Science Summer Prep
6th Grade Vanguard
Canter Middle School

Hello future Pups! The 6th grade Science Teachers thought it would be helpful for you to brush up on a few skills before you begin the school year. Master the activities in this packet and we should be investigating and experimenting in no time! Bring your completed Science Summer Prep packet to science class the first week of school and receive extra credit points!

SKILLS TO PRACTICE OVER THE SUMMER

Linear Measurements: Practice using a metric ruler. Know where to begin.
How are millimeters and centimeters related?
Can you measure centimeters on a "mm" ruler?
Which is smaller, a centimeter or millimeter?

Mathematics: "You cannot do real science without math!" Quantitative observations and data are very important!
Practice rounding decimals to the nearest tenth place.
Practice rounding decimals to whole numbers.
Practice adding, subtracting, and multiplying decimals.
Practice dividing until you don't have a remainder.

Graphing:
Is a table the same as a graph?
Which axis is x? Which axis is y?
What do bar graphs show? What do line graphs show?
Which graph is better for which kind of data?

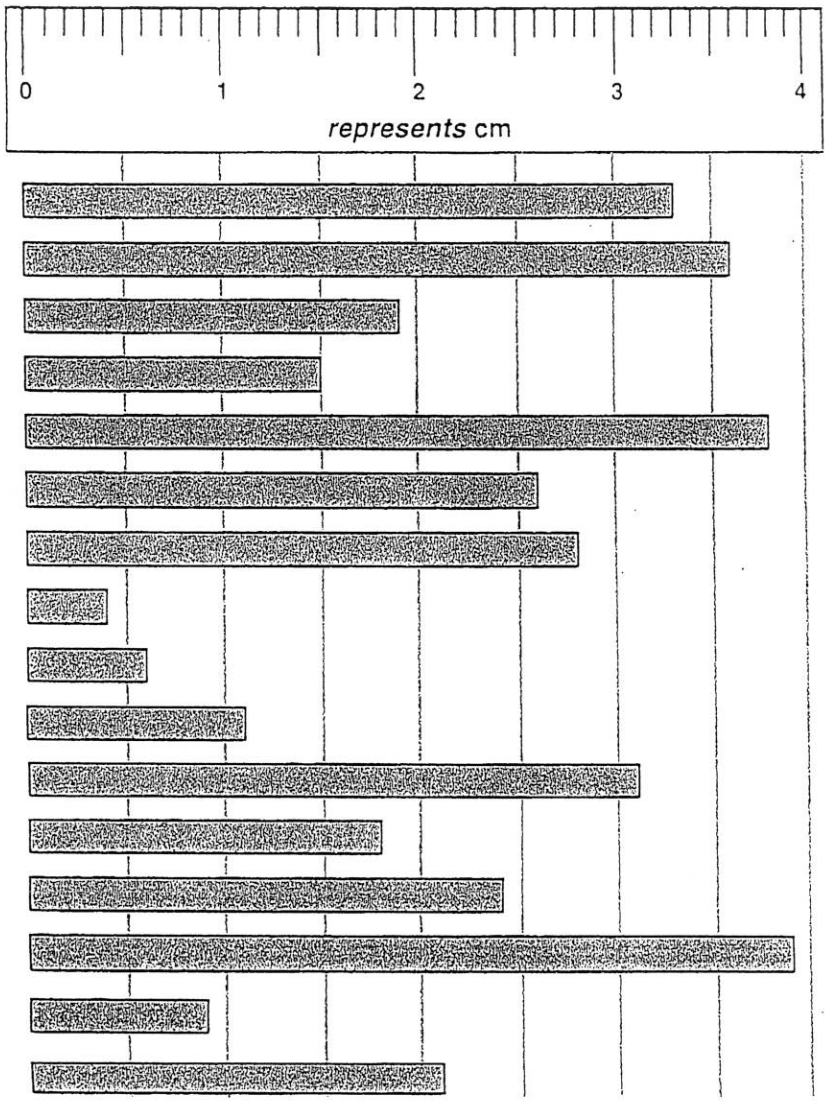
Scientific Prefixes, Suffixes, and Root Words: Science words are usually big words. Often they are made up of two or three Greek or Latin words put together. Many parts of the words are used over and over again. Being familiar with the meaning of some of the parts will help you interpret words that you see for the first time. This should make reading a science textbook or magazine easier. This packet contains a list of scientific word parts and their meanings with word examples for you to define.

