



Great Basin Outdoor School

At-Home Activities for Kids

Bird Feeders and Clothespin Birds

Lesson Plan

Did you know birds are dinosaurs? Yep! Aves are the sole surviving lineage of the entire dinosaur family tree. The non-avian dinosaurs all got wiped out during the Cretaceous-Paleogene (K-Pg) extinction event 66 million years ago. This didn't just kill the dinosaurs - it was a mass extinction, which is a rapid and widespread decrease in the biodiversity on Earth. These may happen when a biosphere under long-term stress undergoes a short-term shock. The long-term stress associated with the K-Pg extinction may have included high levels of volcanism as well as sea level regression. The shock was an impact of a massive comet or asteroid 6 to 9 miles wide, which devastated the global environment, mainly through an extended winter (caused by dust, ash, and other material getting ejected into the atmosphere by the impact and blocking radiation from the sun) after the impact. The winter halted photosynthesis in plants and plankton. Since all species are connected via a food web, and food of almost any kind begins with plants, this ended up negatively affecting most species. We have evidence that this extinction occurred in the geologic record (the history of Earth recorded in the rocks that make up its crust, as seen by sections of different kinds of rock layers), which is true of all mass extinctions. In areas all around the world, rock layers from the time of the extinction contain a higher concentration (up to 160 times in some places!) of the element iridium than normal. Iridium is extremely rare on the Earth but very abundant in asteroids and comets. When the asteroid hit the Earth, iridium was ejected everywhere! The crater from this asteroid is located in Mexico.

Why some animals survive great environmental stressors and some go extinct has to do with adaptations and natural selection. When an organism adapts, it develops traits or skills that fit to the changing environment successfully. Natural selection is a process whereby species which have traits that enable them to adapt in an environment survive and reproduce, and then pass on their genes to the next generation. At the same time, some organisms may possess traits which cause them to fail to survive or multiply at a stable rate, and tend to be eliminated from the ecosystem. The current hypothesis for why birds survived the extinction that killed the dinosaurs is that the forests got destroyed during the extinction, killing tree-dwelling birds, but ground-dwelling birds survived by being fit to adapt to a treeless world. Once the forests were regrown, birds moved back into the trees and began flying again. Birds are characterized by feathers, toothless beaked jaws, the laying of hard-shelled eggs, a high metabolic rate, and a strong yet lightweight skeleton made of thin and hollow bones. They are also highly adapted for rapid digestion. All of these characteristics are great adaptations for the skill of flight, which itself is an adaptation for hunting, fleeing from predators, and more. Birds' diets are varied and often include nectar, fruit, plants, seeds, carrion, and various small animals, including other birds. These special adaptations have made birds an extremely successful class of animals for a very long time – beginning when they survived the extinction that killed the non-avian dinosaurs and 75% of all species on Earth!



Great Basin Outdoor School

At-Home Activities for Kids

Bird Feeders and Clothespin Birds

Lesson - Kids

Did you know that birds are dinosaurs? Yep! Birds are the only surviving group of the entire dinosaur family tree. The non-avian (not-bird) dinosaurs all got wiped out 66 million years ago. And it wasn't only the dinosaurs that got killed – the dinosaurs got killed as part of mass extinction (an *extinct* animal is one that doesn't exist anymore because they all of them died). A mass extinction is a very fast decrease in a large amount of life on Earth. Mass extinctions may happen when a biosphere (we categorize all things on Earth into “spheres”, and the biosphere is the category of all living things) is struggling due to a harsh environment, and then some big event happens which starts killing species. Around 66 million years ago, the dinosaurs were struggling because a ton of volcanoes kept erupting, and then a huge rock from space (called an *asteroid*) hit the Earth, causing a big explosion. After the explosion, it was winter for a very long time! The long winter happened because when the asteroid hit Earth, it ejected tons of dust and ash into the atmosphere, blocking the sun. When living things cannot see the sun, they may start to die. The sun is where plants get their food, through a process called *photosynthesis*. So, when the plants couldn't see the sun during this long winter, they started dying. Since all living things are connected in a big food web, and food of almost any kind begins with plants, this ended up hurting most species.

