Lesson 7: Inequality of Fractions

Purpose: To determine inequalities of fractions in special cases

Materials: Fraction Bars, paper and pencils, 8-Bars mat and markers

TEACHER MODELING/STUDENT COMMUNICATION

Activity 1 Using bars to determine inequalities

1. Distribute a deck of bars to each group and assign pairs of students to be partners.

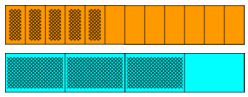
Fraction Bars

- Spread your bars face down.
- Select a bar and compare the bar to your partner's to see who has the smaller shaded amount. If the shaded amounts are equal, select two more bars.

Call on a few pairs of students:

- Describe your bars by giving the color and number of shaded parts and say which fraction is smaller. (For example, a red bar with 1 part shaded and a blue bar with 1 part shaded, and one-sixth is less than one-fourth.)

As students orally give their inequality statements, write a few using the less than (<) sign. Remind students that the sign's tip points to the smaller number and the opening or "mouth" faces or "bites" the bigger number.



$$\frac{5}{12} < \frac{3}{4}$$

Select one of their examples where the smaller fraction has the larger numerator and denominator, such as the example shown here. Discuss such an example by asking:

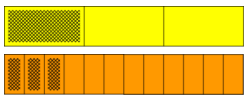
- How can a fraction like 5/12 be less than 3/4 when its numerator and denominator are both greater? (Even though the orange bar has 5 parts shaded and the blue bar has only 3 parts shaded, the parts of the orange bar are smaller.

Fraction Bars

2. Ask each pair of students to select new bars whose shaded amounts are not equal and place them side by side to determine who has the greater shaded amount. As they describe their bars and give the greater fraction, write some of these inequalities on the overhead using the greater than (>) inequality symbol. Point out that the tip of the symbol still points to the smaller number and that the "mouth" still bites the bigger number.

Select an example where the bigger fraction has the smaller numerator and denominator, as shown below, and pose the following question:

- How can the fraction 1/3 be greater than 3/12 when it has the smaller numerator and denominator? (the parts of the yellow bar are larger.)



$$\frac{1}{3} > \frac{3}{12}$$

Repeat this activity with the following variation:

- Select new bars that are both the same color and write a less than statement.

List a few of their inequalities: 3/6 < 5/6, 1/4 < 4/4, 5/12 < 8/12, and 1/3 < 2/3.

- Look at these inequality statements. How can you always tell which of two fractions is smaller when the fractions have the same denominator? Explain (**The fraction with the smaller numerator is the smaller fraction because the parts of both bars have the same size.)**

3. Write the following fractions, one at a time, and ask students to write either a "less than" or a "greater than" inequality statement:

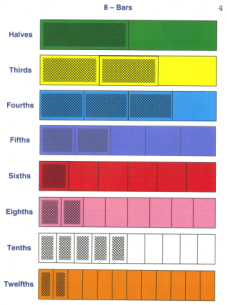
$\frac{3}{10}$ $\frac{7}{10}$ $\frac{4}{7}$ $\frac{2}{7}$ $\frac{5}{9}$ $\frac{7}{9}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{7}{15}$ $\frac{4}{15}$

Activity 2 Fraction inequalities from the 8-Bars mats

paper and pencils

8-Bars mats

Give each student or pair of students an 8-Bars mat. One example of these mats is shown here. Arbitrarily select any two types of bars on these mats, say sixths and tenths.



- Write a fraction inequality statement for the sixths and tenths bars from your mat. Ask a few students for their inequalities.

- Find three bars on your mat that are side-by-side and which decrease in shaded amounts or increase in shaded amounts and write a chain of inequalities for these fractions. For example, on mat #4 shown here: 3/4 > 2/5 > 1/6 or 1/6 < 2/8 < 5/10.

Game: 8-Bars Inequality (whole class)

Pass out a sack of markers and an 8-Bars mat to each student or pairs of students.

8-Bars mats & markers

- I will say the name of a fraction, and for each one you can place a marker beside the bar if it is represented on your mat.

- For any fraction equal to 1/2, you may place a marker on all the half-bars on your mat, regardless of their color.

- The first player to get markers beside any three bars that are side-by-side and which all decrease in shaded amounts or all increase in shaded amounts wins the game.

INDEPENDENT PRACTICE and ASSESSMENT

Activity Sheet #7A and **Activity Sheet #7B**