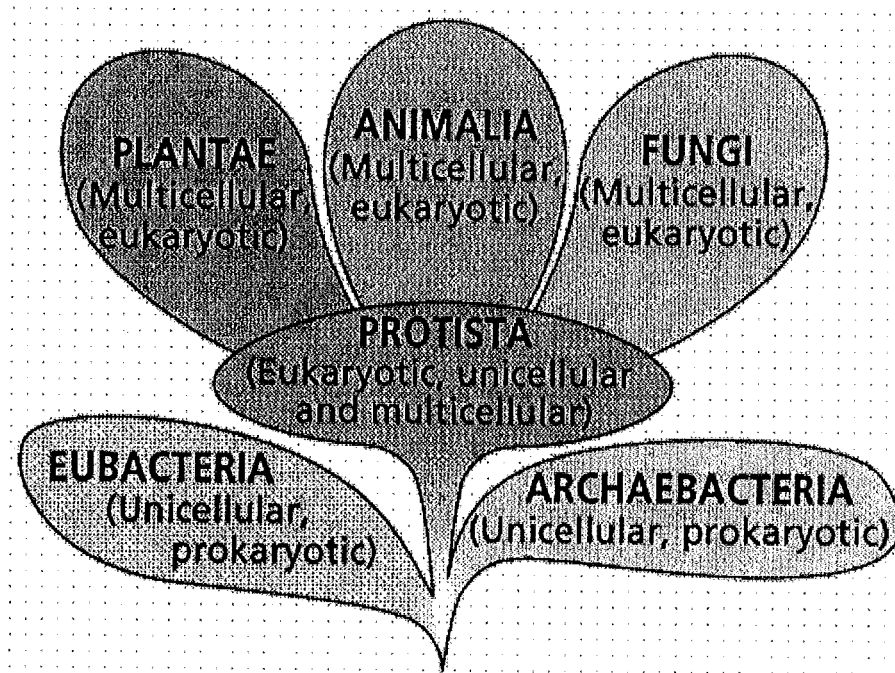


Unit 1:

Unity and Diversity



Name: _____

Notes:

Unit 1 Objectives:

By the end of this unit, you should be able to:

1-1 Themes of Biology

- List seven general characteristics that distinguish living from nonliving things
- Name and define the nine life functions
- Define and differentiate between the words in the following pairs:
 - metabolism:homeostasis

1-2 The Scientific Process

- Describe and identify the steps of the scientific methods
- Differentiate between the words in the following pairs:
 - hypothesis: theory
 - theory: law
 - variable: control
 - observation: inference
 - independent variable: dependent variable
 - qualitative observation: quantitative observation
- Create a graph, plotting data points on the correct axes while making an appropriate scale
- Define and describe the steps in a controlled experiment
- Become familiar with SI (metric) measurement

15-1 Categories of Biological Classification

- List the 7 levels of biological classification in order from largest to smallest
- Explain how and why organisms are assigned scientific names
- Use a dichotomous key to identify organisms

Chp 20

- State the names of the 6 kingdoms and identify the defining characteristics of each

Unit 1 Vocabulary

<u>Vocabulary Term</u>	<u>Definition</u>
Animalia	
Archaeobacteria	
Autotrophs	
Binomial Nomenclature	
Biology	
Carolus Linnaeus	
Cells	
Class	
Control	
Dependent Variable	
Eubacteria	
Eukaryote	
Excretion	
Fungi	

<u>Vocabulary Term</u>	<u>Definition</u>
Genus	
Growth	
Homeostasis	
Hypothesis	
Independent Variable	
Kingdom	
Law	
Locomotion	
Metabolism	
Nutrition	
Organism	
Phylum	
Plantae	
Protista	

<u>Vocabulary Term</u>	<u>Definition</u>
Prokaryote	
Regulation	
Reproduction	
Respiration	
Scientific Method	
Species	
Synthesis	
Theory	
Transport	
Variable	

"To Be or Not to Be" **(alive that is)**

Directions: Complete the chart below as you examine the specimens provided. You must reach a UNANIMOUS decision before checking a box. Check ONLY 1 of the boxes!

<u>Specimen</u>	<u>Alive Now</u>	<u>Once Alive</u>	<u>Never Alive</u>	<u>Reason</u>
1.)				
2.)				
3.)				
4.)				
5.)				
6.)				
7.)				
8.)				
9.)				
10.)				

Concluding Questions:

1.) Which specimen was the most difficult to classify?

2.) Explain why this specimen was the most difficult to classify.

3.) What characteristics did all of the living things have in common? (List as least 3)

4.) What characteristics do you have?

Life Processes Notes

Organism:

An organism has characteristics that distinguish it from something non-living:

- | | |
|-----------|-----------|
| 1.) _____ | 2.) _____ |
| 3.) _____ | 4.) _____ |
| 5.) _____ | 6.) _____ |
| 7.) _____ | 8.) _____ |
-

Organisms also carry out chemistry, known as _____

- 1.) _____
- 2.) _____
- 3.) _____
- 4.) _____
- 5.) _____
- 6.) _____
- 7.) _____
- 8.) _____
- 9.) _____

*The overall result of all this chemistry (a.k.a. _____),
is known as an organism's _____.

*Organisms to these life functions so that they can maintain
_____, which is maintaining a _____
_____ despites changes in the external
_____.

Life Functions

Directions: Fill in the chart. Use colored pencils or markers in your drawings when appropriate.

Life Function	Definition	Picture
1)		
2)		
3)		
4)		
5)		

6)			
7)			
8)			
9)			

CHAPTER REVIEW(ADDITIONAL REVIEW
OF CONCEPTS)**CHAPTER****1****Know the Terms**

Select the most appropriate words from the following list to complete the paragraph.

respiration	biology	aerobic
synthesis	metabolism	homeostasis
cells	energy	organism
anaerobic	nutrition	reproduction

(1) is the study of living things. Anything that is living is called a/an (2), which is composed of one or more (3) and utilizes (4) to maintain its organization and carry out normal functions. This is derived through the process of (5). There are two forms of this in living organisms. One type requires the use of oxygen and is called (6). (7) respiration does not require oxygen. The total of all chemical reactions within an organism is called (8). Some of these reactions involve building more complex molecules from less complex ones. This is called (9). In all cases, however, the organism is trying to maintain a constant internal environment, called (10).

