CCSS.MATH.CONTENT.3.NF.A.3.D

Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Comparing Fractions (from http://www.cehd.umn.edu/ci/rationalnumberproject/RNP2/Lesson01.pdf)

The RNP level 1 lessons support students' development of informal ordering strategies. Four informal ordering strategies have been identified: same numerator, same denominator, transitive, and residual. These strategies are not symbolic ones, but strategies based on students' mental representations for fractions. These mental representations are closely tied to the fraction circle model.

Same denominator: When comparing $\frac{4}{5}$ and $\frac{3}{5}$ students can conclude that $\frac{4}{5}$ is larger because when comparing parts of a whole that are the same size (in this case 5ths) then 4 of those parts are bigger than 3 of them.

Same numerator: When comparing $\frac{4}{5}$ and $\frac{4}{6}$, students can conclude that is bigger because 5ths are larger than 6ths and four of the larger pieces will be bigger than 4 of the smaller pieces. Students initially come this understanding by comparing unit fractions.

Transitive: When students use benchmark of ½ and one they are using the transitive property. When comparing $\frac{6}{14}$ and $\frac{9}{16}$ students can conclude that $\frac{9}{16}$ is larger because $\frac{6}{14}$ is a little less than $\frac{1}{2}$ and $\frac{9}{16}$ is a little more than $\frac{1}{2}$.

Residual: When comparing fractions $\frac{2}{3}$ and $\frac{3}{4}$ students can decide on the relative size of each fraction by reflecting on the amount away from the whole. In this example, students can conclude that $\frac{3}{4}$ is larger because the amount away from a whole is less than the amount away from the whole for $\frac{2}{3}$. Notice that to use this strategy students rely on the same numerator strategy; they compare $\frac{1}{4}$ and $\frac{1}{3}$ to determine which of the original fractions have the largest amount away from one.

Comparison strategies name:_____

comparing fractions using the same numerator, same denominator, transitive, and residual strategies

For each pair of fractions, explain which is larger using one of the strategies: same numerator, same denominator, transitive or residual. Your explanation should be complete (explains all of the reasoning for that problem, doesn't just refer to the strategy).

(a) $\frac{1}{8}, \frac{1}{7}$

(b) $\frac{3}{8}, \frac{3}{7}$

(c) $\frac{3}{9}, \frac{4}{9}$

(d) $\frac{9}{10}, \frac{3}{4}$

(e) $\frac{6}{8}, \frac{5}{7}$

(f) $\frac{5}{8}, \frac{4}{11}$