Name _____ Date _____ Class _____

WORKSHEET 27 MATH SKILLS

What Is SI?

To make sharing information easier, most of the world uses the SI of measurement. SI, which stands for Système Internationale, is a standard for measuring mass, length, volume, and other quantities. It is used by all scientists to avoid the confusion of comparing data that is based on different measuring systems. Three common SI units are in the chart at right. Obviously, these three units are not suitable for all measuring needs. But most quantities can be measured using one of these units with one of the prefixes in the chart below.

Quantity	Unit	Symbol
length	meter	m
volume	liter	L
mass	gram	g

Prefix	Powers of 10	Symbol	Example
kilo-	1000 (10^3)	k	kilogram (kg)
hecto-	100 (10^2)	h	hectoliter (hL)
deca-	10 (10^1)	da	decameter (dam)
—	1	—	meter (m), gram (g), liter (L)
deci-	0.1 (10^{-1})	d	decigram (dg)
centi-	0.01 (10^{-2})	c	centimeter (cm)
milli-	0.001 (10^{-3})	m	milliliter (mL)

PROCEDURE: To convert between SI units, first find the prefixes of your numbers in the chart above. If you are converting from a smaller prefix to a larger prefix (moving *up* the chart), *divide* your number by a power of 10. If you are converting from a larger prefix to a smaller prefix (moving *down* the chart), *multiply* your number by a power of 10.

SAMPLE PROBLEM A: Convert 500 decimeters (dm) to kilometers (km).

Step 1: Find the prefixes of the numbers.

decimeters to **kilo**meters

Step 2: Notice that you will move up the chart four places when converting from deci- to kilo-. Therefore, you will *divide* your number by 10 × 10 × 10 × 10, or 10,000.

$$500 \div 10{,}000 = 0.5\,0\,0 \rightarrow 0.05$$

500 decimeters (dm) = **0.05 kilometers** (km)

SAMPLE PROBLEM B: 2.5 centiliters (cL) is how many milliliters (mL)?

Step 1: Find the prefixes.

centiliters to **milli**liters

Step 2: Because you move down the chart one place when converting from centi- to milli-, multiply your number by 10.

$$2.5 \times 10 = 2.5 \rightarrow 25$$

2.5 centiliters (cL) = **25 milliliters** (mL)

Copyright © by Holt, Rinehart and Winston. All rights reserved.

Metric System Notes

In science class, we will be using the **Metric System.** The metric system is a system of measurement that is used by scientists all over the world. Most countries only use the metric system. In the United States, we use the **English System.** This lab is designed for you to form a mental image of what some common measurements are in both the English and metric systems.

Can you name some units that we use?

Liquid _____

Mass _____

Length _____

Temperature _____

Time _____

In the metric system, we will be using the following terms: **Grams, Liters, Meters, Seconds, and Celsius.** Can you guess which one is used for:

Liquid _____

Mass _____

Length _____

Temperature _____

Time _____

In addition, you can add the prefixes below, to the basic unit, in order to more easily identify size.

Prefix	Symbol	Factor Number	Factor Word
Tera	T	1,000,000,000,000	Trillion
Giga	G	1,000,000,000	Billion
Mega	M	1,000,000	Million
Kilo	k	1,000	Thousand
Hecto	h	100	Hundred
Deca	da	10	Ten
Deci	d	0.1	Tenth
Centi	c	0.01	Hundredth
Milli	m	0.001	Thousandth
Micro	u	0.000001	Millionth
Nano	n	0.000000001	Billionth
Pico	p	0.000000000001	Trillionth

Name _____ Date _____ Class _____

Work with the System!

1. Write True or False next to each statement.

   a. 12 hg = 1.2 kg _____ b. 54 cm = 5.4 mm _____

   c. 0.5 dL = 0.005 cL _____ d. 4.5 g = 0.45 dag _____

   e. 111 cm = 1.11 m _____ f. 7 cL = 70,000 kL _____

2. Fill in the missing numbers and units in the equations below.

   a. 25 mm = _____ cm b. 27 kg = 270,000 _____

   c. 50 cm = 0.005 _____ d. 1.2 dL = _____ L

   e. 0.9 L= _____ mL f. 41 hm = 4,100,000 _____

3. 1 m = _____ dm = _____ cm = _____ mm

4. 5 kg = _____ hg = _____ dg = _____ cg

5. Special balances can weigh to the 0.00000001 g. How many kilograms is this?

   _____

6. A chemistry experiment calls for 5 g of baking soda. Your measuring spoon holds 5000 mg of powder. How many scoops will you need for the experiment?

