SCAFFOLDING TASK: COMPARING FRACTIONS

Adapted from NCTM Illuminations
Suggested Time for Task: 2 class periods

STANDARDS FOR MATHEMATICAL CONENT

MCC3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Understand two fractions as equivalent (equal).
> b. Recognize and generate simple equivalent fractions, e.g., ½ = 2/4, 4/6 = 2/3. Explain why fractions are equivalent by using a visual fraction model.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Counting fractional parts is the groundwork for comparing and understanding the two parts of fractions. When developing this thinking, it is useful to display fraction pie pieces and count them together as a class. For example, using the fractions 1/4, 2/4, 3/4, 4/4, and 5/4, the class can discuss the relationship the fractions have with one whole. (Van De Walle, p. 138)

ESSENTIAL QUESTIONS

- What relationships can I discover about fractions?
- How can I compare fractions?
- What equivalent groups of fractions can I discover using Fraction Strips?

MATERIALS

- Comparing Fractions task sheet
- 9" x 12" sheets of paper in six different colors (cut into 1" x 12" strips) Each child will need 6 strips, one of each color.
- Scissors

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

Give students six strips of paper in six different colors. Repeat the Fraction Strip folding and labeling activity from the Exploring Fractions Task. This time, ask students to separate the Fraction Strips by cutting on the folds giving them 2 - ½ strips, 3 – 1/3 strips, and so forth. Give each student a plastic sandwich bag or envelope to store the strips.

Arrange students in small groups of 2-3 students. Give them approximately ten minutes to write down their observations about the separated Fraction Strips. Have each group share some of their comments. Lead the groups to consider questions such as:

- Do you see any special relationships among the different colored strips?
- Place a ½ strip on your desk. How many strips or combinations of strips are the same size as ½?
- When fractions are the same size, they are called *equivalent*. What other equivalent sets of fractions can you create?

Have students line up their fraction strips and find as many relationships as they can. For instance, they might notice that three of the 1/6 pieces are equal to four of the 1/8 pieces, or that two of the 1/3 pieces are equal to four of the 1/6 pieces. Have students record these relationships on paper. When they have finished, have them share the relationships they have discovered. Record the relationships on chart paper and discuss.
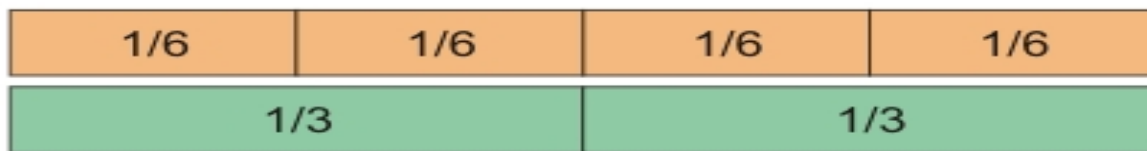
Students will notice that one whole is the same as 2/2, 4/4, 8/8, 3/3, or 6/6. Another example includes the relationship between ½, 2/4, 4/8, and 3/6. Tell students that when fraction strips are the same length, they represent equivalent fractions. Students may also notice that for each of these fractions, the numerator is ½ of the denominator.

Part II

Students will work in small groups to answer the questions in the activity sheet. The teacher should monitor the groups, asking questions, and encouraging students to explore the concept of fractions.

Have groups (at least 2-3) share their solution to question numbers 6 and 7. Try to pick groups who presented different ways of solving the problems. After this lesson, have students store their Fraction Strips in a plastic sandwich bag.

Part III
      Students can practice comparing fractions using the following activity adapted from <u>Elementary and Middle School Mathematics: Teaching Developmentally</u> by John A. Van de Walle, Karen S. Karp, and Jennifer M. Bay-Williams, p. 290.

      The friends below are playing red light-green light. Who is winning? Use your fraction strips to determine how far each friend has moved.

Mary – ¾	Harry – ½	Larry – 5/6
Sam – 5/8	Michael – 5/9	Angie – 2/3

      Adapted from <u>Elementary and Middle School Mathematics: Teaching Developmentally</u> By John A. Van de Walle, Karen S. Karp, and Jennifer M. Bay-Williams, p. 290.

<u>FORMATIVE ASSESSMENT QUESTIONS</u>

- What relationships did you discover about fractions?
- How can you compare fractions?
- What equivalent groups of fractions did you discover?

<u>DIFFERENTIATION</u>

Extension
- Have students create additional fraction strips and write about relationships.
- Students can use coffee filters, paper plates, or other objects to create different models to illustrate inequalities.

Intervention
- Use ready-made Fraction Tiles or Virtual Manipulatives.

<u>TECHNOLOGY RESOURCES</u>

http://www.mathplayground.com/Scale_Fractions.html

http://nlvm.usu.edu/en/nav/frames_asid_105_g_2_t_1.html?from=topic_t_1.html

http://illuminations.nctm.org/ActivityDetail.aspx?ID=80

Name: _____ Date: _____

COMPARING FRACTIONS
(Adapted from a Learning Task by Angela Lacey Hester, Floyd County, GA)

1. Using complete sentences and math words, write 3 observations you and your group made about the Fraction Strips.

Use your Fraction Strips to answer the following questions.

2. What fraction is equivalent to 2 of your 1/4 strips?

3. What fraction is equivalent to 3/6?

4. What fraction is equivalent to 6/8?

5. If you had made a fraction strip for 1/10s, how many tenths would it take to make to equal 1/2?

Put on your thinking caps….

6. In the space below, draw a Fraction Strip divided into fourths. Draw 2 additional shapes divided into fourths. Make one of your drawings a real-life example of something you might partition (divide) into fourths.

7. Pretend it is 7:30 a.m. Math Class begins at 8:00 a.m. Ashley says class starts in 30 minutes. Harrison says class starts in half an hour. Which child is correct? On the back of this page, draw a picture and write 2-3 sentences to explain your answer.