BIOLOGY SUMMER PACKET

PLEASE COMPLETE THIS PACKET IN ITS ENTIRITY

Welcome to Biology! You will complete a challenging but worthwhile Biology course. While this class will be enjoyable, please be aware that this class will require studying every day, homework, and numerous out of class assignments. You will be expected to study and be prepared for class (and possibly a quiz) every day. I am looking forward to meeting you, and I hope that you are ready for an exciting school year. ****YOU WILL NEED A THREE INCH, THREE RING BINDER AND 5 TAB DIVIDERS FOR THIS CLASS. I WOULD RECOMMEND NOTEBOOK PAPER WITH REINFORCED HOLES. A LINED PAPER NOTEBOOK IS NOT ACCEPTABLE!!****

Mrs. Poppe (email me at jessicapoppe@choiceschools.com if you have questions about this packet)

Please fill out the following information:

Last Name:_____First:_____Middle: _____

Address: _____

City, State, Zip Code:_____

Home Phone #: _____

PARENT NAME	RELATIONSHIP TO STUDENT	WORK PHONE #	CELL PHONE #	EMAIL ADDRESS

What school did you attend for 8th grade? _____

What science course did you take in 8th grade? _____

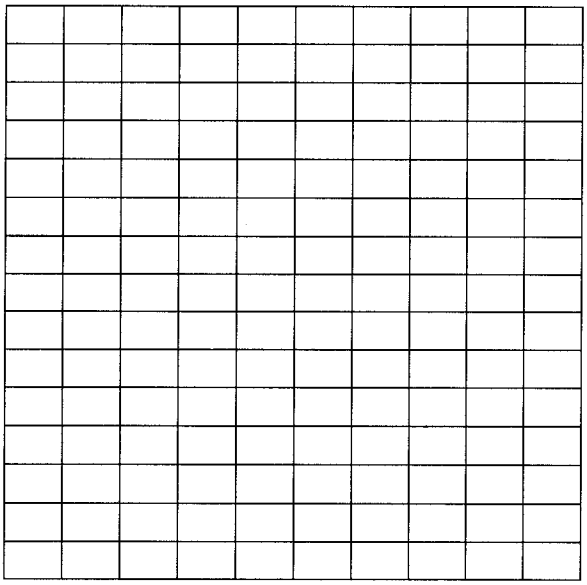
What was the grade that you received at the end of the year in your science class? _____

HOW TO CREATE A GOOD GRAPH (GRAPHING GUIDELINES):

1. Graphs need a title above the graph that summarizes the information that it is showing.
2. Both the X and Y axis need labeled (this means that you need to write what the numbers mean, for example: days, years, degrees Celcius, etc).
3. If you used any kind of symbol or colors then you have to include a key or legend to explain what they mean.
4. Your graph is designed to be visually pleasing and serve as a visual representation of numbers, so make it as large as possible (make it take up as much space as possible on the graph paper).
5. Again a graph is a visual representation of numbers so it needs to be very nice and neat (use rulers if need be).

1. Make a **line graph** for the set of Rainforest data below. The data reflects the amount of rainfall during a 10 hour period. Follow the graphing guidelines above.

