Fractions Live Between 0 and 1

Teacher		**Class**	Grade 3
Subject	Math	**Topic**	Fractions on a number line
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn that a fraction is a number with an exact place on the number line. They fold, mark, and label fractions on a 0 to 1 line.

Curriculum links

- Understand a fraction as a number on the number line; represent fractions on a number line diagram [1]
- 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 [1]
- Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0 [1]

Learning objectives

- Students will understand a fraction as a number on the number line.
- Students will split 0 to 1 into b equal parts to show 1/b.
- Students will plot a/b by counting a jumps of 1/b from 0.

Success criteria

- I can name the size of each part on a 0 to 1 line.
- I can plot 1/b on a number line from 0.
- I can plot a/b by counting jumps from 0.

What students already know

Show a circle split into 2 equal parts with 1 part shaded. Ask: What fraction is shaded? How do you know? Listen for halves and equal parts.

Key words

numerator	top number that tells how many parts we count [8]
denominator	bottom number that tells how many equal parts make the whole [8]
unit fraction	one single equal share, like 1/4 [10]
number line	straight drawing that shows values in order from left to right [17]
whole	the full distance from 0 to 1 on our line [3]

Materials

- long paper strips, one per student plus extras
- printed 0 to 1 number lines, one per student
- pencils, crayons, whiteboard and marker
- Slides 1-7, 9, 11-12
- Video clip 7 Place a fraction (0:00-3:19)
- Worksheet Task B (page 2)

Before the lesson

- Print 0 to 1 number lines and Worksheet Task B, one per student
- Cut long paper strips to the same length as the printed 0 to 1 line
- Test Video clip 7 (0:00-3:19) and load Slides 1-7, 9, 11-12
- Make a large 0 to 1 fourths line for modeling

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Lesson outline

0–10 min **Starter** 10 min · Whole class

Recall equal parts and set the goal of finding fractions between 0 and 1.

YOU DO

1. Show Slides 1-2, read the objectives: understand a fraction as a number on the line and show 1/b and a/b.
2. Show Slides 3-4, review numerator, denominator, and unit fraction with gestures.
3. Hold up a paper strip and say the hook: If this whole strip is the walk from 0 to 1, where would you fold it to split it fairly for two, then for four?
4. Show Slide 5 and give 1 minute think, pair, share: Where would 1/2 go between 0 and 1? How would you find it?

STUDENTS DO

1. Repeat key words and show top number and bottom number with fingers.
2. Tell a partner where 1/2 would go and how to find the middle.
3. Share one idea with the class.

Say: Today we are finding new numbers between 0 and 1. The walk from 0 to 1 is one whole. We will split it into equal parts and find exactly where each fraction lives.

Ask: Where would 1/2 go between 0 and 1? (Halfway in the middle, the same distance from 0 and 1.) · What does the denominator tell us on the line? (How many equal parts divide the whole interval from 0 to 1.) · What does the numerator tell us on the line? (How many parts we count, or how many jumps from 0 [8].)

Check understanding: Thumbs up if you can point halfway from 0 to 1. If unsure, fold a strip in half together and mark the middle before moving on.

Support: Keep a 0 to 1 line with 0 and 1 labeled in view and start with halves only [4]. **Stretch:** Ask where 1/4 would sit compared to 1/2 and why more parts makes smaller parts.

Use: Slides 1–5

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10–25 min **Teaching** 15 min · Whole class

Model how the denominator splits 0 to 1 and the numerator counts jumps from 0.

YOU DO

1. Play Video clip 7 (0:00-3:19). Tell students to watch how 0 to 1 splits into equal parts and listen for where 1/4 lands.
2. Draw a large 0 to 1 line. Mark 0 and 1 as the whole, then split into 4 equal parts, checking the lengths match [1].
3. Count jumps from 0 aloud and label 1/4, 2/4, 3/4, 4/4, noting the endpoint of the part based at 0 locates 1/b [1].
4. Test the claim that 1/4 is bigger than 1/2 because 4 is bigger than 2 by pointing to both places on the line [9].

