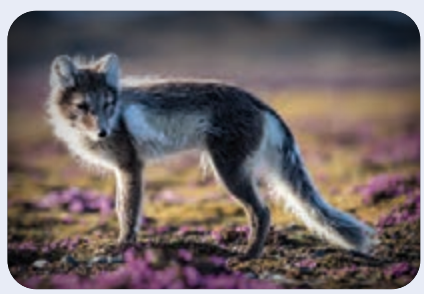
Activity 4

Analyze Like a Scientist

Types of Adaptations

Animals can be found from the coldest polar regions to the hottest deserts and the deepest oceans on our planet. An adaptation is a characteristic of an animal that helps the animal survive. An adaptation can be structural, a change to the animal's body, or behavioral, a change to the way a group of animals behaves or acts.

Read the text that follows, think about both the structural and behavioral adaptations described. **Circle** behavioral adaptations and **underline** the structural adaptations you find in the passages.



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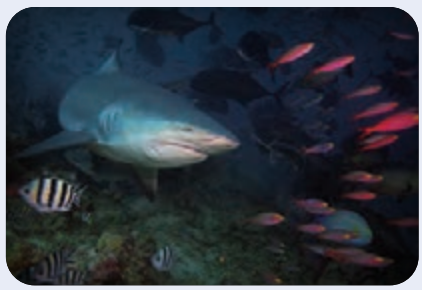
Fennec foxes and Arctic foxes both live in extreme climates. Fennec foxes have a tan-colored coat that provides camouflage in a sandy, rocky environment and protects them from the scorching hot sun. Fennec foxes, like dogs, also cool themselves by panting, taking up to 700 breaths per minute. Arctic foxes live in a different type of desert, a tundra. With temperatures as cold as 50 degree below zero (50º).C in the winter months, a thick fur coat helps them hunt even in deep snow. This coat is white during the winter but turns brown in summer when the snow melts, so they can sneak up on prey in any season. Extra-large ears allow heat to escape to cool fennec foxes, while short ears and legs help the Arctic fox stay warm. Both types of foxes also live in burrows. A burrow is an excellent place for the Arctic fox to stay warm at night and the fennec fox to stay cool during the day. Food can be hard to find at times in both the hot, dry desert and the cold tundra. Both foxes have learned to eat all kinds of food, including insects, fruit, plant roots, and even leftovers from another animal's prey.

Animals that are flexible about what they eat and where they hunt are well-adapted for survival. Bull sharks are special because they can **survive** in both salt water and fresh water, unlike other sharks. Since there are no other sharks in fresh water, bull sharks



have less competition for finding food. They can also sneak up on prey using a camouflage strategy called countershading. Bull sharks have a dark back and white belly. An animal swimming above in the ocean may not see the shark in the shadows. To an animal swimming underneath the shark and looking up, the bull shark may blend in with the bright light of the sun. These sharks sometimes hunt in the day as well as the night, allowing them to surprise their prey.

You have learned about unique survival strategies in some amazing animals. Scientists often classify information as they learn to understand similarities, differences, and patterns. Use the table to **classify** the structural and behavioral adaptations of these three animals.

Animal	Structural Adaptations	Behavioral Adaptations
Fennec Fox		
Arctic Fox		
Bull Shark		

What Are Some Examples of Adaptations in Animals and Plants?

Activity 5

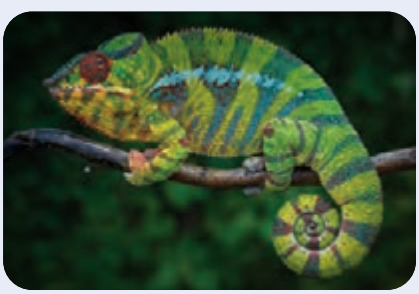
Observe Like a Scientist

The Panther Chameleon

The starred agama lizard you met earlier has adapted to survive in the very hot, dry desert. The panther chameleon is a lizard that lives in a very different environment: a tropical rainforest. Both lizards are reptiles. This means that their bodies are covered with scales. Reptiles are an ancient type of animal found around the world. Lizards in different environments have developed distinct adaptations.

