Grade 3 Fraction Tasks

Empowering Learners in 3.NF: Students learn that because they can partition a whole into different numbers of equal-sized increments, they can expand their known number system beyond whole numbers to include fractions.

For each task, you will find:

Task Description: How does the task represent grade-level understanding?
Standard(s) alignment: To which standard(s) does the task align?
Source: From what source did the task come?
Students show what they know: Examples of student work or thinking that can be helpful within a larger formative assessment process and/or help illuminate different ways that students view a task.
Fostering agency, identity, and belonging: Questions designed to help position students as intellectual leaders, to help students know that the knowledge they are bringing to any particular task counts, and to reflect ideas, grounded in learning rather than correctness, of a mathematical community. Note: some of these questions are generic and can be used to help educators understand what knowledge a student is bringing to the particular task.

Standards addressed: (in order of appearance in the tasks below)

- 2.MD.A
- 3.NF.A
- 3.NF.A.1
- 3.NF.A.2

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Entry Task: Extending the number system to include fractions

This task serves as a bridge between students' prior work with whole numbers and the grade 3 introduction to fractions as numbers. It provides an entry point for the work of fractions that attempts to pique students curiosity toward answering the question, "Why do we need numbers other than whole numbers, anyway?"

How would you describe the length of the line segment shown? How long is it?
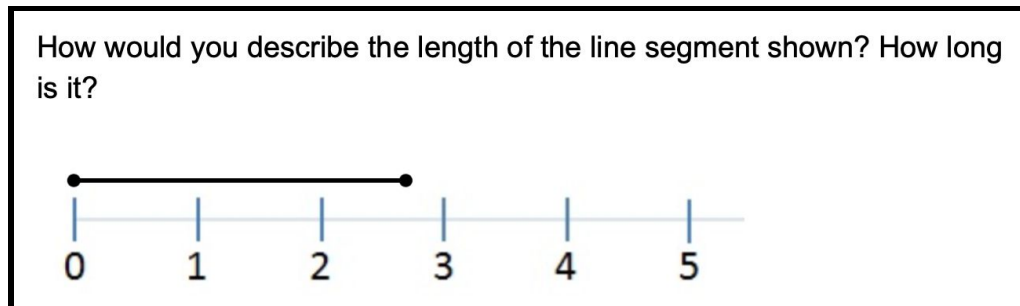
Standard(s) Alignment: 2.MD.A, 3.NF.A
Source: Created by Student Achievement Partners

Students Show What They Know	Fostering Identity, Agency, and Belonging
https://drive.google.com/file/d/1XT1FmSf4w8CI8an3IDrL6Dhaxyan_MBp/view?usp=sharing (Video) What does the student in the video know? Why is focusing on what she knows more helpful than predicting what she might not know?	● What are some things you can say for sure about the length of the line segment? ● Do you think there is a "right" answer to this problem? Why or why not? ● Can you think of anything you might be able to do to find the length of the line segment more accurately?

Resources
● Explore the full grade 3 Number and Operations - Fractions domain on the Coherence Map.

Tasks: Extending whole numbers to fractions through partitioning & counting

The first task begins with students partitioning a whole and locating a unit fraction. This idea is then extended as a new unit fraction (in this case, 1/6) is used to generate other fractions with denominator "6," with the numerator literally describing "how many sixths." These tasks have been grouped to show that when students learning begins with a solid understanding of the unit fraction, they come to understand "5/6" in the same way that they understand "9/6" -- as both are just iterations of the unit fraction 1/6 when the whole has been partitioned into sixths. For many students, connecting this to counting and specifically naming 0 as a fraction (such as "zero sixths") allows students to see the fractions as numbers with locations (rather than naming the space between tick marks).
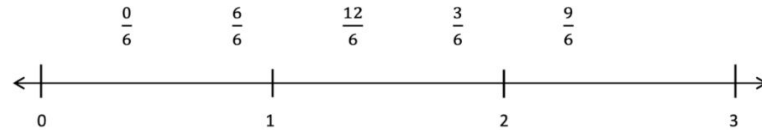
The number line diagram shows the numbers 0 and 1. Place a point at ⅓ on this number line diagram.

Estimate to label the given fractions on the number line. Be sure to label the fractions at 0 and 1. Write the fractions above the number line. Draw a number bond to match your number line.

