

Awesome Adaptations – 3rd Grade Day Session

Purpose:

- To provide a fun and exciting learning experience.
- To explore different adaptations used by plants and animals to survive.
- To highlight the interdependency of plants and animals in an ecosystem.
- To encourage children to consider the impact, positive and negative, that humans can have on their environment.

Science Standards of Learning Addressed:

1. See specific activity descriptions.

Outline:

Opening (~30 mins) – Welcome, Introductions, Policies and Guidelines

Station Rotations + Lunch (~2.25 hours) –

1. Swallows and Sparrows
2. Earthwalk
3. Create a Creature

Large Group (~45 mins) –

1. Feathered Flocks
2. What's for Dinner?

Closing (~30 mins) – Sharing and Review from the Day

Take Home:

Outdoor School Brochure
Brethren Woods Summer Brochure
Birdseed and Pinecone Birdfeeder Instructions

Follow-up Activities:

Activity Sheet
Teacher Evaluation

Swallows and Sparrows

Science Standards of Learning Addressed –

1. 3.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - observations are made and are repeated to ensure accuracy;
 - predictions are formulated using a variety of sources of information;
 - questions are developed to formulate hypotheses;
 - data are gathered, charted, graphed, and analyzed;
 - unexpected or unusual quantitative data are recognized;
 - inferences are made and conclusions are drawn;
 - data are communicated;
 - current applications are used to reinforce science concepts.
2. 3.4 – The student will investigate and understand that adaptations allow animals to satisfy life needs and respond to the environment. Key concepts include
 - behavioral adaptations; and
 - physical adaptations.
3. 3.6 – The student will investigate and understand that ecosystems support a diversity of plants and animals that share limited resources. Key concepts include
 - terrestrial ecosystems;
 - populations and communities; and
 - the human role in conserving limited resources.

Supplies – Clothespin or unwound paper clip for each participant, containers of sunflower seeds and raisins, pie pan for each group, worksheet/graph for each group, poster board graphs, wet erase markers, pictures of swallows and sparrows

Activity –

1. Have students sit in table groups (6-8 per table).
2. Give each student either an unwound paper clip (swallow) or a clothespin (sparrow), making sure that each group has the same number of each. Explain that swallows have thin, pointed beaks like the unwound paper clip and that sparrows have thicker beaks, like the clothespins. Pass around the pictures of swallows and sparrows.
3. Give each group a container of raisins and seeds. Instruct the groups to pour the contents into the pie pan. Explain that the seeds represent nuts and seeds and the raisins represent soft creatures/insects.
4. Explain that you will give students 1 min to try to gather as much food as they can. They can gather both seeds and raisins, but they should try to get as much food as they can (either kind). Students may only get one piece of food at a time. After they have put that piece of food on that table

- in front of them, then they can get another piece. Be sure that students don't really eat any of the food!!!
5. After 1 min, call time and ask everyone to count up the food. As a group, students should fill in their chart showing how many raisins and seeds were caught by the swallows and sparrows. Use the poster board and one group's results to demonstrate. Have groups return their food to the pie pan (because this experiment illustrates "summer" conditions where there is an abundance of more types of food).
 6. Repeat the exercise two more times. After each time, have students record their data and graph the results from your sample group.
 7. Invite the students to make observations based on the data, ask questions, predict future results, etc. Note any unusual data. Discuss how the two species are surviving. Are both getting enough to eat? What kinds of food are they eating? Do more seeds or insects get eaten?
 8. Now do a similar experiment that shows what happens during the fall as we head toward winter. Have groups return all of the food to their pie pan and switch beaks. Explain that you will be repeating the experiment, but this time, DO NOT return the seeds and raisins to the pie pan after each round. Complete three rounds.
 9. After each round, have students record their data and graph a sample group on the poster board.
 10. Invite the students to make observations based on the data, ask questions, predict future results, etc. Note any unusual data. Discuss how the two species are surviving. Are both getting enough to eat? What kinds of food are they eating? Do more seeds or creatures get eaten?
 11. Explain that the first experiment showed what it is like in the summer for swallows and sparrows when there is plenty of food for both groups. However, in the fall and winter, insects become scarcer, making it harder for swallows to find enough food, as in the second experiment. Ask students what they think swallows will have to do to survive the winter. Ask students to hypothesize what would happen if there were no seeds one summer? What about no insects? Remind students that neither type of bird is "better," they have just had to adapt differently. Sparrows have developed thicker beaks that allow them to eat both types of food – a physical adaptation. Swallows have developed a yearly migration to make sure they get enough food – a behavioral adaptation.
 12. Have students return all of the seeds and raisins to the plastic container and put their unwound paper clips and clothespins in the pie pan.