Read the text that follows to learn more about the special adaptations of the panther chameleon.

The first thing you might notice about a panther chameleon is its brightly colored scales. Unlike the brown and yellow colors of the desert, the rainforest is filled with green leaves and colorful flowers in bloom. Multiple bright colors provide camouflage for the panther chameleon.



All day long, the chameleon is on the hunt. It holds tightly to branches and vines using V-shaped feet and a tail that can be used like a hand. The chameleon's eyes are especially helpful as it searches for insects. Can you look two different directions at the same time? Unlike human eyes, chameleon eyes face opposite directions and can move independently of each other. One eye can be searching for something to eat, while the other is on the lookout for danger in a totally different direction.

Life Skills **I can respect others' ideas.**

This adaptation This adaptation allows the panther chameleon to both find a meal and avoid becoming prey at the same time.

If the chameleon does find itself in danger, however, it has one last trick. Since this lizard does not have teeth or claws for defense, it tries to make itself look fierce. First, it puffs up its body with air. Then, it opens its mouth wide. It can also change the colors of its scales. This display will probably scare the attacker.

Photo Credit: Miriam82 / Shutterstock.com

How is the panther chameleon well-adapted for survival in the rainforest?
In the table, **record** the adaptations described in the passage. Then, **classify** each as structural or behavioral. **Describe** how each adaptation helps the chameleon survive.

Data Table: Evidence of Adaptations in Living organisms

Adaptation	Structural (S) or Behavioral (B)	How does the adaptation help the animal?

Activity 6

Analyze Like a Scientist

Plant Adaptations

You can find plants growing in almost every place that sunlight shines. Even the bottom of sea ice in polar regions has tiny plants growing on it. Like animals, plants have structural adaptations that help them survive and grow in different environments. Can plants also have behavioral adaptations? **Read** the passage that follows to find out.

Two Terrific Trees

Surviving on the Southern African savannah can be tough for many plants. The temperature in this grassland habitat is mild, but the lack of water is extreme. During the dry season, which lasts for half of the year, almost no rain falls. Due to these drought conditions, most large plants cannot grow there. If you stand on a hill and look over the savannah though, there is one large tree that can be seen scattered throughout the landscape.

This is an acacia tree. The acacia is able to survive through many months of drought. Tiny leaves growing on the top of this "umbrella" tree help hold in water while soaking up sunlight needed to make food. One very long root, a taproot, grows downward. This root searches for water as deep as 35 meters below the surface. Like a camel storing fat in its hump, the acacia tree stores water in its trunk.

Umbrella Acacia

Many plants in the savannah are eaten by animals for the water and nutrients they hold. Why is the acacia not one of them?

First, most animals (except the giraffe) cannot reach high enough to get a mouthful. Second, sharp spines guard the leaves from hungry mouths. When an animal begins eating the leaves of the acacia, the tree also begins to produce a poison that makes the leaves taste terrible. It then sends a smelly message in the wind to acacia trees nearby telling them to start making the same poison.

Across the Atlantic Ocean in the Amazon rainforest of Brazil, another umbrella-shaped tree rises above the landscape. In the overgrown rainforest, it is easy to find water but hard to reach sunlight. Growing up to 70 meters tall, the kapok emerges high above other trees. Above other treetops, leaves can get torn by the wind. Hand-shaped leaves with narrow parts allow wind to move more gently through the leaves. The kapok tree uses the wind to send a different type of message than the acacia tree. Instead of keeping animals away, the kapok invites bats to come visit its delicious-smelling flowers. The wind also carries the tree's fluffy yellow seeds across the forest.

Buttress Roots of the Kapok Tree

How does this extra tall tree stay upright in soggy soil? The kapok tree stays firmly rooted thanks to large, wide roots called buttress roots. Even though they are not planted deeply in the ground, the roots begin high up on its trunk, holding the tree securely in place. If you ever visit a rainforest, you can stand inside these roots—some of which can start up to 5 meters above ground.

Talk Together Did you read about any behavioral adaptations of the acacia or kapok trees? Do you think that plants can have behavior? Why or why not?