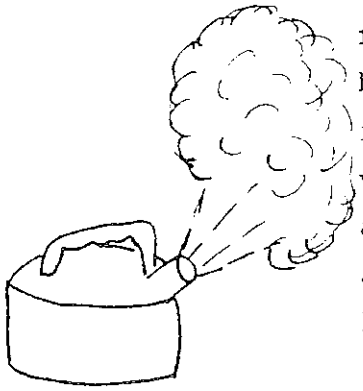
Science

STATES OF MATTER Day 5 (to replace day 5 if you used it already)

Read the paragraph below. Then find the underlined words in the word search.

There are three states of matter -- solids, liquids, and gases. These states can change from one to another when heat is applied. The molecules that form a solid vibrate slightly, but are so strongly attracted to each other that they stay together. Therefore the solid keeps its shape. When heat is applied, it is changed into the energy of the now rapidly-moving molecules. The molecules have enough motion to move apart. In some solids, the orderly arrangement breaks down and they flow. They are now a liquid. When the liquid is heated, the molecules move so fast that there is a great deal of space between them. They have become a gas or a vapor.



a c f w o l f d b g t k s
r o p a v l m o p n n i p
e m o l e c u l e s a g a
t h i j k o k m m a e t c
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r t e h n g n t i n a d i
b a n e n s e t m a h r e
i g a a r e r e t a s n g
v d r t w e g r d s j o n
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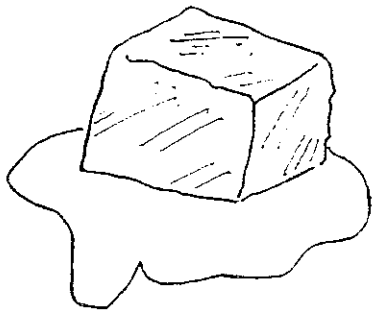
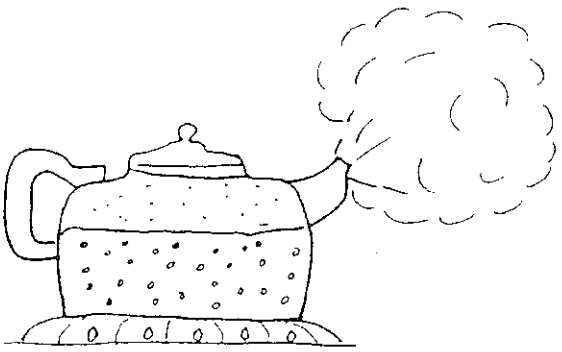


BONUS: Using ice as an example, explain the three states of matter and how they can change when heat is applied.

THINK:
In which state of matter do molecules vibrate the least?
a. solid b. liquid c. gas d. a and b

WHAT STATE AM I IN?

Answer each question with one of the three state of matter: solid, liquid, gas.



_____1. In this state, molecules move the fastest.

_____2. The molecules have a rigid pattern in this state.

_____3. This state conforms to any shape of a container.

_____4. This state spreads out in all directions and maintains no shape.

_____5. Molecules vibrate, but they do not move apart in this state.

_____6. Syrup is an example of this state.

_____7. This state can be changed into a liquid by heating.

_____8. Wood is an example of this state.

_____9. Oxygen is an example of this state.

_____10. In this state, molecules move freely, but they are still attracted to one another.

_____11. Helium is an example of this state.

_____12. Evaporation changes this state into a vapor.

THINK:
Which of the following is <u>not</u> a definition of a liquid?

a. takes the shape of its container
b. can be changed into a vapor if heated
c. has a definite shape
d. molecules move freely, but remain attracted to each other

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Laboratory Skills 8

Using Graphing Skills

Introduction

Recorded data can be plotted on a graph. A graph is a pictorial representation of information recorded in a data table. It is used to show a relationship between two or more different factors. Two common types of graphs are line graphs and bar graphs.

In this investigation, you will interpret and construct a bar graph and a line graph.

Problem

How do you correctly interpret and construct a line graph and a bar graph?

Pre-Lab Discussion

Read the entire investigation. Then, work with a partner to answer the following questions.

