4th Grade Math

Module 6: Decimal Fractions

Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is taught in the classroom. Module 6 of Eureka Math (Engage New York) covers decimal fractions.

Focus Area Topic A: *Exploration of Tenths*

Words to Know:

Decimal number - number written using place value units that are powers of 10 (10, 100, 1,000, etc.)

Tenth - place value unit such that 10 tenths equals 1 one

Fraction - numerical quantity that is not a whole number

Metric System

1 meter = 1,000 millimeters
1 meter = 100 centimeters
1 kilometer = 1,000 meters
1 liter = 1,000 milliliters
1 kilogram = 1,000 grams

OBJECTIVES OF TOPIC A

▶Use metric measurement to model the decomposition of one whole into tenths.
▶Use metric measurement and area models to represent tenths as fractions greater than 1 and decimal numbers.
▶ Represent mixed numbers with units of tens, ones, and tenths with number disks, on the number line, and in expanded form.

Focus Area Topic A: *Exploration of Tenths*

Exploring Tenths with Metric Measurement

Students use their understanding of fractions to explore tenths. They use metric measurement and see tenths in relationship to one whole in the context of 1 kilogram, 1 meter, and 1 centimeter. Let's measure the ant below in cm. We can see 1 cm showing on the ruler. That cm is separated into 10 equal parts. The ant is 6 parts long. That means it is $\frac{6}{10}$ of a cm in length.

We can write $\frac{6}{10}$ as a decimal like this � 0.6.
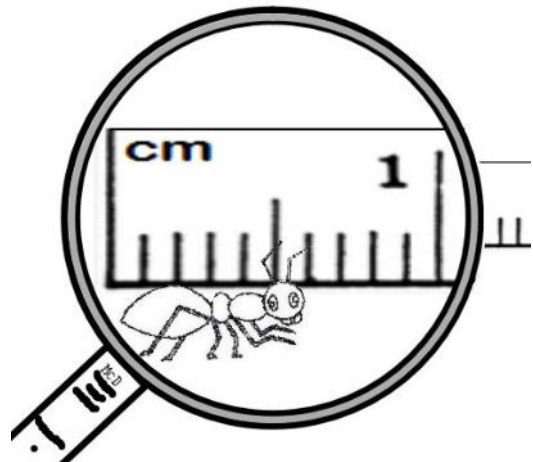
Example Problem and Answer

Write the length of the ant in centimeters.

Fraction form: $\frac{6}{10}$ cm

Decimal form: 0.6 cm

How far does the ant need to walk before its head is at the 1 cm mark? 0.4 cm

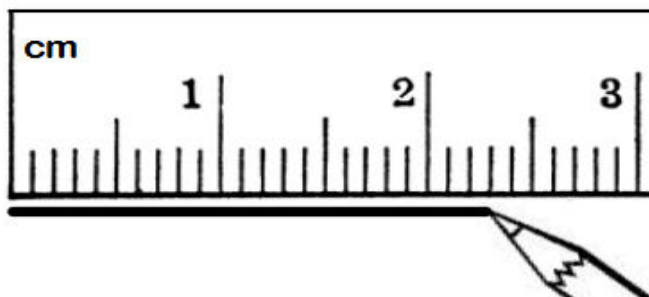Fill in the blank to make the sentence true in both fraction form and decimal form.

$\frac{2}{10}$ cm + $\frac{8}{10}$ cm = 1 cm

0.2 cm + 0.8 cm = 1.0 cm

Focus Area – Topic A: *Exploration of Tenths*
### Decimal Fractions Greater than 1

Students will continue to use metric measurement to investigate decimal fractions greater than 1. In this example, a line is drawn that measures $2\frac{3}{10}$ cm.

Students will recognize $2\frac{3}{10}$ cm can be expressed in unit form as 23 tenths cm and also can be expressed as a decimal number as in 2.3 cm.