$\frac{5}{6}$

Locate and label the following fractions on the number line.

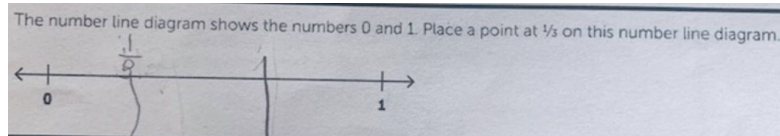$\frac{0}{6}$ $\frac{6}{6}$ $\frac{12}{6}$ $\frac{3}{6}$ $\frac{9}{6}$

**Standards Alignment:** 3.NF.A.1, 3.NF.A.2
Sources: Grade 3 Mini-Assessment, Task 1
Engage NY, Grade 3, Module 5, Topic D, Lesson 15, Problem Set Task 1d
Engage NY, Grade 3, Module 5, Topic D, Lesson 17, Problem Set Task 1

Students Show What They Know	**Fostering Identity, Agency, and Belonging**

Students Show What They Know

The number line diagram shows the numbers 0 and 1. Place a point at ⅓ on this number line diagram.

(continued on next page)

Estimate to label the given fractions on the number line. Be sure to label the fractions at 0 and 1. Write the fractions above the number line. Draw a number bond to match your number line.

Locate and label the following fractions on the number line.
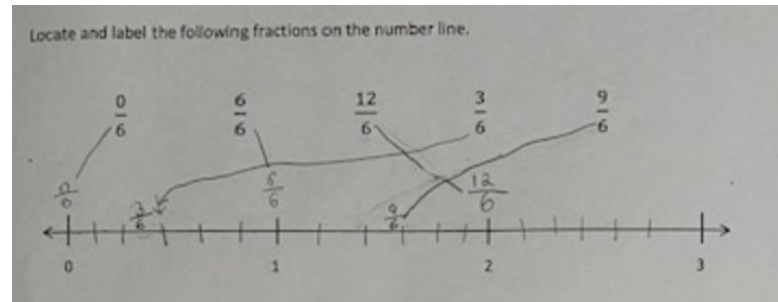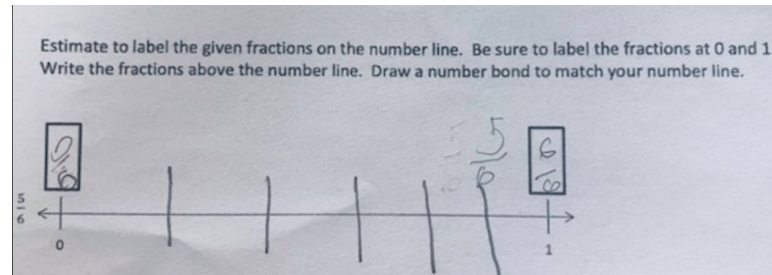
This task allows students to experiment with their own strategies to partition (for example, by starting in the middle, or half, and moving out in both directions). By providing students more space to partition on their own students will be able to describe their process and the way they have partitioned and placed points on the number line.

Fostering Identity, Agency, and Belonging

- What numbers do you know that are between zero and one?
- What are some other numbers (fractions) that you can find on the number line(s) shown?
- Do you notice any fractions that are equal to whole numbers? Which ones?

Resources
- Read this blog post to understand the importance of the language of fractions.
- Locating Fractions Greater than One on the Number Line, an additional task to support instruction.

Task: Find 1

This task targets a deeper understanding of partitioning and equivalence, specifically what it means for a fraction to be equal to 1. The unit fraction continues to be an important part of students' understanding of how to use the fraction 1/b to locate "1" at b/b.

Task

a. Locate 1 on the number line. Label the point. Be as exact as possible.

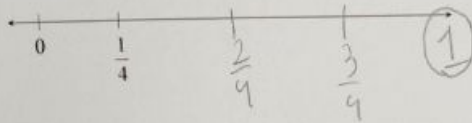b. Locate 1 on the number line. Label the point. Be as exact as possible.

