



«Science Lesson Plans

Voracious Vertebrates

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Description

The students will be classifying different animals into the five classes of vertebrates: mammals; fish, birds, an reptiles by using unique and common characteristics of each.

Grade Level

5th Grade

Lesson Objective

The student will be able to...

Compare the different classes of vertebrates by their differences and commonalities.

Use and create a dichotomous key to place vertebrates into their proper class.

Explore the adaptations vertebrates have made to survive within their environment.

Collect data and create a table and graph.

Understand the impact technology has had on vertebrates.

Create a quality "level of learning" statement at the end of this unit.

GLEs

Strand 3: Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms.

d. Classify vertebrate animals into classes (amphibians, birds, reptiles, mammals, and fish) based on their

e. Identify plants or animals using simple dichotomous keys.

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills and scientific knowledge in scientific investigation, reasoning, and critical thinking

E. The nature of science relies upon communication of results and justification of explanations

a. Communicate the procedures and results of investigations and explanations through: oral presentation; maps; data tables; graphs (bar, single line, pictographs); or writings

b. Interpret data in order to make and support conclusions

Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology is advanced by and can advance science as it seeks to apply scientific knowledge to meet human needs

B. Advances in technology often result in improved data collection and an increase in scientific information

a. Describe how new technologies have helped scientists make better observations and measurements (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers)

Depth of Knowledge

Level 2

Instructional Strategies

Making Connections: Making meaningful connections during read-alouds can serve to improve comprehension and engagement by helping learners to better relate to what is being read. Three connections that help readers use their background knowledge are:

Text-to-Self: readers link the text to past experiences or background knowledge;

Text-to-Text: readers recognize connections from one book to another;

Text-to-world: readers connect text to events or issues in the real world.

Questioning: Readers ask themselves questions before, during and after reading. Questioning allows readers to find meaning, find answers, solve problems, and do away with any confusion as they read. Asking questions is not only done at the beginning of scientific inquiry and leads readers to more understanding of investigations.

Inferring: Inferring, or “reading between the lines” causes a reader to take clues from their reading and merge that with their own knowledge to be able to better interpret the text and draw conclusions. Readers should make inferences before reading. Predictions are another way of making inferences.

Time Needed

5 days

Materials

8½ x 11 colored paper (various colors), 3 per student

Crayons, markers, or colored pencils

Seeds from the Scott Foresman Science Kits for Lab 4

Science Notebooks

Pens, pencils

Bird Beaks: tweezers; chopsticks; craft sticks; spoons; clothespins; toothpicks, and plastic forks (with tongs)

Bird Food: jelly beans; raisins; rice; gummy worms; foam packing; actual bird seed

Masking tape

Timers

Small paper plates

Pictures of Pond Scene

Graph paper

Math Template

8½ x 11 white paper

What is a Vertebrate? by Bobbie Kalman or

The Animal Kingdom: A Guide to Vertebrate Classification and Biodiversity by Kathryn Whyman

Academic Vocabulary

vertebrate, mammal, fish, reptile, bird, amphibian, adaptations, classify, species, metamorphosis,

Lesson Plan

Day 1: **Engage** with pretest (DOK 1), Nonfiction book read aloud, **Explain** dichotomous keys (DOK 1) and **E** Seed Directed Inquiry (DOK 2).

Day 2: **Explore** with student text pages 10 – 15 (DOK 1) and have students **Explain** by creating their folded booklets (DOK 1) which teachers will use to **Evaluate** student learning.

Day 3: **Explain** with video clip. **Elaborate** with Bird Beak Lab (DOK 2). **Evaluate** Bird Beak Lab (DOK 2).

Day 4: **Explain** (DOK 1) and **Explore** (DOK 2) dichotomous keys with the “Wacky People” dichotomous key c on the smartboard.

Days 5-6: **Evaluate** (DOK 2, 3) with the table, graph, and LOL statement made about the pond scene. **Evalu** with the posttest.

Lesson Narrative:

***Engage** Administer teacher created pretest over material. Read *What is a Vertebrate?* by Bobbie Kalman o Kingdom: A Guide to Vertebrate Classification and Biodiversity by Kathryn Whyman to the students to review concepts of classification of vertebrates. Teacher will do a “think aloud” while reading this book, letting studer questions they may have while reading. Teachers will also want to include some text-to-self connections they reading.

***Explain** Review with the students how they use the scientific processes of observing and classifying (this wi introduction to dichotomous keys).

***Explore** The students will complete Seed Directed Inquiry lab zone page 4 from their Scott Foresman scienc dichotomous key to classify seeds by comparing and contrasting their properties. Students will use their Scie record their predictions, their experiment, and their findings on the Seed Lab.

***Explore** Have students read the student text pages 10 – 15 of their Scott Foresman science text to be able t different characteristics of the different classes of vertebrates.

***Explain** Students will use the text to construct a classification of vertebrate fold book with three different shee (Headings will be: Vertebrates; Amphibians; Birds; Fish; Mammals; and Reptiles). Students will be asked to characteristics of each class on the sheets for each animal. Students may also choose to draw a picture repr from each class. Students will be asked to construct at least 2 “if – then” statements based on the characteris to be included on each vertebrate page.