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Match the word with the correct definition.

- | | |
|------------------------|-------------------------|
| a. nutrients | f. life |
| b. regulation | g. transport |
| c. excretion | h. growth |
| d. sexual reproduction | i. assimilation |
| e. ingestion | j. asexual reproduction |

- | | |
|--|-----------|
| 11. taking in food | 11. _____ |
| 12. reproduction involving only one parent | 12. _____ |
| 13. removal of wastes from an organism | 13. _____ |
| 14. the passing of substances into or out of cells or circulation within an organism | 14. _____ |
| 15. incorporation of materials into an organism | 15. _____ |
| 16. reproduction involving two parents | 16. _____ |
| 17. the process by which living organisms increase in size | 17. _____ |
| 18. all activities that help maintain homeostasis | 18. _____ |
| 19. quality distinguishing organisms from inorganic materials | 19. _____ |
| 20. substances an organism takes from its environment | 20. _____ |

LIFE ACTIVITIES AND BODY SYSTEMS

Name _____

Match the life activity in Column I with its example in Column II.

Column I

1. nutrition _____
2. circulation _____
3. respiration _____
4. excretion _____
5. synthesis _____
6. regulation _____
7. growth _____
8. reproduction _____
9. metabolism _____
10. homeostasis _____
11. digestion _____

Column II

- a. a cat has a litter of six kittens
- b. the cells utilize glucose to produce energy
- c. a plant absorbs minerals from the soil
- d. a plant forms large starch molecules from smaller sugar molecules
- e. the bloodstream brings oxygen and food to the cells
- f. waste products are eliminated during perspiration
- g. a person sweats to keep body temperature at a safe level
- h. the brain coordinates the various systems of the body
- i. process by which food is changed into a form the body can use
- j. the human body produces hormones, vitamins, proteins, enzymes, etc. to keep it functioning
- k. a 7-pound baby becomes a 180-pound man

Fill in the blanks with the correct body systems.

The lungs are the main organ of the _____ system, but they are also an organ in the _____ system. The lymph and the lymphatics are part of the _____ system. Although food does not pass through the liver and gall bladder, they are part of the _____ system. As a duct gland, the pancreas is part of the _____ system. As a ductless gland, the pancreas is part of the _____ system. The hypothalamus, through its neurosecretory cells, coordinates the activities of the _____ and _____ systems.

A Story: Is Sammy Alive?

Part 1

Sammy was a normal, healthy boy. There was nothing in his life to indicate that he was anything different from anyone else. When he completed high school, he obtained a job in a factory, operating a machine press. On this job he had an accident and lost his hand. It was replaced with an artificial hand that looked and operated almost like a real one.

Is Sammy Alive?(explain why or why not) _____

Part 2

Soon afterward, Sammy developed a severe intestinal difficulty, and a large portion of his lower intestine had to be removed. It was replaced with an elastic silicon tube.

Is Sammy Alive?(explain why or why not) _____

Part 3

Everything looked good for Sammy until he was involved in a serious car accident. Both of his legs and his good arm were crushed and had to be amputated. He also lost an ear. Artificial legs enabled Sammy to walk again, and an artificial arm replaced the real arm. Plastic surgery enabled doctors to rebuild the ear.

Is Sammy Alive?(explain why or why not) _____

Part 4

Over the next several years, Sammy was plagued with internal disorders. First, he had to have an operation to remove his aorta and replace it with a synthetic vessel. Next, he developed a kidney malfunction, and the only way he could survive was to use a kidney dialysis machine (no donor was found for a kidney transplant). Later, his digestive system became cancerous and was removed. He received nourishment intravenously. Finally, his heart failed.

Luckily for Sammy, a donor heart was available, and he had a heart transplant.
Is Sammy Alive?(explain why or why not) _____

Part 5

It was now obvious that Sammy had become a medical phenomenon. He had artificial limbs, nourishment was supplied to him through his veins; therefore he had no solid wastes. The kidney dialysis machine removed all waste material. The heart that pumped his blood to carry oxygen and food to his cells was not his original heart. But Sammy's transplanted heart began to fail. He was immediately placed on a heart-lung machine. This supplied oxygen and removed carbon dioxide from his blood, and it circulated blood through his body.

Is Sammy Alive?(explain why or why not) _____

Part 6

The doctors consulted bioengineers about Sammy. Because almost all of his life-sustaining functions were being carried on by machine, it might be possible to compress all of these machines into one mobile unit, which would be controlled by electrical impulses from Sammy's brain. This unit would be equipped with mechanical arms to enable him to perform manipulative tasks. A mechanism to create a flow of air over his vocal cords might enable him to speak. To do all this, they would have to amputate at the neck and attach his head to the machine, which would then supply all nutrients to his brain. Sammy consented, and the operation was successfully performed.

Is Sammy Alive?(explain why or why not) _____

Part 7

Sammy functioned well for a few years. However, a slow deterioration of his brain cells was observed and was diagnosed as terminal. So the medical team that had developed around Sammy began to program his brain. A miniature computer was developed: it could be housed in a machine that was humanlike in appearance, movement, and mannerisms. As the computer was installed,

Sammy's brain cells completely deteriorated. Sammy was once again able to leave the hospital with complete assurance that he would not return with biological illness.

Is Sammy Alive?(explain why or why not) _____

Classification Activity:

Directions:

- 1.) ***Independently*** separate the items into 3 categories.
-Give each group a title.

Group 1:

Title: _____

Items in group: _____

Group 2:

Title: _____

Items in group: _____

Group 3:

Title: _____

Items in group: _____

- 2.) ***Now, with your group...***Share your classification system. Defend your classification skills!