Earthwalk

Science Standards of Learning Addressed –

1. 3.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - observations are made and are repeated to ensure accuracy;
 - questions are developed to formulate hypotheses;
 - inferences are made and conclusions are drawn;
 - data are communicated;
 - current applications are used to reinforce science concepts.
2. 3.4 – The student will investigate and understand that adaptations allow animals to satisfy life needs and respond to the environment. Key concepts include
 - behavioral adaptations; and
 - physical adaptations.
3. 3.6 – The student will investigate and understand that ecosystems support a diversity of plants and animals that share limited resources. Key concepts include
 - aquatic ecosystems;
 - terrestrial ecosystems;
 - populations and communities; and
 - the human role in conserving limited resources.
4. 3.9 – The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include
 - there are many sources of water on Earth;
 - the energy from the sun drives the water cycle;
 - the water cycle involves several processes;
 - water is essential for living things; and
 - water on Earth is limited and needs to be conserved.
5. 3.10 – The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include
 - the interdependency of plants and animals;
 - the effects of human activity on the quality of air, water, and habitat;
 - the effects of fire, flood, disease, and erosion on organisms; and
 - conservation and resource renewal.
6. 3.11 – The student will investigate and understand different sources of energy. Key concepts include
 - energy from the sun;
 - sources of renewable energy; and
 - sources of nonrenewable energy.

Supplies – See specific earthwalk options

Background –

Design an earthwalk experience using activities below that are appropriate for the size of the group, time limit, and area of camp being used.

Activity –

1. Explain that the group is going on an earthwalk. An earthwalk is similar to a hike, but along the way we'll stop to look around and do some activities. Remind everyone to keep alert!
2. Set some ground rules including staying on the path (unless otherwise instructed) and staying together as a group. Ask an adult leader to take up the rear. Please do not allow students to play on any of the cooperation course elements.
3. Possible activities and items of interest:
 - a. Terrific Trees –
 - Sassafras Tree (three shapes of leaves, let kids smell a leaf),
 - Red Bud Tree (heart-shaped leaf, bud colors),
 - Tulip Tree/Yellow Poplar (two names, leaf shape),
 - Red Maple Tree (leaf shape, stem color),
 - Evergreens (needles, # of needles in a bundle).
 - b. Camouflage Critters – Have students pair up. Hand out a tile sample to each pair. Invite them to imagine that they are an animal that is that color. Ask students to discuss some examples of animals they might be. Have one partner stay with the teacher and take the other students with you down the trail a short distance. Challenge them to spy a hiding place where they will be camouflaged and to place their tile there. Remember, it still has to be visible – not buried! When everyone has placed their tile, yell for the rest of the group to come and try to find as many tiles as they can. Discuss which tiles were easier to camouflage and which were harder. How would different seasons of the year or areas of camp affect that? Redistribute the chips and play again so that partners can have a chance to try the other job.. Be sure to recollect the tile samples after the activity.
 - c. Mayapples – Invite students to peak under the umbrella.
 - d. Water – Near one of the creeks, remind students that water is essential for all living things. Invite students to share some of the sources of water found on Earth. Ask students what source of energy drives the water cycle (the sun). Review the water cycle with students.
 - e. Plants and Animals – Invite students to look around and name or point out some of the plants and animals that make up the forest ecosystem. Do the same of different plants and animals connect to an aquatic ecosystem – like the lake? Consider the limited amount of resources and how that affects the population sizes of plants and animals that live here. What adaptations might species develop to account for those challenges? How are plants and animals interconnected? What natural events (fire, flood, disease, erosion, etc.) or human influences (affecting the quality of air, water, and habitat) might affect an ecosystem? What are some ways that humans can help to protect ecosystems?
 - f. Energy Resources – Invite students to identify some sources of renewable energy in the forest (trees, wind, water, sun, etc.). Ask students to name sources of nonrenewable energy (coal, oil, natural gas, etc.) What are some ways that humans can help to conserve and renew resources?

