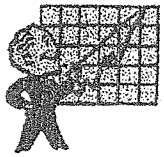
(9)

Name _____ Period _____ Date _____

Graphing Review



Summer Daily High Temperature in Torrance

Time (days)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Temperature (°C)	27	28	31	30	34	38	42	18	20	24	21	29	33	28	38

1. What is the title of the data table? _____
2. What are the two variables? _____
3. What is the unit for time? _____ Unit for temperature? _____
4. What was the highest daily temperature and what day did it occur? _____
5. What was the temperature on Day 10? _____
6. Why is it important to have variables and units in a data table?

What is wrong with each of the following data tables?

1. _____

Height of Tomato Plants

Time	1	2	3	4	5	6	7	8
Height	5	25	70	82	120	306	420	570

2. _____

Time (weeks)	1	2	3	4	5	6	7	8
Height (cm)	5	25	70	82	120	306	420	570

3. _____

Time	1	2	3	4	5	6	7	8
Height	5	25	70	82	120	306	420	570

4. _____

Height								

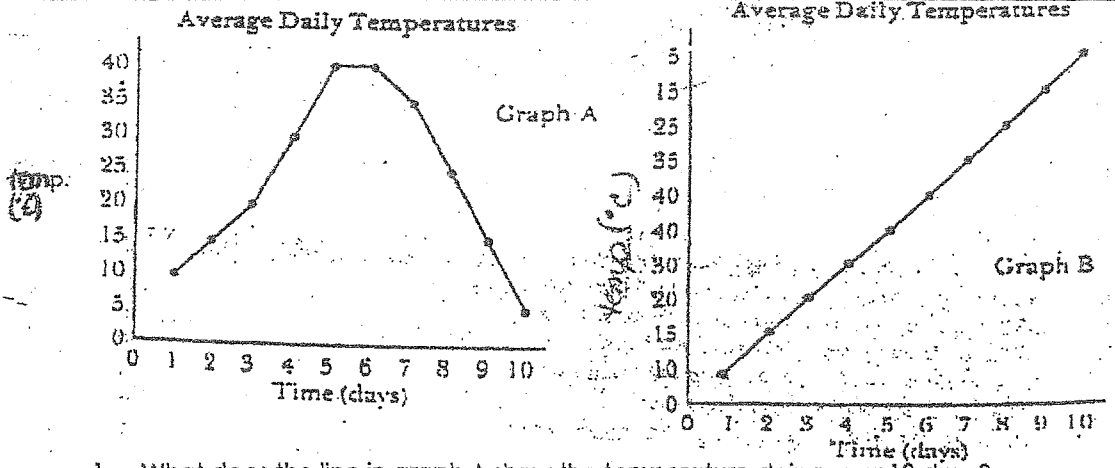
5. _____

Height of Tomato Plants

(weeks)	1	2	3	4	5	6	7	8
(cm)	5	25	70	82	120	306	420	570

Compare the data table below with the two graphs and answer the questions that follow.

Time (days)	1	2	3	4	5	6	7	8	9	10
Temperature (°C)	10	15	20	30	40	40	35	25	15	5



1. What does the line in graph A show the temperature doing over 10 days?
2. What does the line in graph B show the temperature doing over 10 days?
3. What is the major difference in the lines of the two graphs?
4. Look at the data for temperature in the data table. Describe what happens to the temperature.
5. Which graph shows an accurate picture of data?
6. How would you change the graph that does not show an accurate picture of the data?

Use the data tables below to construct a line graph for each. Use a separate piece of graph paper for each.

Average rainfall in Paris

Time (months)	Rainfall (mL)
1	15
2	21
3	28
4	24.5
5	16
6	8
7	2.5
8	1
9	2
10	3
11	5.5
12	10

High Daily Temperatures

Time (days)	Temperature (°C)
1	27
2	28
3	31
4	30
5	32
6	39
7	36
8	18
9	21
10	21
11	24
12	30

Don't forget to include graph title, axis title, units!!!

MAKING & INTERPRETING GRAPHS

There are several ways in which to present data. Often times data tables are difficult to interpret. If the same data is graphed, the relationship between the independent and dependent variables are much easier to see. There are some rules for producing and interpreting graphs:

1. A graph must have a TITLE which tells the reader what the experiment is about.

2. Indent the axes (the horizontal and vertical lines of the graph) from the edge of the graph paper and draw them with a straight edge.

