

LESSON 4

Objective

Compare and order fractions and decimals.

Common Core State Standards

- **6.NS.6c** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

The Number System

Compare and Order Fractions and Decimals

The number line is a useful tool for comparing and ordering fractions and decimals. Students should be able to draw and mark a number line with fractions, with decimals, and with a combination of both types of numbers. They should be able to translate between forms and use whichever form is more convenient or more appropriate in the context of the problem.

Try It! Perform the Try It! activity on the next page.

Talk About It

Discuss the Try It! activity.

- **Say:** One pink Fraction Tower piece represents $\frac{1}{2}$. What decimal is equivalent to $\frac{1}{2}$?
- **Say:** Three green Fraction Tower pieces together represent $\frac{3}{5}$. What decimal is equivalent to $\frac{3}{5}$? Note that each green tower piece is $\frac{1}{5}$, or 0.2. Three pieces equal $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$, or $0.2 + 0.2 + 0.2 = 0.6$.

Solve It

Reread the problem with students. Students find the equivalent decimals for the fractions using the equivalency cubes. Students locate these decimals on a number line, reading from left to right: 0.375, 0.5, 0.6, 0.75, 0.8. Next they write the foods in order: salami, Swiss, Cheddar, turkey, ham.

More Ideas

For other ways to teach about comparing and ordering fractions and decimals—

- Have students use Base Ten Blocks to compare fractions and decimals. Provide students with decimals and fractions in simplest form. Have students write each number as a fraction with denominator 100 and model with Base Ten Blocks. Have students order the numbers.
- Have students use the Rainbow Fraction® Circle Rings to compare the sizes of the Fraction Circle pieces in the set. Ask students to place each piece inside the fraction ring and mark and label each piece starting from the 0. Then have students use the decimal ring to label each of the fraction pieces they marked.

Formative Assessment

Have students try the following problem.

Which of the following statements is true?

- A. $0.5 < \frac{5}{8}$ B. $0.15 > \frac{3}{10}$ C. $\frac{4}{5} > 0.8$ D. $\frac{1}{3} < 0.25$

Try It! 20 minutes | Groups of 3

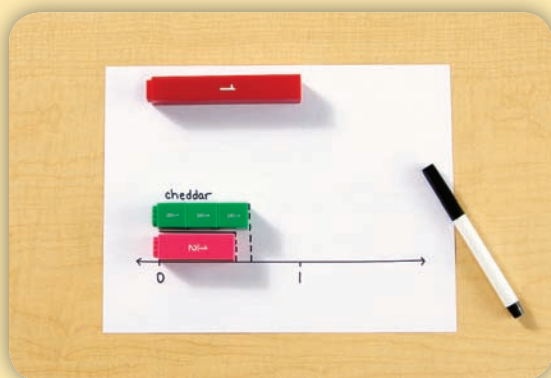
Here is a problem about ordering fractions and decimals.

Bob is making a snack tray for a party. He bought two packages of cheese, $\frac{1}{2}$ pound of Swiss and $\frac{3}{5}$ pound of Cheddar. The deli clerk sliced meats for Bob. Bob got 0.8 pound of ham, 0.75 pound of turkey, and 0.375 pound of salami. Write the foods in order from least to greatest weight.

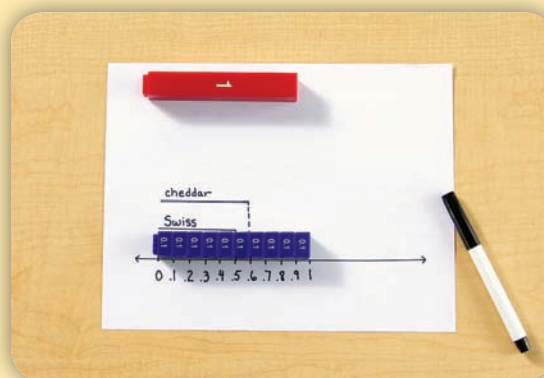
Introduce the problem. Then have students do the activity to solve the problem. Give each group of students Fraction Tower Equivalency Cubes, a straightedge, paper, and pencil.

Materials

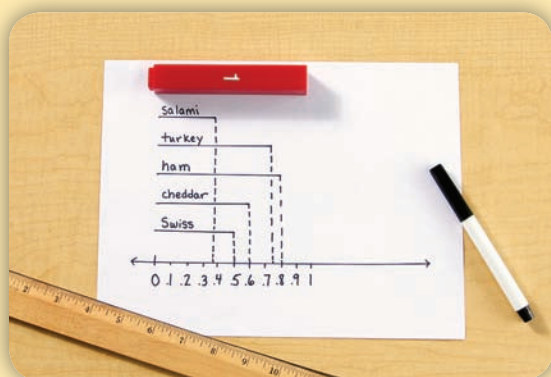
- Fraction Tower® Equivalency Cubes (1 set per group)
- straightedges (1 per group)
- paper (1 sheet per group)
- pencils (1 per group)



1. Say: Select Fraction Tower pieces to represent the Swiss cheese and the Cheddar cheese. Draw a blank number line. Mark zero. Use a red tower to mark 1. Use the towers to draw a segment for each type of cheese. Students trace along the tops of the pink and green towers and write Swiss and Cheddar.