Create a Creature

Science Standards of Learning Addressed –

1. 3.1 – The student will demonstrate and understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - observations are made and are repeated to ensure accuracy;
 - predications are formulated using a variety of sources of information;
 - questions are developed to formulate hypotheses;
 - inferences are made and conclusions are drawn;
 - current applications are used to reinforce science concepts.
2. 3.4 – The student will investigate and understand that adaptations allow animals to satisfy life needs and respond to the environment. Key concepts include
 - behavioral adaptations; and
 - physical adaptations.
3. 3.5 – The student will investigate and understand relationships among organisms in aquatic and terrestrial food chains. Key concepts include
 - producer, consumer, decomposer;
 - herbivore, carnivore, omnivore; and
 - predator and prey.

Supplies – Variety box of spiral noodles, camouflage pictures, potato or similar object for each participant, markers, pom poms, pipe cleaners, glue guns and glue sticks, yarn, other art supplies

Activity –

1. Before participants arrive, distribute noodles in a marked off area on the grass. Pocket a green worm for yourself.
2. Gather the group around the marked off area. Challenge participants to be birds and fly into the marked area to “eat” three worms (by picking them up) and then fly back to the edge. Flapping wings and bird sounds are encouraged! Ask students to just get one worm each time.
3. After everyone has their worms, ask what colors of worms they caught. Ask if anyone found a green worm.
4. Show the students the green worm from your pocket. Ask students why not many of them found a green worm (hard to see because the grass is green).
5. Ask if anyone knows what that is called (camouflage). Explain that camouflage is one adaptation that many animals use to protect themselves from predators. Ask students to name other adaptations that animals might have.
6. Move inside to the tables and chairs. Have participants sit in table groups of 6-8. Pass around the camouflage pictures so that students can see different types of camouflage.

7. Invite students to create a creature using the information they have learned at school and reviewed today. They can use any of the materials on their table. As they design their creature, they should keep in mind the following:
 - What will your creature eat (producer, consumer, decomposer, herbivore, carnivore, omnivore)?
 - How will they find their food and eat it?
 - Where will your creature live?
 - How will they protect themselves from predators or humans (predators and prey)?
 - What physical or behavioral adaptations will they have?
8. Allow time for creativity. Invite adults to help students with the glue guns to prevent burns.
9. Save a few moments at the end for students to introduce their creature to the other students at their table.
10. Designate a bench for each class to put their creatures so that they can dry. Remind the groups not to forget to take their creatures home at the end of the day!

Feathered Flocks

Science Standards of Learning Addressed –

1. 3.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - observations are made and are repeated to ensure accuracy;
 - predications are formulated using a variety of sources of information;
 - questions are developed to formulate hypotheses;
 - inferences are made and conclusions are drawn;
 - current applications are used to reinforce science concepts.
2. 3.4 – The student will investigate and understand that adaptations allow animals to satisfy life needs and respond to the environment. Key concepts include
 - behavioral adaptations; and
 - physical adaptations.
3. 3.10 – The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include
 - the effects of human activity on the quality of air, water, and habitat;
 - the effects of fire, flood, disease, and erosion on organisms; and
 - conservation and resource renewal.

Supplies – Scenic pictures, index card for each pair of participants, pencil or pen for each pair of participants

Activity –

1. In an open area, randomly spread all the papers and scenic photos on the field or basketball court face down. (If the wind is blowing, you may have to do this activity inside or use rocks on top of the papers.)
2. Explain that more than 1/3 of the world's bird species migrate with the seasons. This is behavioral adaptation that allows them to survive. As winter comes, the days become shorter and colder. Birds need more food. Plants no longer produce seeds, nuts, and berries. Small prey stay hidden, and fish and water life are hidden beneath the ice. When the days get colder, birds increase their body fat for more fuel to fly south.
3. Ask participants how far they think birds fly at one time. Some small songbirds can fly from New England to South America without stopping. The amount of fat needed for that flight could fit into a teaspoon. Birds migrate during the day or night. Larger (geese) or predators (hawks) generally migrate by day. These birds navigate in the safety of darkness. During the day they search for food and rest. Birds navigate by the stars, position of the sun, or land features such as rivers, mountains, and coastlines.
4. Ask participants if they can think of a route they take often and can remember how to get there (ex. to school, a favorite store, grandparents

house, etc.) Note that they are using landmarks to remember the route. What if they had to remember a route to fly?