STUDENTS DO

1. Watch the video and raise a hand when 1/4 is shown.
2. Count aloud with the teacher: 1/4, 2/4, 3/4, 4/4.
3. Point on own mini line to show 1/4 is left of 1/2, so 1/2 is farther from 0.

Say: The bottom number splits the walk into that many equal parts. The top number counts how many small jumps we take from 0. Each small jump is one unit fraction.

Worked example: To plot 3/4: 1. Mark 0 and 1, that is the whole. 2. Split 0 to 1 into 4 equal parts. 3. Each small part is 1/4 [1]. 4. Jump 3 times from 0: 1/4, 2/4, 3/4. The endpoint locates 3/4 [1]. 3/4 is to the right of 1/4, so it is greater.

Ask: We want fourths. How many equal parts must split 0 to 1? (4 parts, the denominator shows the total number of equal parts in the whole [2].) · How far is 3/4 from 0? (3 lengths of 1/4 from 0, the endpoint locates 3/4 [1].)

Check understanding: On mini whiteboards students sketch a 0 to 1 line split into fourths and circle 2/4. If parts are unequal or counting is off, remodel equal folding and recounting from 0.

Support: Keep pointing to the 0 to 1 interval as 1 whole and count the equal parts together before naming any fraction [3]. **Stretch:** Ask students to explain why 3/4 is farther from 0 than 1/4 even though the denominators are the same.

Use: Video clip 7 (0:00–3:19), Slides 6–7

25–45 min **Main activity** 20 min · Pairs

Build unit fractions and a/b on a 0 to 1 line by folding and labeling.

YOU DO

1. Give out strips, printed 0 to 1 lines, pencils. Show Slide 9 task.
2. Model folding the strip in half, then in half again to make 4 equal parts.
3. Line the folded strip under the 0 to 1 line, mark each fold, and label 1/4, 2/4, 3/4, 4/4 in consecutive order [5].
4. Circulate as pairs point and count jumps, checking each part has size 1/b [1].

STUDENTS DO

1. Fold strip, line it under the 0 to 1 line, mark folds and label 1/4, 2/4, 3/4, 4/4.
2. Take turns pointing from 0 and counting jumps aloud with partner.
3. Hold up lines and explain that the endpoint labels the length and the fraction [3].

Say: Fold your strip to make 4 equal parts. Line it under your 0 to 1 line. Mark and label 1/4, 2/4, 3/4, 4/4. Point and count jumps with your partner.

Worked example: My strip is the whole from 0 to 1. Folded twice I have 4 equal parts [1]. The first fold end from 0 is 1/4, the second is 2/4, the third is 3/4, the last is 4/4 which is 1. Each part has size 1/4 [1].

Ask: How do you know your 4 parts are equal? (They line up exactly and are the same length; the interval 0 to 1 is partitioned into b equal parts [1].) · Where is 2/4? How many jumps from 0? (2 jumps of 1/4 from 0; the endpoint locates 2/4 [1].) · What is 4/4? (4 jumps reach 1, so 4/4 and 1 are at the same point.)

Check understanding: Tour lines to check numerators go up 1, 2, 3, 4 while denominator stays 4 [5]. If folds are unequal, refold together and copy marks from a folded strip [4].

Support: Give a line already marked with 0 and 1 as a supportive guide, and start with only halves and fourths [4].
Stretch: Ask students to fold and label thirds or sixths and explain how more parts makes each part smaller.

Use: Slide 9

45–55 min **Practice** 10 min · On their own

Practise reading and marking unit fractions on 0 to 1 lines on their own.

YOU DO

1. Hand out Worksheet Task B. Read the first 0 to 1 line together.
2. Model counting equal parts to get the denominator, then counting jumps from 0 to get the numerator.
3. Give 7 minutes quiet work to find unit fractions, reminding that numerators go up in order while denominators stay the same [5].
4. Stop for a 1 minute partner check of labels.

