1.3 Fractions Greater Than 1

Overview

In this activity, students work with a partner to place fractions and mixed numbers greater than 1 on a number line. They also focus on equivalency.

Manipulative Note

Cuisenaire rods are wooden or plastic blocks that range in length from 1 to 10 cm. Each rod of a given length is the same color. That is, all the 1-cm rods are white, all the 2-cm rods are red, all the 3-cm rods are light green, and so on.

Materials

Fractions Greater Than 1 recording sheet (**Reproducible 1c**), 1 per pair of students

Fraction Cards, Set A (**Reproducible 1d**), 1 set per group

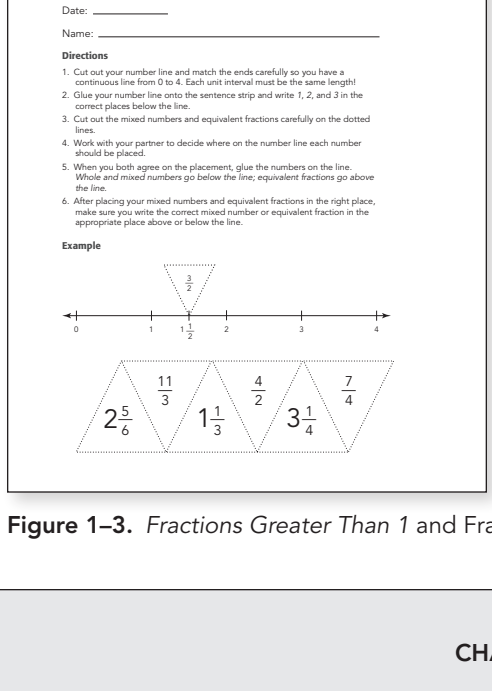
Cuisenaire rods, 1 set per pair of students

Jumbo Cuisenaire rods or tag board "rods" with magnetic tape for display

sentence strips, 1 per pair of students

glue sticks, 1 per pair of students

1. Display a large number line with the numbers 0 to 4 marked as shown here. If using the Jumbo Cuisenaire rods or a homemade equivalent, your unit interval should be 24 cm.



REPRODUCIBLE 1C

Fractions Greater Than 1

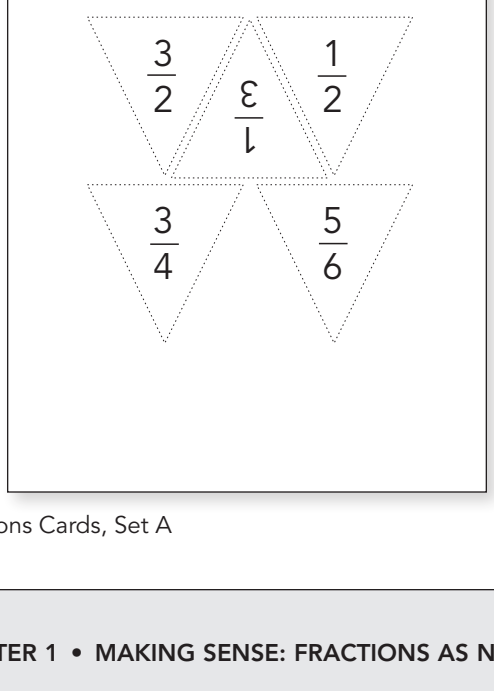
Date: _____

Name: _____

Directions

1. Cut out your number line and match the ends carefully so you have a continuous line from 0 to 4. Each unit interval must be the same length!
2. Glue your number line onto the sentence strip and write *1*, *2*, and *3* in the correct places below the line.
3. Cut out the mixed numbers and equivalent fractions carefully on the dotted lines.
4. Work with your partner to decide where on the number line each number should be placed.
5. When you both agree on the placement, glue the numbers on the line. *Whole and mixed numbers go below the line; equivalent fractions go above the line.*
6. After placing your mixed numbers and equivalent fractions in the right place, make sure you write the correct mixed number or equivalent fraction in the appropriate place above or below the line.