Decimal Numbers and Area Models

Students represent decimal numbers using the area model and see that numbers containing ones and fractions, i.e., mixed numbers, can also be expressed using decimal notation.
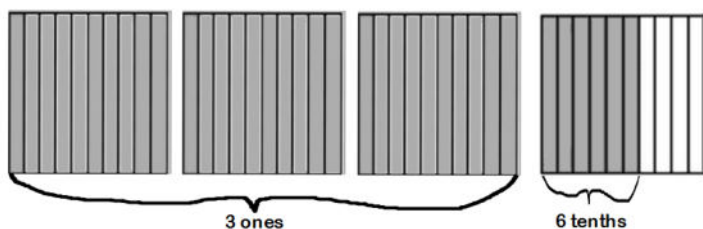
Students then write statements of equivalence that match the area models as in the following.
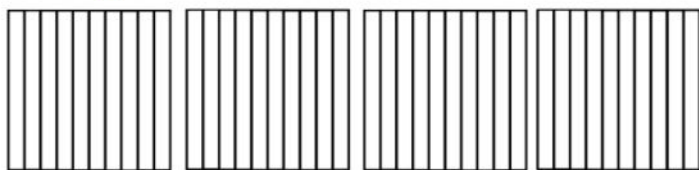
$$3\frac{6}{10} = 3 + \frac{6}{10} \quad \text{and} \quad 3.6 = 3 + 0.6$$
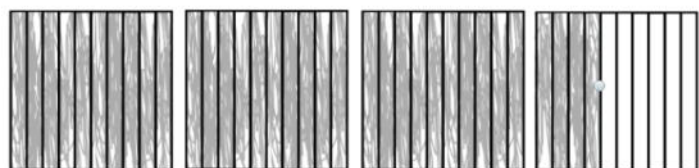
Example Problems and Answers

Write the following as an equivalent decimal then, model and rename the number.

Before

$$3\frac{4}{10} = \underline{\hspace{3cm}}$$

After $\quad 3\frac{4}{10} = \underline{\quad 3.4 \quad}$

$$3\frac{4}{10} = 3 + \frac{4}{10} = 3 + 0.4 = 3.4$$
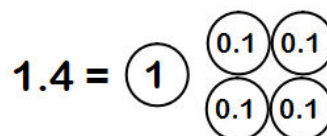

Module 6: Decimal Fractions
Decimal Notation and Place Value

To explore the place value of each unit in a decimal number with tenths, students use number disks to rename groups of 10 tenths as ones. Consider the example below.

Each disk represents 1 tenth. The students will group 10 disks together to form 1 whole.

When modeling with place value disks, we exchange the 10 one tenth disks for a disk that represents 1 whole.

Students learn to record the value of each digit of a mixed number in expanded form.

Mixed Number	Decimal	Expanded Form
$1\frac{4}{10}$	1.4	$(1 \times 1) + (4 \times \frac{1}{10})$

Decimal Notation and Number Lines

Students model the value of decimal fractions by plotting them on the number line. In this example, we will plot $11\frac{8}{10}$ on this number line that is separated into 10 parts.
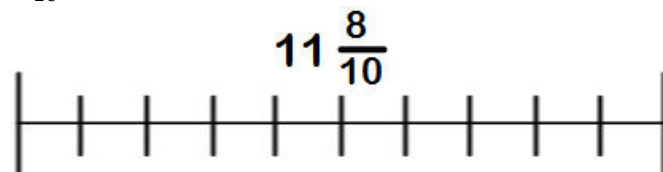
First, we will need to determine between what two whole numbers is $11\frac{8}{10}$. It is between 11 and 12 so we label that on the number line.
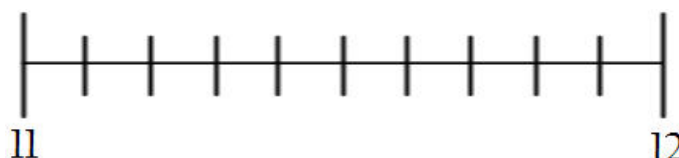
Now we can count 8 parts from the 11 toward the 12 and mark that spot with a point.