STUDENTS DO

1. Complete Worksheet Task B, counting parts and writing fractions.
2. Compare answers with a partner and fix any missing marks.

Say: Look at how many equal parts split 0 to 1. That is your bottom number. Count jumps from 0. That is your top number. Write the fraction at its exact point.

Worked example: 0 to 1 split into 3 equal parts. Each small part is 1/3. One jump from 0 is 1/3, two jumps from 0 is 2/3 [1].

Ask: How did you find the denominator? (Counted how many equal parts divide the whole interval from 0 to 1.) · How did you find 2/3 on a thirds line? (2 jumps of 1/3 from 0; values increase from left to right [10].)

Check understanding: Spot-check Task B lines for correct denominators and order. Pull a small group to recount parts from 0 if many errors.

Support: Leave 0 and 1 marked and add color dots under each jump to help count forward from 0 [9]. **Stretch:** Give a line with no labels except 0 and 1 and ask students to place 3/6 by first finding how many parts are needed.

Use: Worksheet Task B

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55–60 min **Plenary** 5 min · Whole class

Return to the objectives and check who can name and plot fractions.

YOU DO

1. Show Slide 11 mystery: I split 0 to 1 into 4 equal jumps. I am 3 jumps from 0. What am I?
2. Show Slide 12 quiz: 0 to 1 split into 3 equal parts, what is one part called and where is 2/3?
3. Revisit I can statements and collect exit answers on whiteboards.

STUDENTS DO

1. Solve the mystery and hold up answers.
2. Answer quiz and self-check: can I name the part size and plot 2/3?

Say: We learned fractions are numbers with exact places. The bottom number splits, the top number jumps. Tell me in your words where 3/4 lives.

Ask: I split 0 to 1 into 4 equal jumps. I am 3 jumps from 0. What am I? (3/4 — three quarters along the line.) · On a fourths line, which is greater, 1/4 or 3/4? How do you know? (3/4, it is farther from 0 and closer to 1; the line shows order and lets us compare [5].)

Check understanding: Use Slide 12 answers as hinge: if most miss thirds, plan reteaching with bars to lines tomorrow.

Support: Keep the labeled fourths line visible while questioning so students can point. **Stretch:** Ask students to predict where 2/4 would land and whether it would match one of the other marks.

Use: Slides 11–12

Common mistakes

Mistake	How to spot it	How to fix it
Thinking 1/4 is larger than 1/2 because 4 is larger than 2	Student points left of 1/2 but says 1/4 is greater	Point to both on the same 0 to 1 line and compare distance from 0; farther right means greater because values increase left to right [10].
Counting tick marks instead of jumps from 0, labeling 0 as 1/4	Labels start at 0 or are one place too far right	Cover 0, count spaces not lines: first space end from 0 is 1/b; the endpoint of the part based at 0 locates 1/b [1].
Splitting 0 to 1 into unequal parts	Parts visibly different lengths but labeled thirds or fourths	Refold strip to check equal lengths; each part must have size 1/b, so unequal parts cannot be unit fractions [1].

Support

- Use 0 to 1 lines already marked with 0 and 1 and start with halves and fourths only [4].
- Provide folded strips to copy equal parts and color dots to count jumps from 0.

Stretch

- Fold and label thirds or sixths and explain why more parts makes each part smaller.
- Place 3/6 on a line showing only 0 and 1, then predict an equivalent landing point.

For the LSE or teaching assistant

Sit with target students during folding; hold the strip while they crease, check equal parts line up, and prompt counting jumps from 0 aloud.

Check for understanding

Question	Answer
0 to 1 is split into 4 equal parts. What is one part called?	1/4.

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Where is 3/4? How many 1/4 jumps from 0?	3 jumps from 0.
0 to 1 is split into 3 equal parts. Where is 2/3?	2 jumps of 1/3 from 0.

Homework

Draw a 0 to 1 line, split into 3 equal parts, and label 1/3, 2/3, 3/3.

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