- 3.) Answer the following questions:

- 1.) How did your individual classification differ from the other members in your group? Give at least 2 specific examples.

- 2.) Which group member's classification system was right? Whose was wrong? Defend your answer.

- 3.) When dealing with living things, name one thing, besides appearance, that scientists could use to group living things into categories. (THINK ABOUT THIS!)

Taxonomy Notes:

Taxonomy = _____

Why would scientists want to classify life?

1.) _____

2.) _____

3.) _____

History of Taxonomy

1.) Bible: Classifies life as _____

2.) Aristotle (4th century BC): Classified animals as (i.e. according to habitat)

a.) _____

b.) _____

c.) _____

3.) John Ray (mid 1600's) coined the phrase "species" to refer to _____

***4.) CAROLUS LINNAEUS (Swedish, 1750's, "father of taxonomy")

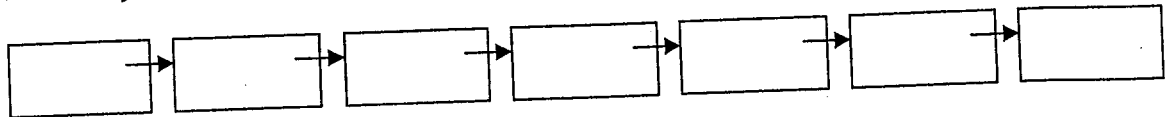
a.) system of classification based on _____

b.) system of scientific naming based on _____ and _____

c.) since _____ and _____ are TWO names, we say that

this is a _____ (bi=2)

*Modern system of taxonomy includes groups called _____



Define Species: _____

The branch of biology that deals with the classification of organisms is called *taxonomy*.

A taxonomist notes the _____
and _____

*For a modern taxonomist, biochemical and genetic makeup may be considered structural characteristics. Thus, organisms that are grouped together share certain structural similarities.

1.) What characteristics are taken into account by taxonomists in classifying organisms?

2.) Would you say that a horse and a dog are more closely related than a horse and a fish? Explain your answer!

Define taxonomy: _____

The basic group in classification is the *species*. Members of the same species interbreed in nature and produce fertile offspring. There are structural variations among members of a species, but these are relatively minor. Closely related species are grouped together in a *genus* (plural, *genera*) and related genera in a *family*. After families come *order*, *class*, *phylum* and *kingdom*.

3.) Which taxonomic group do members show the least variation?

4.) Which taxonomic group do members show the most variation?

5.) "King Phillip Came Over For Gold and Silver" Explain.

6.) Dogs vary greatly in physical characteristics, yet they are all members of the same species. Why is this possible?

The modern system of naming and grouping organisms is based on the work of the Swedish botanist Carolus Linnaeus. In Linnaeus' system, each kind of organism is identified by two Latin names: genus and species. The genus is ALWAYS capitalized and the species is ALWAYS lower case. BOTH the genus and the species are underlined or printed in italics.

7.) Why do you think this modern system of naming organisms is referred to as binomial nomenclature? Who came up with this idea?

8.) Why aren't common names useful to scientists for identifying a particular organism? (hint: use what you learned from the activity above)

9.) List the full classification for humans (begin with kingdom and end with species). Fill in the ENTIRE chart.

	Taxonomic Group	Characteristics
K_____		
P_____		
C_____		
O_____		
F_____		
G_____		
S_____		

Common name: _____

Scientific name: _____

Classification Assignment

Directions:

- 1.) Pick a living thing other than an animal _____
- 2.) Go online to a search engine such as www.google.com
- 3.) Using the internet, find the taxonomic classification of your living thing and complete the chart below.
- 4.) Once you have the chart completed print a picture of your living thing.

	<u>Taxonomic Group</u>	<u>Characteristics</u>
K _____		
P _____		
C _____		
O _____		
F _____		XXXXXXXX
G _____		XXXXXXXX
S _____		XXXXXXXX

What is the scientific name of your animal?

Humans are classified as...

Kingdom	Animal	Multi-cellular, ingest food (i.e. dog, worm, fish, fly, lion)
Phylum	Chordate	Has a dorsal nerve cord
Subphylum	Vertebrate	Has a bony spine (fish, eels)
Superclass	Tetrapod	Has 4 legs (reptiles, birds, amphibians)
Class	Mammal	Has warm blood, fur and mammary glands (mouse, elephant, cow, bat)
Order	Primate	Grasping hands without claws, eyes in front of face (lemurs, tree shrews)
Suborder	Anthropoids	Monkeys and apes
Superfamily	Hominoid	Great apes (gorillas, orangutans, chimps)
Family	Hominid	Human ape
Genus	Homo	Human, tool makers
Species	sapiens	"Smart" man

Directions: Use the chart below to answer questions 1-8.

	Lion	Cat	Dog	Human	Catbird
Phylum	Chordata	Chordata	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia	Mammalia	Aves
Order	Carnivora	Carnivora	Carnivora	Primates	Passeriformes
Family	Felidae	Felidae	Canidae	Hominidae	Mimidae
Genus	<i>Felis</i>	<i>Felis</i>	<i>Canis</i>	<i>Homo</i>	<i>Dumtella</i>
Species	<i>leo</i>	<i>domesticus</i>	<i>familiaris</i>	<i>sapiens</i>	<i>Carolinesis</i>

- 1.) At which level of classification would you describe differences between a lion and a cat?

- 2.) At what level of classification would you describe differences between a cat and a catbird?

- 3.) Lions and cats are structurally similar. What is the LOWEST level at which these similarities can be described?