Scientific Prefixes, Suffixes, and Roots

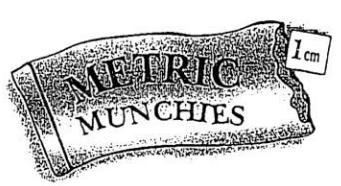
Write a definition for the word example. Use extra paper if needed.

Prefix, Suffix, or Root	Meaning	Examples
a-, an-	not, without	abiotic
ant-, anti-	against; opposed	antibody
bi-	two	biceps bilingual
bio-	life	biology biomass
chlor-, chloro-	green	chlorophyll
chom- , chromo-	color; pigment	chromatophore
exo-	outer; outside	exoskeleton
geo-	earth	geology
graph-	to record; write	geography
hyper-	excessive	hypertension
iso-	equal	isosceles
-itis	inflammation	appendicitis
-logy	study of	cardiology
-meter	a measure; a tool for measuring	barometer
micro-	very small	microbiology
therm-	heat	thermometer

The ruler directly below *represents* metric measurement. Use it to measure each of the long boxes beneath it, and then find the answer in the boxes to the right.



Munch Some Metric Measures



1.9 cm	3.9 cm	3.1 cm	2.6 cm
0.6 cm	2.8 cm	3.6 cm	2.1 cm
0.9 cm	1.5 cm	1.8 cm	1.1 cm
3.8 cm	2.4 cm	0.4 cm	3.3 cm

Measurement Skill

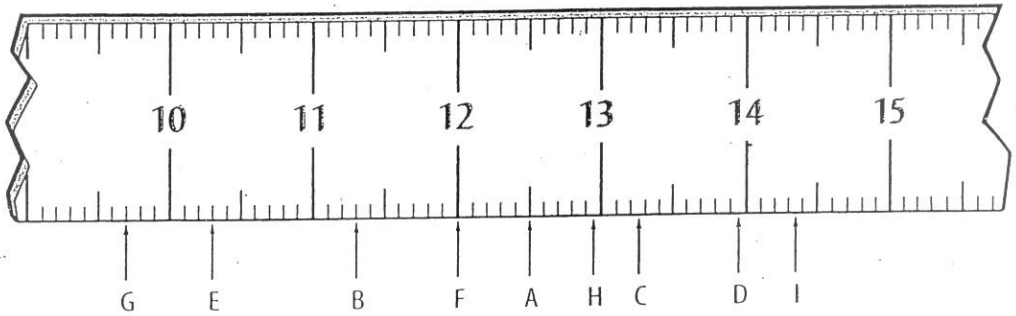
Using a Metric Ruler

Write the length that corresponds to each arrow along the ruler.

A. _____ B. _____ C. _____

D. _____ E. _____ F. _____

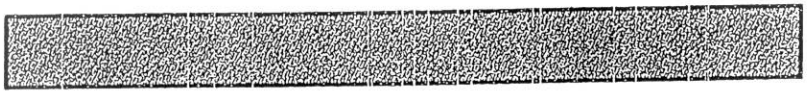
G. _____ H. _____ I. _____



Use a metric ruler or meter stick to find each measurement.

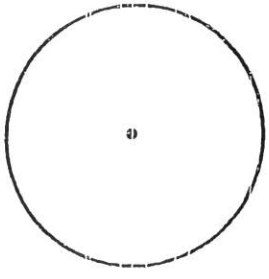
(a) Length of the line in centimeters _____

