INEQUALITY 3.NF.3
Inequality of Fractions

Purpose: To determine inequalities of fractions in special cases

Materials: *Fraction Bars* and activity sheet "Model for Inequality of Fractions" (attached)

TEACHER MODELING/STUDENT COMMUNICATION

Activity 1 Using *Fraction Bars* to determine inequalities

Fraction Bars

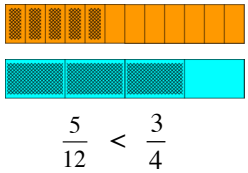
1. Distribute a deck of *Fraction Bars* to each group and assign pairs of students to be partners.

- Spread your *Fraction Bars* face down, and each person selects one.
- Compare your *Fraction Bar* to your partner's to see who has the smaller shaded amount. If the shaded amounts are equal, select two more *Fraction Bars*.

Call on a few pairs of students:

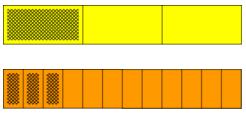
- Describe your *Fraction Bars* by giving the color and number of shaded parts and say which fraction is smaller. (For example, an orange *Fraction Bar* with 5 parts shaded and a blue *Fraction Bar* with 3 parts shaded, and five twelfths is less than three fourths.)

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



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

2. Select new *Fraction Bars* whose shaded amounts are not equal and place them side by side next to your partner's to determine who has the greater shaded amount. As they describe their *Fraction Bars* and give the greater fraction, write some of these inequalities on the projector using the greater than (>) inequality symbol.



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

Point out that the tip of the symbol still points to the smaller number and that the "mouth" still bites the bigger number no matter which way the inequality sign is pointing.

Model for Inequality of Fractions

3. Distribute the activity sheet "Model for Inequality of Fractions" to each student. Select pairs of *Fraction Bars* having the given colors and different shaded amounts, place them on the activity sheet, and write the inequality for the two fractions. Discuss special cases, such as the fraction for a whole *Fraction Bar* (all parts shaded) is greater than the fraction for a zero *Fraction Bar* (no parts shaded).

Activity 2 Inequalities for fractions with the same denominator

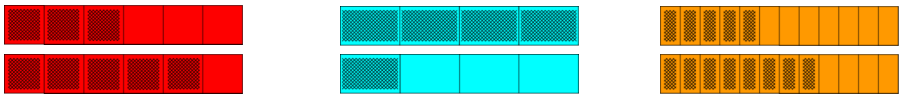
1. Ask each student in a pair to select a *Fraction Bar* having the same color.

- What do the fractions for your *Fraction Bars* have in common? (The fractions have the same denominator. Other answers are possible.)

- Write a less than inequality for your two fractions.

Fraction Bars

2. List a few of their inequalities. As examples:



$\frac{3}{6} < \frac{5}{6}$ $\frac{4}{4} > \frac{1}{4}$ $\frac{5}{12} < \frac{8}{12}$

- 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 its *Fraction Bar* has the smaller number of shaded parts and the parts of both bars have the same size.)

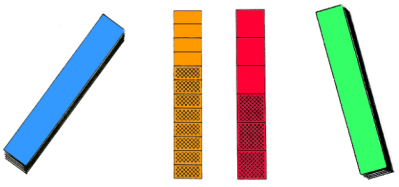
3. Write the following fractions, one at a time, and ask students to write either a "less than" or a "greater than" inequality statement, and to describe the *Fraction Bars* and explain their reasoning. (For example, the *Fraction Bars* for 3/10 and 7/10 both have parts of the same size, and the 3/10 *Fraction Bar* has fewer shaded parts. So 3/10 < 7/10; etc.)

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

Game: Flip (small groups)

Fraction Bars

Divide the *Fraction Bars* into two equal piles and place them in stacks face down. Players flip over their top *Fraction Bars* and compare shaded amounts. The player with the greater shaded amount wins the two bars. If two bars have equal shaded amounts, the two players count off four more bars from their stacks, as they say "F" "L" "I" "P". The player with the greater shaded amount on the last of their four bars wins all 10 bars that have been flipped. When the stacks have been played through, the player with the greater number of *Fraction Bars* wins.



Option: Play the game Flip with *Fraction Bars Playing Cards* rather than *Fraction Bars*.

INDEPENDENT PRACTICE and ASSESSMENT

Worksheets 3.NF.3 #8 and #9