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5th Grade Math

Module 2: Multi-Digit Whole Number and Decimal Fraction Operations

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. Grade 5 Module 2 of Eureka Math (Engage New York) covers Multi-Digit Whole Number and Decimal Fraction Operations. This newsletter will discuss Module 2, Topic D.

Topic D.   Measurement Word Problems with Whole Number and Decimal Multiplication

Words to know

- millimeter (mm)
- centimeter (cm)
- kilometer (km)
- inch (in)
- foot/feet (ft)
- yard (yd)
- mile (mi)
- cup (c)
- pint (pt)
- quart (qt)
- gallon (gal)
- milligram (mg)
- gram (g)
- kilogram (kg)
- ounce (oz)
- pound (lb)
- ton
- fluid ounce (fl oz)
- liter (L)
- milliliter (ml)
- kiloliter (kl)
- unit

Things to Remember!!!

- When converting **bigger unit** to **smaller unit**, you multiply by the bigger **unit** by whole number of smaller **units**.

OBJECTIVES OF TOPIC D

- Use whole number multiplication to express equivalent measurements.

- Use decimal multiplication to express equivalent measurements.

- Solve two-step word problems involving measurement and multi-digit multiplication.

Focus Area– Topic D

Measurement Conversions through multiplication

Knowing the unit conversions

1 foot = 12 inches	1 yard = 3 feet = 36 inches
1 mile = 5,280 feet	1 mile = 1,760 yards

1 centimeter = 10 millimeter

1 meter = 100 centimeters = 1,000 millimeters

1 kilometer = 1,000 meters

1 pound = 16 pound	1 ton = 2,000 pounds
1 gram= 1,000 milligrams	1 kilogram = 1,000 grams

1 cup= 8 fluid ounces	1 pint = 2 cups
1 quart = 2 pints	1 gallon = 4 quarts
1 liter = 1,000 milliliters	1 kiloliter = 1,000 liters

Convert.

a.   15 **yd** =_____ **ft**
   yards to feet: big unit to small unit - multiply
   3 **ft** = 1 **yd**   15 **yd** x 3 **ft** per **yd** = 45 **ft**

b.   _____**g** = 18 **kg**
   kilograms to gram: big unit to small unit - multiply
   1,000 **g** =1 **kg**   18 **kg** x 1,000 **g** per **kg** =18,000 **g**

c.   16 **gal**=_____**qt** =_____**pt**
   gallons to quarts to pints: big unit to small unit to smaller unit – multiply twice
      4 **qt** = 1 **gal**   1 **qt** =2 **pt**
      16 **gal** x 4 **qt** per **gal** = 64 **qt**
      64 **qt** x 2 **pt** per **qt** =128 **pt**

d.   _____**fl oz** = 6.32 **c**
   cups to fluid ounces: big unit to small unit -multiply
      8 **fl oz** =1 cup
      6.32 **c** x 8 **fl oz** per **c**
   = 632 hundredths **c** x 8 **fl oz** per **c**
   = 5056 hundredths **fl oz**
   = 50.56 **fl oz**

e.   9.54 **g** = _____**mg**
   grams to milligrams: big unit to small unit - multiply
      1,000 **mg** = 1 **g**
      9.54 **g** x 1000 **mg** per **g**
   = 954 hundredths **g** x 1000 **mg** per **g**
   = 954,000 hundredths **mg**
   = 9540**.**00 **or** 9540 **mg**

John's dog had 5 puppies! When John and his sister Peggy weigh all the puppies together, they weigh 4 **pounds** 1 **ounce**. Since all the puppies are about the same size, how many **ounces** does each puppy weigh?