(b) Length of the line to the nearest centimeter _____



(c) Height of the rectangle to the nearest millimeter _____

(d) Width of the rectangle to the nearest millimeter _____

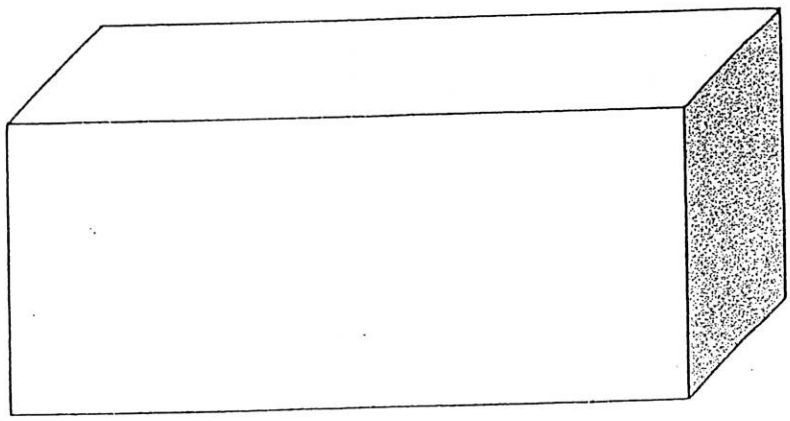


(e) Radius of the circle to the nearest millimeter _____

(f) Diameter of the circle in centimeters _____

(g) Diameter of the circle to the nearest centimeter _____

HINT: If it says "nearest", you need to round your answer so you don't have a decimal point. If not, you should have one decimal point in your answer.



(h) Volume of the box in cubic centimeters

_____ x _____ x _____ = _____

(Measure to the nearest centimeter before multiplying.)

Find the length of an unsharpened pencil (including eraser) in millimeters. _____

What is your height in centimeters? _____ What is your height in meters? _____

Find the length of this sheet of paper to the nearest centimeter. _____

Use your shoe and a metric ruler to complete this section. Keep your shoes on for this one!

(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 1 kilometer? _____

Use ten pennies and a metric ruler to complete this section.

(a) How tall is a stack of ten 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 centimters? _____

Circle the BEST metric unit for each.

(a) The length of an eyelash mm cm m km

(b) The height of a flagpole mm cm m km

(c) The length of a strand of spaghetti mm cm m km

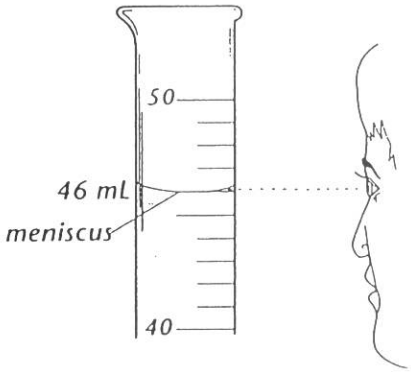
(d) The distance from Chicago, IL, to Peoria, IL. mm cm m km

Name _____ Date _____ Class _____

SKILLS PRACTICE

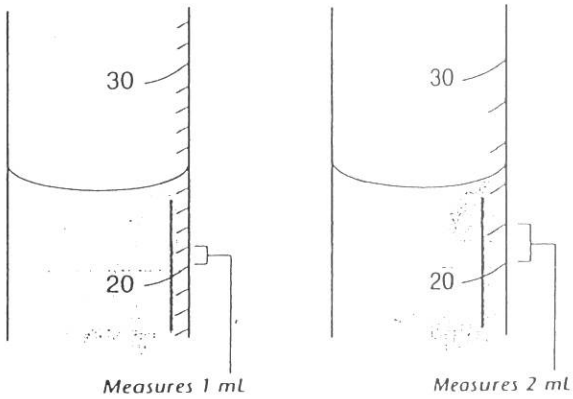
Measuring: Liquid Volume

Write your answers to the questions below in the spaces provided. If you need more space, use the back of this sheet.

