Fraction Number Lines



Materials: Fraction Number Lines Board and Fraction Cards

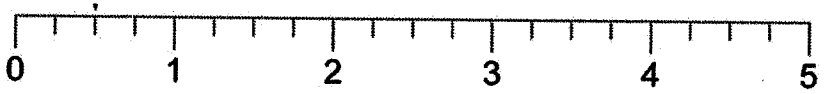
1. Each player chooses one side of the Fraction Number Line board. The fraction cards are placed facedown in a line above the board.

2. Take turns to turn over a fraction card and determine whether the fraction can be placed on your side of the board. If the fraction belongs on one of your number lines write it below the appropriate mark. If the fraction does not belong on any of your number lines return it facedown to the line of cards.

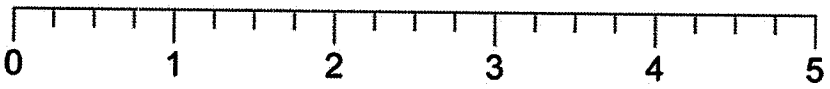
3. Continue to take turns until one player has marked two fractions on each number line.

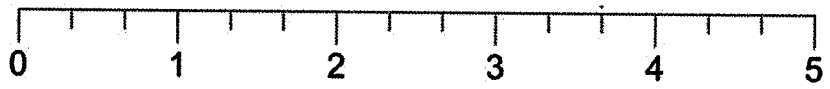
©K-5MathTeachingResources.com

0
1


0
1
2
3
4
5

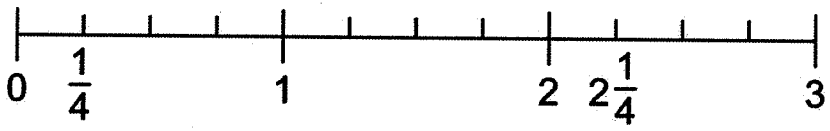
0
1/4
1


0
1
2
3
4
5


0
1
2
3
4
5

0
1
2
3
4
5

0
1/6
1


0
1/4
1
2
2 1/4
3

$\frac{1}{5}$	$\frac{3}{5}$	$1\frac{1}{4}$	$2\frac{3}{4}$
$\frac{2}{4}$	$\frac{2}{6}$	$\frac{5}{6}$	$\frac{3}{4}$
$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{5}$	$\frac{3}{5}$
$\frac{2}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{3}{4}$

Name: _____ Date: _____

USING FRACTION STRIPS TO EXPLORE THE NUMBER LINE

(Adapted from a Learning Task by Michelle Clay, Floyd County, GA)

1. Using complete sentences and math words, write 3 observations you and your group made about fractions between 0 and 1 on the Number Line.

Use your Number Lines to answer the following questions.

2. How many fourths are between 0 and 1?

3. How many 8ths are equivalent to 1 whole?

4. What fraction on the Number Line is equivalent to $\frac{6}{8}$?

Put on your thinking caps....

5. If $\frac{4}{4}$ is equivalent to the whole number 1, how many fourths are in the whole number 2?

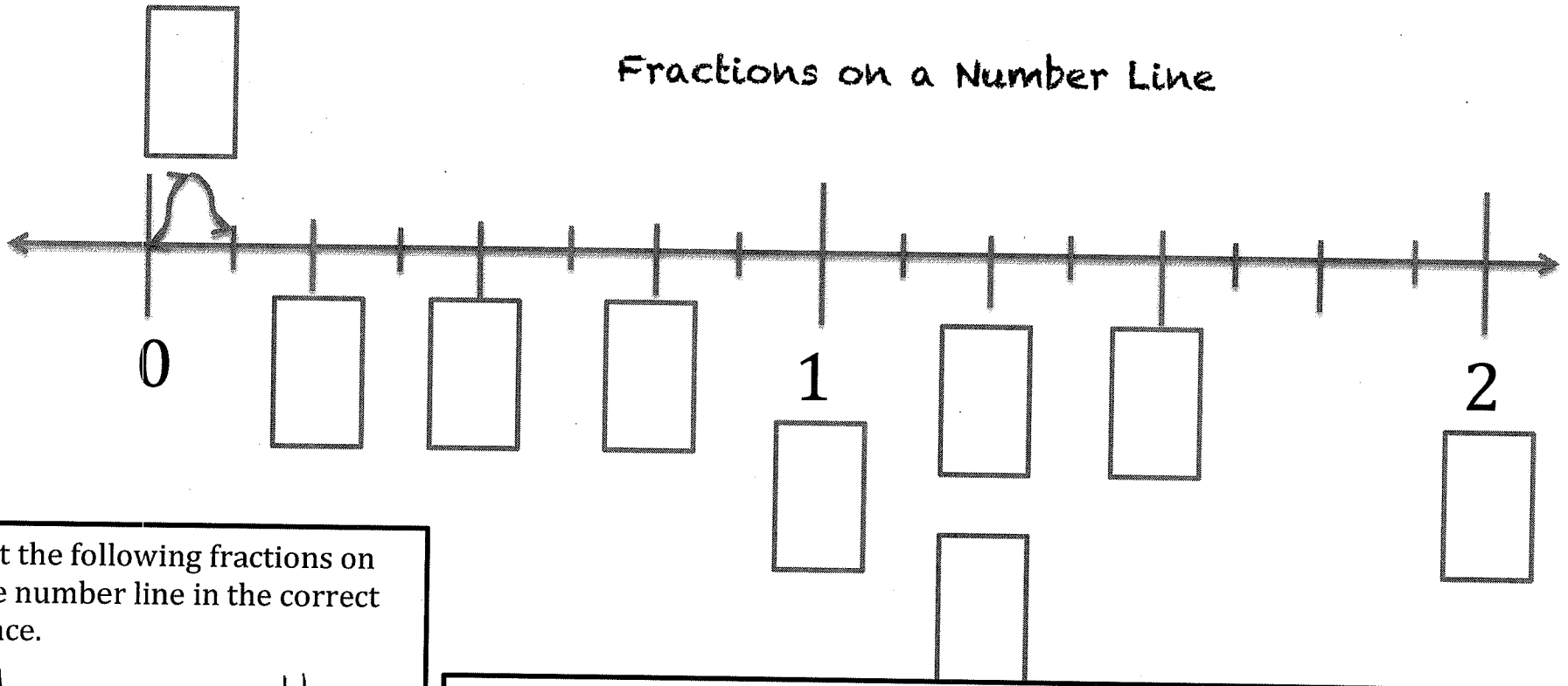
6. What would the fraction 12/4 represent? Draw a picture in the space below to explain your answer.

BONUS:

7. During a lesson on Measurement, students were asked to measure their feet using a ruler. Lexi's foot measured 7 inches. Addie's foot was 5/6 of a foot. Robert's foot was equal to $\frac{3}{4}$ of a foot. Andrew's foot measured 2/3 of a foot. Use your number line to help you arrange the students' foot measurements in order from smallest to largest. On the back of this paper, sketch the Number Lines divided into thirds, fourths, sixths, and inches (1/12). Use pictures, numbers, and words to explain your solution.

NAME: _____

Fractions on a Number Line



Put the following fractions on the number line in the correct place.

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

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

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

$\frac{10}{8}$ $\frac{4}{2}$ $\frac{3}{4}$

Write 3 observations you have made about fractions on a number line.

23