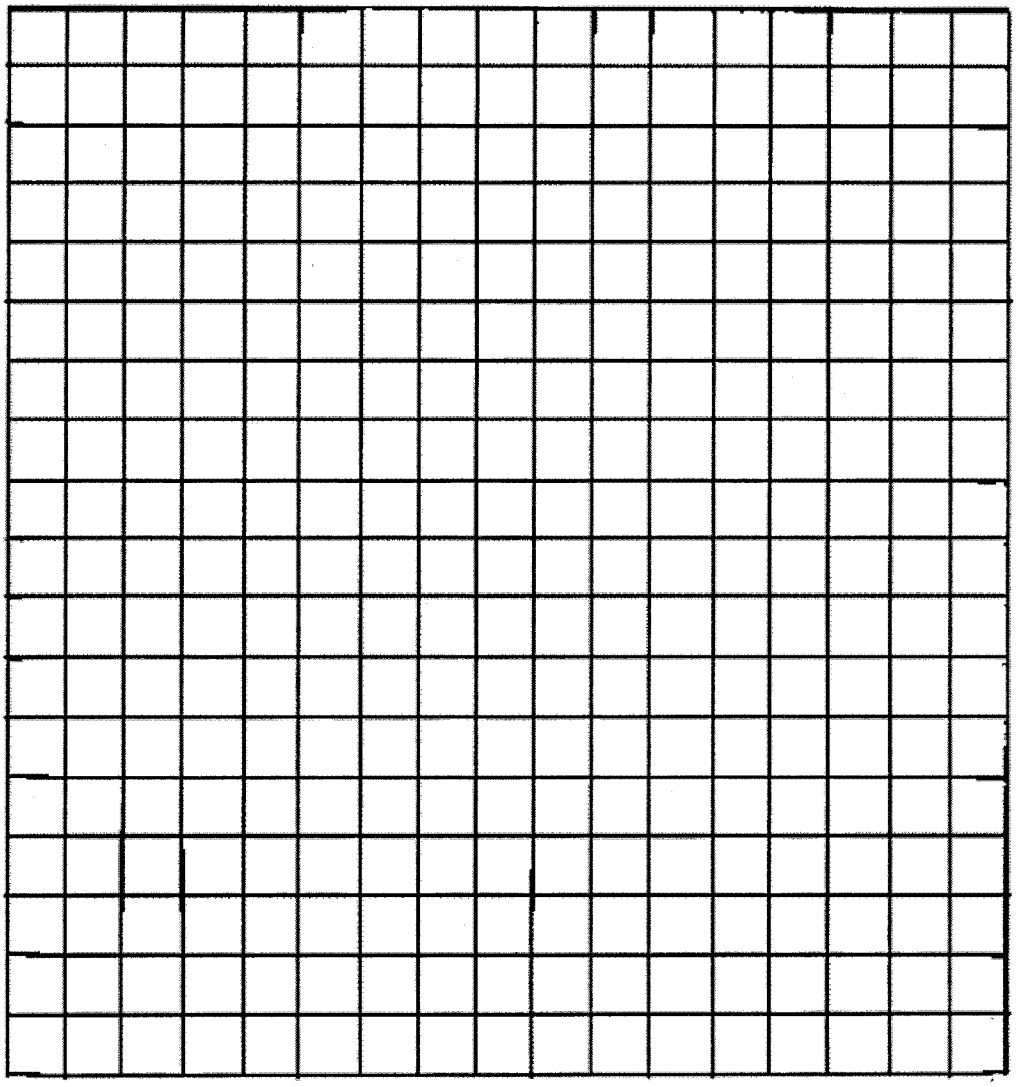
Rainfall (ml)	Time (hr)
2	1
1	2
3	3
5	4
6	5
2	6
13	7
1	8
2	9
4	10



2. Graph the data below. Make a double bar graph. Color code your bars and include a key for your graph. Be sure to follow the graphing guidelines.

Month	Mean Daily Max. Temp (°C)	Mean Daily Min. Temp (°C)
January	31.7	18.7
February	30.9	18.6
March	29.2	16.6
April	25.1	12.6
May	20.2	8.9
June	16.6	6.1
August	17.8	5.8
September	21.1	8.5
October	24.8	12.1
November	27.9	14.7
December	31.1	12.1