   _____

Challenge Yourself!

Some SI prefixes are almost never used because they are so small or large. A micrometer (μm) is 10^{-6} m, while a nanometer is 10^{-9} m. A gigameter is 10^{9} m.

7. a. How many nanometers are in 1 gigameter?

   _____

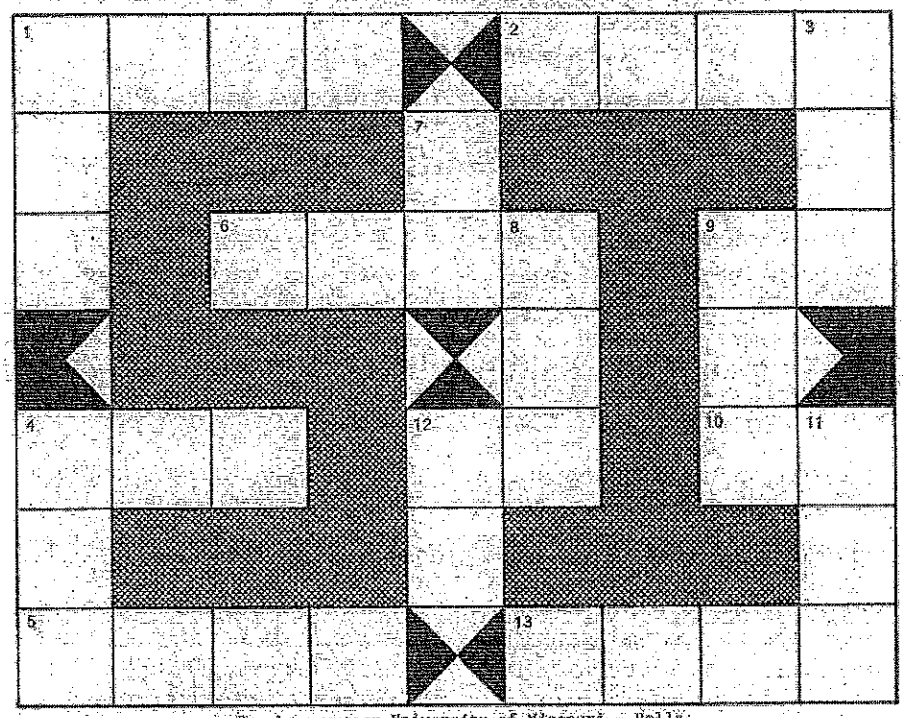
   b. How many gigameters are in 1,000,000,000,000 micrometers?

   _____

Copyright © by Holt, Rinehart and Winston. All rights reserved.

(SI) PUZZLE FOR STUDENTS no.1

Solve like a crossword puzzle except that numbers replace words. Be sure to express answers in the indicated units.



Puzzle courtesy University of Missouri - Rolla

ACROSS

1. 1.5km − 200m = _____ m
2. 4m + 25mm = _____ mm
4. 5hm − 200m = _____ m
5. 300mm × 400mm = _____ cm²
6. 8.4km − 7.6dam = _____ m
9. 100dm = _____ m
10. 1hm − 18m = _____ m
12. 5m × 90dm = _____ m²
13. 5 000m × 300km = _____ km²

DOWN

1. 100mm + 2.5cm = _____ mm
3. 500cm + 200mm = _____ cm
4. 30cm + 0.2dm + 1mm = _____ mm
7. 22 000mm − 10m = _____ m
8. 0.4km + 0.5hm + 5m = _____ m
9. 48cm + 1 000mm = _____ cm
11. 5 000cm × 4 000mm = _____ m²
12. 10dm − 600mm = _____ cm

NOTE: The prefixes hecto (h), deka (da), and deci (d), are not as commonly used as the others in the puzzle, but they are (SI).