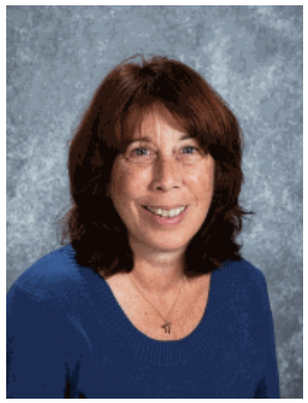
LET'S DO IT!



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Teacher Edition

Science Is A Verb!

Part 2

Teacher Edition

Contents

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Introduction to the lab manual:

This lab manual provides structure for teachers who wish to engage students in hands-on interactive learning but also provides support for teachers who are more comfortable with enquiry based learning. If you are a teacher who is taking his or her first "dive" into hands-on Science, the background material is designed to provide enough structure to help support the organisation of the lab and its materials. Most of the materials are commonly found in local supermarkets and department stores at a nominal cost. A few materials, like scales and hand microscopes can be found on-line. The lab sheets can be given to students so they follow step-by-step, or they can be told a general structure to follow.

The critical portion of any lab is to have a thorough discussion of the results and their thinking after the experiment is completed. It is suggested that you take as much time as the experiment to have this discussion with students. The real learning occurs not from the hands-on experiment, but from a deep discussion of the experiment, while making connections to the concept they are learning. For this reason, it is suggested that the students do the experiment FIRST and then have the students learn the concepts. They will have a better understanding of the concept if they first conduct an experiment, gain the experience and then discuss a new concept.

Even without a strong Science background, get into the habit of asking questions. The process of asking questions and being inquisitive will generate more excitement for students and will engage them in a deeper way of learning Science. "I don't know" is as important to learning as having all the answers. Together you can learn Science and discover the major ideas that Scientists' research.

If you are an experienced teacher, the Teacher Guided Questions to Enquiry are designed to provide prompts for students. These questions are not intended to be assessment questions, but ones that will engage students in the general direction of the benchmark. The teacher may select one or two, but not all of them, to have students start on an open enquiry approach to learning. The students will engage in their own experiment, create their own procedures and make conclusions from their data. For this reason, there are no answers to those questions. They are open ended and can be used to formulate interesting experiments for advanced students. The slight variation in some of the questions in each of the labs is designed to provide a sufficient number of prompts at various levels of Bloom's Taxonomy to engage students.

Throughout the year, encourage questioning, student dialogue and the scientific process. There is no one exact scientific method as is often suggested. The process of learning about the world and universe, drawing conclusions from facts and building these facts into strong scientific theories is the work of Science. Science is always growing, stretching and expanding its knowledge base. It is about challenging well-supported ideas to discover weakness. This is exactly what students should be encouraged to do! And in the end, Science is not something to study, it is something to do!

Science is a VERB!

Note:
Many students may not be able to read or write in this grade. If this is the situation in your class then read the words to the students; they can answer and you can write the words onto the classroom board.

Science is a Verb

LIFE SCIENCES

How can we tell what an animal eats by looking at their teeth?

Description: Students will use inference skills to determine what animals eat from the shape of their teeth.

Student Materials (per group):

- M & M's
- Marshmallows
- Crackers
- Gummy bears or worms
- Fruit leather
- A piece of apple

Additional Teacher Materials:

- Model of human teeth (borrow from school nurse or dentist)
- An assortment of skulls
- Photos of different animals such as a shark, cat, bird, cow, squirrel
- Photos of the food the above animals eat

Background and Misconceptions:

Multi celled animals are either carnivores - meat eaters; herbivores - plant eaters; or omnivores - plant and animal eaters. Their teeth are structurally designed for the type of food they eat. There are 3 types of teeth - incisors, canines and molars/premolars. Incisors are the sharp flat front teeth that enable herbivores to cut and grab on to plant material, including fruits and vegetables. Incisors are also good for scraping food, such as scraping the flesh from inside an artichoke. Mice and other rodents have very large incisors to gnaw at seeds and beavers use their large incisors to cut down trees to use in building their nests. Carnivores use their incisors to bite into and cut meat. Canines are the long sharp teeth on either side of the incisors. Canines enable a predator to capture and kill their prey while some animals use them has a defense against predators. Some omnivores, such as bears and monkeys, use their canines to tear open trees and vegetation for access to insects, sap and water. Molars and premolars are used for chewing and grinding. Animals that eat their prey whole, such as alligators and dolphins, have molars that look like canines. These sharp teeth are used to capture and hold prey while it positions the prey to be swallowed.

