

Algebra/Geometry Institute Summer 2008

Lesson: Converting Frenzy

Faculty: Harold Billings

School: Shelby Middle School
Shelby, MS

Grade Level: 5th Grade



1. Teaching Objective:

Students will convert the unit of volume and mass in the metric system.

2. Instructional Activities

A. Students will receive the value of the different units of volume and mass of the metric system.

Volume

1 liter = 1,000 milliliters

1 liter = 100 centiliters

1 kiloliter = 1,000 liters

Mass

1 gram = 1,000 milligrams

1 gram = 100 centigrams

1 kilogram = 1000 grams

B. Introduce the rules for conversion and show examples.
Rule # 1: Divide to convert a smaller unit to a larger unit.

Ex: A book weighs 690 grams, what is the mass in kilograms?

Grams are smaller than kilograms.

$$1000 \text{ g} = 1 \text{ kg so } 690 \text{ g} \div 1000 = 0.690 \text{ kg}$$

Rule #2: Multiply to convert a larger unit to a smaller unit.

Ex: Melvin bought a 2.5 liter pop. What is the volume of pop Melvin has in milliliters?

Liters are larger than milliliters.

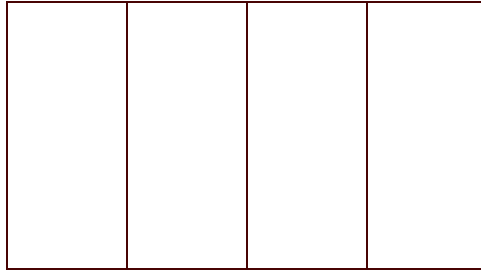
$$1 \text{ L} = 1000 \text{ mL so, } 2.5 \text{ L} \times 1000 = 2500 \text{ mL}$$

**Note: Give more than one example as necessary.*

C. Give each student a sheet of typing paper and instruct
instruct the to fold the paper in a hot dog fold so it
would look as following.



D. Instruct the students to make 2 hamburger folds so it now it looks as following.



Cut out the top layer along the creases, stopping at the top fold.

E. Now instruct the student to write a capital Letter K^3 in the first column to the left. Write a B^2 in the second column. Write C^1 in the third column. Finally, write a M in the finally column so it looks as following.

K^3	B^2	C^1	M
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F. Now, give the meaning for each term in the chart. Have students open each flap to write the definitions under the appropriate letter.

The K stands for kilo (as in kilogram or kiloliter).

The B stands for the base unit. (as in liter or Grams).

The C stands for centi (as in centigram or centiliter).

The M stands for milli (as in milligram or milliliter).

G. Now, give the meaning for superscript number in the chart.

The numbers in the chart represent the numbers of decimal places you have to move to convert each measurement.

For example look at the chart below

K^3	B^2	C^1	M
2.0 kg	→ 2000g	→ 200000cg	→ 2,000,000mg

If you were converting 2.0 kg to (the base unit) grams, look at the superscript between the K and the B, which is 3. And look at which way you had to go to get from K to B and move the decimal that way.

To get from K to the B I had to go to the right, and the superscript between K and B is 3. I move my decimal 3 place to the right.

So, 2.0 kilograms = 2000.0 grams

**Note: Direct the students to write examples on the underside of their flaps*

But what if I was converting 2.0 kilograms to centigrams?

K ³	B ²	C ¹	M
2.0 kg	→	→ cg	

You determine the way to go is to the right, because the C is to the right of the K. Now you have to move 5 decimal places, because the 3 is between the K and the B, and the 2 is between the B and the C. So you add that up you get 5 decimals places to the right.

So, 2.0 kg = 200000.0 cg

**Note: The first two examples were large to small.*

Now lets convert from milliliters to kiloliters.

K ³	B ²	C ¹	M
kL ←	←	←	27.9ML

**Note: Direct students to write examples on the underside of the flap.*

We can see already that we have to go to the left to get from Mg to Kg. So we are moving our decimal to the left. But how many places do we move?

We must add the number of superscripts together that is between ml and kL. Between the M and the C there is a 1. Between the C and the B there is a 2. And between the B and the M there is a 3. So $1+2+3 = 6$ and 6 decimal places to the left is what we have to move.

So, $27.9 \text{ mL} = 0.0000279 \text{ kL}$

H. Assign the practice worksheets (attachment 1) to students. Collect worksheets and review answers as a class.

3. Materials and Resources

a. Materials

1. Worksheet (attachment #1)
2. Typing paper
3. Transparencies to show examples
4. Overhead projector

b. Resources

1. *Collis Grisby* (7th Grade Math Teacher at Shelby Middle).
2. *MCT² Coach Book*. Buckle Down Publishing. Iowa City, Iowa. 2008

4. Assessment.

1. Grade worksheet for completion and correctness.

**Note: Grade depends on the number of question correct.*

Attachment 1

Name: _____

Date: _____

Instruction: Convert the following measurements using the rules or our $K^3 B^2 C^1 M$ chart.

1. 3.2 liters = _____ milliliter

2. 29.8 kg = _____ g

3. 190,280 mL = _____ L

4. 1.5 kg = _____ mg

5. 3.5 L = _____ kL

Key

1. 3.2 liters = 32,000 milliliter

2. 29.8 kg = 29,800 g

3. 190,280 mL = 190.289 L

4. 1.5 kg = 1,500,000 mg

5. 3.5 L = 0.0035 kL