2. Say: Now, use the decimal side of the purple Fraction Tower to mark all the tenths on your number line between 0 and 1. Students mark and label 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, and 0.9.



3. Say: Draw and label a segment for each meat. Notice that 0.75 falls between two divisions and that 0.375 does too. Write the foods in order from least to greatest weight.

Look Out!

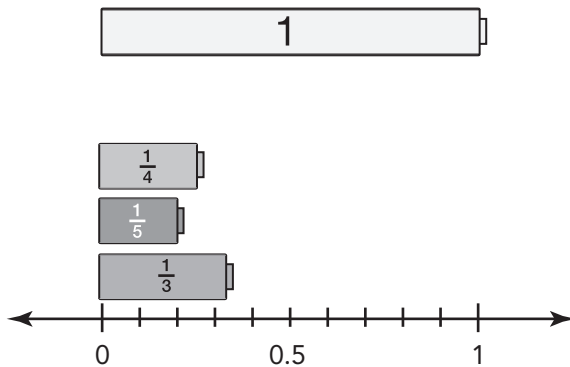
Make sure students think about place value when they compare decimals such as 0.8 (ham) and 0.375 (salami). Some students might think that $0.8 < 0.375$ because $8 < 375$. Point out that $0.8 = 0.800$, so they should compare 0.800 with 0.375 . Since $800 > 375$, $0.800 > 0.375$, and therefore $0.8 > 0.375$. When comparing 0.75 (turkey) with 0.8 (ham), students should see that there's a little more ham than turkey. In this case, $0.80 > 0.75$ because $80 > 75$.



Use Fraction Towers to model each fraction on a number line. Write the fractions as decimals in order from least to greatest.

(Check students' work.)

1.



0.2

0.25

0.3

Using Fraction Towers, model each fraction. Sketch the models using the number line. Write the equivalent decimals in order from least to greatest.

2. $\frac{3}{8}, \frac{1}{6}, \frac{3}{10}, \frac{2}{5}$

least

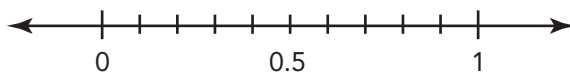
0.16

0.3

0.375

greatest

0.4



Write the fractions as decimals in order from least to greatest.

3. $\frac{2}{3}, \frac{3}{4}, \frac{7}{10}$

0.6; 0.7; 0.75

4. $\frac{3}{5}, \frac{3}{10}, \frac{7}{12}$

0.3; 0.583; 0.6

5. $\frac{3}{8}, \frac{1}{3}, \frac{5}{12}$

0.375; 0.333; 0.416

6. $\frac{5}{6}, \frac{7}{8}, \frac{3}{4}$

0.833; 0.875; 0.75

Answer Key

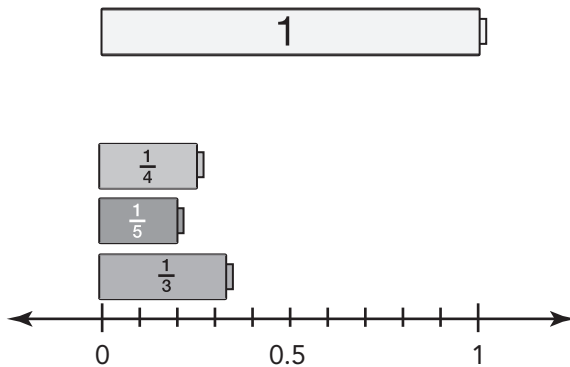
Challenge! Draw a diagram to show why $\frac{1}{5}$ is greater than $\frac{1}{6}$. Use this to compare the fractions $\frac{4}{5}$ and $\frac{4}{6}$. Explain.

Challenge: (Sample) When a circle is divided into 5 parts, one of the parts is larger than a circle divided into 6 parts. Four of the five parts of a circle are also larger than 4 out of 6 parts of a circle. $\frac{4}{5} > \frac{4}{6}$

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Use Fraction Towers to model each fraction on a number line. Write the fractions as decimals in order from least to greatest.

1.

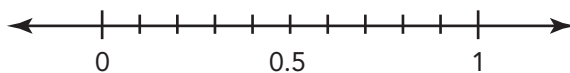


Using Fraction Towers, model each fraction. Sketch the models using the number line. Write the equivalent decimals in order from least to greatest.

2. $\frac{3}{8}, \frac{1}{6}, \frac{3}{10}, \frac{2}{5}$

least _____

greatest _____



Write the fractions as decimals in order from least to greatest.

3. $\frac{2}{3}, \frac{3}{4}, \frac{7}{10}$

4. $\frac{3}{5}, \frac{3}{10}, \frac{7}{12}$

5. $\frac{3}{8}, \frac{1}{3}, \frac{5}{12}$

6. $\frac{5}{6}, \frac{7}{8}, \frac{3}{4}$

Name _____

Challenge! Draw a diagram to show why $\frac{1}{5}$ is greater than $\frac{1}{6}$. Use this to compare the fractions $\frac{4}{5}$ and $\frac{4}{6}$. Explain.

[illegible]