3. LABEL each axis and indicate the UNITS used. The dependent variable (what is being measured) always is shown along the vertical (Y) axis while the independent variable (what factor we are purposefully changing) is always along the horizontal (X) axis. *Numbers along each axis are useless if you do not show what they represent!!!!*

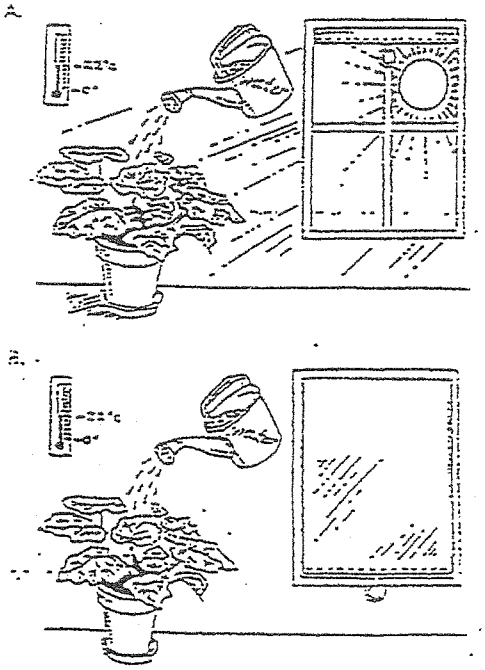
4. Choose an APPROPRIATE SCALE that allows you to get all the data on the graph. Plan ahead, check the largest and smallest values to determine the range for each axis. Make the scale convenient to use. Usually progressing by 1's, 5's, 10's, 50's, 100's, etc., are much easier to use than progressing by 6's, 18's, etc. *Make certain that the number progress in order from lowest to highest without changing the scale for the entire graph!!!*

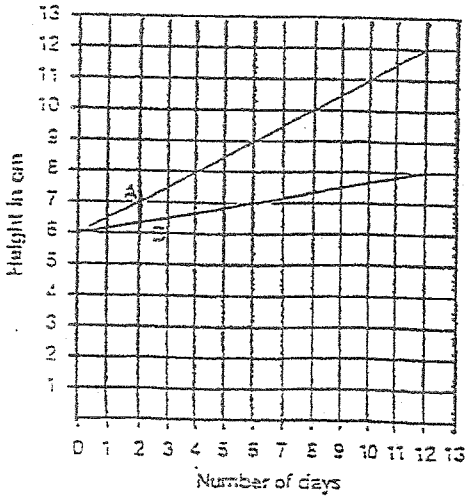
5. Locate points by going across horizontally and then up vertically. Place a solid circle.

6. Draw a smooth curve or a straight line to represent the general tendency of the data points.

7. USE PENCIL when you begin to draw a graph so that you can erase mistakes. Graphs in my class must be NEAT!!!

Let's look at the experiment below:





