Stupendous Stimulating Science Sampler Agenda

Presented by
Dr. Mary Hennenfent, Ed.D.

mary.hennenfent@fhsdschools.org

Portion Control

Center 3-Portion Size

1. In the bowls provided, place the amount of each food you would consider one serving.
2. Using the measuring cup for the cereal and counting the number of chips and cookies in the bowl, record what you considered a serving in your food journal.
3. Look at the food label to determine what the portion size is supposed to be and how many calories are in a portion.
4. Using the measuring cup for the cereal and counting the number of chips and cookies, measure out the actual serving size of each food, using new bowls.
5. Compare your original estimates to the actual serving size. Write the actual serving sizes in your food journal. Were your portions larger or smaller? How many calories would you have consumed in your portions? Why is knowledge about serving size so important?

1. Discuss with students how portion size is related to weight gain in our country. Describe the size of a portion of meat (3oz- credit card sized), a portion of most vegetables (1 cup) and fruits (varies with the fruit).

Ink Control

Instructional Materials

- Basket-style Coffee filters- eleven per student
- Sharpee markers in various colors-
  1 per student
- Compass- one per student
- Pencil
- Isopropyl alcohol in a dropper bottle or a container with a pipette

Background

Sharpee marker ink is not soluble (dissolves) in water, but it is soluble in alcohol.

A. Give each student a coffee filter and a Sharpee marker.

B. Have students fold the coffee filter in half and then in fourths. At the intersection of the two creases have each student make and color in a dot using a Sharpee marker.

C. Have each student predict how large of a circle the ink will make when it spreads. Instruct students to draw a pencil line with a compass to show predictions.

D. Have students place 5-10 drops of alcohol on the dot. Observe what happens.

E. Have each student design an inquiry experiment to determine how to get the largest circle of spreading ink that does not reach the edge of the bottom circle of coffee filter. They will each have ten trials to get the desired result. Instruct students that they may choose the size of the ink spot and the number of drops of alcohol they will use. Students should write their recipe on the data sheet and then experiment. Based on their observations, students should continue to manipulate the variables to get their best attempt.

F. Allow time (10 -15 minutes) for students to conduct their experiments and collect data.

Closure

Have each student display his/her most successful attempt. Have the students that best achieved the goal of the inquiry explain which variables they changed and how they changed them.

Extensions

Allow students to develop other inquiry designs using other paper types and conduct the experiments to collect further data.

Assessment

Look at each student's experimental design and data to determine which thinking strategy they utilized to accomplish the task.

Penguin Adaptations

How small are penguin feathers?

1. Give each student a quarter page of one inch graph paper.
2. Tell each student to draw 70 overlapping feathers in one square of the paper. If the square becomes full before reaching 70, write the number of lines drawn in the square next to it and try again in a new square.

**Small stiff feathers of a penguin overlap each other to keep out cold wind and water. There is about 70 feathers oer square inch over the entire penguin's body.

Warmth from color

1. Have students describe the general appearance of color on the penguin.
2. Place two pieces of construction paper, one black and one white, on an overhead projector. Leave the projector on for at least 15 minutes.
3. Have the students place one hand on the black paper. Remove the hand. Have students then place the other hand on the white paper. ** Discuss how the temperature of each color felt. Explain to the students that penguins warm up by facing their black backs to the sun and cool off by placing their white fronts to the sun. Look at pictures of penguins or better yet go to the zoo to observe this adaptation.

Which keeps you warmer blubber or feathers?

1. Obtain a large tub of ice water.
2. Fill a plastic sandwich size zipper bag 2/3 full of shortening to simulate blubber. Place another empty sandwich zipper bag inside the bag of blubber and tape the top of the two bags together with duct tape. You are leaving the opening of the empty bag open, so you can put a hand in the bag insulated by blubber.
3. Fill a plastic sandwich size zipper bag 2/3 full of feathers. Place another empty sandwich zipper bag inside the bag of feathers and tape the top of the two bags together with duct tape. You are leaving the opening of the empty bag open, so you can put a hand in the bag insulated by feathers.

