

Grade



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Grade 5



Scientific Inquiry

Science is all around us. All children are natural scientists, looking at the world around them and trying to make sense of it. Children experiment all the time: What happens when you hit a pile of blocks? What happens if you keep filling a cup with water? What happens when you step on the cat's tail? As we grow, we answer these questions and move on to more sophisticated questions, such as "Why is the sky blue?" or "What is inside your eyeball?" This is the beginning of scientific inquiry.

Science is defined as a branch of knowledge involving systematic observation, experimentation, and induction. In plain speaking, this means that scientists make an observation, and then ask a question about this observation. They then perform an experiment and draw some conclusions based on the results of their experiment.

Reading

Read "The Scientific Method" and "Bird Beaks as Tools" (both found in Reading Selections at the end of this lesson).

Assignments

1. After reading about bird beaks, collect as many pictures of birds as you can. Arrange your bird pictures according to beak type, and group the different beak types together.



ASSIGNMENT SUMMARY

- Read "The Scientific Method" and "Bird Beaks as Tools."
- Collect pictures of birds and group them according to beak type.
- Make a guess about the bird's diet based on its beak.
- Observe birds and make predictions about their diets.
- Experiment: Bird Beaks

MATERIALS

Experiment: Bird Beaks
Bird seed (at least two kinds)

Scientific Inquiry

(continued)

Paste the pictures on a piece of paper, grouped according to beak types, and then draw pictures of the food that each bird eats, using the information in “Bird Beaks as Tools” as a reference. Alternately, you might like to make up a game that matches each bird with its food.

2. Observe the birds in your back yard or a local park. Ask yourself what type of food each bird might eat based on the shape of its beak. Make a list of at least three different types of birds you observe (if you don’t know the type of bird, just describe it as well as you can, particularly its beak shape). If you can’t observe birds directly, find three different pictures to use. Create a hypothesis for each that predicts which types of food the bird will prefer.

Experiment

Bird Beaks

Design a simple experiment to determine which types of food the birds actually eat. One way to do this is to purchase different types of birdseed and set up “feeding stations.” For instance, you might wonder, “Will only birds with triangle shaped beaks eat sunflower seeds?” Or you might ask, “If I put out two different types of bird seed, one with shells and one without, will the birds that eat from each pile of seed have different types of beaks?” You can pose whatever question you like! Once you decide on your question and make a prediction about what will happen, brainstorm ways to test your hypothesis.

List the steps of the scientific method and follow them one by one as you carry out your experiment. Try to remove as many variables as you can. For instance, in this experiment, a variable might be the location of the bird seed. If one pile of bird seed is raised off the ground (where birds feel safe) and one is on the ground near the dog’s resting spot, how might this variable (location) affect your experiment results? You want to make everything the same except for the one thing you are testing.

After conducting your experiment, write a few sentences about what happened during each step of the scientific method. What are your conclusions? How could your experiment be improved?

Scientific Inquiry

(continued)

Conclusions: Comparisons are made between the hypothesis (the original question and what was expected to happen) and what actually did happen. The *conclusion* notes how the variables may have affected the experiment results.

Bird Beaks as Tools

Have you ever noticed how different the beaks of birds are? Some are long and straight, some are short and fat. Others seem very strange, like a toucan's, or a pelican's big pouch-like beak. Why do you think that birds have such a variety of beaks? The answer is because they eat different things. A toucan's beak is designed to pluck whole fruits off of trees. A pelican's beak makes it possible for the pelican to scoop up fish like a net. The shape and size of its beak enables the bird to eat what it wants.



Let's look at some other examples.

Ducks have bills with a sieve-like edge that strains out water and allows the duck to capture plants and small aquatic organisms. Warblers have small beaks that can pick small insects off tree bark. Hummingbirds have long thin beaks that act like straws to make it easy to gather nectar from deep inside a flower.

A cardinal has a triangle or cone-shaped beak. The beak's shape and size make it useful for cracking open seeds and nuts, which is what cardinals like to eat. If you were to see another bird with a similar beak (like a grosbeak, finch, or an indigo bunting), you could reasonably guess that they eat the same foods.

However, a cardinal's beak would not be very useful for catching fish, or frogs. What



Learning Assessment

These assessment rubrics are intended to help track student progress throughout the year. Please remember that these skills continue to develop over time. Parents and teachers can use this space to make notes about the learning the student demonstrates or skills that need work.

SCIENCE	Not Yet Evident	Developing	Consistent	Notes
Demonstrates knowledge of the scientific method				
Demonstrates knowledge of experiment variables				
Displays focused observation skills				
Forms a hypothesis based on previous knowledge				
Follows the steps of the scientific method				
Records observations in detail				
Draws conclusions based on results				
Reflects on experiment process and ways to gain more accurate results				
Sorts and classifies information according to different variables				