5. Divide the group into pairs. Give each pair an index card and a pencil. Determine a north starting line and a south ending line.
6. Ask the pairs to line up in the north and begin their migration. They need to select five papers between the north and the south, turn them over, remember the picture, and have their partner write down the access code (two-digit number) in the order they turned them over. All papers must be returned to their original position face down. When they reach south, their fall migration is over and they should have a five-digit access code to help them find their way back in the spring. They should wait in the south until you give the instructions to return north. It is often helpful for you to demonstrate this process as you explain it.
7. After all have reached their south line, explain that in the spring when days grow longer birds return to the north to the same place to mate and raise their young. Tell them they must now remember how to get back to their northern home. They must show they know the way by finding the same five papers they did on the way down in the same order. Their partner will check to see if they are correct by checking the code. If they turn the wrong paper over, they must turn it back over and honk like a goose until they find the correct paper. If after three tries they still can't find the right paper, they should move to the side with other lost birds.
8. Now have the partners switch roles and repeat the activity.
9. If time allows, challenge participants to do better the second or third time using the same route. Since birds fly in flocks, have participants try the activity again (defining a new route) as a group of 3-4 with a recorder.
10. When all have completed a migration, ask them to sit in a circle. Discuss how this was like bird migration. How difficult was it to remember the way? Was it easier the second or third time? If applicable, was it easier to remember the way as an individual or as a flock? Invite students to share ways, other than migration, that animals or plants adapt to deal with environmental changes.
11. Invite students to consider that way the effects of human activity of the quality of air, water, and habitat might affect bird migration. How can humans assist birds and other animals by conservation and resource renewal?

What's for Dinner?

Science Standards of Learning Addressed –

1. 3.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - objects with similar characteristics or properties are classified into at least two sets and two subsets;
 - models are designed and built; and
 - current applications are used to reinforce science concepts.
2. 3.5 – The student will investigate and understand relationships among organisms in aquatic and terrestrial food chains. Key concepts include
 - producer, consumer, decomposer;
 - herbivore, carnivore, omnivore; and
 - predator and prey.
3. 3.6 – The student will investigate and understand that ecosystems support a diversity of plants and animals that share limited resources. Key concepts include
 - aquatic ecosystems;
 - terrestrial ecosystems;
 - populations and communities; and
 - the human role in conserving limited resources.
4. 3.10 – The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include
 - the interdependency of plants and animals;
 - the effects of human activity on the quality of air, water, and habitat;
 - the effects of fire, flood, disease, and erosion on organisms; and
 - conservation and resource renewal.

Supplies – Food web cards, popsicle/craft sticks

Activity –

1. Help students to get into groups with an adult leader (~1:7 ratio).
2. Introduce the idea of a food chain by giving a simple example (grass – rabbit – fox). Note that in nature, food chains connect together to make an interconnected food web where different plants and animals are dependent on each other.
3. Hand out a pack of Food Web cards to each group. Ask the adult leader to give each student at least two cards.
4. Ask students to define the terms producer, consumer, and decomposer and give an example or two of each. Each child should determine if the cards they are holding are producers, consumers, or decomposers.
5. Ask students to define the terms herbivore, carnivore, and omnivore and give an example or two of each. Each child should determine if the consumer cards they are holding are herbivores, carnivores, or omnivores.

6. Ask students to define the terms predator and prey and give an example or two of each. Each child should determine if the cards they are holding are predators, prey, or both!
7. Explain that in their groups, students will now have a chance to create their own food web.
8. Hand out Popsicle sticks to each group. Producers should start the food web. Then groups should work together to add all of the other cards to the food web. Use Popsicle sticks to show the relationships between the cards.
9. When all of the groups have finished, ask each group to take out all of the producer cards in their food web. What will happen to the other animals in the food web? What might cause all of the producers to disappear from a food web? Could humans have caused this problem?
10. Invite groups to return the producers to the food web and then brainstorm something that might happen in an ecosystem (fire, flood, disease, erosion, earthquake, volcanic eruption, human influence, etc.) Have students remove any organisms that would be directly influenced by that activity. How will the other organisms be affected?
11. As time allows, invite groups to share what happened to their food web.
12. Remind students that the relationships between plants and animals (including humans) affect whether or not species are able to survive. It's important that we learn as much as we can about the way that different species behave so that we can influence their survival. Today's activities focused on different ways that plants and animals adapt to their environment to be better able to survive. Humans can help and hurt this process.