



Nature-Watch Activity Kit

Beat the Heat Neck Cooler

(Nature Watch Kit #159)

Kit Contents

<u>Item:</u>	<u>Kit Size</u>	
	25	100
Animal Print Bandanas	25	100
Cloth Bags	25	100
Bag of Poly Crystals	1	4
Plastic Teaspoon	5	10
Instructor Manual	1	1

This page includes the Next Generation Science Standards (NGSS) mapping for this kit and Science, Technology, Engineering, and Math (STEM) extensions (on back) to use in adapting and extending this activity to other subject areas.

**See Back for
STEM Extensions**

Next Generation Science Standards Alignment

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS3-1. Use a model to represent the relationship between the needs of different kinds of plants and animals (including humans) and the places they live.
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.
- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
- 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction plants and animals respectively.
- MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.
- HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

This Nature Watch Activity Kit contains an Instructor Manual and materials to implement the curriculum. The kit was designed to be used with adult supervision only. Unsupervised use is not recommended.

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STEM Extensions

Science

Feel the difference blubber can make for a polar bear, a dolphin, and other animals that have blubber. Prepare two buckets of ice water, making sure that the temperature in both is the same (you may need to add more ice to one if it is not). On one hand, wear a single Ziploc bag. On the other hand, wear a Ziploc bag apparatus that is made to resemble blubber – one Ziploc bag covered by a thick layer of vegetable shortening and placed inside another Ziploc bag, with the inner bag folded over and secured with duct tape to the outer bag. Place one hand in each bucket and have a classmate start a timer. Take each hand out of the ice water as soon as you feel the temperature of your hand change. Your classmate should record the time when you take each hand out. After everyone has a chance, discuss how the times were different for each hand and what it felt like to have a layer of blubber. Find out how blubber works to keep bodies warm.

There is great variation in the shape and size of bird beaks depending on the environment where the bird species lives, the type of food it eats, and other uses of its beak (such as digging or hunting). Beaks are adapted to these factors so the bird can best survive in its surroundings. Set up a bird buffet to test out different beak shapes on different shapes of foods. Try using macaroni, sunflower seeds, raisins, gummy worms, peanuts, fish-shaped candies, juice, or other foods that resemble things that birds eat. For beaks, choose utensils and tools that resemble bird beaks such as tongs (hornbill), a straw (hummingbird), a nutcracker (parrot), and a slotted spoon (flamingo). Look at pictures of birds to come up with more. Try picking up the various foods with the different kinds of beaks to see what works and what doesn't. How does this show you the way bird beaks function as adaptations in different environments?

Why are ducks constantly preening themselves? This helps them stay dry because as they preen they are spreading oil over their feathers. The oil is a water repellent. Try an experiment to see how this works. Cut out two feather shapes from a paper bag. Brush oil over one of the feathers. Then, use medicine droppers to add water onto each one. What happens to the water on each feather? What happens if you tip the feathers or turn them over?

Make cut-outs of small butterfly shapes on white paper. Color and decorate the butterfly shapes so that they can camouflage with various surfaces around the room. Tape them to these surfaces, then challenge your friends to find as many butterflies as they can.

Technology

Use a word processing or paint program on the computer to create a template for trading cards. Make animal adaptation trading cards with the name of the animal and a picture of it on one side, and a list of its adaptations on the other side. Use the cards to play trivia games with your classmates and to group the animals together based on similar characteristics.

Some animals have very interesting or even strange adaptations. Go online to learn about these (look up “animal adaptations” with key words like wacky, weird, and strange and you will come across a lot). Create a WebQuest challenging your classmates to find which animals have each of the adaptations. See how many they can discover in 15 minutes, then together learn more about each animal.

Engineering

In products that we produce, people often imitate the adaptations that help animals survive; this is called biomimicry. Think of snowshoes as similar to polar bear feet and flippers for swimming similar to seal and flippers. List as many products as you can think of that copy animal adaptations in some way.

Think about your top three favorite animals and their adaptations. Choose one adaptation from each animal and create and draw a new creature that has these adaptations. How does this combination of adaptations help your creature? What kind(s) of environment(s) can this creature live in?

Math

(Younger) Come up with a list of 10 animals that have teeth, and find out how many teeth each one has. What is the average? What is the highest number of teeth? Lowest? Group the animals into categories of similar numbers of teeth. What similarities do you see among the animals with similar numbers of teeth? What differences? How do teeth serve as adaptations for these animals?

(Older) Do a more extensive exploration of animal teeth. Find out how many teeth 50 different animals have. Group them into categories of animals with 0-10 teeth, 11-20 teeth, and so on. Plot the results on a bar graph that shows how many animals fall into each category. Try out different variations to get the most useful graph.