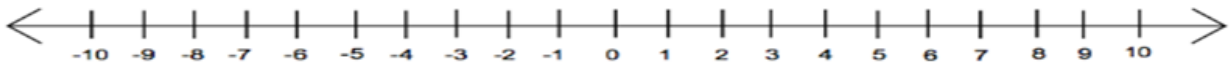

The Fraction Chain
Task #4

(This Task builds from Task 1, 2, and 3)

Adapted from North Carolina Department of Public Instruction

Student Objectives: "I can place fractions with different denominators on a number line?"

Standards to Measure	**Mathematical Practices**
4.NF.A.1 Explain why a fraction *a/b* is equivalent to a fraction *(n x a)/(n x b)* by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principal to recognize and generate equivalent fractions. **4. NF.A.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model..	4. Model with mathematics. 5. Use appropriate tools strategically. 7. Look for and make use of structure.

Materials:
6 – 10 foot strings (one per group), Fraction Cards, paper clips, math notebooks, graph paper, pictures of a ruler, scale, and thermometer

G **Engage Students with the Goal**	<u>State and Rate</u> Objective: "I can place fractions with different denominators on a number line?" Students rate themselves to the goal (1, 2, 3, 4).	Setting Objectives and Providing Feedback
A **Access Prior Knowledge**	What do these pictures have in common? Show Pictures of: a thermometer a ruler a scale	Nonlinguistic Representation Identifying Similarities and Differences

N **New Information**	**Prior to beginning this lesson:** Set up strings around the room where students are going to work in groups of four. Have one string available for a whole group discussion. Discuss with the class about using a number line as another way to represent a fraction. Where do we see fractions on number lines in the real world? Holding up a ruler to give students the context of ½, ¼ and 1/8 of inches would be helpful. Distribute the whole number cards (0-4) to each group of students. Discuss how we could arrange them on our number lines. (We don't want a discussion about leaving space between the numbers at this time; we are just looking for the order.) Have one student share how they would arrange the cards on the whole group's string. Once students are in agreement, dismiss them to place the whole number cards on their own string, and return to the large group. Once the students have returned, discuss any differences between the group's number lines.	Similarities and Differences Nonlinguistic Representation Cues, Questions, and Advance Organizers
A **Application**	Hand out the halves number cards next. Explain to the class that they are going to add these cards to their number line. Students will not have to return this time to the large group. Students place the halves number cards on their number line where they belong. They can adjust the whole number cards if they need to. If a half number card has the same value as a whole number card, the students are to hang it below the whole number card with a paper clip. Once the majority of the class has set up their number line, stop everyone and discuss the work they have done up to this point. **Questions to pose:** What changes to the number line did you need to make? Why? What did you do when you had 4/2 as a card? Why did you place it under the 2? Are 2 and 4/2 the same number? Why? Is there anything else that you notice about our number line at this time? Do you see any patterns beginning to form? Hand out the remaining number cards (fourths, eighths, and mixed numbers). Each group will need to place the cards on the number line. They are allowed to change or modify their number line at anytime to make the task easier. They cannot remove any card from the number line, only move it. As the students are completing the number line, the teacher is moving from group to group discussing patterns that students see, any problems they may be having, confirming or questioning students' conjectures, and redirecting students that need help.	Cooperative Learning Providing Feedback Generating and Testing Hypotheses Practice and Homework

	Once the number line is complete and the teacher has checked it, students can recreate it in their math notebooks. They can also add any notes or findings they have made during the activity. Bring the class back together to discuss the number lines. Add the halves to the group number line to represent the work that was done before the students were allowed to add the other number cards. Have a student or students demonstrate how they began the process. Did they sort the cards into piles of like denominator or other groups? What were some of the first cards students placed? Why did they choose these cards? Discuss changes that needed to be made to the number line as the activity continued. Were there any patterns the students discovered as they were placing their cards? Complete the whole group number line. Look at a column of cards that are paper clipped together. What is similar about these fractions? Some students might say they are all the same number. Have students explain why that is. Share the notes and conjectures students wrote in their notebooks. **More Denominators** Repeat this activity but use fraction cards that have thirds, sixths, and twelfths as denominators. **Suggested questions as students work:** Could you add any of the half and fourth cards as well? Where would they go? **Culminating task** Give students the following task: One student placed the fraction 1 2/3 between 1 ½ and 1 ¾ on the number line. Are they correct? Prove your answer using both a picture and a written explanation.	
G **Revisit the Goal**	<u>State and Rate</u> Objective: "I can place fractions with different denominators on a number line?" Students rate themselves to the goal (1, 2, 3, 4).	Setting Objectives and Providing Feedback

Evaluation of Students

Formative: As students work, observe them and pose questions to check for their mathematical understanding.

Plans for Individual Differences

Intervention: Start with just the numbers 0 and 1. Once the student has placed all the card in the correct location, they can add the whole number 2 and the fractions in between.

Some students will need to build their number line on graph paper to have equal spacing between each interval. You may need to tape two pieces of graph paper together.

0	1	2	3
4	$\frac{1}{2}$	$\frac{2}{2}$	$\frac{3}{2}$
$\frac{4}{2}$	$\frac{5}{2}$	$\frac{6}{2}$	$\frac{7}{2}$
$\frac{4}{4}$	$\frac{5}{4}$	$\frac{6}{4}$	$\frac{7}{4}$
$\frac{8}{4}$	$\frac{9}{4}$	$\frac{10}{4}$	$\frac{11}{4}$

$\frac{12}{4}$	$\frac{13}{4}$	$\frac{14}{4}$	$\frac{15}{4}$
$\frac{16}{4}$	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$
$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$
$\frac{8}{8}$	$\frac{9}{8}$	$\frac{10}{6}$	$\frac{11}{8}$
$\frac{12}{8}$	$\frac{13}{8}$	$\frac{14}{8}$	$\frac{15}{8}$

$\frac{16}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$
$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$
$3\frac{3}{4}$	$3\frac{1}{2}$		