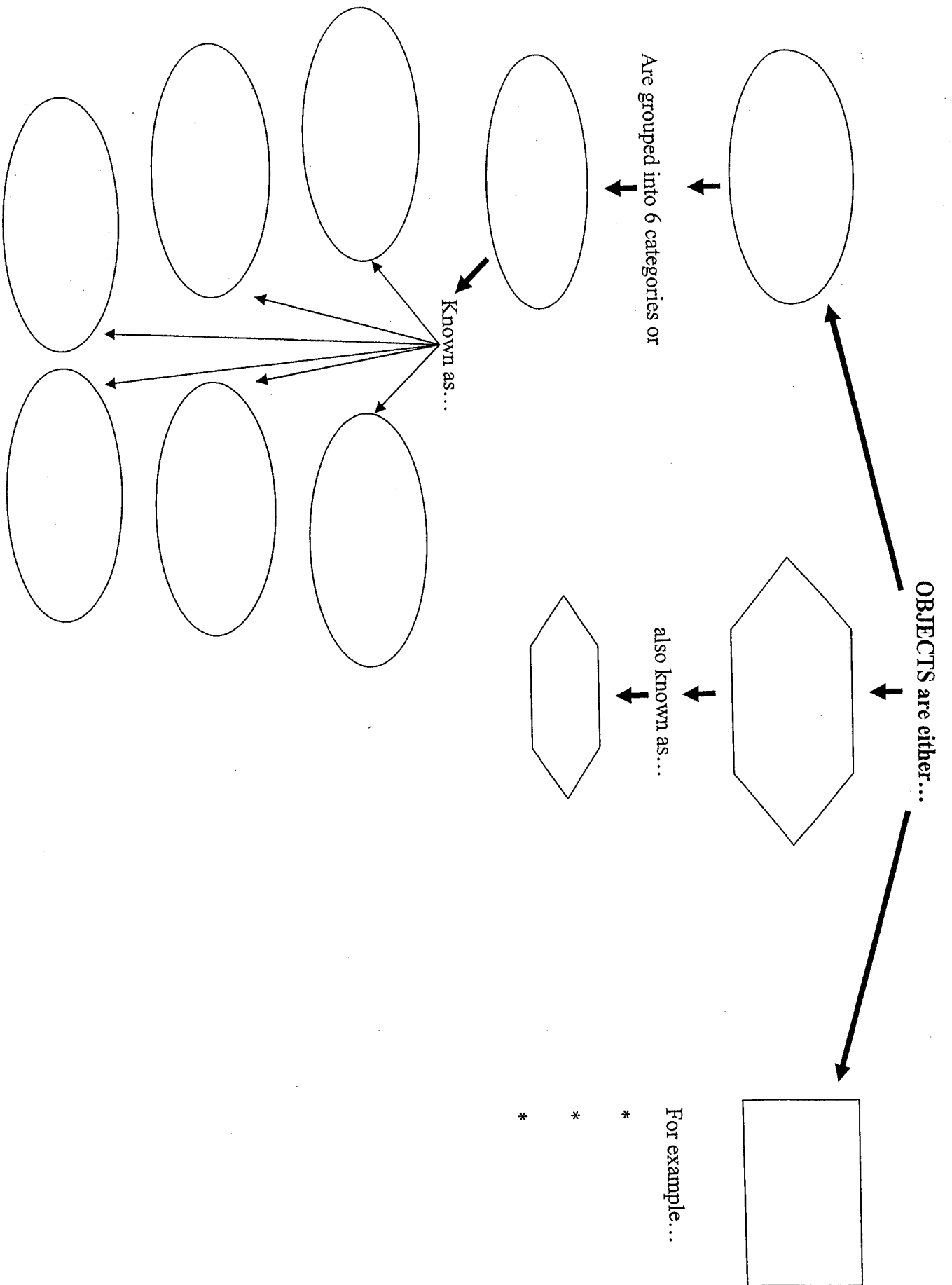
- 4.) The classification unit that would first differentiate the cat from the dog is?

- 5.) Which of the following is the LOWEST level at which structural similarities between a cat and catbird can be described?

- 6.) Humans and dogs are structurally similar. What is the LOWEST level at which these similarities can be described?

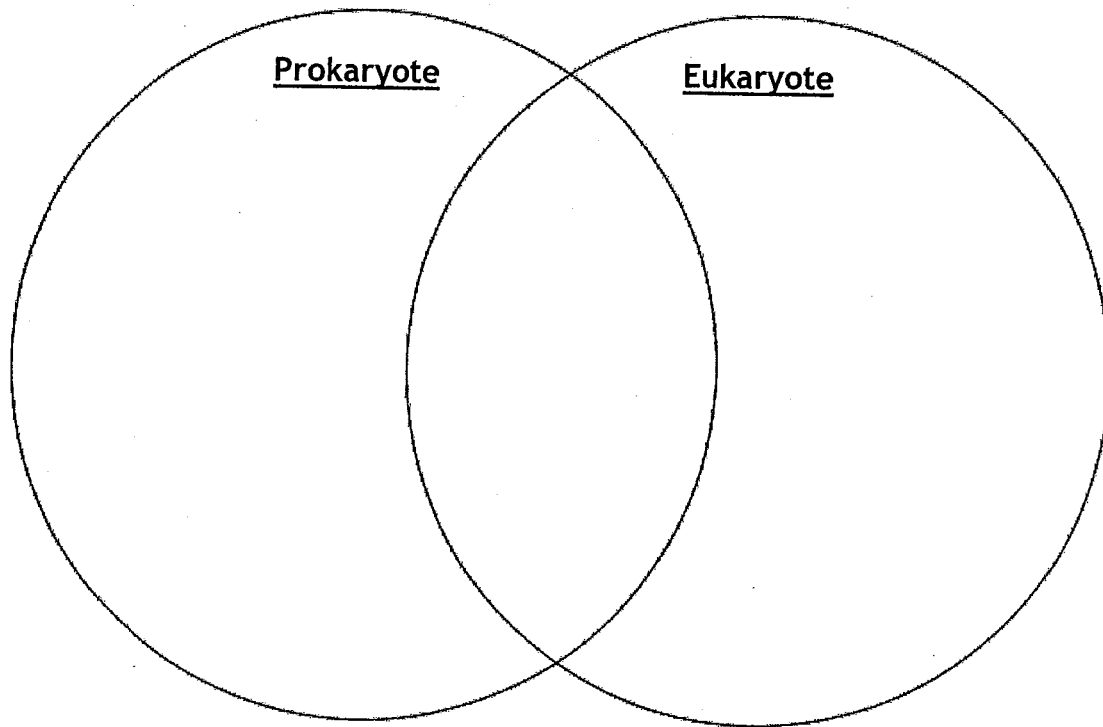
- 7.) Lions and dogs are structurally similar. What is the lowest level at which these similarities can be described?

