

# Math Connections for Parents

Grade 4 Module 6  
Decimal Fractions

Welcome to Module 6 of the EngageNY curriculum. In this module, students will move from working with fractions, to working with fractions and decimals. Students will work with tenths ( $\frac{1}{10}$  or 0.1) and hundredths ( $\frac{1}{100}$  or 0.01) and even decimals greater than one (3.45). Students will use place value to explore decimals. They will compare decimals, add decimals, and extend that work to solving problems involving money with decimals.

## Important Words and Concepts

- Decimal number: number written using place value units that are powers of 10
- Decimal expanded form:  $24.59 = (2 \times 10) + (4 \times 1) + (5 \times 0.1) + (9 \times 0.01)$
- Decimal fraction: fraction with denominator of 10, 100, 1,000, etc.
- Decimal point: period used to separate whole number from decimal
- Fraction expanded form:  $(2 \times 10) + (4 \times 1) + \left(5 \times \frac{1}{10}\right) + \left(9 \times \frac{1}{100}\right) = 24 \frac{59}{100}$
- Hundredth: place value unit, 0.01 or  $\frac{1}{100}$
- Tenth: place value unit, 0.1 or  $\frac{1}{10}$
- Expanded form:  $135 = 100 + 30 + 5$

## **Multiplication and Division within 100**

Students in fourth grade are expected to know, from memory, all products of two one-digit numbers. Continue to practice these facts at home. Additionally, students will be working with adding decimals, so mastery of addition and subtraction facts and algorithms is key as well.

## KEY STANDARDS

- Express a fraction as an equivalent fraction, with denominators 10 and 100 (e.g.  $\frac{3}{10} = \frac{30}{100}$ )
- Add two fractions with denominators 10 and 100 (e.g.  $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$ )
- Use decimal notation for fractions with denominators 10 or 100 (e.g. rewrite 0.62 as  $\frac{62}{100}$  or describe a length as 0.62 meters)
- Compare two decimals to the hundredths place using  $<$ ,  $>$  or  $=$ . Use a visual model to compare the decimals.
- Use four operations ( $+$ ,  $-$ ,  $\times$ ,  $\div$ ) to solve word problems with distances, time, liquid volumes, mass and money.

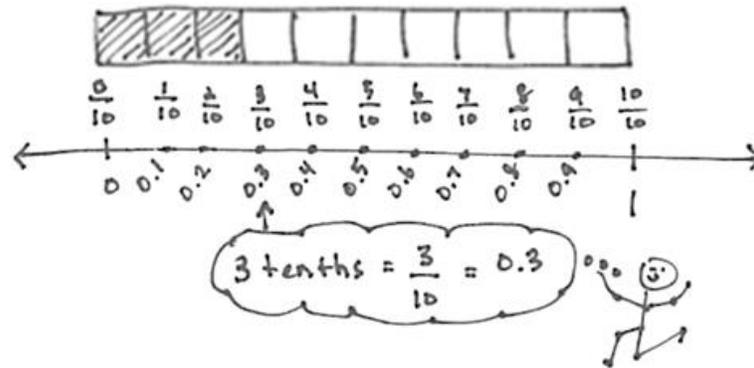
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## Graphics and Strategies you may see...

Students will use a **number line** to show fractions and their decimal equivalents.



To show their understanding of place value, students will be asked to show **decimal expanded form**:

$$31.46 = (3 \times 10) + (1 \times 1) + (4 \times 0.1) + (6 \times 0.01)$$

and **fraction expanded form**:

$$31 \frac{46}{100} = (3 \times 10) + (1 \times 1) + (4 \times \frac{1}{10}) + (6 \times \frac{1}{100})$$

When comparing fractions, lining up numbers with the decimal place and correct place value will help, as with this example comparing bags of rice.

Rice Bag	ones (kilograms)	.	tenths	hundredths
A	0	.	1	0
B	0	.	6	5
C	0	.	7	
D	0	.	4	6

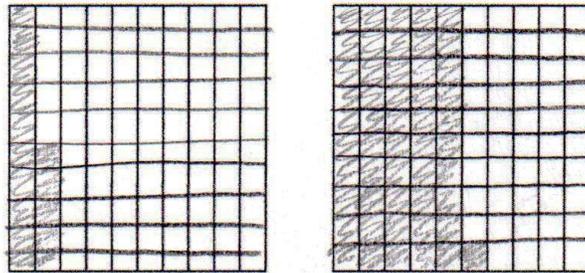
0.7 kg, 0.65 kg, 0.46 kg, 0.1 kg

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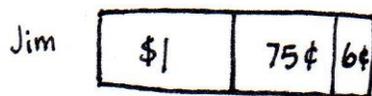
Students can also compare decimals using an **area model** for tenths and hundredths:



$$0.15 < 0.51$$
$$0.51 > 0.15$$

Using what they have learned about decimals, students will apply that knowledge to word problems, mostly involving money.

Example: *Jack has 2 quarters and 7 dimes. Jim has 1 dollar, 3 quarters, and 6 pennies. How much money do they have together? Write your answer as a decimal.*



They have \$3.01 together.

$$1 \text{ dollar } 20 \text{ cents} + 1 \text{ dollar } 81 \text{ cents}$$

$$= 2 \text{ dollars } 101 \text{ cents}$$

$$= 3 \text{ dollars } 1 \text{ cent}$$

$$= \$3.01$$