4-5: Learning Goals

- Let's use decimals to describe increases and decreases.

4-5-1: Fractions to Decimals

A calculator gives the following decimal expansions for some unit fractions:

$\frac{1}{2} = 0.5$

$\frac{1}{3} = 0.3333333$

$\frac{1}{4} = 0.25$

$\frac{1}{5} = 0.2$

$\frac{1}{6} = 0.1666667$

$\frac{1}{7} = 0.142857143$

$\frac{1}{8} = 0.125$

$\frac{1}{9} = 0.1111111$

$\frac{1}{10} = 0.1$

$\frac{1}{11} = 0.0909091$

4-5-2: Repeating Decimals

$\frac{7}{8}$

$$\begin{array}{r} 0.875 \\ 8\overline{)7} \\ -0 \\ \hline 70 \\ -64 \\ \hline 60 \\ -56 \\ \hline 40 \\ -40 \\ \hline 0 \end{array}$$

$\frac{7}{12}$

$$\begin{array}{r} 0.58333 \\ 12\overline{)7} \\ -0 \\ \hline 70 \\ -60 \\ \hline 100 \\ -96 \\ \hline 40 \\ -36 \\ \hline 40 \\ -36 \\ \hline 40 \\ -36 \\ \hline 4 \end{array}$$

4-5-2: Repeating Decimals

1. Use long division to express each fraction as a decimal.

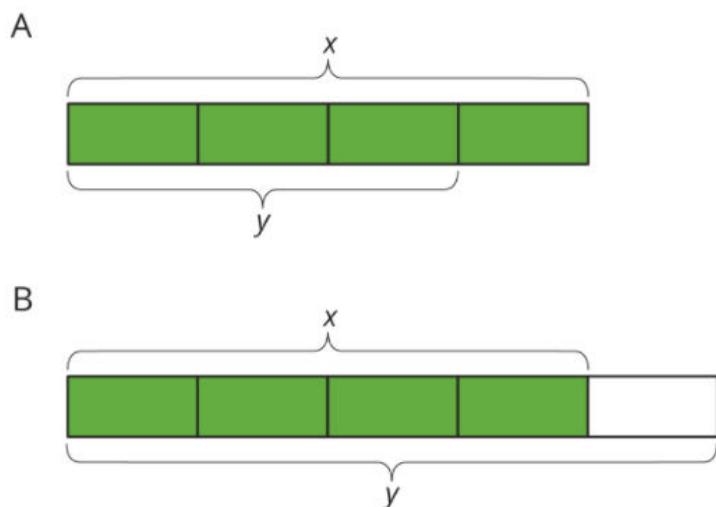 $$\frac{9}{25} \qquad\qquad \frac{11}{30} \qquad\qquad \frac{4}{11}$$

2. What is similar about your answers to the previous question? What is different?

3. Use the decimal representations to decide which of these fractions has the greatest value. Explain your reasoning.

4-5-3: More and Less with Decimals

1. Match each diagram with a description and an equation.

Diagrams:

Descriptions:

Equations:

A

x

y

B

x

y

An increase by $\frac{1}{4}$

An increase by $\frac{1}{3}$

An increase by $\frac{2}{3}$

A decrease by $\frac{1}{5}$

A decrease by $\frac{1}{4}$

$y = 1.\overline{6}x$

$y = 1.\overline{3}x$

$y = 0.75x$

$y = 0.4x$

$y = 1.25x$

2. Draw a diagram for one of the unmatched equations.

4-5-4: More Representations

Your teacher will give you a set of cards that have proportional relationships represented 2 different ways: as descriptions and equations. Mix up the cards and place them all face-up.

Take turns with a partner to match a description with an equation.

1. For each match you find, explain to your partner how you know it's a match.

2. For each match your partner finds, listen carefully to their explanation, and if you disagree, explain your thinking.

3. When you have agreed on all of the matches, check your answers with the answer key. If there are any errors, discuss why and revise your matches.

Card Sort: More Representations

Noah ate x ounces of blueberries, and Elena ate $\frac{1}{3}$ less than that.

Card Sort: More Representations

$y = 0.75x$

4-5: **Lesson Synthesis**

Give examples of how we can use the distributive property to create equivalent expressions that make it easier for us to calculate an amount plus (or minus) a fraction of that amount, but written with decimals.

4-5: repeating decimal

A repeating decimal is an infinite decimal expansion that eventually repeats the same sequence of digits over and over again. The repeated sequence is indicated by a line above it.

4-5: **Learning Targets**

- I understand that "half as much again" and "multiply by 1.5" mean the same thing.

- I can use the distributive property to rewrite an equation like x+0.5x=1.5x.

- I can write fractions as decimals.

4-5-5: Reading More

Kiran read for x minutes, and Andre read for $\frac{5}{8}$ more than that. Write an equation that relates the number of minutes Kiran read with y, the number of minutes that Andre read. Use decimals in your equation.