- 8.) Lions, cats and dogs have similar structural characteristics. What is the lowest level at which these similarities can be described?



Overview of Cell and Body Characteristics

1.) Cell Type:



So, what is peptidoglycan? _____

2.) Cell Construction

Cell wall: _____

Cell membrane only: _____

3.) Body Type:

Unicellular: _____

Ex.) _____

Multicellular: _____

Ex.) _____

4.) Nutrition:

Heterotroph: _____

Ex.) _____

Autotroph: _____

Ex.) _____

Directions: Use textbook pages 432 to 433 to complete the following chart.

<u>Characteristics</u>	<u>Eubacteria</u>	<u>Archaeobacteria</u>	<u>Protista</u>	<u>Fungi</u>	<u>Plantae</u>	<u>Animalia</u>
Cell Type						
Cell Structure						
Body type						
Nutrition						
Example						

SELF QUIZ—SCIENTIFIC METHOD AND THE SI SYSTEM

Name _____

Circle the letter of the correct answer.

1. In an experiment, one ____ is tested at a time to determine how it affects results.
a. control b. variable c. problem d. observation
2. The ____ describes the use of equipment and materials in an experiment.
a. procedure b. conclusion c. control d. problem
3. A ____ is the part of an experiment that provides a reliable standard for comparison.
a. procedure b. theory c. variable d. control
4. The information already recorded about a scientific subject is the scientific ____.
a. record b. method c. technique d. experiment
5. ____ are the recorded facts and measurements from an experiment.
a. Procedures b. Data c. Theories d. Inferences
6. The practical use of scientific knowledge is called ____.
a. research b. inferring c. procedure d. technology
7. A ____ is an explanation of observations that have been tested many times.
a. conclusion b. hypothesis c. theory d. record
8. A(n) ____ is a suggested solution to a scientific problem.
a. observation b. hypothesis c. problem d. procedure
9. Instruments and our senses are used to make ____ during an experiment.
a. observations b. hypotheses c. problems d. controls
10. A(n) ____ is performed under carefully controlled conditions to test a hypothesis.
a. activity b. observation c. inference d. experiment
11. A scientific ____ describes how nature works.
a. record b. law c. hypothesis d. result
12. To be accepted, a scientific discovery must produce ____ each time it is tested.
a. the same results b. the same hypothesis c. new conclusions d. new data
13. If after numerous tests a major hypothesis cannot be shown to be false, it may be accepted as ____.
a. a control b. a theory c. data d. an observation
14. New observations that do not agree with an accepted theory may cause the theory to be ____.
a. explained b. rejected c. proven d. recognized

SELF QUIZ . . . CONTINUED

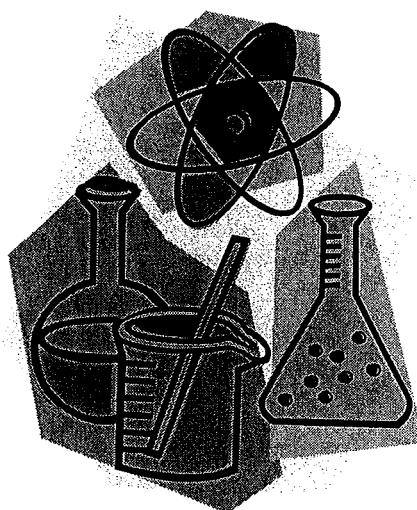
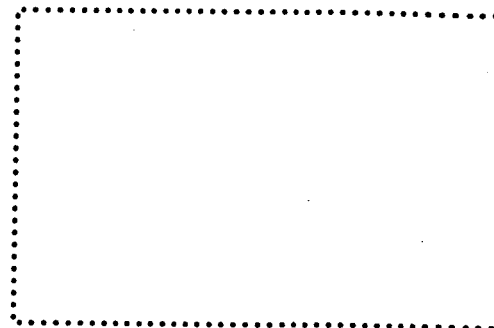
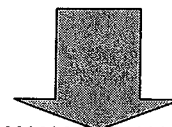
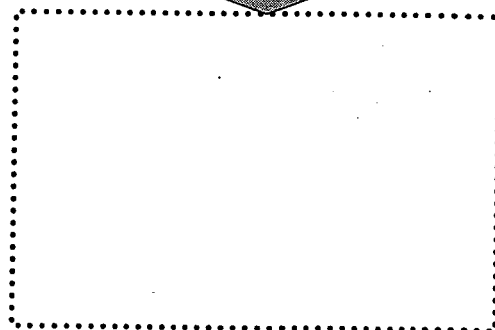
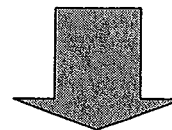
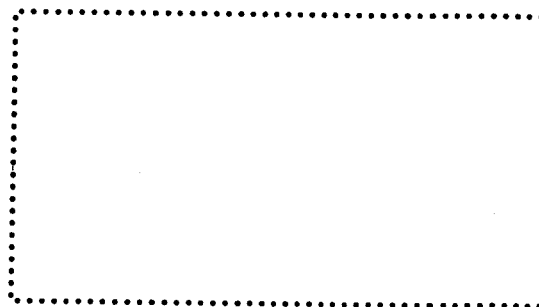
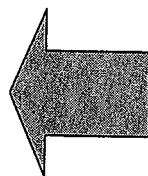
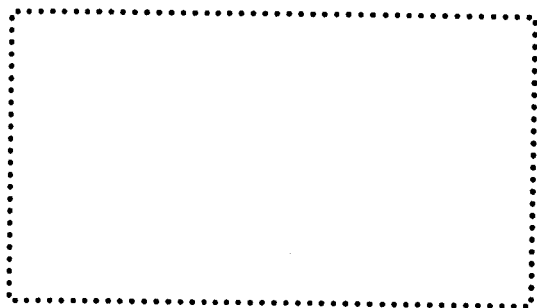
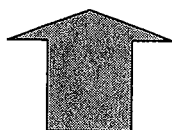
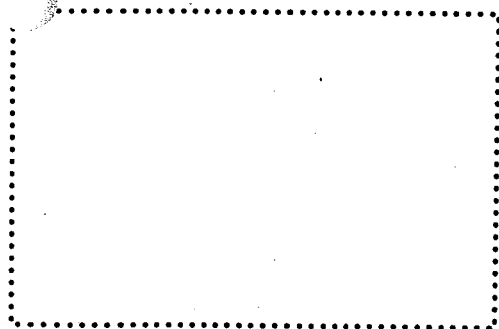
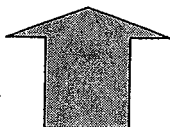
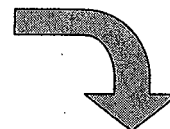
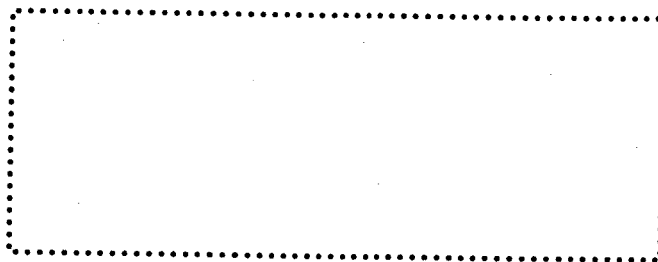
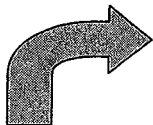
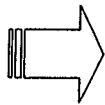
Name _____