1. Would a line graph or a bar graph be better for showing the number of birds of each color in a population?

_____

2. How could you plot more than one responding variable on a line graph?

_____

_____

3. Where do you place the manipulated variable on a line graph?

_____

4. Which type of graph would you use to show comparisons? Explain the reason for your answer.

_____

5. Why is it important to have all parts of a graph clearly labeled and drawn?

_____

Procedure

Part A. Interpreting Graphs

1. The type of graph that best shows the relationship between two variables is the line graph. A line graph has one or more lines connecting a series of points. See Figure 1. Along the horizontal axis, or *x*-axis, you will find the manipulated variable in the experiment. Along the vertical axis or *y*-axis, you will find the responding variable.

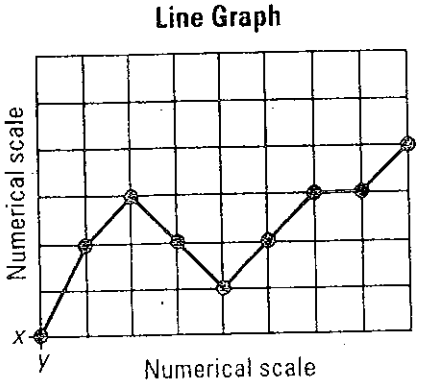

Figure 1

2. Use the line graph in Figure 2 to answer questions a through f below.

   a. Which plant grew the tallest? _____

   b. How many plants grew to be at least 6 cm tall? _____

   c. Which plant grew the fastest in the first five days? _____

   d. Which line represents plant 2? _____

   e. After 10 days, how much had plant 3 grown? _____

   f. How long did it take for plant 1 to grow 6 cm? _____

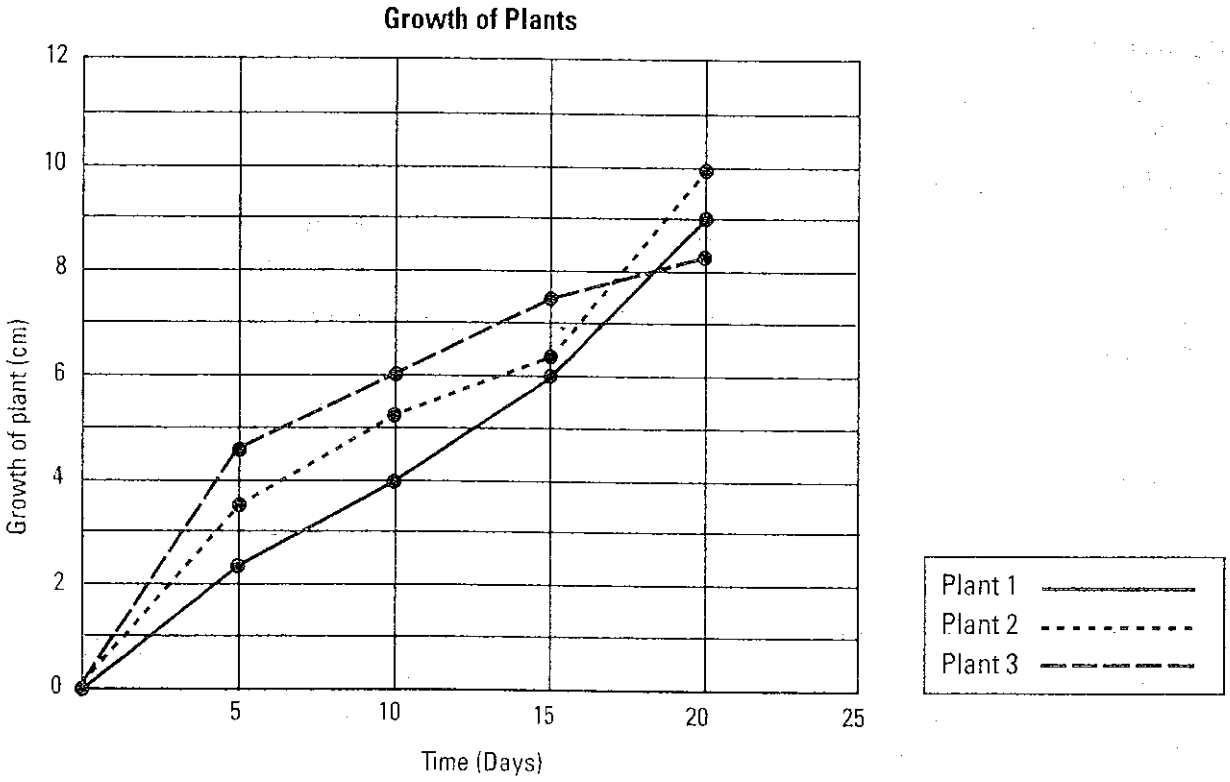

Figure 2

3. A bar graph is another way of showing relationships between variables. A bar graph also contains an x-axis and a y-axis. But instead of points, a bar graph uses a series of columns to display data. See Figure 3. On some bar graphs, the x-axis has labels rather than a numerical scale. This type of bar graph is used only to show comparisons.

