

Fractions on a Number Line Two-Sided Banner

This Really Good Stuff® product includes:

- Fractions on a Number Line Two-Sided Banner, laminated
- This Really Good Stuff® Activity Guide

Congratulations on your purchase of this Really Good Stuff® **Fractions on a Number Line Two-Sided Banner**—a powerful reference tool that helps students visualize fractions.

Meeting Common Core State Standards

This Really Good Stuff® **Fractions on a Number Line Two-Sided Banner** is aligned with the following Common Core State Standards for Mathematics:

Numbers and Operations—Fractions

- 3.NF.A.2** Understand a fraction as a number on the number line; represent fractions on a number line diagram.
- 3.NF.A.2a** Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
- 3.NF.A.2b** Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
- 3.NF.A.3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
- 3.NF.A.3a** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

Grade 4 Overview

- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
 - Understand decimal notations for fractions, and compare decimal fractions.
- 4.NF.A.1** Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Assembling and Displaying the Fractions on a Number Line Two-Sided Banner

Before displaying the **Fractions on a Number Line Two-Sided Banner**, make copies of this Really Good Stuff® Activity Guide, and file the pages for future use. Or, download another copy of it from our Web site at www.reallygoodstuff.com. Hang the Banner where students will be able to see it easily.

Introducing the Fractions on a Number Line Two-Sided Banner

Tell students that they are going to review fractions on a number line. Remind students that fractions represent a part of a whole. Examine several examples of visual models, such as $1/2$ (circle with $1/2$ shaded) or $2/3$ (rectangle, with two of three parts shaded). Emphasize that in the visual models, the denominator represents the number of equal parts in the whole and the numerator represents the number of parts to shade.

Draw a number line with the numbers 1, 2, 3, 4. Remind students that the number line goes on forever in both directions, can be used to show whole numbers, and can also show fractions between whole numbers. Display Side 1 of the **Fractions on a Number Line Two-Sided Banner**, and explain how this Banner represents the space on the number line between 0 and 1. Describe how this number line shows a dog, Rover, (at 0) who is trying to get home (to 1) using the sidewalk (number line).

Think aloud as you model using the number line: “Let’s think about where Rover will be on the sidewalk when he is halfway home. The

2 in the denominator tells us that the number line needs to be divided into **two** equal parts. The red mark on the line divides the space between 0 and 1 into two equal parts (or halves). The 1 in the numerator tells us that we need to move to one of those equal spaces.” (Model jumping down the number line by following the red path.) “This is $1/2$. If Rover moves another $1/2$, he will get to his home at 1.” (Model moving down the number line on the red path.) “We can also think about this as two-halves, which is equivalent to **one whole**.” Repeat to feature quarters and eighths.

Find My Fraction

On the board, draw a number line with arrows on each end. Explain that we can use what we learned from Rover to find other fractions on the number line. Model finding $1/3$ on the number line by labeling 0 and 1 and then dividing the number line into three equal parts or thirds. Label the first segment with $1/3$. Extend to $2/3$ and $3/3$. Remind students that $3/3$ is equivalent to 1. Have students practice with $2/4$, $4/5$, $3/6$.

Finding Fractions 0 to 1

To build on the understanding of how to partition a blank number line to represent fractions, copy and distribute the *Finding Fractions (0 to 1) Reproducible*. Tell students to locate the given fractions on the number line. Use their reproducibles to assess students’ understanding.

Many Names for Fractions

Refer to the **Fractions on a Number Line Two-Sided Banner**. Remind students that there are many smaller numbers between the whole numbers that can be represented as fractions. Explain that the name of the fraction is based on the number of equal parts that it takes to make one whole and that the same location on the number line can have more than one name. Review how the number line is broken into halves, quarters, and eighths. Model finding an equivalent fraction. For example, “ $1/4$ and $2/8$ are in the same location, so $1/4 = 2/8$. We can see that $2/8$ is the same length as $1/4$ on the number line.” Copy and distribute the *Many Names for Fractions Reproducible*. Review the directions with students to use the number line to find equivalent fractions. Use their reproducibles to assess students’ understanding.

Variation: Extend to sixteenths: Have students explore how many sixteenths would be equivalent to $1/8$, $1/4$, $3/8$, $1/2$.

Comparing Fractions on the Number Line

Refer to the Banner. Have students create number sentences that compare fractions using greater than, less than, and equal to, and explain how they used the number line to find their answers. For example, “ $1/4 < 3/8$ because $1/4$ comes before $3/8$ on the number line, and $1/4$ is equal to $2/8$, so I know $1/4$ is less than $3/8$.”

Exploring Fractions Greater than 1

Display Side 2 of the **Fractions on a Number Line Two-Sided Banner**. Review with students that they can also find fractions on the number line that are greater than 1: Have them describe what they see on the number line and how it relates to what they know about fractions from 0 to 1. Copy and distribute the *Finding Fractions (0 to 2) Reproducible*. Have students locate the given fractions on the number line. Use their reproducibles to assess students’ understanding.

Name: _____ Date: _____

Finding Fractions 0 to 2

Find each fraction on the number line. On each number line, make sure to

- Identify 0, 1, 2.
- Divide the space between each whole number into equal parts.
- Label the fraction.

