



Primary Success Publications

# *Successful Science Lessons*

## **Grade Two**



*By Jean Roberts*

Practical sequential lessons to teach Science



**Primary Success Publications®** By Jean Roberts

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## **Lesson 10 - Animals adapt to their environment**

**Review:** Review the needs of animals, the meaning of 'life cycle' and 'habitat'.

### **Lesson:**

This is a very large subject and it could be a lengthy theme - but it is just one facet of this unit - you can shrink it to this one lesson or stretch it as long as you wish!

As winter and the cold weather comes, animals must adapt. (Talk about the word 'adapt', meaning change to suit the conditions.) Discuss the seasons. Animals must live through the cold winters. As in the summer, most animals still need food, water and protection from predators.

Make a list of local warm-blooded animals that stay in your area all winter. Deer, squirrels, rabbits, mice, birds, etc. If it is very cold in your area, talk about how these animals must adapt. What do people do to adapt to cold weather? They put on warmer coats and hats and they stay indoors. Do animals do those things, too? How can the animals (mammals) put on warmer clothes? Many animals grow warmer thicker winter fur coats. This begins in the early fall, so by the cold weather the animals can stay warm. Birds grow soft down under their outside feathers to stay warm.

Some animals change their summer brown coats to white ones. Why would they do that? Rabbits and weasels that live in the north are brown all summer and turn white in the winter so their enemies can't see them as well in the snow. See the toothpick exercise on the following page. Teach the word 'camouflage'.

How do these animals find food? Deer have sharp hooves that are used to dig through the snow to the grass below. Deer are also able to eat bark from young trees and twigs to stay alive. What do squirrels do to have food in the winter? They collect seeds and nuts and hide them in a hollow tree or other safe place to eat when the snow covers the ground. Mice burrow through the snow to find food. Birds eat berries that are left from the previous summer and seeds on plants that poke through the snow.

Many animals find a cozy place to spend the cold weather. If they have a small hole in the ground or in a tree, or even in the snow, the heat from their bodies will help to warm their space. Often several animals in a family will huddle together to keep warm.

**Follow-up exercise:** Draw a brown rabbit in its summer coat, blending with the earth and grass and trees and then in the white winter coat, barely seen in the snow.

### **Desired lesson outcome:**

Understanding that animals change and adapt to seasonal conditions and be able to give some examples.

## Additional Ideas

Make an entry in the Science Journal. Print sentences beginning with these or other sentence starters:

Today we talked about .....

Animals can do these things to adapt to winter: 1. 2. 3.

Animals' fur acts like insulation - it keeps the heat inside. Some animals grow more fur during the winter. Others cover themselves in snow or mud. Some animals hide from the cold in trees, in caves, under rocks, or underground.

Research an animal that adapts: 1. the animal name 2. tell about its habitat 3. why does the animal have to adapt? 4. how does the animal adapt to cold weather?

Have a box of coloured toothpicks. Count how many there are of each colour in the box. Scatter the toothpicks over a grassy area. Have the students pretend to be birds and the toothpicks are worms to eat. Ask the children to go out and each pick up one toothpick only - picking up the first one they see, and bring it back to you. They pick up the 'worm' immediately after spotting it from the air (eye level, of course, not bending down to look closely) Have them do this several times. Sort the toothpick colours that were collected. Have the students make inferences to explain why there are more of some colours and some colours were more difficult to spot. Talk about the word 'camouflage'. This means that something is difficult to see because the colours blend into the surroundings. Discuss camouflage fabric and why it is used by hunters and soldiers.

Brainstorm a list of animals that use camouflage as their main protection against predators.

The feathers of most birds are oily. There are oil glands at the base of the feather, and you can see ducks and geese and other birds grooming themselves by pecking at these glands to make the feathers oily.

Cut two feathers from construction paper or a brown paper grocery bag. Dip a finger or paint brush into salad oil and cover one feather. Now, use a spray bottle to squirt water onto both feathers. Predict what will happen. The water is absorbed by the plain one and rolls off the oily one. How does this help the birds?

Some animals have thick fat to protect them from the cold. Mammals that live in the northern oceans - whales, dolphins, seals, etc., eat a lot of food in late summer and grow a thick layer of fat or blubber under the skin. To illustrate how this helps to keep them warm, put several cups of soft lard in a large baggie. Fill a large container with cold water and ice cubes. The child puts his/her hand into a thin plastic glove and then into the lard. Attach at the wrist with an elastic band. Then he puts the hand into the ice water. Can he feel the cold?

This is a rabbit in the summer.

This is a rabbit in the winter.

## Lesson 55 - Friction

**Review:** Talk about the inclined plane and what the students learned in the last lesson.

**Lesson:** Let's do the same experiment as yesterday. Have a pile of books, an elastic tied to a bag with some weight. Take another book to make an inclined plane, as yesterday. This time, have a book with a shiny cover. Measure the energy it took to pull the bag up the inclined plane by measuring the stretch of the elastic. Now, tape some rough surface to the book - perhaps thin carpet or sandpaper - using the same degree of slope.

What do the students think will happen? Will there be the same amount of energy used now to slide the bag? Why? The inclined plane is the same! Predict and test this, and the students will see that it takes more energy - the bag did not slide as easily and it took more power. Why is this? Elicit their opinions. The rough surface causes 'friction'. Introduce the word. When something moves on a rough surface, it takes more energy because of friction.

Take small toy cars. Have the students push them to see how they travel on the different floor surfaces or other surfaces in your classroom - lino and carpet on the floor, the table tops, etc. Where will the car roll the easiest and go the furthest? On which surface does the car travel the least? Why? Talk about the friction on the different surfaces.

If it is winter, discuss fun in the snow. We use shiny surfaces for sledding and skiing. There is less friction when you use a shiny carpet or toboggan, or slippery skis. People even put wax on the skis to make them slide faster. What would happen if the bottom of your toboggan had a rough surface? There would be more friction.

Does the slide on the playground let you go fast? Why or why not? What might you do to make the slide faster? You might polish the slide surface. What can the person who is sliding do to go faster? Do you think the pants you are wearing matters? What happens if you drag your feet on the sides of the slide?

Talk about other things that move. How could friction affect these things?

### Follow-up exercise:

Draw the experiment, and write about friction.

### Desired lesson outcome:

Understanding that moving things require different amounts of energy because of friction.





## Additional Ideas

Write in the Science Journal:

What did we want to know?

What did we do?

What were the conclusions?

Slide your finger across something shiny and across sandpaper. Which is easiest? Which takes less energy?

If possible, go outdoors and run on different surfaces. Which is easier on which to run? Is it the pavement, grass or sand (earth)?

Have you had a pair of shoes with smooth soles? Did you sometimes slip and slide? Does anyone have shoes with rough soles to grip? Can that person slip and slide on the floor? If you wanted to slide, which shoes would you wear? The rough rubber soles have more friction so you do not slide easily.

On some cold days there is ice on puddles on the schoolground. Children like to slide on the icy puddles. Why can they slide on the ice and not on the earth or concrete? What is the difference? One is very smooth and one is rough. Talk about friction.

Make a 'slide' with a piece of plywood or foam board - about 3 feet long and 1 foot wide. Prop one end on several large books to make a pile about 8" to 1 foot high.

Cover the board with different things and then run matchbox cars down to see what happens. You could cover the board with a towel, a pillowcase, sandpaper pieces or carpet pieces.



# Friction

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Draw two pictures that show the experiment you did.

The energy used to pull up a smooth surface
The energy used to pull up a rough surface

Which took more energy? Why? \_\_\_\_\_

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