1. What is the independent variable (the factor we are purposefully changing)?

2. What is the dependent variable (the factor we are measuring)?

3. Which of the two plants is the control? _____ Explain how you know this.

4. Identify the data for this experiment. How is it displayed?_____

5. State a possible hypothesis for this experiment.

6. What variable s were controlled?_____

7. Practice reading from the graph.
a) What is the height of plant A on Day 1?_____ Day 6_____ Day 10_____

b) On which Day did plant A double its growth?_____

c) On which Day are plant A and Plant B the same height?_____

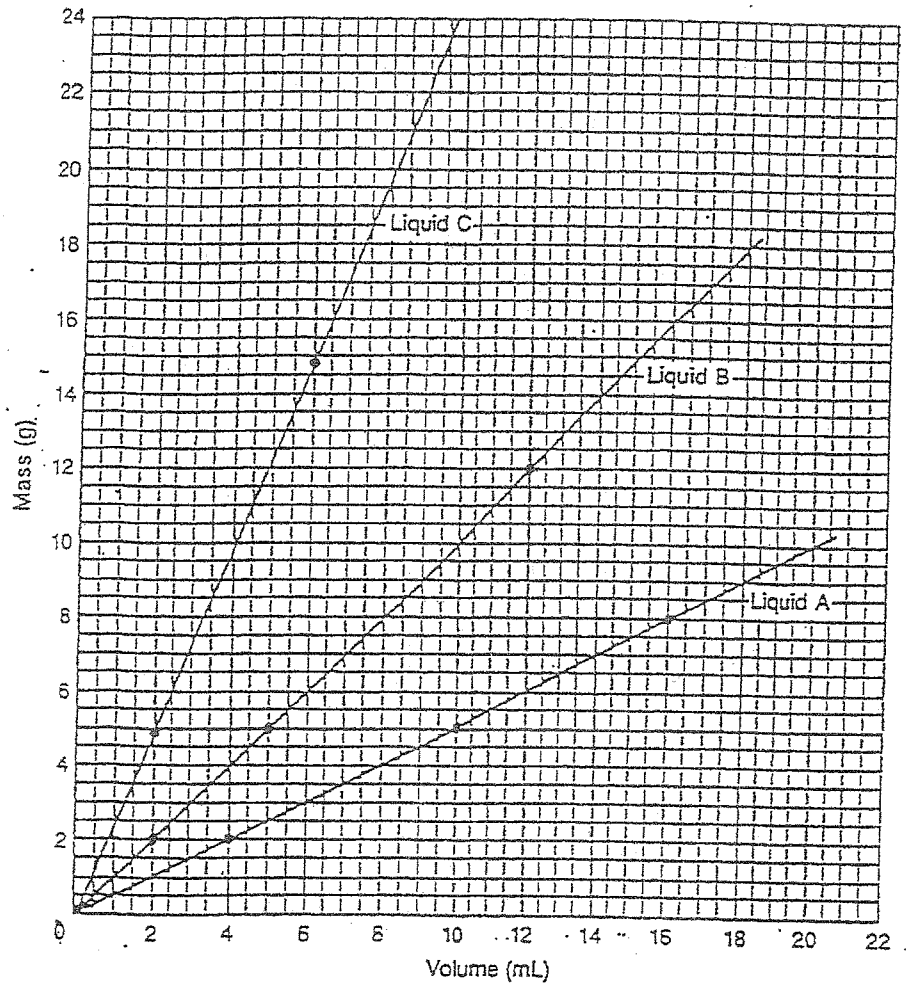
8. Practice inferring information from the graph.
a) Why was it important that both plants were the same height at the start of the experiment?

b) What would be your conclusion from looking at the data in the graph? Remember that a GOOD conclusion always restates the hypothesis and refers to the data.

Science 1

Gathering Information From Graphs

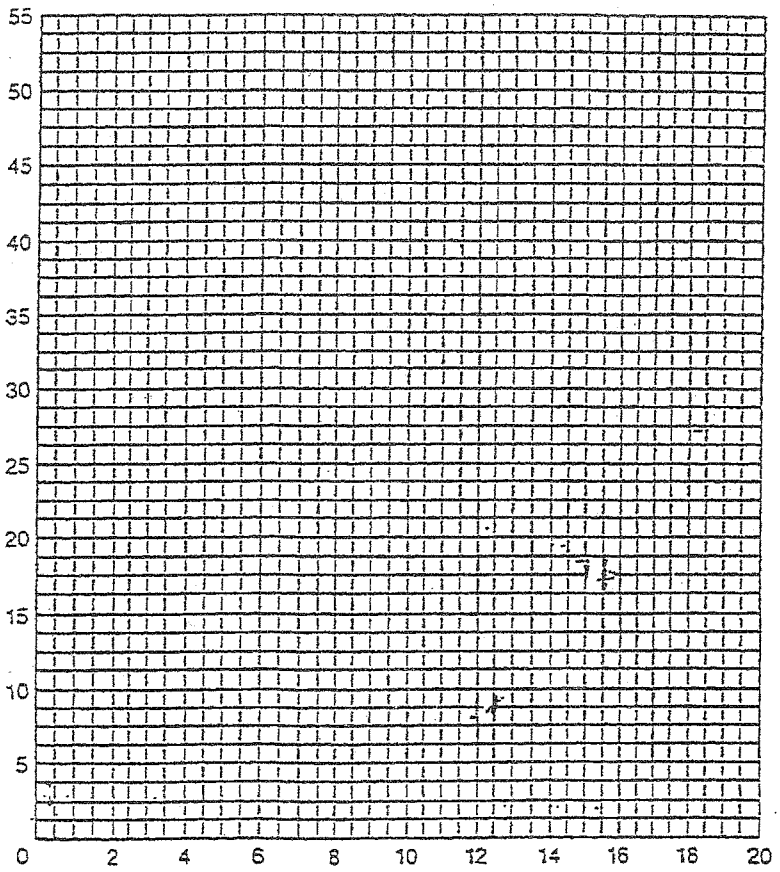
Use the graph below to answer the questions that follow.



1. What is the mass of 5 mL of Liquid A?
2. What is the volume of 12 g of Liquid B?
3. Which liquid has the greatest mass for 10 mL of volume?
4. Which of the liquids has a density of 1 g per 1 mL?
5. What is the mass of Liquid A when the volume is 6.5?
6. What happens to the liquids as their volumes increase?