15. A ____ is a logical explanation to a problem based on observation.
a. control b. theory c. conclusion d. procedure
16. The commonly used unit in the measurement of temperature in the Biology laboratory is the ____ .
a. Kelvin b. Celsius c. Fahrenheit d. boiling point
17. The ____ is the unit of time in the SI system.
a. day b. second c. minute d. hour
18. A ____ is a fixed quantity used for comparison.
a. procedure b. variable c. standard d. prefix
19. The unit of mass commonly used in the laboratory is the ____ .
a. meter b. cubic meter c. gram d. kilometer
20. The space occupied by an object is its ____ .
a. volume b. height c. width d. length
21. The amount of matter in an object is its ____ .
a. mass b. volume c. size d. balance
22. A scale commonly used by scientists for measuring temperature is the ____ scale.
a. degree b. Celsius c. boiling point d. Fahrenheit
23. There are ____ in one kilogram.
a. 0.001 grams b. 1000 milligrams c. 0.001 milligrams d. 1000 grams
24. Standards are important for comparing observations and are used ____ .
a. by everyone c. only for counting things
b. only in tropical rainforests d. only in scientific experiments
25. One-hundredth of a meter is written as a ____ .
a. decimeter b. millimeter c. centimeter d. kilometer
26. How many millimeters make a centimeter?
a. 100 b. 10 c. 1000 d. 0.10
27. A prefix meaning one thousand standard units is ____ .
a. milli- b. centi- c. kilo- d. deci-
28. On the Celsius scale, water boils at what temperature?
a. 32 degrees b. 212 degrees c. 0 degrees d. 100 degrees
29. 50 cc of water would equal which quantity?
a. 5000 mL b. 500 mL c. 50 mL d. 0.5 L
30. Which of the following units would we use to measure the distance to Australia?
a. millimeters b. centimeters c. kilometers d. kilograms

The Scientific Method

Observation is the first step in identifying an occurrence or a “problem” you wish to investigate.

START



Observation Activity:

Directions: Make some OBSERVATIONS about the following situations.

Example 1:

Now, draw some conclusions based on your observations:

Example 2:

Now, draw some conclusions based on your observations:

Example 3:

Now, draw some conclusions based on your observations:

Define *observation*:

Define *inference*:

Once your hypothesis is supported by a lot of evidence, we call it a:

A *scientific law* _____

Ex.) _____

Graphing

Independent variable= _____

Dependent variable= _____

*Dependent variable may change as the Independent variable changes!

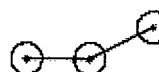
Graphing Practice

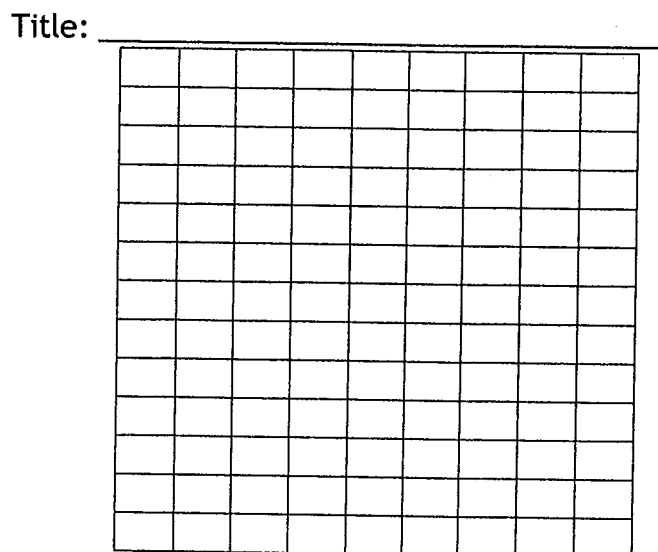
The average amount of carbon dioxide gas produced by yeast after 30 minutes at various temperatures. The chart displays the data collected.