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



2. $\frac{7}{8}$



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



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



5. Choose one fraction from above. Describe how you found where to place the fraction on the number line.



Name: _____ Date: _____

Finding Fractions 0 to 1

Find each fraction on the number line. On each number line, make sure to

- Identify 0 and 1.
- Divide the space between 0 and 1 into equal parts.
- Label the fraction.

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



2. $\frac{3}{8}$



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

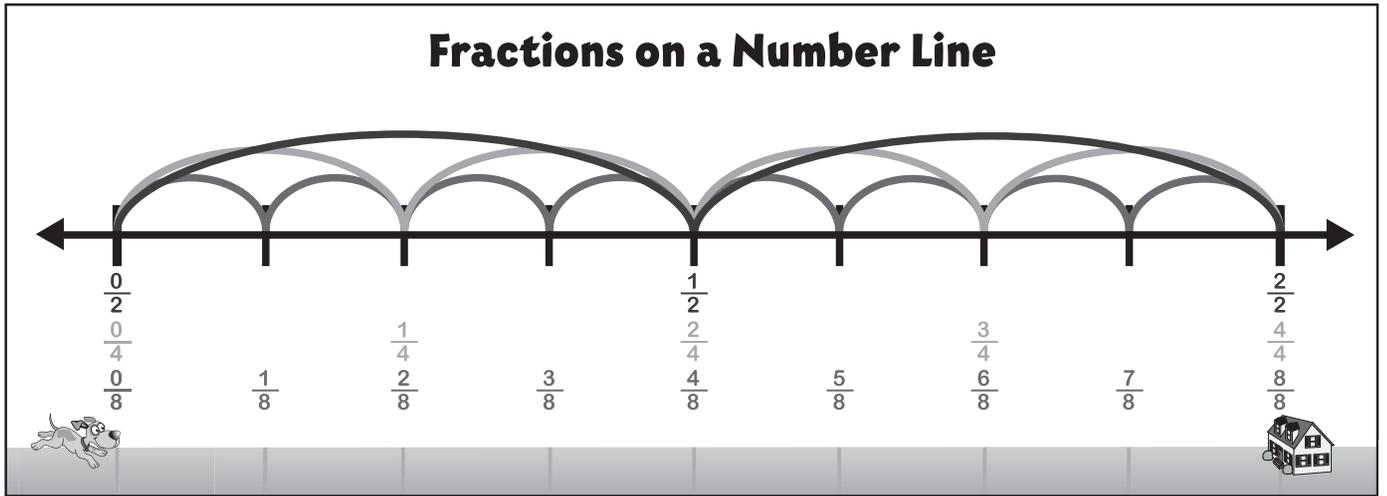


4. $\frac{2}{5}$



5. Choose one fraction from above. Describe how you found where to place the fraction on the number line.

Name: _____ Date: _____



Use the number line above to find another name for the fraction.

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

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

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

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

5. Choose one fraction from above. Describe how you found where to place the fraction on the number line.

This Really Good Stuff® product includes:

- 6 Two-sided Fractions on a Number Line Write Again® Mats, Write Again® wipe-off laminate
- This Really Good Stuff® Activity Guide

Congratulations on your purchase of these Really Good Stuff® Fractions on a Number Line Write Again® Mats—interactive and versatile tools that help students to visualize fractions.

Meeting Common Core State Standards

The Really Good Stuff® Fractions on a Number Line Write Again® Mats are aligned with the following Common Core State Standards for Mathematics:

Numbers and Operations—Fractions

- 3.NF.A.2** Understand a fraction as a number on the number line; represent fractions on a number line diagram.
- 3.NF.A.2a** Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
- 3.NF.A.2b** Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
- 3.NF.A.3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
- 3.NF.A.3a** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
- Grade 4 Overview**
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
 - Understand decimal notations for fractions, and compare decimal fractions.
- 4.NF.A.1** Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Introducing the Fractions on a Number Line Write Again® Mats

Before introducing the Fractions on a Number Line Write Again® Mats, make copies of this Really Good Stuff® Activity Guide, and file the pages for future use. Or, download another copy of it from our Web site at www.reallygoodstuff.com. Always use a dry erase marker on the Mats in order to preserve their Write Again® wipe-off laminate surface.

Tell students that they are going to review fractions on a number line. Remind students that fractions represent a part of a whole. Examine several examples of visual models, such as $3/4$ (circle with three of four parts shaded) or $1/3$ (rectangle, with one of three parts shaded).

On the board, draw a number line with the numbers 1, 2, 3, and 4. Remind students that the number line goes on forever in both directions, can be used to show whole numbers, and can also show fractions between whole numbers. Display the Fractions on a Number Line Write Again® Mats, and explain how these Mats can be used to show fractions on the number line. Describe how you can use Side 1 to show fractions between 0 and 1 and use Side 2 to show fractions greater than 1. Tell students to use the fraction bars in the corner as a reference.

