



Education Dept.
Georgia Aquarium
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Snack Attack

Teachers' Guide

Grades 3rd -5th

Program Description:

Come explore predator-prey relationships in the ocean and investigate the importance of this balance in a community. Discover how some of our amazing animals catch their meals - and how they keep from becoming a meal for something else!

Enduring Understandings for Snack Attack:

- All organisms have adaptations that allow them to survive in their natural habitats.
- All organisms in an ecosystem are connected as part of a food web.
- Humans play an important role in maintaining healthy ecosystems and balancing natural processes.

Objectives:

- Students will classify organisms according to their physical characteristics.
- Students will investigate the adaptations that allow an animal to survive successfully in its habitat.
- Students will understand the roles of both predators and prey in a food web and the interdependence of all organisms in an ecosystem.
- Students will know and discuss how humans play an important role in maintaining healthy aquatic ecosystems.

Georgia Performance Standards Addressed:

Third Grade

S3CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Observe and describe how parts influence one another in things with many parts.
- b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world.

S3L1. Students will investigate the habitats of different organisms and the dependence of organisms on their habitat.

- d. Explain what will happen to an organism if the habitat is changed.



- S3L2. Students will recognize the effects of pollution and humans on the environment.
- a. Explain the effects of pollution (such as littering) to the habitats of plants and animals.
 - b. Identify ways to protect the environment.
 - Conservation of resources
 - Recycling of materials

Fourth Grade

S4CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Observe and describe how parts influence one another in things with many parts.
- b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world. Identify ways in which the representations do not match their original counterparts.

S4L1. Students will describe the roles of organisms and the flow of energy within an ecosystem.

- a. Identify the roles of producers, consumers, and decomposers in a community.
- b. Demonstrate the flow of energy through a food web/ food chain beginning with sunlight and including producers, consumers, and decomposers.
- c. Predict how changes in the environment would affect a community (ecosystem) of organisms.
- d. Predict effects on a population if some of the plants or animals in the community are scarce or if there are too many.

S4L2. Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation), and external features (camouflage and protection).

- a. Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (for example: camouflage, use of hibernation, protection, etc.).

ELA4LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions. The student

- b. Asks relevant questions.
- c. Responds to questions with appropriate information.
- f. Displays appropriate turn-taking behaviors.
- i. Responds appropriately to comments and questions.
- j. Volunteers contributions and responds when directly solicited by teacher or discussion leader.

Fifth Grade

S5CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Observe and describe how parts influence one another in things with many parts.
- b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world. Identify ways in which the representations do not match their original counterparts.

S5L1. Students will classify organisms into groups and relate how they determined the groups with how and why scientists use classification.

- a. Demonstrate how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal).

ELA5LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions. The student

- b. Asks relevant questions.
- c. Responds to questions with appropriate information.
- f. Displays appropriate turn-taking behaviors.
- i. Responds appropriately to comments and questions.
- j. Volunteers contributions and responds when directly solicited by teacher or discussion leader.

Before coming to the aquarium, the student should:

Have a working knowledge of the following vocabulary:

- **Adaptation:** the changing over time of the structure, function, or behavior of an organism, which enables it to be better suited to its environment
- **Camouflage:** an animal's ability to blend in with their surroundings
- **Cartilage:** a firm, elastic substance found in the bodies of humans and other animals
- **Classification:** the grouping of organisms into categories on the basis of evolutionary or structural relationships between them
- **Conservation:** the use of natural resources in a way that ensures their continuing availability to future generations; the wise and intelligent use or protection of natural resources
- **Coral Reef:** type of marine habitat found mostly in tropical regions
- **Fish:** a cold-blooded aquatic vertebrate that has gills, varied fins, and scales
- **Freshwater:** of, relating to, living in, or consisting of water that is not salty
- **Gills:** the respiratory organ for aquatic animals that breathe water to obtain oxygen
- **Habitat:** the area where an organism or ecological community normally lives
- **Invertebrate:** lacking a backbone or spinal column
- **Pollution:** the contamination of soil, water, or the atmosphere by the release of harmful substances

- **Predator:** an organism that lives by preying on other organisms
- **Prey:** animals that are killed and eaten by other animals
- **Saltwater:** relating to, consisting of, or containing salt water
- **Vertebrate:** having a backbone or spinal column

Pre-visit activities:

1. Predators in Pursuit – Students will investigate predator-prey relationships and animal adaptations

Post-visit activities:

2. Spotless School – Students will participate in a school yard clean up and collect nonpoint source pollution.

Predators in Pursuit

(Adapted from the Savannah River Ecology Laboratory's "Be a Predator for a Day")

Objective: Students will investigate predator-prey relationships and gain an understanding of some of the adaptations that help animals survive.

