Name: _____ Date:_____ Period:_____

Welcome to the Metric Olympics! Test your measurement skills! Each competitor will participate in seven events of measurement skill. Keep up your training by completing Metric Olympics II and III!

Metric Olympics I

At each event:

1. Read the event Directions
2. Complete the event: The order in which you do the events does not matter.
3. After completing event: Each competitor should conduct the event, record your estimated measurement (using the correct metric units), and do an accurate actual measurement.
4. After completing event--Calculations: Once you have completed the event, do the appropriate calculations (this can be done later). To find the difference, SUBTRACT (a) from (b). Write absolute difference--no negative values--then calculate percent error to see how close your estimates were to actual values. SHOW YOUR WORK!

EVENT	ESTIMATE (a)	ACTUAL (b)	Difference (|a-b|)	% ERROR $\frac{\|a-b\|}{b}$ X 100%
Synchronized Lung Testing	_____ s	_____ s		
Cotton Ball Shot-put	_____ cm	_____ cm		
Right Handed Penny Grab	_____ g	_____ g		
Left-Handed Sponge Squeeze	_____ mL	_____ mL		
Big Foot Contest	_____ cm^2	_____ cm^2		
Thermodynamic Finger Diving	____ ^oC	_____ ^oC		
Straw Javelin	_____ m	_____ m		

Metric Olympics II

Practice making metric estimates and measurements – Using appropriate measurement tools, complete the following table. As before, SHOW YOUR WORK where applicable.

Object	ESTIMATE (a)	ACTUAL (b)	Difference (|a-b|)	% ERROR $\frac{\|a-b\|}{b}$ X 100%
Paper Cup	_____ mL	_____ mL		
Arm Span (tip to tip)	_____ m	_____ m		
Mass of Personal Item (free choice) _____	_____ g	_____ g		

Metric Olympics III

Practice making metric estimates and measurements – Using appropriate measurement tools, complete the following table. As before, SHOW YOUR WORK where applicable.

Try to find objects of these lengths	Name of Object	ESTIMATE (a)	ACTUAL (b)	Difference (|a-b|)	% ERROR $\frac{\|a-b\|}{b}$ X 100%
40 cm		_____ cm	_____ cm		
15 m		_____ m	_____ m		
10 mm		_____ mm	_____ mm		

Practice: Using the skills you just learned, complete the following problems. Show your work where necessary.

1. What type of measurement can be done with each unit?
   a) mm _____
   b) cm^2 _____
   c) mL _____
   d) g _____

2. Circle the BEST metric unit for each:
   a) Length of an eyelash: mm cm m Km
   b) Height of a flagpole: mm cm m Km
   c) Volume of a swimming pool: mL L kL
   d) Mass of a Great Dane (dog): mg g kg

3. Use 10 pennies and a metric ruler to compete this section.
   a) How tall is a stack of 10 pennies in centimeters? _____
   b) How tall would a stack of 100 pennies be in centimeters? _____
   c) How tall would a stack of 1000 pennies be in centimeters? _____

4. Use your shoe and a metric ruler to complete this section. Keep your shoes on!
   a) What is the length of your shoe to the nearest centimeter? _____
   b) How many shoes would it take heel to toe to make 1 meter? _____
   c) How many shoes would it take to make one kilometer (1000 meters)? _____

Metric Olympics - Directions Sheet

CATCH-UP / WORK AHEAD

1. Anytime you find yourself waiting for a station, complete any calculations you have not yet done.
2. Remember to estimate (predict) the measurement before you use tools to make any actual measurements.

Event #1. SYNCHRONIZED LUNG TESTING

1. Get a stopwatch
2. Everyone in the group should start holding breath at the same time.
3. Record time when you let go of your breath.
4. Calculate % error.

Event #2. COTTON-BALL SHOT-PUT

1. Get meter sticks and cotton-ball for your group.
2. Throw cotton-ball from the zero end of the meter stick.
3. Measure the distance traveled for each throw.
4. Calculate % error.
5. Please return cotton balls to where you found them.

Event #3. RIGHT-HANDED PENNY GRAB

1. Grab Pennies. (small handful)
2. Put them in a weighing boat or beaker on a scale (make sure scale is reading zero with only the beaker sitting on it).
3. Record mass of Pennies.
4. Calculate % error.

Event #4. LEFT-HANDED SPONGE SQUEEZE

1. Saturate the sponge in 1000mL beaker of water.
2. Squeeze the water into a beaker.
3. Transfer the water from the beaker into a graduated cylinder. Measure and record the volume.
4. Pour back into 1000mL beaker
5. Calculate % error.

Event #5. BIG FOOT CONTEST

1. Put one sheet of large paper on the floor.
2. Trace the feet of all the people in your group on separate sheets.
3. Using rulers, calculate the area of your foot by making the best rectangle around your foot. Don't forget that the area for a rectangle is length x width
4. Calculate % error.

Event #6. THERMODYNAMIC FINGER DIVING

1. Go to a sink
2. Let hot water run for about 20s
3. Fill up 600mL beaker with 500mL of hot water
4. Return hot water to lab station
5. Let everyone feel the temperature
6. Use a temperature probe or thermometer to get actual temperature.
7. Calculate % error.

Event #7. STRAW JAVELIN

1. Find the tape measure on the floor. Throw the straw from zero.
2. Measure distance to the middle of the straw
3. Calculate % error.
4. Return straws to where you found them.