4. Place an empty sandwich zipper bag on a student's hand. Have him/her place just the fingers of the bag-covered hand in the ice water. Try not to get water inside the bag. You will have to show students how dip their fingers at a 90-degree angle in the water. **Discuss whether blubber or feathers kept your hand warmer. Discuss what might happen if penguins didn't have the protective layer of blubber.

Great Lengths

Materials:

Measure Up Bugs ISBN 1-58476-166-0
Plastic insects
Adding machine tape
Centimeter ruler
Meter stick
Graph paper
Lined paper and pencil
Great Lengths Data Sheet

Activities:

1. Introduce students to the metric system, meter, centimeter and millimeter. Explain how the system is based on tens.
2. Give each student a baggie with plastic insects. Have them measure the length of each insect in millimeters.
3. Have students choose one insect to focus on. Have students measure any three parts of the insect. (leg, antennae, eye) Write the measurements in the data sheet.
4. Have students measure the corresponding three parts on their bodies. This may require some adult help. Substitute ear length for antennae length. Write these measurements in the data sheet.
5. Measure out the same sizes of adding machine tape for the six measurements. Have the students determine how many of the insect's part will it take to measure the same length

as the corresponding part on them. Write this amount in the data sheet.

6. Have students graph their data (bar graph) to show a different way of comparing numbers.

Assessment:

Check graphs for accuracy against student data sheets

Button Bug Natural Selection

Natural Selection is a theory that states that organisms with traits (adaptations) that help them survive live to have babies, those that do not have traits (adaptations) that help them survive will not have babies and will die.

This simulation is a great way to show how adaptations help organisms survive.

Materials:

M&M candies of two colors - Holiday bags (2-3) work best. I used a Christmas bag for this activity.

Forest- A paper cup or plastic bag between 2-4 students provides a replenishing station for bugs at their desks or table.

After students graph the class data, discuss the trends shown in the graph. While every simulation is a little different, you should see a decline in red bugs and the green bugs increase in population. Once there are few red bugs left to eat, you should see the green bug population decline and the red bug population rebound.

Have students discuss how the predator (frog) is affected by these population shifts. Ask students what would cause a population to shift?

Button Bug Natural Selection – student page

Facts about Button Bugs:

1. Button bugs are the prey of the terrible button bug eating frog…YOU!
2. Red button bugs are yummy, show up easily and move slow so they are easy to catch. Green button bugs are not as tasty and move quickly so they are harder to catch.
3. You, the terrible button bug eating frog, prefer to eat the red button bugs. You eat ONLY red button bugs unless none are available. In that case, you resort to eating green button bugs to stay alive.
4. New button bugs are born each "generation". The birthrate equals the death rate. You will simulate birth by getting spare bugs selected randomly.

Procedure:

1. Get a random population of 10 button bugs from the "forest".
2. Count the green button bugs and the red button bugs and record the numbers in the data chart under generation #1.
3. Eat three red button bugs. If you do not have three red bugs, fill in the missing number by eating green bugs.
4. Add three bugs from the forest. (One bug for each bug that dies.) Choose the bugs randomly.
5. Record the number of green bugs and red bugs you now have under generation #2.
6. Eat three red button bugs. If you do not have three red bugs, fill in the missing number by eating green bugs.
7. Add three bugs from the forest. (One bug for each bug that dies.) Choose the bugs randomly.
8. Record the number of green bugs and red bugs you now have under generation #3.
9. Repeat steps 6-8 twice to have data for 5 generations.

Data Chart **Name : _____**

Generation	Green Button Bugs	Red Button Bugs
1		
2		
3		
4		
5		

Place your data in a class data chart provided by your teacher.

Graph the class data. Give the graph an appropriate title. Label the X axis Generations and the Y axis Number of Button Bugs. Make a legend that indicates the two colors you will use for the data of the two types of bugs.