Grade 3 : Parts and Wholes
"Comparing Fractions" (Activity 15)
(From: Mathology)

Students are introduced to the fraction symbol, then use a number line to show fractions of a length. In groups, students fold number lines to show equal parts, then use them to compare fractions. To consolidate, students compare unit fractions, then compare fractions with the same numerator.

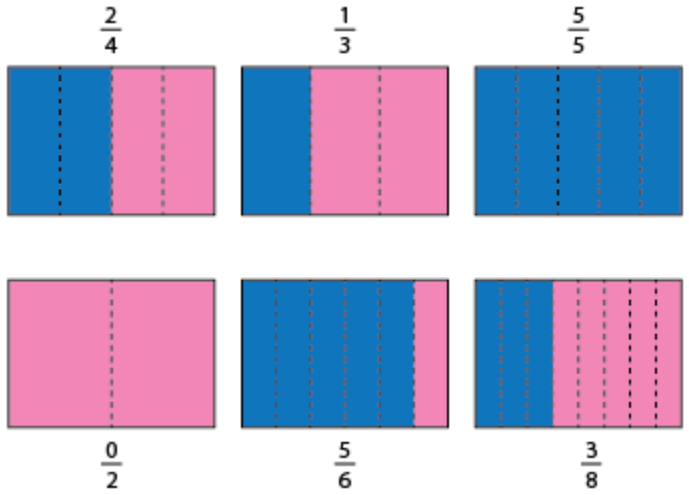
When working with fractions, it is very common to overemphasize fourths. It is important that other fractions, such as fifths, sixths, and tenths are also explored.

Big Idea	Curriculum expectations
Relating the size and number of equal parts in a whole	**B1. Number Sense**: demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life • **Fractions: B1.6** use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts • **Fractions: B1.7** represent and solve fair-share problems that focus on determining and using equivalent fractions, including problems that involve halves, fourths, and eighths; thirds and sixths; and fifths and tenths
Learning Goals	Success Criteria

•	I understand that... • We use the number of equal parts to name the unit (e.g., a line folded into 4 equal parts shows fourths). • For the same whole, as the number of equal parts increases, the size of each unit gets smaller. • The denominator of a fraction tells the number of equal parts in the whole, which tells us the *unit* . The numerator tells the number of parts counted.
Materials	**Math Language / Vocabulary**
• Master 7: Paper Shapes (Strips) • Master 8: Number Lines (6 lines per group) • Exit Ticket • Practice *(All Line Masters, Exit Tickets and Practice Pages can be accessed by logging into your Mathology account)*	• Fraction • Whole / part • Equal parts • One-half / one-third / one-fourth / one-sixth / one-eighth • Numerator • Denominator
Prior Knowledge	
Students may benefit from prior experience with: • sharing items equally • partitioning shapes into equal parts • using ordinal number names • comparing and ordering quantities	
Minds On	

Introduce the fraction symbol. Show the pictures below. Have students try to identify what each number in the fraction symbols represents.
Annotate the fractions for students as they share:

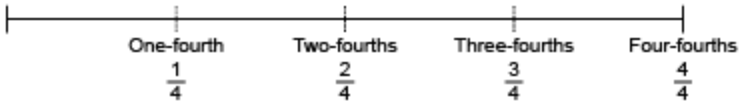
(e.g., $\frac{2}{4}$ $\frac{\text{(blue parts)}}{\text{(total number of parts)}}$).



Point out that the top number, the numerator, tells us our *count* (in this case, we are counting the blue shaded regions). The bottom number, the denominator, tells the *unit* (how many equal parts there are in the whole).

Show a number line. Fold the line into fourths. Have students suggest how they would label each fold line, then label as shown.

Help students see that because the line represents a length or distance, we place the labels on the fold lines (i.e., fraction represents the space between fold lines). Count the unit fractions and encourage students to count with you as you label, e.g., 1 one-fourth, 2 one-fourths, 3 one-fourths, etc.



Ask: *"Where is 0? Where is 1? Where do you think 2 would be?"*

Help students see that four-fourths is the same as 1, or 1 whole.

Action!

Give each group 6 number lines. Encourage students to label the ends of the lines with 0 and 1.

