Name_____

Physical Geography
Lab Activity #01

Due date_____

Système International

COR Objective 2, SLO 2

1.1. Introduction

While the general public in the United States still uses the "Imperial" system of weights and measures, (e.g., feet, pounds, gallons, Fahrenheit), most of the rest of the world – and the entire scientific community – uses the metric system, (e.g., meters, kilograms, liters, Celsius). Today, the metric system has been incorporated into what is formally known as the *Système International*, or *S.I.* system of measurement. Most of us are very familiar with the Imperial (American) system, but the vast majority of scientific inquiry and research is conducted using the metric system and we should be able to convert units from one system into the other.

There are two levels of conversion accuracy that are useful to us. First, it is helpful to have a rough idea of the equivalents – the kind of conversions you can do quickly in your head without a calculator or computer program. For example, it is useful to know that one kilometer is about $^{2}/_{3}$ of a mile, or that a meter is about 39 inches, just slightly longer than a yard. The second kind of conversions are exact equivalents – for example, one kilometer
equals 0.621 mile. These exact conversions are necessary if a precise measurement in one system must be duplicated in the other system.

1.2. Rounding

In scientific work, many of the numbers used are measured quantities and so are not exact – they are limited by the precision of the instrument used in the measurement. Further, calculations based on measured quantities can be no more precise than the original measurements themselves. Therefore, measurements and the results of calculations should be recorded in a way that shows the degree of measurement precision. For example, if you
use an electronic calculator to divide the following two measured quantities, you would get:

5.7 centimeters ÷ 1.75 minutes = 3.2571429 cm/min

But, is 3.2571429 a truly correct answer? Not really. In general, the greater the number of digits in a measurement or calculation answer, the greater the implied precision of measurement. A mathematical operation cannot make your measurements more precise. In the example above, our distance measurement is only accurate to a tenth of a centimeter, (perhaps limited by the measurement device we used), and our final answer can be no
more precise than this. So:

5.7 centimeters ÷ 1.75 minutes = 3.3 cm/min

When rounding off numbers, if the first digit to be dropped is less than 5, leave the preceding digit unchanged; if the first digit to be dropped is 5 or greater, increase the preceding digit by one. So: 6.64 becomes 6.6, while 6.75 becomes 6.8.

1.3. Practicing Conversions

Complete the following conversions and use the rounding rules outlined above. A conversion program can be downloaded from the class website (http://avconline.avc.edu/mpesses/geog101l.html).

S.I. Units	American Units
198 centimeters	_____ inches
24 meters	_____ feet
1,300 kilometers	_____ miles
4.5 liters	_____ quarts
144 grams	_____ ounces
228 kilograms	_____ pounds
12° C	_____ ° F
29 meters	_____ yards
175 kilometers	_____ miles
42 liters	_____ gallons
37° C	_____ ° F

American Units	S.I. Units
3 inches	____ centimeters
4.3 feet	_____ meters
18 yards	_____ meters
375 miles	_____ km
5.5 quarts	_____ liters
16 gallons	_____ liters
14 ounces	_____ grams
65 mph	_____ kph
72° F	_____ ° C
my weight	_____ kg
my height	_____ cm

S.I. Units	S.I. Units
198 centimeters	_____ meters
24 meters	_____ mm
1,300 kilometers	_____ meters
500 meters	_____ km
318 centimeters	_____ meters

S.I. Units	American Units
40 ° C	_____ ° F
3.0 liters	_____ cubic in.
10 km	_____ miles
1 cm	_____ inches
0 ° C	_____ ° F
100 ° C	_____ ° F

S.I. Units	S.I. Units
2280 grams	_____ kilograms
13 kilograms	_____ grams
1,600 meters	_____ km
1.75 meters	_____ cm
1.75 meters	____ decimeters

American Units	S.I. Units
25 mph	_____ kph
40 pounds	_____ kg
50 miles	_____ km
85 ° F	_____ ° C
1 quart	_____ liters
10 gallons	_____ liters

End of Lab 01