Comparing fractions using a number line

Original lesson by Melissa Romano

In this lesson students compare fractions with different denominators by using number lines.

Rationale
It is important students move from concrete fractional models to the representation of fractions using numbers and the number line. Concrete fractional models are an important initial component in developing the conceptual understanding of fractions. However, it is vital to link these models to fraction numerals and representation on the number line. This movement from visual models to fractional numerals should be a gradual process as students gain understanding of the meaning of fractions.

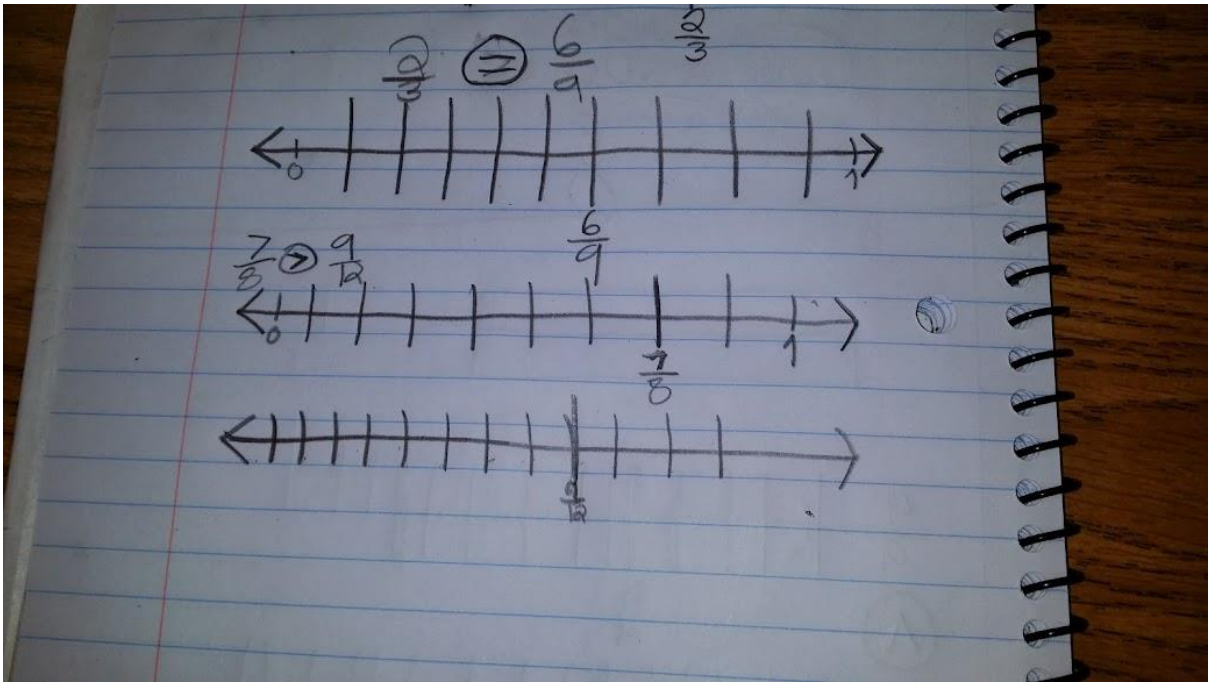
This lesson is also important in developing students' ability to compare fractions by using a benchmark fraction or creating same denominators. While this lesson does not have students create same denominators, it does build students conceptual understanding of equivalent fractions. Students will place fractions like $\frac{2}{3}$ and $\frac{6}{9}$ on a number line and be able to see that they represent the same amount or part of the whole. This understanding is important before students can be successful with creating same denominators to compare fractions.

Concept development

35 MINUTES

Draw two number lines with end points 0 and 1 on the board for all students to see. Write two fractions; $\frac{4}{9}$ and $\frac{7}{11}$. Model how to draw the two number lines parallel to each other. Divide the first number line into 9 equal parts. Explain to students that it is okay to just use 'eyeballing' for the equal parts, however it is important to be as precise as possible in order for the number line model to be helpful when comparing numbers using a number line. Next, divide the second number line into 11 equal parts. Ask students where to place the $\frac{4}{9}$ on the first number line and where to place the $\frac{7}{11}$ on the second number line. Once each fraction is placed on the number line, model writing the number sentence $\frac{4}{9} < \frac{7}{11}$. Note: One strategy to use in order for students to have equal and equally spaced parts is to encourage students to draw long number lines. It is easier for students to divide two long strips of paper into 9ths and 11ths and determine the part size equally versus if the number line is short

This is an example of a student's work showing fractions on a number line.



Students draw 10 number lines on a piece of paper. Give them 10 different fraction pairs to compare. Students represent the fractions on parallel number lines. As students work, circulate the room to observe students' strategies and thinking.

Wrap Up - Student debrief

10 MINUTES

To conclude this lesson, lead a discussion about using tools strategically and that number lines are not always the best way to compare fractions. Give students these two fractions to compare: $\frac{5}{6}$ and $\frac{6}{7}$

Students may realise that both fractions are one part away from being one whole. Listen for students describing the size of the parts and concluding that $\frac{6}{7}$ is larger because it's parts are small, therefore the part away from one whole is also smaller than the part in $\frac{5}{6}$.