Answer: First, we need to put all of the puppies' weight in the same **units**. We are looking for a final answer of **ounces**. So, we are converting from **pounds** to **ounces**: big **unit** to small **unit** - multiply.   16 **ounces** = 1**pound**

$$4 \textbf{ pounds} \times 16 \textbf{ ounces per pound} = 64 \textbf{ ounces} \qquad 64 \textbf{ ounces} + 1 \textbf{ ounce} = 65 \textbf{ounces}$$

$$65 \textbf{ ounces} = 5 \text{ puppies weight in } \textbf{ounces}$$

65**ounces**

? **oz**	? **oz**	? **oz**	? **oz**	? **oz**
(weight of puppy)	*(weight of puppy)*	*(weight of puppy)*	*(weight of puppy)*	*(weight of puppy)*
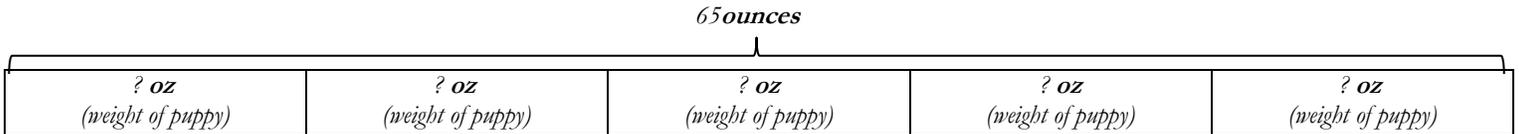
65**ounces** ÷ 5 *puppies* = 13 **ounces**

Each puppy weighs 13 ounces.

$$\begin{array}{r} 1\ 3 \\ 5\overline{\smash{\big)}\ 6\ 5} \\ \underline{-5}\ \downarrow \\ 1\ 5 \\ \underline{-1\ 5} \\ 0 \end{array}$$

Susan is training to be in the Mrs. Fitness contest. She ran 3.75 **km**, swam 0.76 **km**, and biked for 23.2 **km**. Susan completed this routine three times a week. How far did Susan travel in one week while training? Express your answer in meters.

Answer: First, we will convert from **km** to **m**: big **unit** to small **unit** - multiply. 1,000 **m** = 1**km**

3.75**km** × 1000 **m** per **km** =3,750 **m**   0.76 **km** × 1000 **m** per **km** =760 **m**   23.2**km** × 1000**m** per **km** = 23,200**m**
          (Susan ran)   *(Susan swam)*   *(Susan biked)*

$$\begin{array}{r} 3,750\textbf{m} \\ 760\textbf{m} \\ \underline{+\ 23,200\textbf{m}} \\ 27,710\textbf{m} \text{ (Susan's travel for 1 time)} \end{array}$$

$$\begin{array}{r} 27,710\ \textbf{m} \\ \times \underline{\qquad 3} \text{ (trainings in a week)} \\ 83,130\ \textbf{m} \end{array}$$

Susan traveled a total of 83,130 **meters** in one week of training.

Another Approach: 3.75 **km**   27,710**m**

                 0.76 **km**   ×   3 *(trainings in a week)*

                23.20 **km**   83,130**m** *(total distance in one week of training)*

               27.71 **km** × 1000 **m** per **km** = 27,710 **m**

Fast Mail charges $5.35 to ship a 2 **lb**-package. For each ounce over 2 **lb**, they charge an additional $0.18 per **ounce**. How much would it cost to ship a package weighing 3 **lb** 8 **oz**?

Answer: First we need to see how many 2 **pounds** can be taken out of the total weight of the package.

     3 **lb** 8 **oz** *(weight of package)*
    - 2 **lb** 0 **oz** *($5.35 - cost for shipping 2 **lb**)*
     1 **lb** 8 **oz** *(left over weight)*

Now we need to convert our packages left over weight into the same **unit** *of* **ounces**.

Convert **pounds** *to* **ounces**: *big* **unit** *to small* **unit** *(multiply)* 16 **oz** = 1 **lb**

$$\begin{array}{r} 16\ \textbf{oz} \\ \underline{+\ \ 8\ \textbf{oz}} \\ 24\ \textbf{oz} \end{array}$$
24 **oz** *($0.18 per* **oz***)*
0.18 × 100 = 18

$$\begin{array}{r} 24\ \textbf{oz} \\ \times \underline{\ 18} \\ 192 \\ \underline{+\ 240} \\ 432 \end{array}$$
432 ÷ 100 = 4.32

$$\begin{array}{r} \$5.35 \text{ (cost for 2 \textbf{lb})} \\ \underline{+\ \$4.32} \text{ (cost for 24 \textbf{oz})} \\ \$9.67 \end{array}$$

It will cost $9.67 to ship a package weighing 3 **lb** *8* **oz**.