Group #	Temperature (Degrees Celsius)	Volume (mL)
1	5	0
2	20	5
3	40	12
4	60	6
5	80	3

Directions:

- 1.) Give an appropriate title for your graph.
- 2.) Label the x and y axes.
- 3.) Determine an appropriate scale to plot your data.
- 4.) Plot the data points. Surround each point with a small circle and connect the points.

Example: 



Name: _____
Class: _____

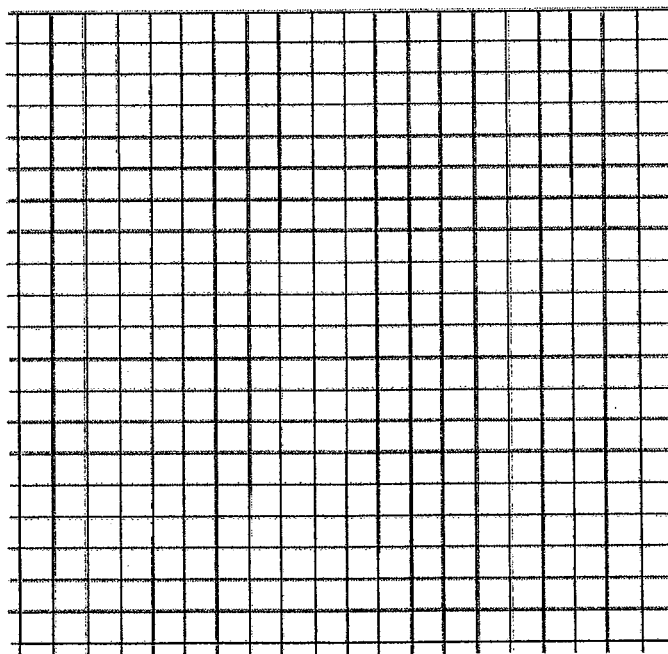
Graphing Practice

1. A clam farmer has been keeping records concerning the water temperature and the number of clams developing from fertilized eggs. The data is recorded below.

Data Table

Water Temperature in °C	Number of developing clams
15	75
20	90
25	120
30	140
35	75
40	40
45	15
50	0

2. *Directions:* Using the information in the data table, construct a line graph on the grid *below*. Remember to use all your Graphing Rules!!!



3. What is the dependent variable? _____
4. What is the independent variable? _____
5. What is the optimum temperature for clam development? _____

Base your answers to questions 6 through 9 on the information and data table below and on your knowledge of biology.

A number of bean seeds planted at the same time produced plants that were later divided into two groups, *A* and *B*. Each plant in group *A* was treated with the same concentration of gibberellic acid (a plant hormone). The plants in group *B* were not treated with gibberellic acid. All other growth conditions were kept constant. The height of each plant was measured on 5 consecutive days, and the average height of each group was recorded in the data table below.

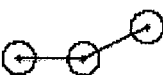
Data Table

	Average Plant Height (cm)				
	Day 1	Day 2	Day 3	Day 4	Day 5
Group A	5	7	10	13	15
Group B	5	6	6.5	7	7.5

Directions (6–8): Using the information in the data table, construct a line graph on the grid on the next page, following the directions below.

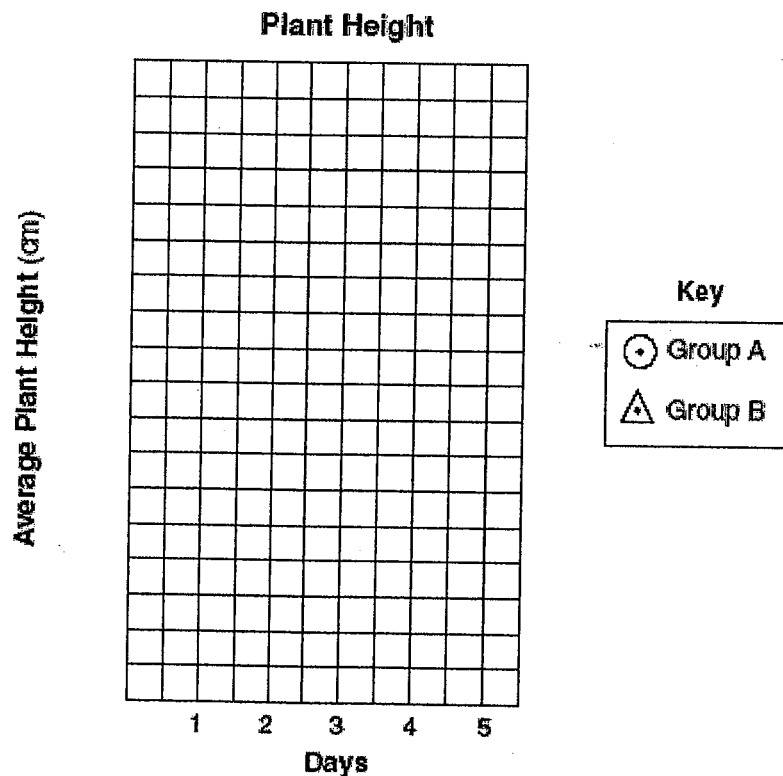
6 Mark an appropriate scale on the axis labeled “Average Plant Height (cm).” [1]

7 Plot the data for the average height of the plants in group *A*. Surround each point with a small circle and connect the points. [1]

Example: 

8 Plot the data for the average height of the plants in group *B*. Surround each point with a small triangle and connect the points. [1]

Example: 



9 What is the dependent variable? _____

10 What is the independent variable? _____

9 State a valid conclusion that can be drawn concerning the effect of gibberellic acid on bean plant growth. [1]

Name: _____

Directions: Answer the following questions by reading each paragraph.

Identify the Controls and Variables



Smithers thinks that a special juice will increase the productivity of workers. He creates two groups of 10

workers each and assigns each group the same task (in this case, they're supposed to staple a set of papers). Group A is given the special juice to drink while they work. Group B is not given the special juice. After an hour, Smithers counts how many stacks of papers each group has made. Group A made 1,587 stacks, Group B made 2,113 stacks.