Science is a Verb
Life Sciences:

Teacher Guided Questions to Enquiry:

Use these questions to get the students started on their own enquiry!

1. What kinds of teeth do humans have?
2. What kinds of teeth do meat-eating animals have?
3. What kinds of teeth do fruit or plant-eating animals have?

Additional Hints:

- When discussing types of teeth with students it helps when you begin using human teeth as the example, this connects students to the lesson. Try to get a set of molded teeth from your local dentist Dental Association so students can observe the different shapes and location of teeth. You can also provide students with a mirror so they can look at their own teeth.
- An assortment of skulls is useful for having students observe the different arrangement of teeth. Using the skulls probe students to infer what animal they could eat based on the shape of their teeth.
- Consider your school district's policy about providing food for students to eat. The fruit leather was suggested to represent meat since students often have to tear and pull it apart with their teeth. You may choose to use jerky and if you do there are vegetarian options available at your local natural food store. Be cautious of students at this age who may be losing their baby teeth. The list of food in the materials is a suggested list, they were chosen since they would best represent the type of work different teeth do.
- It is not necessary for students to be able to identify the types of teeth by name, only connect the structure of the teeth to the type of food the animal will eat.
- During the lesson provide each student with one piece of food. Ask them to eat the food and think about which teeth they used to either chew, cut, grind, or tear the food. As students chew each type of food, prompt them to describe which teeth they used and what the teeth did while eating it.
- When students are looking at skulls and images ask them to justify why they connected the type of teeth to the type of food the animal eats.

Science is a Verb
Life Sciences:

How can we tell what an animal eats by looking at their teeth?

TEACHER ANSWER KEY

Description: You will explore the type of teeth animals need to eat plants and other animals.

Materials: Food provided by your teacher

Procedures:

1. Your teacher will give you different types of food. Pay attention to the teeth you use and how the teeth work. Think about what your teeth do when you are eating. Do they cut, grind, chew or tear the food you are given.

For each food item, write the name of the food and circle what your teeth did:

Food Item				
1. _____	cut	grind	chew	tear
2. _____	cut	grind	chew	tear
3. _____	cut	grind	chew	tear

Science is a Verb
Life Sciences:

How can we tell what an animal eats by looking at their teeth?

2. Think about the food your teacher gave you, circle which food item is most like eating a plant?

Food item 1 Food item 2 Food item 3

3. Circle which food item you think is most like eating meat?

Food item 1 Food item 2 Food item 3

4. Draw the type of teeth you think a plant eating animal has.

5. Draw the type of teeth you think a meat eating animal has.

How can we tell what an animal eats by looking at their teeth?

6. Look at the picture of the lion's teeth. What does the lion eat? Circle whether it eats plants or animals.

Plants Animals

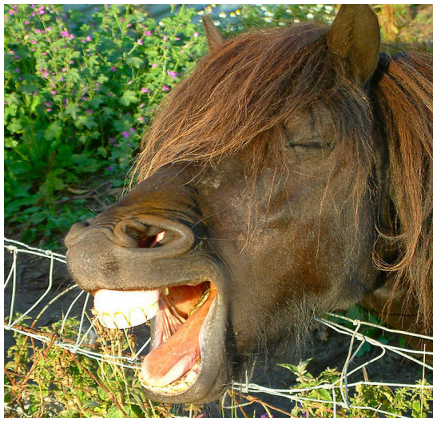
7. Look at the picture of the beaver's teeth. What does the beaver eat? Circle whether it eats plants or animals.

Plants Animals

Science is a Verb
Life Sciences:

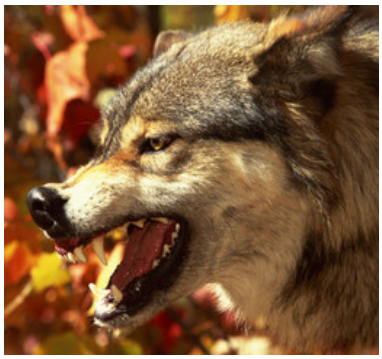
How can we tell what an animal eats by looking at their teeth?

8. Look at the picture of the pony's teeth. What does the pony eat? Circle whether it eats plants or animals.



Plants Animals

9. Look at the picture of the wolf's teeth. What does the wolf eat? Circle whether it eats plants or animals.



Plants Animals