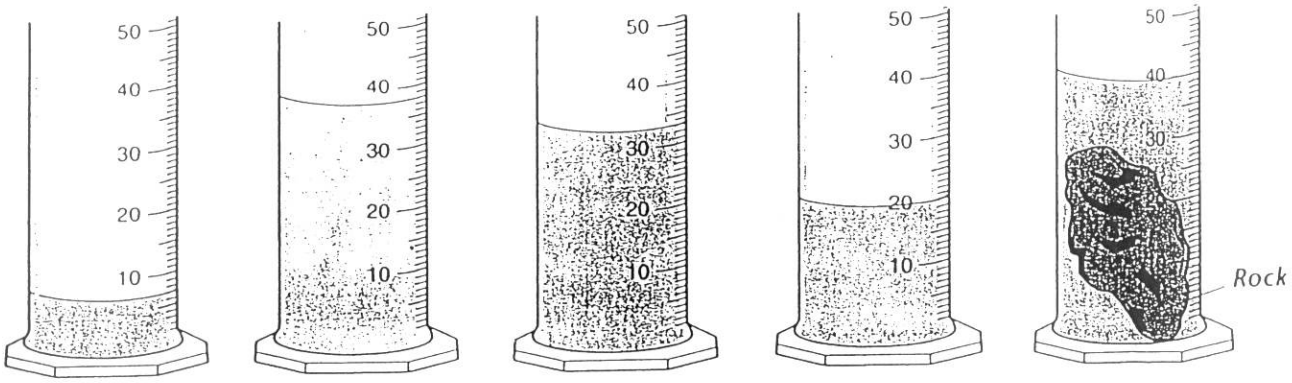


The volume of an object is the amount of space it takes up. You will often measure the volume of liquids using a graduated cylinder. ("Graduated" means that the cylinder is marked with measurement units.) Always read a graduated cylinder at eye level. Also, water in a graduated cylinder has a curved surface called the meniscus. Read the volume at the bottom of the meniscus.

Hints: Always check the unnumbered marks on a graduated cylinder to see how many sections there are and what they measure. Also, sometimes you have to estimate a measurement between two marks. Prove to yourself that both graduated cylinders on the right contain 25 mL.



What is the volume of the liquid shown in graduated cylinders 1–4 below? What is the total volume in graduated cylinder 5?



1. _____ 2. _____ 3. _____ 4. _____ 5. _____

6. If the diagrams for Questions 4 and 5 show the same graduated cylinder before and after the rock was added, what can you infer about the volume of the rock?

_____

7. **Think About It** Describe how you can use a graduated cylinder to measure the volume of an irregular object.

Name _____ Date _____ Class _____

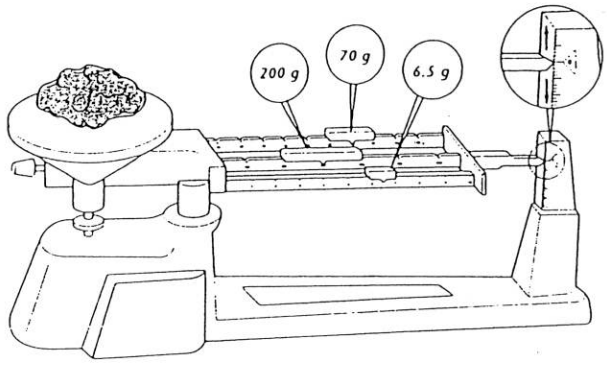
SKILLS PRACTICE

Measuring: Mass

Write your answers to the questions below in the spaces provided. If you need more space, use the back of this sheet.

Mass is the amount of matter in an object. There are different kinds of balances used to measure mass. Be sure you understand how your balance works. Some balances give a single reading. Others give two or more readings that you have to add together.

For example, look at the triple-beam balance on the right. Notice that the middle beam measures the largest amounts. To read the mass of an object, find and record the masses shown on each of the beams. Then add the readings.

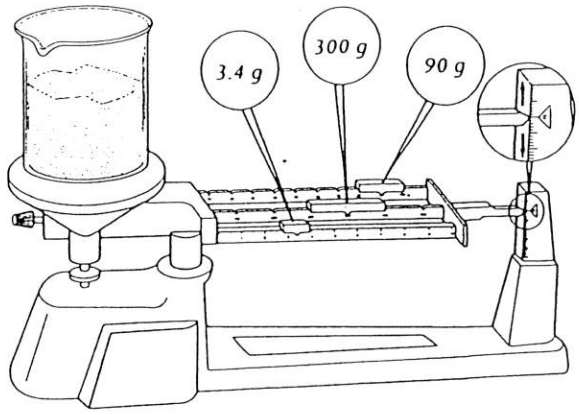


200 g + 70 g + 6.5 g = 276.5 g

Hint: Sometimes you have to find the mass of a substance in a container. Find the mass of the container alone. Then subtract that mass from the combined mass.

Mass of substance and container	29 g
Mass of container	− 13 g
Mass of substance	16 g

1. Using the diagram on the right, find the combined mass of the substance and its container. What is the mass of the substance if the mass of the container is 25 g?



_____

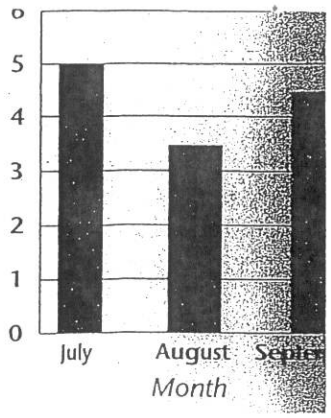
_____

_____

2. What is the mass of a powder if the combined mass of the powder and its container is 12 grams and the mass of the container alone is 4 grams? _____

_____

3. **Think About It** How are the three beams on a triple-beam balance different?



