# **Scaffolding Task:** Decimal Fraction Number Line

## STANDARDS FOR MATHEMATICAL CONTENT

**MCC4.NF.7** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of the comparisons with the symbols >, =, or <, and justify the conclusions, e.g. by using a visual model.

## STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

## BACKGROUND KNOWLEDGE

To make the link between fractions and decimals, students need to understand how the base-ten system can be extended to include numbers less than 1. Fractions that have denominators of 10, 100, and 1,000 and so on are commonly referred to as decimal or base-ten fractions. Focusing on these fractions during early decimal concept development can make the transition between fractions and decimals easier.

## ESSENTIAL QUESTIONS

- What are the characteristics of a decimal fraction?
- What patterns occur on a number line made up of decimal fractions?

## MATERIALS

- Paper/Poster paper
- Pencils/markers
- Set of the attached decimals fraction cards for each pair
- Copies of “Tenths Squares” and “Hundredths Squares”

## GROUPING

Individual or partner grouping

## TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

**Comments**

This may be many students' first formal experience working with decimal fractions. This scaffolding task is meant to reinforce fraction comparison skills using visual models, as well as help students make the fractions to decimals connection by using familiar fraction concepts and models to explore numbers that are easily represented by decimals. Students will create models of decimal fractions using tenths and hundredths squares, order these decimal fractions on a number line, and look for patterns that occur when using decimal fractions.

**Task:**

**Part 1**

*1. Using the 2 sets of decimal fraction cards, create a model for each fraction using a tenths or hundredths square.*
*2. Create 2 number lines using the decimal fraction cards and the models you created.*
*3. Answer the following questions for reflection and be ready to share your thinking!*

- *How did you know the models you made matched the fraction cards?*
- *How did you know where to place your fraction cards and models on the number line?*
- *What patterns did you see as you completed your number line?*

**PART 2**

Have students share their number lines and explain how they placed their fractions and models on the number line. Guide students through a discussion of decimal fractions by using the following prompt:

- *All of the fractions we used today are examples of "decimal fractions." Based on the fractions you see on your number line, what do you think a decimal fraction is? Explain your thinking.*

## FORMATIVE ASSESSMENT QUESTIONS

- How did you know your models matched the fraction card?
- What was your strategy for placing the fractions on a number line?
- What have you noticed about the fractions that you're working with today?
- What patterns do you see in the fractions you're working with today?
- Did students use correct thinking as they placed fractions on the number lines?

## DIFFERENTIATION

**Extension**

- Provide students with mixed numbers that have decimal fractions to extend their number lines. Have them label each mixed number as an improper fraction as well.

**Intervention**

- Give students only the tenths or hundredths cards to work with in order to focus on simply placing fractions on a number line without comparisons to one another. Provide a number line with endpoints listed.

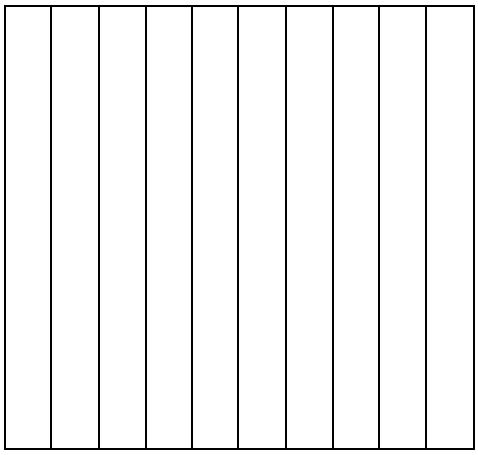
## Decimal Fraction Cards Set 1

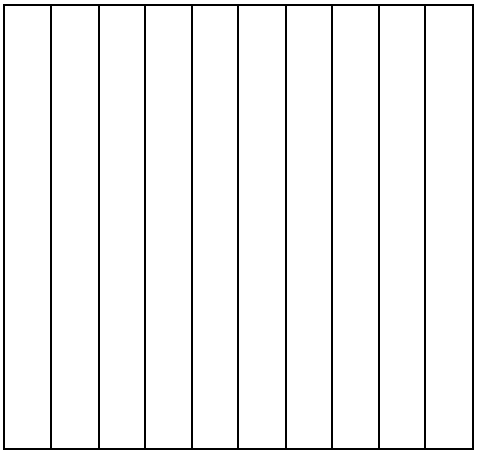
| | | | | |
|---|---|---|---|---|
| $\frac{1}{10}$ | $\frac{7}{10}$ | $\frac{3}{10}$ | $\frac{5}{10}$ | $\frac{6}{10}$ |
| $\frac{8}{10}$ | $\frac{2}{10}$ | $\frac{10}{10}$ | $\frac{9}{10}$ | $\frac{4}{10}$ |