Example



REPRODUCIBLE 1D

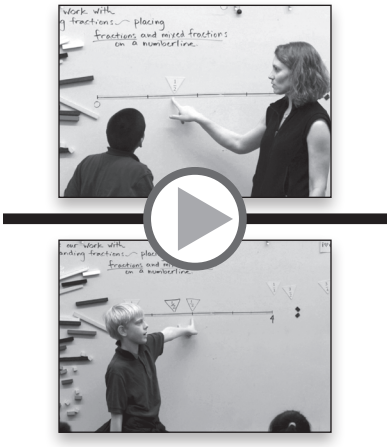
Fraction Cards, Set A

Figure 1–3. *Fractions Greater Than 1* and Fractions Cards, Set A

2. Show students the $\frac{1}{2}$ card and ask for a volunteer to come up and place it on the number line. (See Figure 1–3 on page 15; also available as Reproducible 1d.)
3. Ask the student to justify his or her placement and invite the other students to provide feedback about the placement. For example, if students don't agree with the placement, ask them to explain why and to help the other student find the correct placement.
4. Repeat with the cards showing $\frac{1}{3}$, $\frac{3}{4}$, and $\frac{5}{6}$.

This illustrates Strategy #9 of the ten essential strategies for supporting fraction sense: *Provide opportunities for students to engage in mathematical discourse and share and discuss their mathematical ideas, even those that may not be fully formed or completely accurate.* To learn more about this strategy, see Chapter 1 of *Beyond Pizzas & Pies: 10 Essential Strategies for Supporting Fraction Sense, Grades 3–5, Second Edition* (McNamara and Shaughnessy 2015).

VIDEO CLIP 1a

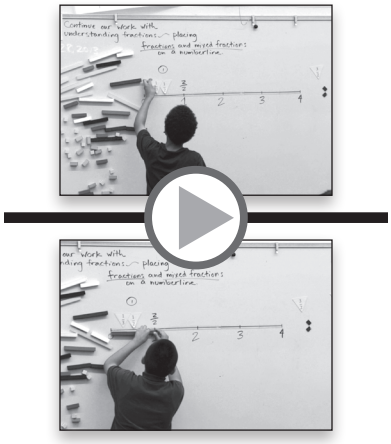


Placing $\frac{1}{2}$ on the Number Line

This clip comes at the beginning of Activity 1.3. After Ms. Kretschmar shows students a four-unit number line with only the whole numbers 0 and 4 labeled, we see several students share their thinking about where to place $\frac{1}{2}$ on the line. Three different locations are suggested and discussed. What does Ms. Kretschmar learn about what students do and don't understand about fractions on the number line from the discussion?

For commentary on the above, see the Appendix: Author's Video Reflections.

VIDEO CLIP 1b



Using Cuisenaire Rods to Place $\frac{1}{3}$ on the Number Line

In this clip, we see two students, Coleo and Juan, show where $\frac{1}{3}$ goes on the number line. Why does Ms. Kretschmar call on Juan to use the Cuisenaire rods to justify Coleo's placement? How does Juan's use of the Cuisenaire rods support students' understanding of placing fractions on the number line?

For commentary on the above, see the Appendix: Author's Video Reflections.

5. Make sure to be explicit about how to use the Cuisenaire rods to partition the unit interval into the appropriate number of segments. For example, with the fraction $\frac{1}{3}$, guide students to the understanding that the unit interval needs to be partitioned into three equal segments because the denominator of the fraction is three. If you find your students are really struggling with this, you may want to teach one of the number line lessons from Chapter 2 in *Beyond Pizzas & Pies, Second Edition* (NcNamara and Shaughnessy 2015), *before* doing this activity.

6. Show students $\frac{2}{3}$ and ask for a volunteer to come up and place it on the number line.

7. Ask the student to justify her placement and invite the other students to provide feedback about the placement. For example, if students don't agree with the placement, ask them to explain why and to help the other student find the correct placement.

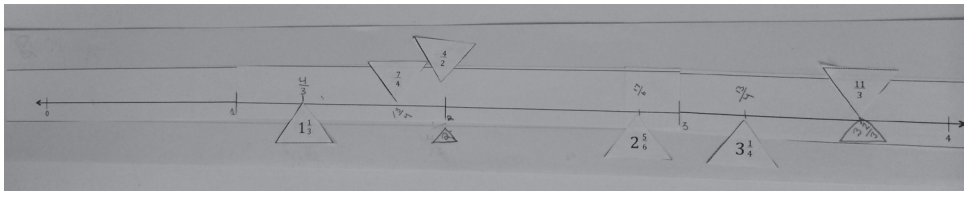


Figure 1–4. Example of student-made number line from Activity 1.3.

VIDEO CLIP 1c

Using Cuisenaire Rods to Place $\frac{3}{2}$ on the Number Line

In this clip, we see Samantha place $\frac{3}{2}$ on the number line. How does Samantha use the Cuisenaire rods to help her place the fraction?

