

Name \_\_\_\_\_

## **METRIC MEASUREMENT**

There are 10 stations set up in the classroom. Each station is numbered. There is a Task Card at each station with instructions. The equipment and supplies needed for each station are already at the station.

You need to bring a pen or pencil and this answer sheet with you as you move from station to station. Your job is to go to each station, read the instructions on the task card at the station and complete this lab sheet.

Your entire group must move together.

No more than one group may be at a station at any time.

The stations may be done in any order.

You may use your *Nature of Science* handout to answer questions.

Always include the unit as part of the measurement. For example 10g, 32ml, or 543cm. Without the units, numbers are meaningless.

### **Measuring Length**

**Background Information:** There are four primary units used for length or distance: kilometers (km), meters (m), centimeters (cm), and millimeters (mm).

1000 meters = 1 kilometer

100 centimeters = 1 meter

10 millimeters = 1 centimeter

Kilometers are used for very long distances similar to how we use miles. Meters are slightly longer than yards. Centimeters are about half the size of an inch. Millimeters are quite small; they are about the width of your fingernail.

**Procedure:**

1. Answer these questions before you begin measuring:
  - a. What symbol is used to abbreviate meter? \_\_\_\_\_
  - b. How many centimeters are on the ruler? \_\_\_\_\_
  - c. What symbol is used to abbreviate centimeter? \_\_\_\_\_
  - d. Millimeters are abbreviated mm. How many mm are in 10 cm? \_\_\_\_\_
2. Read the instructions at this station, then fill in the data chart.

Object	Estimation of Length in cm	Actual length in cm	Actual length in mm

Compare the length in cm to the length in mm. What do you notice?

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**Longer Length****Procedure:**

1. Fill in the data chart.

Object	Estimation of Length in m	Actual length in m	Actual length in cm

## Measuring Mass

**Background Information:** The amount of matter in an object is its MASS. We measure mass using an instrument called a triple beam balance. The metric unit of mass that the balance uses is the gram. The kilogram is another commonly used unit of mass. Kilograms are used for massing large and heavy objects.

**Procedure:**

1. Answer these questions before you begin measuring:
  - a. What is the symbol used to abbreviate gram? \_\_\_\_\_
  - b. How many grams are in a kilogram? \_\_\_\_\_
2. Read the instructions at this station, then fill in the data chart.

Object	Ranking (1 – 5) from lightest to heaviest	Estimation of mass in g	Actual mass in g	Actual ranking from lightest to heaviest

## More Mass

**Procedure:**

1. Fill in the data chart:

Mass of Pie Pan	Estimation of Marshmallows	Actual # of Marshmallows

## Regular Volume

**Background Information:** Volume is the amount of space an object takes up. Solid volume is measured in cubic centimeters or milliliters, Liquid volume is measured in milliliters or liters.

**Procedure:**

1. Fill in the data chart.
2. Show your work.

Object	Estimation of volume in cc	Show the math	Actual volume in cc

## Irregular Volume

**Background Information:** When an object is submerged in water, the water level will rise. The amount the water level rises is equal to the volume of the object. This is called *displacement*.

**Procedure:**

1. Fill in the data chart.

Object	Estimation of volume in ml	Original volume of water	Volume of water with object	Actual volume of object in ml

## Measuring Capacity

**Background Information:** Capacity is the volume a container will hold. It is also a measure of the matter in a container.

**Procedure:**

1. Answer these questions:
  - a. Define meniscus:

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- b. Describe how to read a graduated cylinder:

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2. Fill in the data chart:

Container	Estimation of volume in ml	Actual volume in ml

## ThinkQuest

Procedure:

1. Follow the instructions on the task card.
2. Fill in the chart.

<b>Length</b>	27cm = _____ft	Conversion 1	Conversion 2	Conversion 3
<b>Volume</b>	Description:			
<b>Mass</b>	123kg = _____g	Conversion 1	Conversion 2	Conversion 3
<b>Temperature</b>	Definition:			
<b>Time</b>	Time in Fiji	Time in Moscow	Time in Islamabad	

## Temperature

**Procedure:**

1. Fill in the data chart

	<b>Estimated Temperature in °C</b>	<b>Actual Temperature in °C</b>
<b>Hot Water</b>		
<b>Room T. Water</b>		
<b>Cold Water</b>		

## Conversion Game

1. Fill in the answers in the chart below:

6.7 m = _____ cm	9 g = _____ kg	94.23 mm = _____ m
3 cc = _____ ml	843.09 km = _____ m	094.91 l = _____ ml
23 kg = _____ g	84.8 ml = _____ l	83 cm = _____ mm
_____ ml = 2 cc	_____ g = 23.5 kg	_____ m = 245 mm
_____ l = 987 ml	_____ cm = 234 mm	435 hm = +++++ cm
23 dm = _____ m 10	Mm = _____ $\mu$ m	1 dag = _____ hg
1 dkg = _____ dag		