Materials:

- Predator cards (one for each student) – hole-punched and laminated (or covered with plastic sheet protector)
 - Cards can be found online here:
- <http://www.uga.edu/srel/kidsdoscience/predator-prey/predator-cards.pdf>
- Prey cutouts
 - Templates for prey animals can be found online here:
- <http://www.uga.edu/srel/kidsdoscience/predator-prey/prey-templates.pdf>
- String or yarn for predator cards (so that students can wear them around their necks)
- Stickers (small colored dots) for students to mark prey animals that have been "killed"
 - If you plan to re-use the prey animals or to play more than one round, use small post-it notes instead of stickers for easy removal
- Data sheets (one for each student)
- Pen or pencil for each student

Vocabulary: predator, prey, adaptation, camouflage, food chain, food web

Background:

All animals have basic survival needs, one of which is food. Different animals, however, have adapted to many different food items and feeding styles. Among other things, some are grazers, some are filter feeders, some are scavengers, and some are predators. Within each of these categories, animals have developed a variety of behaviors and physical structures to go along with their particular feeding styles. For example, a humpback whale filters plankton from the water with baleen, attached to its jaw, while a whale shark catches the same food using special filters in their gills.

Predators also have adaptations which help them to catch prey, while prey animals have adaptations to keep them from being caught. Some examples of these adaptations are:

- Speed (gazelle, cheetah, or dolphin)
- Hearing (the ears of a deer or bat)

- Vision (eagles and other birds of prey)
- Camouflage – comes in many varieties. Some animals hide by blending in with the background (octopus), some have stripes or spots to disrupt their outlines (zebra), some mimic other animals or objects (katydid)

These adaptations help maintain the balance between predators and prey in an ecosystem. While it is important for predators to have prey to eat, it is also very important for prey populations to have predators. Without the checks provided by predators, populations can grow out of control until food resources are too scarce to support them.

During this activity, students will investigate some of the feeding relationships found in a typical woodland ecosystem, and will see firsthand how camouflage can help protect animals from predators.

Procedure:

1. Print out predator cards and laminate or put into plastic sheet protectors. Hole punch cards and tie yarn or string on so the students can wear them. Print out and cut out the prey animals. Some of these animals (about 1/3) should be brightly colored so that they will be easy to spot. The rest should be colored to match various backgrounds in the room so that they will be camouflaged and more difficult for the students to locate. Distribute prey animals around the room (use double-sided tape).
2. Introduce the terms **predator** and **prey** to the class. Ask the students to name some animals that are examples of each. Are some animals both predator and prey? Which one are we? Ask the students to name some characteristics that predators might have to help them catch prey, as well as characteristics that help prey animals keep from being caught. What do we call these traits? (**adaptations**).
3. Hand out predator cards, data sheets, pens and pencils, and stickers (each student will need at least 6 stickers). Students may also need a clipboard or book to press on for writing. Have the students look at their cards to see what animal they are and point out to them that each predator can only eat certain types of prey. Ask the students to check and see which type(s) of prey they can eat and have them circle those types at the top of their data sheet.
4. Give the students 5 minutes to search for prey in the room. When they find their prey, they “kill” it by marking it with a dot sticker. Before they continue to hunt, they will need to record on their data sheet the location and type of prey that they found. This simulates time taken by the animal to eat their prey before they resume hunting. Once a prey item has been marked, it is off-limits to all other predators and cannot be “eaten” again.
5. After 5 minutes, have the students sit down and finish their data sheets. They will need to add up the number of each type of prey item they caught. Once the students have finished adding, share the survival guide with them so they can check to see if they survived.

Discussion:

Ask the students, by show of hands, how many of them survived. Why is it harder for some animals to find food than others? What made some of the prey items easier to find? Or harder? Review **adaptations** and **camouflage**. What happens to the predators if they cannot capture enough prey? What happens to prey populations if predators disappear? Is it important to have both predators and prey in a community? Why?

Extensions:

1. Using the predator-prey relationships from the game, draw a food web on the board with the students' help. Also include other parts of the community, such as producers and decomposers.
2. Ask the students to think of ways that humans are connected to the food web. How do we impact the plants and animals in our community? What are some things we can do to make sure our impacts are positive instead of negative?