For commentary on the above, see the Appendix: Author's Video Reflections.

8. Ask students what is different about the fraction $\frac{3}{2}$ compared with the other fraction they placed on the line.

9. Students will notice the fraction is between 1 and 2, unlike the other fractions, which were all less than 1 (or between 0 and 1).

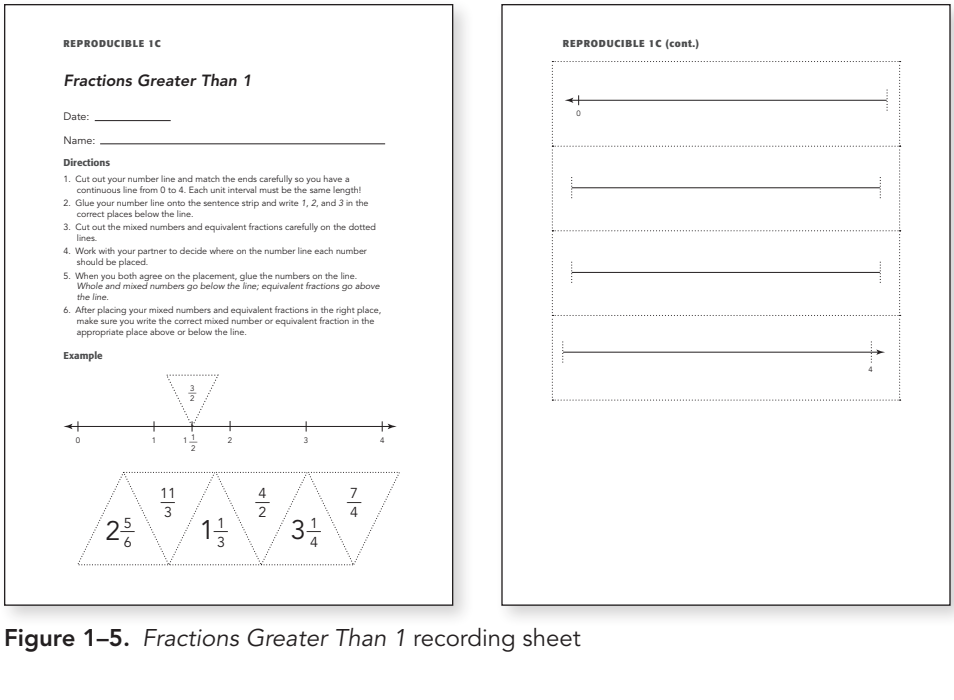
10. Tell students that they are going to work with a partner and use the Cuisenaire rods to place fractions on a number line and that all of the fractions are greater than 1.

11. Give students the recording sheet and answer questions about the task. (See Figure 1–5; also available as Reproducible 1d.) Students may take turns placing numbers but have to explain their rationale to their partner.

12. Remind students that improper fractions should be placed above the line and mixed numbers should be placed below the line. After placing the numbers, students should write the mixed number or improper fraction equivalent in the appropriate place.

13. After students have placed all their fractions, have them compare their results with another pair of students and discuss any discrepancies.

14. Wrap up the lesson by asking students to share their strategies for translating between mixed numbers and improper fractions.



REPRODUCIBLE 1C

Fractions Greater Than 1

Date: _____

Name: _____

Directions

1. Cut out your number line and match the ends carefully so you have a continuous line from 0 to 4. Each unit interval must be the same length!
2. Glue your number line onto the sentence strip and write *1*, *2*, and *3* in the correct places below the line.
3. Cut out the mixed numbers and equivalent fractions carefully on the dotted lines.
4. Work with your partner to decide where on the number line each number should be placed.
5. When you both agree on the placement, glue the numbers on the line. *Whole and mixed numbers go below the line; equivalent fractions go above the line.*
6. After placing your mixed numbers and equivalent fractions in the right place, make sure you write the correct mixed number or equivalent fraction in the appropriate place above or below the line.

Example

REPRODUCIBLE 1C (cont.)

Figure 1–5. *Fractions Greater Than 1* recording sheet

VIDEO CLIP 1d

Deciding Where to Place $\frac{11}{3}$ on the Number Line

In this clip, we hear from Braulio as he shares how he and his partner determined where to place $\frac{11}{3}$. How does Braulio draw on his understanding of unit fractions and whole numbers to decide which two whole numbers $\frac{11}{3}$ is between?

For commentary on the above, see the Appendix: Author's Video Reflections.