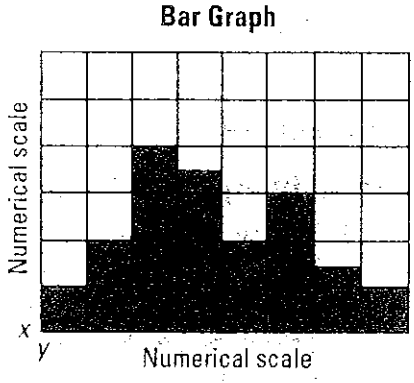

Figure 3

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4. Use the bar graph in Figure 4 to answer questions a through e below.

   a. At birth, what is the average number of red blood cells per mm^3 of blood?

   _____

   b. What appears to happen to the number of red blood cells between birth and 2 months?

   _____

   c. What happens to the number of red blood cells between the ages of 6 and 8 years?

   _____

   d. Between what ages is a human likely to have 4.6 million red blood cells?

   _____

   e. After 14 years of age, do males or females have a higher red blood cell count?

   _____

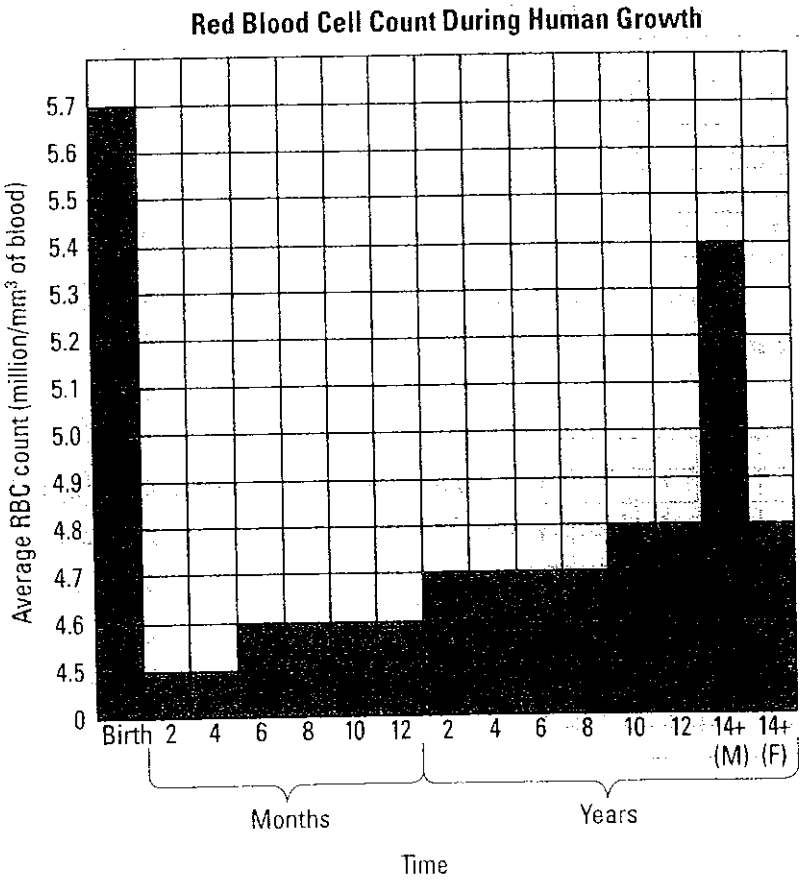

Figure 4

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CLIMATE AND LATITUDE

Many factors can affect our earth's climate: the presence of mountains, bodies of water, and perhaps even sunspots! The distance from the equator, or latitude, has a very important effect on climate also. The graph shows average monthly temperatures. Use it to help answer the questions below.