My Data Sheet

I am a PREDATOR: (circle one)

Hawk Alligator Kingsnake Praying Mantis Bobcat Bullfrog

My PREY are:

Snakes Frogs Mice Fish Insects Rabbits

I found these prey items:

	Location of Prey	Type of Prey
1		
2		
3		
4		
5		
6		
7		
8		

What I ate (data summary):

Prey Species:	Number That I Ate:
Snakes	
Frogs	
Mice	
Fish	
Insects	
Rabbits	

Predator Survival Guide (Prey items needed to survive):

Predator:	What it needs to eat:					
Hawk	2 snakes	OR	4 mice	OR	1 snake & 2 mice	
Alligator	4 fish	OR	3 frogs	OR	2 fish & 2 frogs	OR 3 fish & 1 frog
Kingsnake	2 snakes	OR	3 mice	OR	1 snake & 2 mice	
Praying Mantis	5 insects					
Bobcat	2 rabbits	OR	5 mice	OR	1 rabbit & 3 mice	
Bullfrog	2 frogs	OR	4 fish	OR	6 insects	OR
	1 frog & 2 fish		OR	1 frog & 3 insects		OR
	2 fish & 2 insects			OR	1 frog & 1 fish & 2 insects	

Source:

University of Georgia, Savannah River Ecology Laboratory. “Be a Predator for a Day”. 14 January 2004. 27 July 2009.

<http://www.uga.edu/srel/kidsdoscience/kidsdoscience-predator-game.htm>

Spotless School

Grade Level: 3rd – 5th

Duration: 45 minutes

Objective: Students will conduct a schoolyard clean-up gathering nonpoint source pollution.

Materials:

- Plastic bags
- Pencil
- Data sheet
- gloves

Background:

Pollution is an alteration of the physical, chemical, or biological properties of water by the introduction of any substance that renders the water harmful to use. There are two types of pollution: point source and nonpoint source pollution. *Point source pollution* occurs when pollutants are discharged from any identifiable point, such as factories and water treatment plants. They enter the water body usually through a pipe and are controlled by permits and the Clean Water Act. *Nonpoint source pollution* is contamination that does not originate from one specific location, and comes from everywhere. Nonpoint source pollution is commonly found on school grounds. This type of pollution often is carried across land by water when it rains and then dumped into bodies of water. All types of pollution can impact the health of fish and aquatic organisms. Schoolyard clean-ups are a great way to improve water quality by removing pollution that may end up in the nearest body of water.

Procedure:

1. Ask the students “What is pollution?”
2. Ask them for examples of pollution and write them on the board (if they don’t mention any point source pollution, add them to the list).
3. Ask students the difference between point source pollution and nonpoint source pollution. Help students categorize the list on board as either point source pollution or nonpoint source pollution.
4. Ask the students which type of pollution is the hardest to control? (nonpoint source pollution). Tell them point source pollution is controlled by permits and the Clean Water Act.
5. Divide students into teams of three or four and give them a bag, pencil, and a data sheet.
6. Conduct a school yard clean up. If you have access and permission, a waterway clean up can be done there as well.

7. Tell students one person on each team is responsible for recording the type of trash found on the data sheet as they walk around the school yard picking up trash.
8. Review safety rules.
9. Take the students around the school campus including the front entrance, playground and any other location that may have pollution.
10. After half an hour (or longer if you wish), gather all the plastic bags, and take them back to the classroom.
11. Have students tally their data sheet and analyze the data (Did they find more of one type of trash?).
12. Have students share how they feel after the activity, how they feel looking at the trash and what they can do to help reduce pollution.

Assessment:

- Have students brainstorm ways they can contribute to minimizing pollution on the school campus. Create a document and present it to the appropriate person on school staff.
- Students can create various types of graphs representing the data collected during the clean-up.
- Students can reflect on their clean-up activity by writing a journal entry.

Extension:

- Students will participate in a river clean-up with a local organization, such as “Rivers Alive” or “Keep Georgia Beautiful.”

Resources:

EPA. Polluted Runoff; 12/08/05; <<http://www.epa.gov/owow/nps/kids/>>.

The Earth Works Group. 1990. 50 Simple Things Kids Can Do To Save The Earth. New York, Scholastic, Inc.

Data Collection

Names: _____

Date: _____

Type of Pollution	Number
Bags	
Paper	
Balloons	
Plastic Bottles	
Glass Bottles	
Aluminum Cans	
Bottle Caps and Lids	
Clothing and Shoes	
Cups/Plates/Silverware	
Food Wrappers/Containers	
Straws	
Toys	
Styrofoam	
Other	

Most common item collected:

Most unusual item collected:

Did you enjoy cleaning up your school ground?

Number of bags collected as a class:

Three ways I can reduce pollution at school:

1. _____
2. _____

3.