What is your

GRAPHING IQ ?

_____1. (Yes/No) Is a chart the same as a graph?

_____2. Which of the following describes horizontal?
   a. across and flat
   b. up and down

_____3. Which of the choices above describes vertical?

_____4. Which axis (X or Y) on a graph is horizontal?

_____5. Which axis is vertical?

_____6. What is the place/point called where the axes meet?

_____7. Which type of graph (bar/line) shows how something has changed over time?

_____8. Which graph type compares data from a number of distinct categories?

_____9. Which graph type allows you to estimate values for conditions that you did not test in the experiment?

_____10. (T/F) Every graph should have a title?

_____11 Which axis (X or Y) represents the manipulated /independent variable?

_____12. Which axis (X or Y) represents the responding/dependent variable?

_____13. (T/F) It is unnecessary to label the axes if the variables are given in the title of the graph.

_____ 14. (T/F) Bars in a bar graph should be the same width,

_____15. (T/F) Bars in a bar graph should have the same height.

_____16. (T/F) X and Y axes may be numbered differently.

_____17. (T/F) It is not necessary to number every increment on an axis.

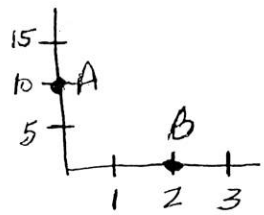
_____18. (T/F) Units must be included in the labels of axes when applicable.

_____19. How many numbers define a point on a line graph?

_____20. Points can be labeled/identified by writing their corresponding numbers on the graph (coordinates) in parentheses (1, 1). Which coordinate (X or Y) comes first?

_____21. What are the coordinates for the origin?

_____22. (Yes/No) On a line graph, is it necessary to draw lines to determine the coordinates of a point that lies on an axis?



_____23. What are the coordinates for point A?

24. On a line graph, other than an axis, what does a flat line indicate?

25. When is a legend/key necessary on a graph?

BONUS: How could we best graph the data from this activity?

GREAT WEBSITE: http://nces.ed.gov/nceskids/graphing

Name _____

Making A Line Graph

Your task is to make a line graph for the facts given in the table at the right. To do this, follow these steps:

Average Height for Children

Age (years)	Height (cm.)
0 (birth)	46
1	74
2	84
3	91
4	99
5	107

Step 1. Choose a title for your graph. (Tell what relationship your graph is going to show.)

Step 2. Determine the horizontal and vertical scales for your graph. (Your scales will have to represent the least and greatest values from the two sets of facts being compared. You might have to try several scales before you find the best ones.) Remember to write the values for the scales on the graph.

Step 3. Write labels for each scale. (Tell the kinds of facts being compared.)

Step 4. Plot the points to show how the two sets of facts are matched.

Step 5. Connect the points.

Step 6. Draw your graph in the space provided.

Title _____

Label _____

Scale

Scale

Label _____

Mathematics

Round off to the nearest tenth place:

123.45 = _____ 6789.23 = _____ 91.89475 = _____

56.53 = _____ 2.47 = _____ 2536.19 = _____

Round to whole numbers:

123.45 = _____ 6789.23 = _____ 9.8 = _____

56.5 = _____ 2.43 = _____ 2536.51 = _____

Add the following. Attach a sheet of notebook paper showing your work.

10 + 1.2 = _____ 2.3 + 5.6 = _____ 7.81 + 9.12 = _____

9.75 + 6.3 = _____ 6 + 0.047= _____ 0.9 + 0.15 = _____

Calculate the following. Use a calculator only to check your answers! Show your work on a sheet of notebook paper.

10 - 0.09 = _____ 123 x 1.23 = _____ 6.9 - 2.15 = _____

3.5 - 2.5 = _____ 45.6 x 5 = _____ 3.7 x 1.75 = _____

Divide the following. Show your work on a sheet of notebook paper.

$\frac{12}{24}$ = _____ 375 ÷ 2 = _____ 467 ÷ 4 = _____

How do you indicate a repeating decimal? _____

Now work this: 32 divided by 3 = _____