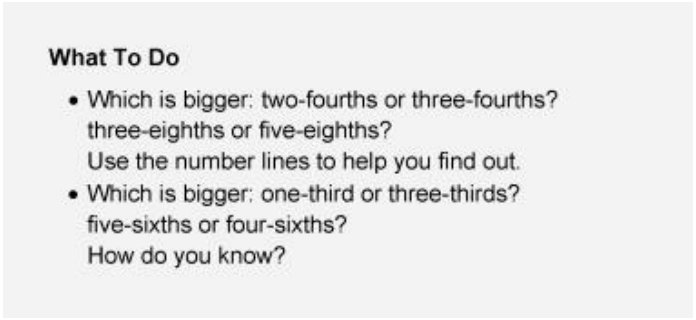
Linear Model: Number Lines

What To Do

- Fold 3 lines into 2, 4, and 8 equal parts.
  Label each part with the fraction it represents.
- Which line has the most parts? the fewest parts?
  the biggest parts? the smallest parts?
- Compare one part from each line.
  Which is biggest: one-half, one-fourth, or one-eighth? Explain.

- Fold 3 lines into 2, 3, and 6 equal parts.
  Label each part with the fraction it represents.
- Which line has the most parts? the fewest parts?
  the biggest parts? the smallest parts?
- Compare one part from each line.
  Which is biggest: one-half, one-third, or one-sixth? Explain.

Comparing Fractions



Probing Questions:

- *How do you know that the line with the most parts has the smallest parts?*
- *How did you decide which fraction was bigger?*
- *How is using a line to show a fraction like using a paper square (area model)? How is it different?*
- *Do you think one-half of a small square would be the same as one-half of a big square? Explain.*

Look-Fors

- Are students able to partition lines equally?
- Do students understand that units (e.g., fifths) must be the same size or do they only focus on the number of parts?
- Do students see the relationship between the number line and the area models? Do they understand that one-half of each describes the same number, but not necessarily the same quantity?
- Are students able to compare the parts accurately? Are they using math language to make the comparisons (e.g., whole, part, equal parts, fraction)?

Consolidation

Have students share the strategies they used to fold the lines into the different numbers of equal parts and how they compared the sizes of the different parts (e.g., overlaying parts, folding).

Have students use their number lines to compare unit fractions. Ask, *"Which is bigger: ⅕ or ½ ?"*

If students are successful, challenge them to compare fractions with like numerators. Ask: *"Which is bigger: 2/4 or 2/6 ?"*

Ask: *"Does anyone have a line divided into 4 equal parts with all parts shaded? If so, what number does it represent? How do you know?"*
Help students see that four-fourths represent 1 whole.

Count by unit fractions and encourage students to count by unit fractions at every opportunity. Counting is a powerful demonstration of what students know about the quantities that fractions represent. Counting also allows students to build number sense related to fractions (similar to the way in which counting whole numbers allows students to build number sense related to whole numbers, including an understanding of quantity and relative magnitude).

If students are ready, challenge them to think beyond 1. For example, ask: *"Which is bigger: one and 2 one-fifths or two and 1 one-fifth?"*

To allow students to show what they have learned in this lesson, go to the **Exit Ticket** and/or **Practice** . For the Exit Ticket, provide students with a number line cut from Master 8: Number Lines. (access by logging into Mathology)

Highlight for Students

- We use the number of equal parts to name the unit (e.g., a line folded into 4 equal parts shows fourths).
- For the same whole, as the number of equal parts increases, the size of each unit gets smaller.
- The denominator of a fraction tells the number of equal parts in the whole, which tells us the *unit* . The numerator tells the number of parts counted.

Supports for Student Learning

Accommodation: Focus on folding lines into 2 and 4 equal parts, then comparing different numbers of halves and fourths (e.g., two-fourths and three-fourths). Or, provide 2 equal lengths of string and have students fold, then cut the string to make 2 and 4 equal parts.

Extension: Have students fold copies of a number line in different ways to compare other fractions (e.g., fifths and tenths).

Independent Tasks / Assessment Opportunities

All assessments, in the moment feedback/prompts, and independent tasks can be accessed by logging into your Mathology account.

SEL Self-Assessments (English) and Teacher Rubric

Extension Activities

Log in to your Mathology.ca / Mathologie.ca account to access Intervention and Extension activities, Professional Learning Videos and Assessment tools.

Technology

If you require support logging into your Mathology/Mathologie account, please contact Kerry Stack or Erica Doucet.

https://etr.mathology.ca/

Use the Comparing Fractions Tool to model relating the size and number of equal parts in a whole. Show the same rectangle in each part of the workspace. Use the arrows to divide each rectangle into a different number of equal

parts. Click on parts to colour them. Discuss what fractional amount each model shows. Compare the shaded parts to decide which model shows the bigger amount.