WEEKDAY WONDERS

Content developed by the Tennessee Aquarium Education Department

TENNESSEE AQUARIUM

Changing Ecosystems: Day 4

Weekday Wonders helps young scientists explore changes in ecosystems this week. They begin by thinking about what changes in their neighborhood. The scientists will dig deeper into how the places that animals live change, focusing on both land and water. Then they will consider how often ecosystems change, finishing the week learning about why diverse ecosystems are healthier ecosystems.

These curated activities are listed in a suggested sequence but may be done in the order that works best for you and your young scientists. Learn more about this series in the Introduction to Weekday Wonders.

Question of the Day

How often do ecosystems change?

Daily Nature Journal

Ask your young scientist to go to their nature journaling spot and write or draw an entry for the day. New to nature journaling? Check out the Guide to Nature Journaling to learn more about daily entries.

Your scientist should also add to the Week-long Drawing that he or she started in Monday's Weekday Wonders activities.

Changing Seasons

Have your young scientists think about how plants and animals change to survive in high and low temperatures as seasons change. Have them write about their ideas. Ask them to include any behaviors your young scientist observed in plants or animals as the season changed to spring.

Seasonal Survival

Ask your scientist to think about ways that ecosystems might change in different seasons. They might mention that it is colder in winter and hotter in summer, there is more snow in winter and rain in spring, or that the number of daylight hours changes throughout the year. Then have your young scientist name some ways they think animals might respond to the changes. This activity will help them consider how some animals respond.

Have your young scientist look at the descriptions on page 3. Then ask them to sort the responses into categories to show similar ways of responding to the change in seasons. They may sort the cards any way they choose, but they should make sure to have at least two animals in each category.

Once your scientist has had a chance to sort the descriptions, share with them that scientists look at a few categories when they think about how animals respond to the seasonal changes.

- Animals can move to a new location, called migration. The Sandhill Cranes, Monarch Butterflies, Humpback Whales, and Porcupine Caribou all migrate.
- Animals can also spend the cold seasons being mostly inactive, which is called hibernation. The Brown Bats, Groundhogs, and Box Turtles spend the winters hibernating.
- Still other animals experience physical changes to their bodies that help them survive the different seasons. These include Penguins, Red Wolves, and Darter fish.

If these categories are not the same as the ones that your young scientist chose, ask them if they can now sort the animals to fit these descriptions.

To extend this activity, ask your scientist to find pictures of each animal or of the animals they are most interested in. Alternately, you might have your scientist find two additional examples for each category.

Preparedness Scramble

So far in these activities the changes to ecosystem have been slow, such as the seasons changing. Ecosystems can change rapidly which affects plants and animals, including humans. In the same way that the animals in these activities have to respond to changes, humans must also be ready to respond to rapid changes. This movement activity will give young scientists a chance to think about these changes that happen quickly while also understanding how to respond to each.

In this scramble, you will call out events that will lead to a chance in the ecosystem. Scientists should respond by acting out what they should do if the event happens. For the first few, call out both the event and the response. Once your scientist starts to understand how to respond to each of the events, you can begin to just call out what is happening while they rush to "prepare." Use the following prompts.

- Fire: Drop and scoot along the floor on stomach
- Flood: Climb up on something to get to a higher point
- Earthquake: Take cover under a sturdy object
- Storm: Hold on to something stable
- Winter storm: Jump, run in place, or add clothes to stay warm
- Lightning: Crouch down in a small ball and put head down

Seasonal Survival Descriptions

Sandhill Cranes spend the winter in Texas, New Mexico, and northern Mexico. In spring, they fly north to breed during the summer months in Canada, Alaska, and Siberia.

Darter fish are brightly colored during their breeding season. The rest of the year they are colors like brown, olive green, and black.

In winter when there are few insects, **Brown Bats** stay in caves, mines, and other places rarely moving. Their heart rates slow to 10 beats per minute and they can go minutes without taking a breath.

Humpback Whales have feeding areas off the coast of Alaska and eastern Russia. In the mild summer season, there is plenty of food. These areas become too cold in winter and the whales travel to warm, tropical waters around Hawaii.

In September to October, **Monarch Butterflies** begin flying toward Mexico and some parts of southern California. In March, the next generation of butterflies begins traveling north toward southern Canada and the northeastern United States. It can take four generations of butterflies to complete the journey.

Penguins' feathers keep them warm and dry in cold water. Once a year, the penguins lose all their feathers, called a molt. It takes a few weeks and it cannot return to the water and eat until all of the feathers are replaced.

In winter, **Groundhogs** spend several days at a time asleep. Their temperature drops and they wake up briefly every three or four days, then go back to sleep.

As winter comes, **Red Wolves**' coats become thicker because of an undercoat. It keeps them warm in cold temperatures. In spring, the wolves begin to shed the undercoat to spend summer with a thinner, cooler coat.

Winters are cold for **Box Turtles** and there is not much food to eat. When it is too cold, they spend three to four months where there body processes are very slow and they do not need food. They do not move or open their eyes during this time so they must stay in a protected place.

Porcupine Caribou spend summers in a range between Alaska and Canada where they can find plenty of food. In the winters, they travel 400 miles to the Arctic to have calves.