***Evaluate** Teacher will conduct an informal evaluation based on the students’ booklets and their “if – then” stz will look for evidence that students have correctly identified the unique qualities and made accurate statement vertebrate classes which are included in their notes for each class.

***Explain** Teacher will use show a video clip on beak structural adaptations birds have made from “[Scientific Voyage to the Galapagos: Evolving Beaks](http://learn360.com/ShowVideo.aspx?TagName=beak&ID=19768)” by going to the following link: <http://learn360.com/ShowVideo.aspx?TagName=beak&ID=19768> . Show examples of beaks for specific birds (see attachments on beaks).

***Elaborate** The Bird Beak Lab Experiment. Students will examine the bird class of vertebrate and how their b adapted to suit their habitats. The students will be able to recognize how different beaks affect the types of fo Teacher will set up various bird feeding habitats throughout the room using disposable aluminum pans contain include such things as jelly beans, raisins, rice, foam packing, peanuts, actual bird seed, or gummy worms). Students will be grouped in groups of 2. Each student should be given a paper plate which represents their “nest” and access to various chopsticks; craft sticks; spoons; clothespins; toothpicks, and plastic forks (with or without missing tongs. Some can be placed in water or juice. Students will also need the Bird Beak Lab forms. Each group member needs “beaks” which has been taped to their finger and thumb and attempt to collect food from the pan and put it in t will be given one minute. Their partner will time their attempt to collect food. After the allotted time, ask stude

and amounts of food they were able to put in their nest on their lab forms. Repeat the procedure as needed so each student can experience each of the beaks. Students will then decide which beak worked best for each food. Students use their Science Notebooks to record their predictions, their experiment, and their findings on the Bird Beak Lab.

***Evaluate** After all students are finished, the class will come together to discuss their results. The students complete an assessment scoring rubric. The teacher will also assess the students on how well they completed their lab work within their cooperative groups.

***Explain and Explore** Show students the “Wacky People” on the smartboard. Review the steps in following ; answering the questions on the practice page. Using the other Wacky People included, students will create a dichotomous key, using their math template to help in creation of a chart. Students may work individually or in small groups to solve your dichotomous key.

***Evaluate** Evaluation will be a tool used throughout this unit of study. Students will be taking a pretest to assess their understanding before beginning this unit. The same test will be used to assess their learning at the end of the unit. They will be allowed to use their notes they have compiled during the posttest. Teachers will continue to use formative assessment. Students’ Science Notebooks to assess the level of their learning. Students will examine a picture of a pond ecosystem and will be asked to create and construct a table classifying all the vertebrates and their unique qualities found in that ecosystem. They will further show their level of learning by creating a graph of the data that is on their table. Students will then write a “learning” statement about the vertebrates found in the pond ecosystem (GLEs 3:1,d; 7:1,E,a; 7:1,E,b;) (Performance Standard) Students will look at the characteristics of a new species we introduce into this pond ecosystem. They will be asked to determine which class it will fit, and develop a logical argument about how it will affect the existing pond ecosystem.

***Extension** After working with dichotomous keys with “Wacky People” and seeds (Directed inquiry – see prior unit) students will be asked to apply their knowledge to create a dichotomous key of five to ten vertebrates (allowing for learning for students). (GLE 3:1,e)

Misconceptions: While studying vertebrates, students often have the following misconceptions: This unit of study will dispel these common misconceptions about vertebrates.

- Only large land animals are mammals;
- Turtles are amphibians because they live in and out of water;
- All birds fly;
- Cold-blooded means that the vertebrate has a low body temperature;
- Whales, dolphins, jellyfish and starfish are fish;
- All birds eat the same types of food.

Safety

It is important for students to follow the established safety rules in the classroom. When dealing with food items, students to be reminded that they are not to be eating during any science times.

General Suggestions for Students and Teachers

It is important for teachers to read the specific instructions for each of the activities for this unit. Although the daily form, further information about each activity will be helpful to teachers. It is also important for teachers to complete the experiment(s) ahead of time. If there is no smartboard available for instruction, the pond scene can be reproduced on a poster for students. It can also be copied and used on an overhead projector for easier use in a classroom setting.

Resources

 [Vertebrate pretest](#)

 [Wacky People Dichotomous Key](#)

 [Pond Picture](#)

 [Pond Worksheet](#)

 [Beak Matching](#)

 [Beak Lab Data Collection Sheet](#)

Literature links

What is a Vertebrate? by Bobbie Kalman
Guide to Vertebrate Classification and Biodiversity, by Kathryn Whyman
Beaks and Bills by Mel Higginson
Fine Feathered Friends by Tish Robe
About Birds by Cathryn Sill
Beak by Sneed Collard
Unbeatable Beaks by Stephen Swinburne
Fine Feathered Friends by Dr. Seuss
Animal Shapes by Brian Wildsmith
Snakes by Seymour Simon

Text book link(s)

Grade level 5

Unit A: Life Science; Chapter 1; Lessons 2-3; pages 10–17

SF Materials: Directed Inquiry (p. 4), Activity Book pp. 29-30 (work pages and scoring guide); leveled readers Organisms,” “Grouping Living Things,” and “The Cat Family;” vocabulary cards with unit.

Key concepts: [adaptations](#) [amphibian](#) [bird classification](#) [dichotomouskey](#) [fish](#) [mammal](#) [reptile](#) [vertebrates](#)

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