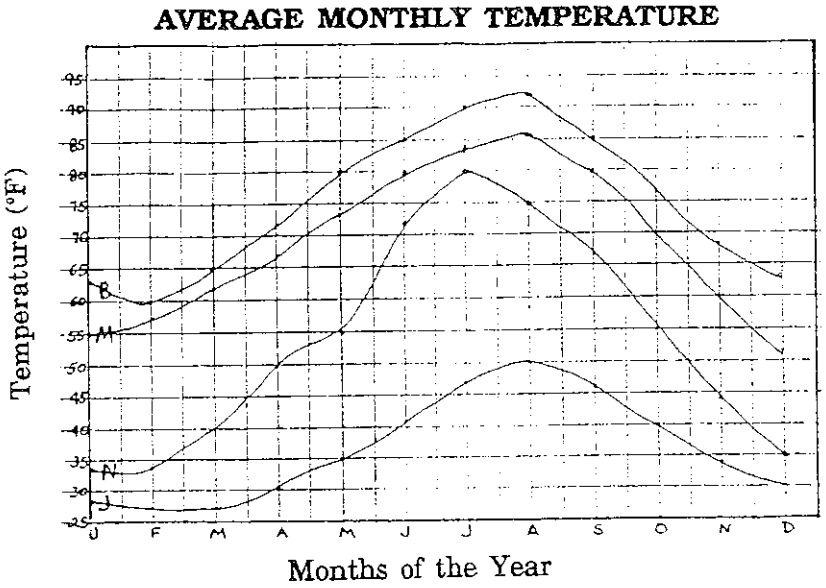
Key

J - Juneau
latitude 58°

N - New York
latitude 40°

M - Mobile
latitude 31°

B - Brownsville
latitude 26°



1. What is the annual temperature range for each city. (Find the difference between the warmest and coldest months.)

   Brownsville _____ New York _____

   Mobile _____ Juneau _____

2. Which city has the least temperature range? _____

   Greatest? _____

3. Which city has the coolest climate? _____

   Warmest? _____

4. Which city is closest to the equator? _____

   Farthest? _____

5. In your own words, explain the relationship between average monthly temperatures and latitude.

   _____

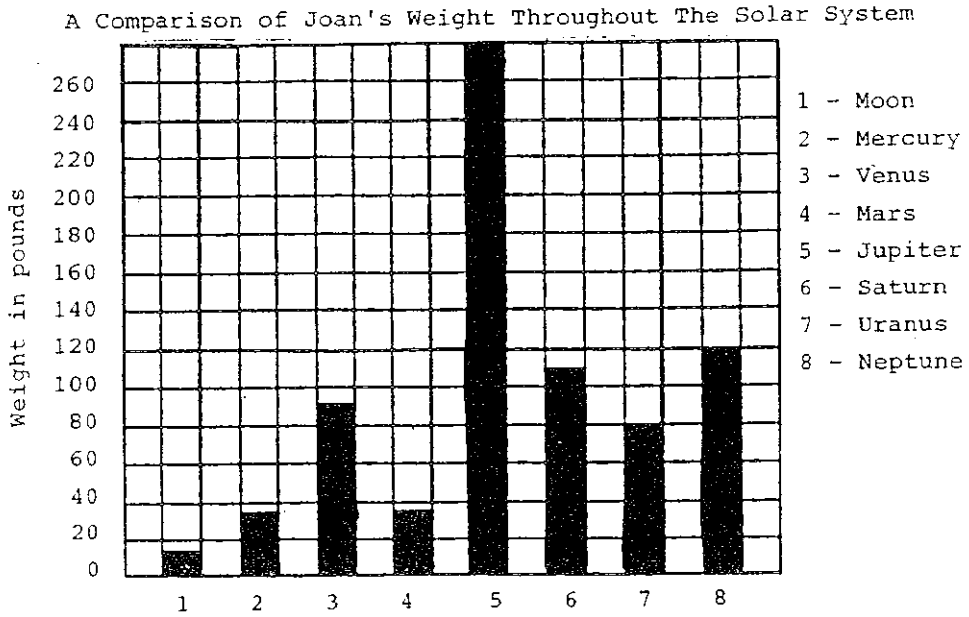
   _____

Science Day 9

GRAVITY

Gravity is an attraction of one body for another. This attraction we measure as weight. The strength of an object's gravitational force depends on how much material is in the object, or its mass. The less mass an object has, the less gravitational force it has acting upon it; and the more mass, the greater the gravitational force. The planets and moons have different masses. Therefore, they have different gravitational pulls. Don't confuse mass with size, however. A large box of feathers has less mass than a small brick of gold. Some of the larger planets have less mass than some of the smaller ones.