Plot the data in the table on the graph. Be sure to label your graph and give it a title. Then answer the questions that follow.

Inches	Centimeters
1.0	2.5
2.0	5.1
3.0	7.6
4.0	10.2
5.0	12.7
6.0	15.2
10.0	25.4
20.0	50.8



1. How many centimeters are in 9 inches?
2. How many inches are in 4 cm?
3. How many inches are in 30.5 cm?
4. Calculate how many centimeters are in 100 inches.
5. Calculate how many inches are in 101.6 centimeters.

Interpreting and Making Line Graphs

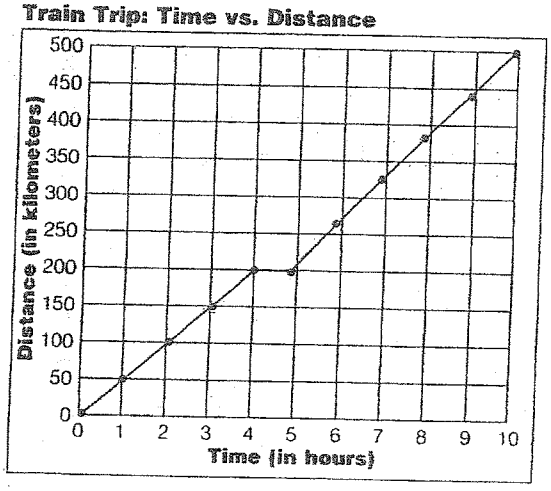
In science, essential information is often presented in line graphs. Line graphs show how one quantity depends on or changes with another.

Part A

The line graph below shows the distance a train traveled in a ten-hour trip. Time is shown on the horizontal axis and distance is shown on the vertical axis. Use the graph to answer these questions.

1. What unit of measurement is used in the scale on the horizontal axis?
2. What unit of measurement is used in the scale on the vertical axis?
3. How far did the train travel between the third and tenth hour? during the entire trip?
4. Determine the train's average speed during the first four hours of its trip.
5. When did the train stop? How can you tell from the graph?
6. Was the train moving at a constant speed during the last five hours of its trip? Explain your answer.

Train Trip: Time vs. Distance



Train Trip: Time vs. Speed

Time (in seconds)	Speed (in meters/second)	Time (in seconds)	Speed (in meters/second)
0	0	25	20
5	5	30	20
10	10	35	10
15	10	40	0
20	15		

Part B

Follow the steps below to make a line graph of the data in the table.

1. On a piece of graph paper draw horizontal and vertical axes that meet at a point near the lower left corner of the paper. Leave enough room below the horizontal axis and next to the vertical axis for labels.
2. Label the axes, using the horizontal axis for time and the vertical axis for speed. Give the units of measurement in parentheses. Label the point where the axes intersect as "0."
3. Choose a scale for each axis. For the horizontal axis figure out the total time you need to graph and the total number of squares along the horizontal axis. Divide the number of squares by the time. If necessary, round this number to a whole number. This will give you the number of squares per unit of time. Then mark off the scale with equal intervals. Repeat this procedure for the vertical axis, substituting the maximum speed for the total time to determine your scale.
4. Plot the data in the table, one point at a time. Connect the points and give your graph a title.

Using a Bar Graph to Compare Densities

Bar graphs are useful for comparing measurements or properties, such as density. All graphs should contain a title, labels, and axes—lines that intersect at a right angle. The title and labels show the items that are being compared and the units used for the comparison. In a density bar graph, one axis shows the names of the substances and the other shows units of density. Follow the instructions to make a bar graph comparing the densities of the elements in the table below.

1. Draw the two axes so they intersect near the lower left-hand corner of your paper, as shown. Show density on the horizontal axis and the elements on the vertical scale.
2. Decide on a reasonable scale for the density values. Notice that the range of values for the thirteen elements is 2.0 to 19.3 g/cm^3.
3. List the elements along the vertical axis with equal spaces between the elements' names.
4. For each element, draw a horizontal line that ends even with the value for its density along the horizontal axis. Since most of the given values are not whole numbers, estimate where the horizontal line should stop.
5. Use the horizontal lines to draw bars for each of the elements. Make each bar the same thickness. Use pencils or markers to shade the bars.
6. Give your graph a title.

Densities of Elements

Element	Density (g/cm^3)
aluminum	2.7
copper	8.8
gold	19.3
iron	7.7
lead	11.3
mercury	13.5
nickel	8.9
silver	10.5
sulfur	2.0
tin	7.3
uranium	18.7
zinc	7.1