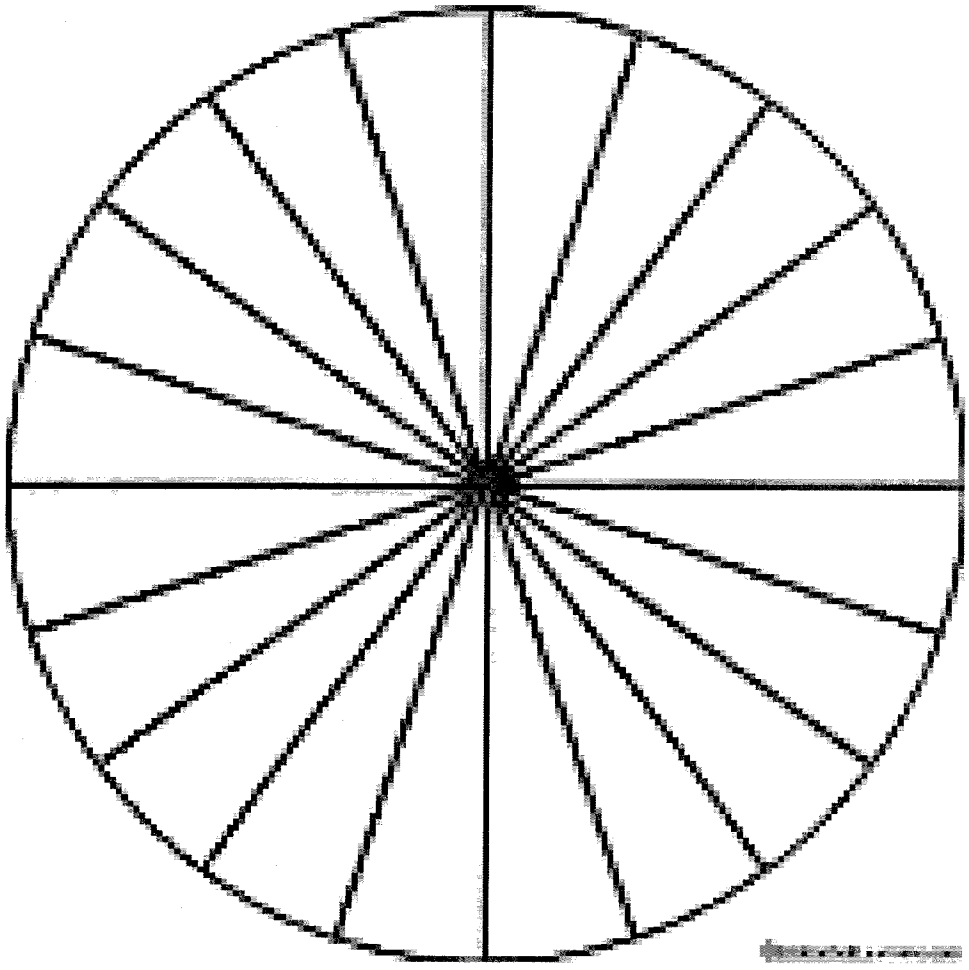
KEY:



3. A pie chart is used to show data that are pieces of a whole. All of the data needs to equal (or add up to) a whole (if data is in %, the it should all = 100%). Make a pie chart of the energy data below. Color code your pie chart pieces and include a key for your chart. Write the % for each pice piece on it. Each piece of the circle = 5%. Be sure to follow the graphing guidelines discussed earlier.

U.S. Energy Use in 1996

Petroleum	38%
Natural Gas	24%
Renewable	8%
Nuclear	8%
Coal	22%



KEY:

Science and the Scientific Method

Anyone who has ever read a mystery novel or seen a "whodunit" on TV has seen the scientific method in action. Anyone who has ever tried to figure out what happens to the refrigerator light when you close the door, or where that other sock goes after you put it in the drier, has used the scientific method. The scientific method is not a mystical, incomprehensible rite that only science nerds use to solve problems. Instead, it is a logical, organized method for identifying and researching a problem, and creating a strategy for solving it.

The scientific method is split up into five major steps:

1. Determining the problem or question.
    a. In this step, you (the researcher) must decide what it is that you will be studying. This sounds like a simple procedure, but it is actually very important. It identifies exactly what you wish to learn and it allows you to focus only on that material.
2. Development of a hypothesis.
    a. The hypothesis is not a just a random W.C.G (Wild Crazy Guess) to your problem. Instead, the hypothesis is an Educated Guess. In other words, it involves researching the problem and finding out what other people have learned, and using that information to help devise an answer. An important aspect of the hypothesis is that it should answer the original question, and it MUST be testable!
3. Design an experiment to test the hypothesis.
    a. Design an experiment whose results will either support or disprove your hypothesis. If your hypothesis is supported, then the results of your experiment will indicate that your hypothesis is correct. However, this does not mean that your hypothesis is 100%, beyond a shadow of a doubt, correct. There may be other factors that will influence the results that you haven't tested. Therefore, it is important to say that the hypothesis is supported; you should never say that it is proven! However, the results of your experiment can prove your hypothesis wrong!
    b. There should be at least two groups in your experiment. The first group is the **experimental group**. This group is the group that has the factor that is being tested (Experimental Variable). It is easy to identify the experimental variable, since it is usually stated in the hypothesis. The second group is the **control group**. The control group is identical to the experimental group in every way, except that they lack the experimental variable. (If there were other differences, then they would invalidate the results of the experiment.)
4. Conduct the experiment and collect the data.
    a. Run the experiment that you have so carefully constructed. In this step, you will be measuring the **dependent variable**. This variable is the thing that is being observed or measured. Any pieces of information that you collect regarding the dependent variable are called DATA.
5. Draw Conclusions from your data.
    a. Here, it is stated directly whether the hypothesis was supported or disproven.
    b. If your hypothesis is supported, it should be repeated, since one of the basic foundations of the scientific method is that it is repeatable. The more an experiment is repeated, the more valid the results are. However, if there is a hypothesis that is supported by many experiments and a lot of data, we call that hypothesis a **theory**.

c. The word theory is often misused in everyday language. Theory and hypothesis are **not** synonyms; a hypothesis is just an educated guess that perhaps has been supported once or twice by an experiment. A **theory** was once a hypothesis, but is now supported by a lot of data and is accepted as being correct, until new information is discovered to disprove it.

You are conducting an experiment to determine if increased ultraviolet radiation from the decrease in the ozone layer is killing off frog tadpoles. After examining all of the data available in the library, you decide to go with a hypothesis that increased ultraviolet radiation from the sun is killing off the tadpoles.

You design an experiment with a control and an experimental group. Group 1 involves 100 tadpoles in a five gallon container of water, which is covered by glass (knowing that the glass will filter out the ultraviolet radiation). Group 2 will be set up exactly like group 1, except that instead of being covered with glass, it is covered with an acrylic plexiglass, which will not filter out the U.V. radiation. You then place the groups outside for a period of a month, and observe the results.

Results

	Group 1	**Group 2**
Number of tadpoles started with	100	100
Number of tad poles finished with	96	96

4. Using this information, answer the following questions.

A. What is the experimental variable and what is the dependant variable?

B. Does the information from this experiment support the hypothesis?

C. If no, then what might be causing the decrease in frog populations?

D. Which is the control group, and which is the experimental group?

E. What is the difference between the two groups? Should they be different in any other way?

Simpsons Experimental Design

Smithers thinks that a special juice will increase the productivity of workers. He creates two groups of 50 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. Independent Variable

3. Dependent Variable

4. What should Smithers' conclusion be?

5. 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 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.

6. What was the initial observation?

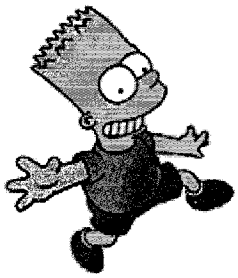
Identify the-

7. Control Group

8. Independent Variable

9. Dependent Variable

10. What should Homer's conclusion be?



Bart believes that mice exposed to microwaves will become extra strong (maybe he's been reading too much Radioactive Man). 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 8 out of 10 of the microwaved mice were able to push the block away. 7 out of 10 of the non-microwaved mice were able to do the same.

Identify the-

11. Control Group

12. Independent Variable

13. Dependent Variable

14. What should Bart's conclusion be?

15. 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.

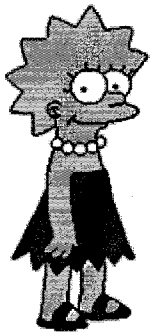
Identify the-

16. Control Group

17. Independent Variable

18. Dependent Variable

19. Explain whether the data supports the advertisements claims about its product.



Lisa is working on a science project. Her task is to answer the question: "Does Rogooti (which is a commercial hair product) affect the speed of hair growth". Her family is willing to volunteer for the experiment.

20. Describe how Lisa would perform this experiment. Identify the control group, and the independent and dependent variables in your description.