Standards Alignment: 3.NF.A.2
Source: Illustrative Mathematics Task: Find 1

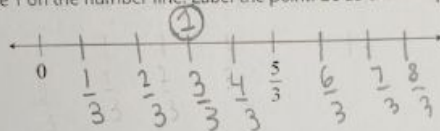### Students Show What They Know

Students show their ability to locate 1 on the number line. By providing students with a point on the number line, the task allows students to show the process of partitioning according to the given point. Students show whether they understand a fraction as the number one on the number line when one is an endpoint and when it is in between zero and a fraction over one.

Fostering Identity, Agency, and Belonging

- What are some other numbers (fractions) that you can find on the number line(s) shown?
- What are some similarities and differences between the two problems?

Resources
- Read this blog post to understand a choral counting process to build conceptual understanding of fractions.
- Closest to 1/2 , an additional task to support instruction.

Task: Locating two numbers given the locations of 0 and a unit fraction

This task is aligned to the cluster level to reflect its relationship to many of the mathematical ideas in the grade 3.NF domain. It relies heavily on a strong understanding of simple equivalent fractions as it shows a unit fraction 1/3 but locates it at the second tick mark instead of the first. Therefore, students may either find other fractions with denominator 3 on the number line, or they may recognize 1/3 as equivalent to 2/6 and label other numbers by counting by sixths.

Place points at the numbers ⅔ and ⅞ on the number line diagram shown. Label each point.
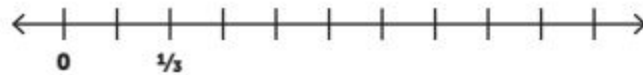
Standards Alignment: 3.NF.A
Source: [Grade 3 Mini-Assessment, Task 9](#)

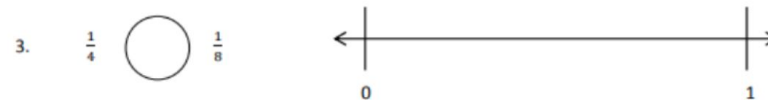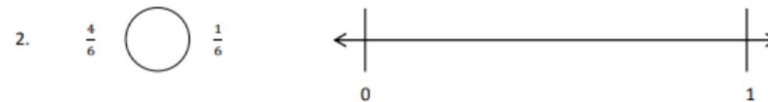| Students Show What They Know	Fostering Identity, Agency, and Belonging
[3.NF.A_Cluster Level_Elias](#) (Video) (Similar task: find 4/3 and 5/6 given a number line like the one shown)	- What are some other numbers (fractions) that you can find on the number line(s) shown? - How is this problem similar to others you've seen before? How is it different? - What do you know? What are you wondering?

Resources
- [Find 2/3](#), an additional task to support instruction.

Task: Comparing two fractions with the same numerator or same denominator

This task leverages students' knowledge of partitioning the whole to locate fractions and extends that to directly compare the magnitude of two fractions with either the same numerator or the same denominator. When two fractions have the same numerator, partitioning the whole on the number line can help students to see how the larger denominator creates smaller increments and the smaller denominator creates larger increments.
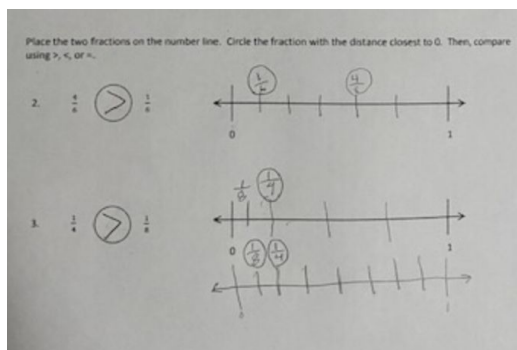
Place the two fractions on the number line. Circle the fraction with the distance closest to 0. Then, compare using >, <, or =.

2. $\frac{4}{6}$ ◯ $\frac{1}{6}$

0   1

3. $\frac{1}{4}$ ◯ $\frac{1}{8}$

0   1

Standards Alignment: 3.NF.A
Source: Engage NY, Grade 3, Module 5, Lesson 18, Problem Set, Tasks 2 and 3

Students Show What They Know	Fostering Identity, Agency, and Belonging
This task allows students to show how they are comparing fractions with like and unlike denominators using inequality symbols. The task also provides students with a number line to show where the numbers are located in comparison to the number one.	- What does it mean for one number to be "bigger than" another? Can you think of a time where it was important for you to know which number is bigger? - What might you do first to locate these fractions on the number line?

Resources
- Which is Closer to 1?, an additional task to support instruction.