

Developing Fraction Sense – Teacher Notes

In the same way that there is number sense that goes beyond skill with the algorithms for whole numbers, there is much to know about fractions that is not included in instruction in the algorithms for fractions. We'll look at sequenced sets of exercises that help students to develop fraction sense. Designed especially as warm-up exercises for algebra students with weaknesses in fraction skills, these exercises are puzzles that promote reasoning and a deeper understanding of fractions (farrand).

Materials: None

Key Questions:

Can you tell whether the following statements about fractions are true without using paper/pencil or finding a common denominator or using another standard algorithm? Be ready to explain how you know if the statement is true.

Procedure:

Write the first statement on board/overhead. Ask students the key question above. Tell them that you are going to give them 1 minute to think about the problem before they are allowed to discuss their reasoning in their groups. Tell them they can draw pictures if they want but you are not looking for them to find a common denominator or do other “school math” to figure this out. The discussion is the most important part of this lesson and the goal is to have students verbalize and hear as many ways as they can about how to make a decision on the relative size of these fractions. Plan on only doing 2 or 3 at the most during a session. The problems have been carefully sequenced, don't skip around but as students become more adept at understanding the comparison by using anchor fractions (more than/less than $\frac{1}{2}$, smaller/bigger pieces, etc.) move on to the next section – Addition of fractions.

Fraction Sense Problems

Comparison

$$\frac{8}{15} > \frac{1}{2}?$$

$$\frac{7}{22} > \frac{1}{3}?$$

$$\frac{6}{11} > \frac{7}{15}?$$

$$\frac{7}{9} > \frac{13}{12}?$$

$$\frac{1}{6} > \frac{1}{7}?$$

$$\frac{7}{8} > \frac{8}{9}?$$

$$\frac{7}{9} > \frac{7}{10}?$$

$$\frac{5}{11} > \frac{4}{13}?$$

Addition

$$\frac{1}{2} + \frac{1}{3} > 1?$$

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4} > 1?$$

$$\frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} > 1?$$

$$\frac{4}{15} + \frac{5}{18} > \frac{2}{3}?$$

$$\frac{8}{9} + \frac{1}{10} > 1?$$

$$\frac{1}{9} + \frac{1}{9} > \frac{1}{8}?$$

$$\frac{7}{15} + \frac{9}{17} > 1?$$

$$\frac{1}{7} + \frac{1}{6} + \frac{1}{5} > \frac{1}{2}?$$

Subtraction

$$\frac{13}{14} - \frac{1}{11} > 1?$$

$$\frac{11}{10} - \frac{12}{11} > 0?$$

$$2 - \frac{5}{6} > 2 - \frac{3}{4}?$$

$$\frac{7}{13} - \frac{1}{2} > \frac{1}{14}?$$

$$\frac{1}{2} - \frac{5}{11} > \frac{1}{11}?$$

$$\frac{1}{5} - \frac{1}{6} > \frac{1}{7} - \frac{1}{8}?$$

$$\frac{11}{10} - \frac{12}{11} > \frac{1}{7} - \frac{1}{8}?$$

$$\frac{1}{7} - \frac{1}{8} > \frac{1}{9}?$$

$$\frac{1}{2} - \frac{1}{3} + \frac{1}{4} - \frac{1}{5} > 0?$$

$$\frac{1}{2} - \frac{1}{3} - \frac{1}{4} + \frac{1}{5} > 0?$$

Multiplication

$$\frac{1}{3} \cdot \frac{17}{16} > \frac{1}{3}?$$

$$\frac{5}{6} \cdot \frac{1}{2} > \frac{1}{2}?$$

$$\frac{3}{7} \cdot \frac{5}{11} > \frac{1}{4}?$$

$$5 \cdot \frac{7}{6} > 6?$$

$$\frac{17}{35} \times 8 > 4?$$

$$5 \cdot \frac{5}{6} > 4?$$

Division

$$\frac{5}{7} \div 4 > \frac{1}{7}?$$

$$\frac{11}{7} \div 5 > \frac{2}{7}?$$

$$\frac{5}{9} \div \frac{1}{9} > 4?$$

$$4 \div \frac{2}{3} > 4?$$

$$\frac{5}{9} \div \frac{1}{10} > 5?$$

$$\frac{5}{11} \div 2 > \frac{1}{4}?$$

$$\frac{23}{4} \div 5 > 1?$$

$$\frac{15}{7} \div 2 > 1?$$

$$\frac{1}{2} \div \frac{1}{3} > 2?$$

$$\frac{15}{7} \div \frac{1}{2} > 4?$$

$$5 \div \frac{4}{7} > 10?$$

$$5 \div \frac{7}{8} > 5?$$

$$\frac{8}{9} \div \frac{1}{2} > 2?$$

$$\frac{11}{13} \div \frac{13}{15} > 1?$$

Scott Farrand
farrand@csus.edu

Deb Stetson
stetson@csus.edu