Identify the:

1. Control Group
2. Experimental Group
3. Independent Variable
4. Dependent Variable
5. What should Smithers' conclusion be?
6. How could this experiment be improved?



Homer notices that his shower is covered in a strange green slime. His friend Barney tells him that coconut juice will get rid of the green slime.

Homer decides to check this out by spraying half of the shower with coconut juice. He sprays the other half of the shower with water. After 3 days of "treatment" there is no change in the appearance of the green slime on either side of the shower.

7. What was the initial observation?

Identify the:

8. Control Group
9. Experimental Group
10. Independent Variable
11. Dependent Variable
10. What should Homer's conclusion be?



Bart believes that mice exposed to microwaves will become extra strong. He decides to perform this experiment by placing 10 mice in a

microwave for 10 seconds. He compared these 10 mice to another 10 mice that had not been exposed. His test consisted of a heavy block of wood that blocked the mouse food. He found that 9 out of 10 of the microwaved mice were able to push the block away. 3 out of 10 of the non-microwaved mice were able to do the same.

Identify the:

11. Control Group
12. Experimental Group
13. Independent Variable
14. Dependent Variable
15. What should Bart's conclusion be?
16. How could Bart's experiment be improved?



Krusty was told that a certain itching powder was the newest best thing on the market, it even claims to cause 50% longer lasting itches. Interested in this product, he buys the itching powder and compares it to his usual product. One test subject (A) is sprinkled with the original itching powder, and another test subject (B) was sprinkled with the Experimental itching powder. Subject A reported having itches for 30 minutes. Subject B reported to have itches for 45 minutes.

Identify the:

17. Control Group
18. Experimental Group
19. Independent Variable
20. Dependent Variable
21. Explain whether the data supports the advertisements claims about its product.

Living Environment
Independent vs. Dependent Variable

Name _____
Date _____

Define, in your own words, the following:

Independent Variable:

Dependent Variable:

A good experimental question often fits the following format:

How does X affect Y?

In that question, which variable does "X" represent? _____

Y? _____

Which variable should be plotted on the X axis? _____

Y axis? _____

Instructions: For each of the following experiments, identify the independent and dependent variable by labeling an "I" over the independent variable and a "D" over the dependent variable.

Next, write down the experiment in the question format, **how does X affect Y?**

Experiment 1:

A student is determining how plant growth will be affected by the hours of sunlight.

Question: _____

Experiment 2:

A pharmaceutical company is determining how different doses of their drug Zobadem will affect blood pressure.

Question: _____

Experiment 3:

A Brighton High School student wants to know if she can improve her mile time by doing daily leg squats.

Question: _____

Experiment 4:

Your neighbor wants to test if Miracle Grow actually improves the size of his hydrangea blooms.

Question:

Experiment 5: A young boy is wondering how many Legos he can add to his tower before it topples over.

Question:

Experiment 6: You write one

Question:

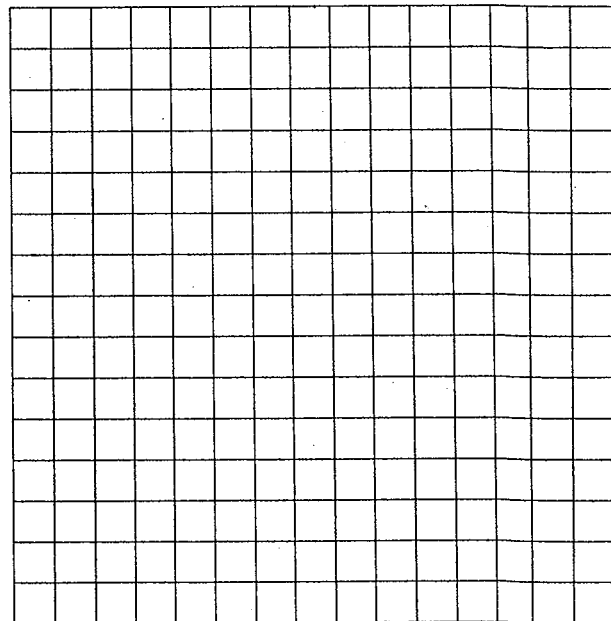
Now, using any of the experiments 1-5 create a data table with headings. Create your own data for at least 5 trials.

From your data, create an appropriate graph.

*Make sure to pick an appropriate scale, label both axes and give your graph a title!

DATA TABLE:

TITLE: _____



Living Environment Scientific Method

Name _____
Date _____

You are part of a research team working for the Federal Drug Administration (FDA). A drug manufacturer is suspected of making false claims about the effectiveness of a weight loss pill. Your job is to test the product to see if in fact the claims about weight loss are valid and can be supported by scientific evidence. In your plan, be sure to . . .

- ❑ State a hypothesis
- ❑ Describe an experimental group and a control group
- ❑ State the independent and dependent variables
- ❑ Describe the variables that must stay the same
- ❑ Describe data *that would support* your hypothesis

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

THE SCIENTIFIC METHOD

Name _____

Put the following steps of the scientific method in the proper order.

- _____ Organize and analyze data
- _____ State a hypothesis
- _____ Identify the problem
- _____ State conclusion
- _____ Design and carry out an experiment
- _____ Make observations and record data
- _____ Gather information

Match the term in Column I with its definition in Column II.

Column I

- 1. theory _____
- 2. law _____
- 3. hypothesis _____
- 4. experiment _____
- 5. variable _____
- 6. control _____
- 7. data _____
- 8. conclusion _____
- 9. application _____

Column II

- a. suggested explanation to a problem or observation based upon known information
- b. used to test a hypothesis
- c. anything that can affect the results of an experiment
- d. observations and measurements made during an experiment
- e. part within the experiment that is maintained without change in order to provide a comparison for the part of the experiment containing the variable
- f. hypothesis that has been tested and supported by a great amount of evidence over a long period of time
- g. statement describing (but not explaining) a natural event or phenomenon
- h. new use to which results are put or new technique developed
- i. a summary that explains whether or not the data support the hypothesis