Canon Paleo Curriculum
Unit: The Nature of Science
Lesson Plan 10
Qualitative/Quantitative

Activity Name: Cookie Lab

Supplies:
3 different types of store-bought chocolate chip cookies, enough for each student
Sheets of paper with A, B, and C written at the top.
Scales for weighing cookies
Ruler for measuring
Calculators for math problems
“Cookie Lab” handouts

Preparation
Having supplies ready
Have students do “Qualitative Vs. Quantitative” and “Observation and Inference” Work Sheet
Provide rulers, worksheets, calculators, and scales

Concept:
Students will determine which cookie is best quantitatively and qualitatively.

Activity:
Pass out the activity sheets
Pass out cookies
Have students follow the handout
propose a hypothesis
do qualitative and quantitative data

Conclusions:
Students learn to assess how these two types of data that assist researchers when they test a hypothesis.

Time: 1 hour to 1 ½ hour.

NAME- _____

DATE _____

PERIOD _____

COOKIE LAB-USING THE SCIENTIFIC METHOD

INTRODUCTION:

Often two types of data can be collected from an experiment. Quantitative data is information that can be accurately measured and recorded. Qualitative data is information that requires judgment on the part of the researcher. In this lab you will be asked to take both quantitative and qualitative data.

I. PROBLEM

1. Which brand of cookie is the least expensive?
2. Which brand of cookie is the best tasting?
3. Which brand of cookie has the best appearances

II. FACTS

Brand Number of Cookies per Bag A B C Cost

III. FORMING HYPOTHESIS-Form a hypothesis about each of the problems given in Step I .

1. _____

2. _____

3. _____

IV. EXPERIMENT

Part A: Each group of three students should have nine cookies (three of each brand). Place the three cookies of each brand on a labeled sheet of paper so you will not mix them up. The members of your group should take turns weighing each cookie and recording its mass on the table labeled Part A: Quantitative Data.

Part B: Take one cookie of each brand and as a group record the qualitative data for the three brands of cookies. Rate the cookies on a scale from I to 3, 1 being the worst and 3 being the most desirable for each quality.

V. RESULTS

Part A. Quantitative Data

Brand	Mass			Average Mass	Mass of Bag
	1	2	3		
A					
B					
C					

Part B: Qualitative Data

Brand	Texture	# of chips	Crispiness	Color	Mass	Size	Taste	Total
A								
B								
C								

VI. CONCLUSION

1. Now that you know the mass and cost of each bag of cookies,

   determine which brand was the least expensive.

2. Look back to your original hypotheses.

   Which hypotheses are supported by your data? _____

   Which hypotheses are refuted by your data? _____

3. Which brand of cookie is the best tasting? _____

4. Which brand of cookie has the best appearance? _____

5. Compare your results with other groups. Are the results alike? _____

6. Which data, qualitative or quantitative, is most consistent with the rest of the class?

   _____

7. Which type of data would you expert to be most accurate? Why? _____

   _____

   _____

COOKIE LAB – Key for Teachers

This lab will very from group to groups. After lab is complete have class come back together as a group and develop the data collected for the best conclusion. Grades should be based on thorough collection of data and the conclusions reached by individual groups.

General Biology Unit Exam -- KEY FOR TEACHERS

Name _____

Date _____

Period _____

Write the letter of the term or phrase that correctly completes the statement.

_B__ 1. The recorded measurements taken during an experiment are:
(a) conclusions (b) data (c)variables (d) controls.

_D__ 2. A statement that explains an observations is called the
(a) experiment (b) observation (c) variable (d) hypothesis

_B__ 3. Changes that occur during an experiment are compared with an unchanged group called the:
(a) variable (b) control (c) hypothesis (d) conclusion

_B__ 4. Testing the hypothesis is called:
(a) a conclusion (b) an experiment (c) a theory (d) a law

_D__ 5. At the end of an experiment, a scientist forms a(n):
(a) problem (b) hypothesis (c) observation (d) conclusion

Each sentence below describes a step of the scientific method. Match each sentence with a step of the scientific method listed below.

A. recognize a problem
B. form a hypothesis
C. test the hypothesis with an experiment
D. draw conclusions

_A__ 6. Grant wondered if dyes could be taken out of leaves, flowers, and stems of plants.

_C__ 7. Tiffney soaked six different kinds of seeds in water for 24 hours. Then she planted the seeds in soil at a depth of I cnL She used the same amount of water, light, and heat for each kind of seed.

_A__ 8. Ty read about growing plants in water. He wanted to know how plants could grow without soil

_B__ 9. Angela said," If I grow five seedlings in red light, I think the plants will grow faster than the five plants grown in white light."

_D__ I0. Doug fed different diets to three groups of guinea pigs. His experiment showed that guinea pigs need vitamin C and protein in their diets.

Multiple Choice: Write the letter of the phrase or term that correctly finishes the statement.

_A__ 11. The petrified trees at Florissant Fossil Beds are thought to be:
(a) sequoias (b) firs (c) beech (d) ponderosa pines

_D__ 12. The trees are thought to have become petrified as a result of-
(a) hot lava from volcanoes (b) old river deposits (c) Pikes Peak sediments (d) volcanic mudflows

_C__ 13. Dinosaur fossils are not found at Florissant Fossil Beds because:
(a) the climate was too cold (b) they were not in the area (e) they were already extinct (d) they did not get preserved

_C__ 14. Only the bases of the trees are petrified because:
(a) the tops had already rotted away (b) fire burned the tops off (c) that was the only part that got surrounded (d) the bases were stronger than the rest of the tree

_D__ 15. By studying the petrified trees, scientists have determined that:
(a) the climate was much different at one time than it is today (b) the rain was much greater than today (c) the trees were up to 500 years old based on tree ring studies (d) all of the above