As you model using the number line, think aloud, and say: “This number line has the points 0 and 1 already labeled. This line in the middle is halfway between 0 and 1, and it divides the space between 0 and 1 into two equal parts, so that mark must be $1/2$.” Label $1/2$ on the number line. Draw a mark between 0 and $1/2$, and another mark between $1/2$ and 1. Tell students, “These marks divide the space between 0 and 1 into four equal parts, so these marks show $1/4$, $2/4$, and $3/4$. Label $1/4$, $2/4$, and $3/4$.” Indicate, “By thinking about dividing the number line into equal parts, we can figure out where any fraction is located on a number line.”

Find My Fraction

Model finding $1/3$ on the number line by dividing the number line into three equal parts or thirds: Remind students that they are finding approximate locations on the number line. Label the first segment with $1/3$. Extend to $2/3$ and $3/3$. Remind students that $3/3$ is equivalent to 1. Refer to the fraction bars to compare work. Show students how $1/3$ should be between $1/4$ and $1/2$ and how $2/3$ should be between $1/2$ and $3/4$. Have students practice with $3/4$, $2/5$, $1/5$, $5/6$, $3/6$, and $7/10$.

If students struggle to see thirds with the $1/2$ already marked on the number line, flip over the Fractions on a Number Line Write Again® Mats, and work using Side 2. Instruct students to mark the end of the number line with a 1, divide it into thirds, and proceed from there.

Fractions on a Number Line Write Again™ Mats

Many Names for Fractions

Review with students that there are many smaller numbers between the whole numbers that can be represented as fractions. Remind students that the name of the fraction is based on the number of equal parts that it takes to make one whole and that the same location on the number line can have more than one name. Focus on the halves, quarters, and eighths on the fraction bars. While you model finding an equivalent fraction on the fraction bars, say, “ $\frac{1}{4} = \frac{2}{8}$, so they are in the same location on the number line.” Have students identify other equivalent fractions using the fraction bars, and then locate and label them on the **Fractions on a Number Line Write Again® Mats**.

Variation: Extend to fractions that are not included in the sample of fraction bars, such as sevenths and sixteenths.

Landmarks on the Number Line

Referring to Side 1 of the **Fractions on a Number Line Write Again® Mats**, note, “ $\frac{1}{2}$ is marked because it is an important fraction that helps us find other fractions. We can use $\frac{1}{2}$ as a landmark, just like we use landmarks, such as statues and buildings to find places.” Say, “Think about other fractions that are equivalent to $\frac{1}{2}$ by looking at the fraction bars. I see $\frac{3}{6} = \frac{1}{2}$, so I can write $\frac{3}{6}$ at the $\frac{1}{2}$ mark. That means there are three sixths between 0 and $\frac{1}{2}$, so I need to divide this space (pointing to the space between 0 and $\frac{1}{2}$) into three equal parts. There are also three sixths between $\frac{1}{2}$ and 1 to make a total of six sixths between 0 and 1.” Draw and label $\frac{1}{6}$, $\frac{2}{6}$, $\frac{4}{6}$, and $\frac{5}{6}$.

Extension: Ask what other fractions are equivalent to $\frac{1}{2}$ and what else students notice about the numerator and denominator of all of the fractions that are equivalent to $\frac{1}{2}$. (Possible answers: *The denominators are all even. We can multiply the numerator by 2 to get the denominator. We can divide the denominator by 2 to find the numerator.*)

Drawing Conclusions about Unit Fractions

Have students find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$. Ask, “What do you notice about the size of the fraction as the denominator gets larger? Why do you think fractions with a larger denominator are smaller?” (Possible answer: *The denominator tells you how many pieces to divide the space between 0 and 1 into. If you divide it into more pieces, each piece will be smaller.*)

Finding the Greatest Fraction

Prepare index cards with fractions, such as $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{6}$, $\frac{4}{8}$, and $\frac{7}{8}$. Have students work with a partner, and place the cards in a pile facedown. Tell each student to choose a card and to find and label the fraction on his or her **Fractions on a Number Line Write Again® Mat**. Have students determine which fraction is greater and to share number sentences orally with an explanation, such as, *$\frac{7}{8}$ is greater than $\frac{1}{2}$ because it is closest to 1.*)

Variation: Have students create number sentences that compare two given fractions using *greater than*, *less than*, and *equal to*, such as $\frac{1}{4} < \frac{3}{8}$ and $\frac{3}{8} > \frac{1}{4}$.

Exploring Fractions Greater than 1

Display Side 2 of the **Fractions on a Number Line Write Again® Mats**. Review with students that they can also find fractions on the number line that are greater than 1. Label 1 and 2 on the open number line. Model finding $\frac{3}{8}$ and $1\frac{1}{2}$. Remind students that the number is read one-and-a-half, so the fraction is between 1 and 2. Have students practice with $\frac{1}{4}$, $1\frac{1}{3}$, $1\frac{2}{4}$, $\frac{3}{5}$, and $\frac{1}{2}$.

Prepare some of the Mats using a dry erase marker: Divide the lines on Side 2 up into fourths, thirds, and sixths. Ask students to help you label your marks. Utilizing the students’ labels (some may suggest “four thirds” while others say “one and one third”) lead a discussion that makes the equivalence of mixed fractions and improper fractions apparent.