How do we know about this mass extinction? We have evidence that it occurred from rocks that are 66 million years old. In areas all around the world, rocks from 66 million years ago have this special material (which we call an *element*) called Iridium. There is barely any Iridium on Earth but tons of it in asteroids (those big rocks from space we talked about earlier). So, when that asteroid hit the Earth and exploded, Iridium was spread everywhere! Because we see so much Iridium in rocks from 66 million years ago, we can conclude that a big space rock hit the Earth at that time.

But not ALL the animals and plants on Earth went extinct. Some survived – like birds! Some animals can survive crazy things like volcanoes and asteroids because they have *adaptations* that help them when times get tough. Adaptations are qualities of an animal that can help it survive and be successful in new environments. Other animals, like dinosaurs, did not have those qualities, so they all eventually died.

Birds are characterized by special qualities like their feathers, toothless beaks, laying hard-shelled eggs, and a strong but lightweight skeleton made of thin and hollow bones. All of these characteristics are great adaptations for the skill of flight, which itself helps them hunt, flee from predators, and more. Birds eat nectar, fruit, plants, seeds, dead animals, and various small animals, including other birds! All of these special adaptations have made birds an very successful group of animals for a very long time – beginning when they survived the extinction that killed the not-bird dinosaurs and 75% of all of the species on Earth!

Great Basin Outdoor School

At-Home Activities for Kids

Bird Feeders and Clothespin Birds

Bird Feeders

Directions

1. Thread a string through the bare toilet paper roll and tie it to make a large loop to use to hang the bird feeder.
2. Give your kid a heaping spoonful of peanut butter. Have them cover the toilet paper roll completely with it.
3. Have them roll it in the tray of bird seed so that it is completely covered.
4. Your bird feeder is ready to be hung! Discuss the types of birds that live in your area and have the kids decide where exactly they want to hang the bird feeder, and *why* they think this would be the best place to attract birds!

Clothespin Birds

Directions

1. Paint the clothespin any color you'd like (here you can maybe talk about importance of an animal's coloring, e.g. camouflage).
2. Cut a beak out of construction paper (you can also make eyes this way).
3. Once dry, glue on the eyes and beak. The bird's head will be on the end that you squeeze, so that their feet can eventually be placed on some sort of perch.
3. Glue on feathers (talk about all of the amazing adaptations for flight that birds have!).
4. Continue decorating the birds any way that you like!

Materials

- String
- Scissors
- Bare toilet paper roll
- Peanut butter
- Spoon/knife
- Bird seed
- Tray



Materials

- Clothespins
- Feathers
- Googly eyes (optional)
- Construction paper
- Any other decorations
- Glue
- Scissors

Link for Bird Coloring Pages:
<https://www.coloring.ws/birds5.htm>



Great Basin Outdoor School

At-Home Activities for Kids

Bird Feeders and Clothespin Birds

Relevant Next Generation Science Standards

3rd Grade

3-LS4 Biological Evolution: Unity and Diversity

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.

(secondary to 3-LS4-4)

LS4.A: Evidence of Common Ancestry and Diversity

Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (3-LS4-1)

LS4.B: Natural Selection

Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)

LS4.C: Adaptation

For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

4th Grade

4-LS1 From Molecules to Organisms: Structures and Processes

LS1.A: Structure and Function

Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

4-ESS1 Earth's Place in the Universe

ESS1.C: The History of Planet Earth

Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (4-ESS1-1)

5th Grade

5-ESS3 Earth and Human Activity

ESS3.C: Human Impacts on Earth Systems

Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

Crosscutting Concepts

Patterns

Cause and Effect

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Systems and System Models