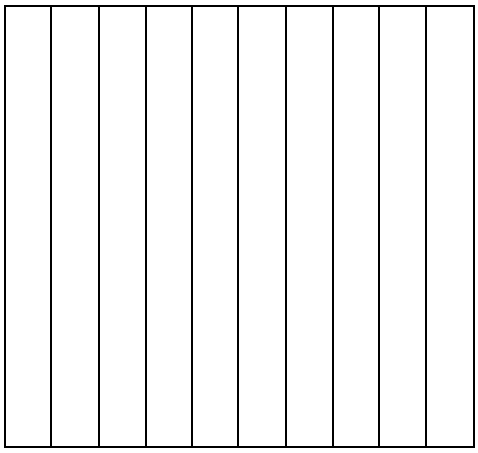
## Decimal Fraction Cards Set 2

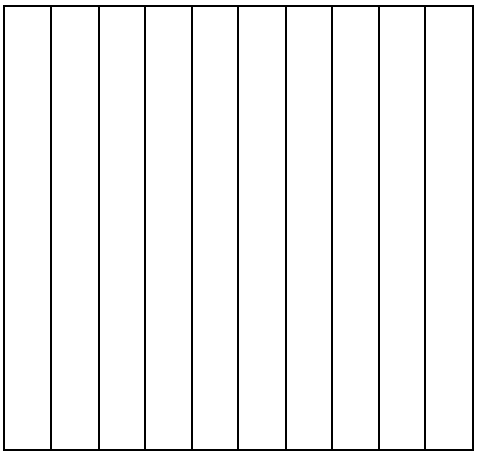
| | | | | |
|---|---|---|---|---|
| $\frac{10}{100}$ | $\frac{70}{100}$ | $\frac{30}{100}$ | $\frac{50}{100}$ | $\frac{60}{100}$ |
| $\frac{80}{100}$ | $\frac{20}{100}$ | $\frac{100}{100}$ | $\frac{90}{100}$ | $\frac{40}{100}$ |

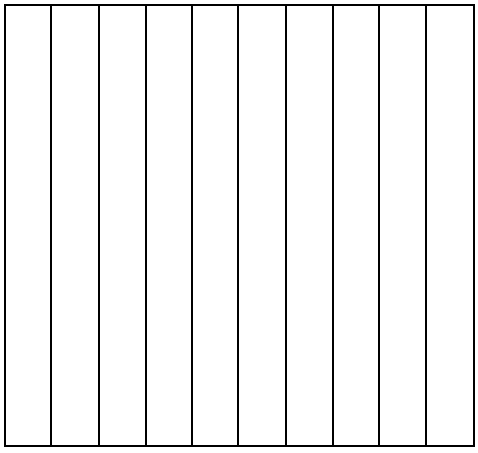
# Tenths Squares

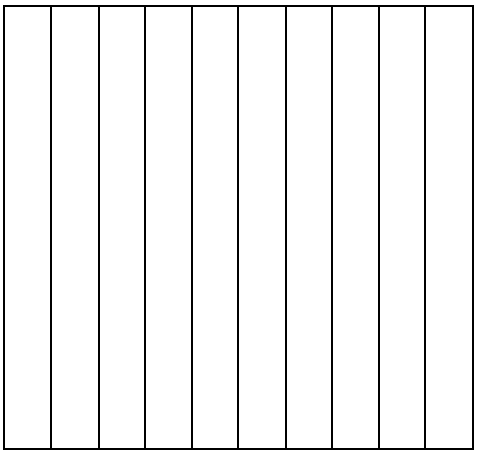












# Hundredths Squares