Find 1

Sample task from achievethecore.org
Task by Illustrative Mathematics, annotation by Student Achievement Partners

GRADE LEVEL Third

IN THE STANDARDS 3.NF.A.2

WHAT WE LIKE ABOUT THIS TASK

Mathematically:
- Helps students understand fractions in relation to whole numbers (3.NF.A.2a).
- Includes an example of a fraction greater than one, allowing students to see that fractions are not limited to values between 0 and 1.
- Requires students to make sense of the problem and persevere in solving it (MP1).

In the classroom:
- Engages students quickly without needing much scaffolding by the teacher.
- Encourages students to share their developing thinking.

This task was designed to include specific features that support access for all students and align to best practice for English Language Learner (ELL) instruction. Go here to learn more about the research behind these supports. This lesson aligns to ELL best practice in the following ways:
- Provides opportunities for students to practice and refine their use of mathematical language.
- Allows for whole class, small group, and paired discussion for the purpose of practicing with mathematical concepts and language.
- Includes a mathematical routine that reflects best practices to supporting ELLs in accessing mathematical concepts.
- Provides opportunities to support students in connecting mathematical language with mathematical representations.
- Prompts teachers to write essential ideas/concepts/language on the board as a reference for students.

MAKING THE SHIFTS[1]

Focus	Belongs to the Major Work[2] of third grade	
Coherence	Integrates fractions with whole numbers, and lays groundwork for grade 4 fraction expectations	
Rigor[3]	Conceptual Understanding: primary in this task	
	Procedural Skill and Fluency: not targeted in this task	
	Application: not targeted in this task	

[1]For more information read Shifts for Mathematics.
[2]For more information, see Focus in Grade Three.
[3]Tasks will often target only one aspect of rigor.

For a direct link, go to: http://www.achievethecore.org/page/614/find-1-task

The steps in this routine are adapted from the Principles for the Design of Mathematics Curricula: Promoting Language and Content Development.

Engage students in the Discussion Supports Mathematical Language Routine as they work through this task. This will invite all students to participate in the conversations and support rich, inclusive discussions.

Numbered Heads Together

Students count off: Each group counts off by the number of students in a group so that every group has a 1, 2, 3, 4, etc.

Pose a Question/Problem: Give students the task.

Heads Together: The students solve this task as a group, recording notes of their thinking so that they will all be able to justify and explain their answers.

Reporting: Call a random number from 1–4 to be the reporter. At this point, students are no longer allowed to talk or write to each other, but the reporting student is allowed to use his/her notes. Ask each reporter to justify the reasoning of their group. Correct answers are not revealed until every reporter has shared.

Engage students in the Collect and Display Mathematical Language Routine as a way to capture the language they use when thinking about this task. This will provide a stable, collective reference for students to refer to, build on, or make connections to while working on future tasks. This collection can be used as a model and then revised and updated as more content is learned.

As students are working on the two questions in this task, circulate and listen to students talk. Record important words and phrases used along with diagrams. Add these to a visual display to use during the whole-class discussion of the task. As this recording is shared, students can clarify how and why they used these words or diagrams. Ask "Which of these help our communication to be more precise?"

Ensure students have ample opportunities in instruction to read, write, speak, listen, and understand the mathematical concepts that are represented by the following term:

- Number line diagram

Students should engage with this concept in the context of mathematical learning, not as a separate vocabulary study. Students should have access to multi-modal representations including: pictures, diagrams, written explanations, gestures, and sharing of non-examples. These representations will encourage precise language, while prioritizing students' articulation of concepts. This concept should be reinforced in teacher instruction, classroom discussion, and student work

ELLs may need support with the following vocabulary words during the classroom discussion:

- Place
- Point

For a direct link, go to: http://www.achievethecore.org/page/614/find-1-task

3.NF.A.2 calls for students to understand fractions as a number on the number line and to represent fractions on a number line diagram. This is part of the standards' progression toward the rational number system (6−8.NS).

For more information on the key concepts needed for students to develop conceptual understanding of fractions in grade 3, read pages 2−4 of the progression document, 3−5 Number and Operations − Fractions, available at www.achievethecore.org/progressions.

3.NF Find 1

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.

Commentary

The purpose of this task is to assess whether students understand fractions as being built from unit fractions and whether they can accurately locate fractions on the number line. This task could also be used in an instructional setting where students work in pairs or small groups to try to figure out how to use the given information to locate other numbers on the number line. If teachers give this task to students without scaffolding, it allows them an opportunity to engage in MP 1, Make sense of problems and persevere in solving them. This task includes the seeds of several important ideas.

Typically, students start with 0 and 1 on the number line and find unit (and other) fractions. In part (a) students must work in the other direction: they use a unit fraction to find 1 on the number line. This task reinforces the idea that a point on the number line represents a number. This kind of work also lays the groundwork for students to represent addition and subtraction on the number line in grade 4.

Part (b) reinforces the meaning of the numerator and the denominator. When students begin with the interval from 0 to 1, they typically start by partitioning that interval into unit fractions defined by the denominator of the fraction they are given. Here they must start with the numerator because they are partitioning the interval between 0 and 5/3. This part also helps reinforce the notion that when a fraction has a numerator that is larger than the denominator, it has a value greater than 1 on the number line.

The following lists related tasks in order of sophistication:
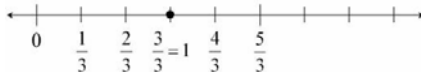
- Locating Fractions Less than One on the Number Line

- Locating Fractions Greater than One on the Number Line

- Closest to $\frac{1}{2}$

- Find 1

- Find $\frac{2}{3}$

- Which is closer to 1?

Solution: Find 1 using equal intervals

While it is not necessary to name all of the intervals on the number line, we expect many students will do so.
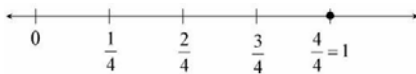
a. There are 4 fourths in 1, so if we take the length from 0 to $\frac{1}{4}$ four times, we will find 1.

b. $\frac{5}{3}$ is 5 equal pieces where 3 pieces make 1. So if we partition the interval between 0 and $\frac{5}{3}$ into 5 pieces, each will be a third and 3 thirds is 1.