On earth Joan weighs 100 pounds. However, on the sun, she would weigh 2800 pounds, and on Pluto she would weigh one pound. Below is a bar graph of Joan's weight on the other planets and moon. Use these paragraphs and the graph to answer the questions.



1. What is gravity? _____
2. Which two planets have approximately the same mass as Earth? _____
3. Which planets have less mass than Earth? _____

_____

4. Which planet has a great deal more mass than Earth? _____
5. How are mass and gravity related? _____

THINK:

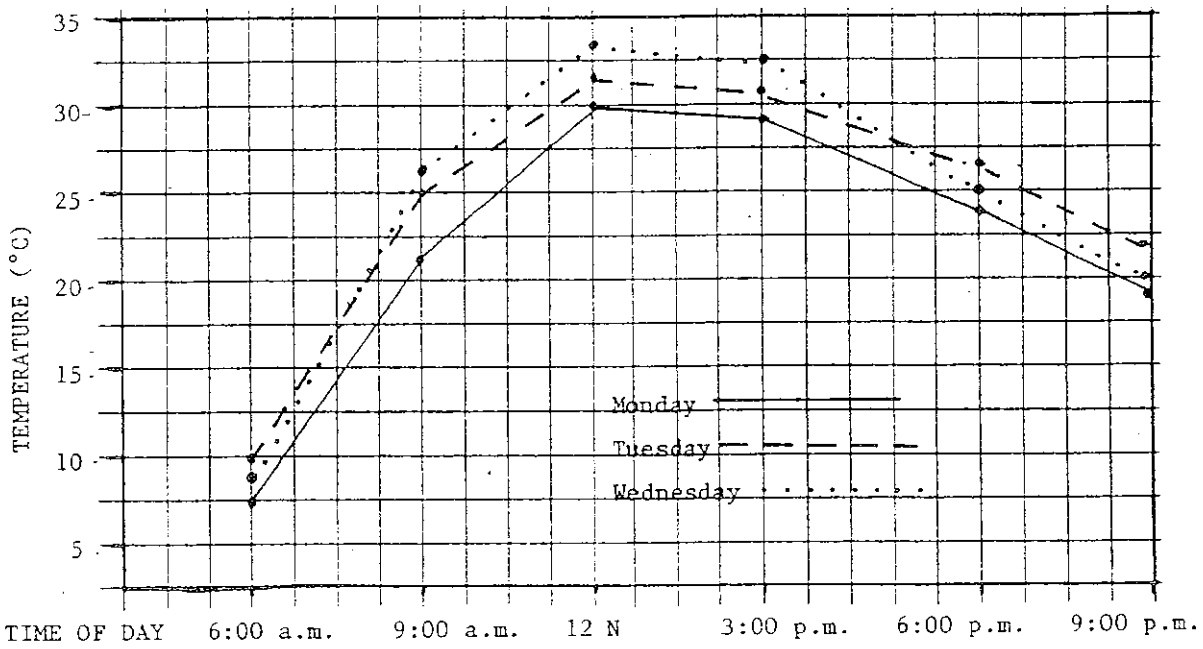
_____ is the amount of matter in an object.

a. weight b. mass c. gravity d. pressure

Science Day 10

TEMPERATURE AND TIME OF DAY

Sandy's science homework was to measure and graph air temperature at six different times of the day for three days. She took these readings in an open shaded area. There was no cloud cover on the days she took the readings. Study the graph below and answer the questions.



1. At what time of day was the lowest temperature recorded? _____

   The highest temperature? _____

2. Why did Sandy take her readings in the shade instead of in the sun? _____

   _____

3. Which day had the highest temperature reading? _____

   What was the high for that day? _____

4. Which day had the lowest temperature reading? _____

   What was the low for that day? _____

5. What pattern is evident in this graph? _____

   _____

THINK: Can you predict what Thursday's highest temperature will be?
a. it cannot be predicted b. 25°C c. 35°C d. 45°C