



«[Science Lesson Plans](#)

Captivating Caves

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Description

The students will learn how caves are formed by creating a cave model, stalagmites, and stalactites. The student will then understand the habitats within the cave and the animals that adapt to live there.

Grade Level

4th and 5th

Lesson Objective

The student will be able to...

- Explain how caves are formed using words, pictures, and models.
- Construct a foldable which explains the three zones of a cave and describe the animals that live in each zone and adaptations they have made to that environment.
- Use scientific vocabulary to describe the cave and its inhabitants.
- Explain the importance of bats to the cave environment.
- 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. Plants and animals have different structures that serve similar functions necessary for the survival of the organism
- Classify vertebrate animals into classes (amphibians, birds, reptiles, mammals, and fish) based on their characteristics

Strand 4: Changes in Ecosystems and Interactions of Organisms

with their Environments,

1. Organisms are interdependent with one another and with their environment Science understanding is developed through the use of science process skills and scientific knowledge in combination with scientific investigation, reasoning, and critical thinking.
 - A. All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem
 - a. Identify the ways a specific organism may interact with other organisms or with the environment (e.g., pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism)
 - b. Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals
 - D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes.
 - a. Identify examples in Missouri where human activity has had a beneficial or harmful effect on other organisms (e.g., feeding birds, littering vs. picking up trash, hunting/conservation of species, paving/restoring green space)

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

- A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties
- b. Compare the physical properties (i.e., size, shape, color, texture, layering, presence of fossils) of rocks (mixtures of different Earth materials, each with observable physical properties)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes
- A. The Earth's materials and surface features are changed through a variety of external processes
- b. Identify the major landforms/bodies of water on Earth (i.e., mountains, plains, river valleys, coastlines, canyons)
- c. Describe how weathering agents (e.g., water, chemicals, temperature, wind, plants) cause surface changes that create and/or change Earth's surface materials and/or landforms/ bodies of water
- d. Describe how erosion processes (i.e., action of gravity, waves, wind, rivers, glaciers) cause surface changes that create and/or change Earth's surface materials and/or landforms/ bodies of water
- e. Relate the type of landform/water body to the process by which it was formed

Depth of Knowledge

Level 3

Instructional Strategies

Lessons include direct instruction, student inquiry, individual and group work.

Reading Comprehension 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 (and listeners) build 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 building meaning, find answers, solve problems, and do away with any confusion as they read. Asking questions is not only a reading skill, but is also 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 them with prior knowledge to be able to better interpret the text and draw conclusions. Readers should make inferences before, during and after reading. Predictions are another way of making inferences.

Time Needed

5 days

Materials

Foldable handout
 Crayons, markers, or colored pencils
 Read Aloud Books
 Homework handouts
 glue
 Chart paper
 Science Notebooks
 Pens, pencils
 For Karst Cave Model:

1. Sugar Cubes For Stalagmite/Stalactite Model:
2. Icing¹ Water
 2. 2 Jars
3. Eye dropper³ Epson Salt
 4. 1/2" wide, 2 ft long strip of cotton material (T-shirt)
4. Small Cups⁵ Magnifying lens
 6. Spoon

5. Foil Pie Plates⁷. Cardboard tray from pop or water

6. Food Coloring and Water **Academic Vocabulary**

karst, stalactite, stalagmite, adaptation, guano, fauna, topography

Lesson Plan

Prior Knowledge: 4th grade students will have completed rock unit, 5th grade students will review rock formations.

Teacher Preparation: Teacher will start the stalagmite and stalactite model for student observation throughout the unit.

Day 1: **Engage** with short PreTest. (DOK 1) **Engage** with picture book read aloud and/or United Streaming Cave Formation Video. (DOK 2)

Introduce and **Explain** (DOK 2) cave formation vocabulary words which students will record and illustrate in their science journals.

Day 2: **Explore (DOK 3)** by constructing a model using Karst Topography lesson on cave simulation. (Day One)

Explain: (DOK 1 & 2) Students will hold a group discussion of the 3 cave zones and the adaptive animals that live in each zone. Information will be recorded on chart paper.

Day 3: **Explore: (DOK 3)** Complete Karst model (day 2). **Elaborate: (DOK3)** Students will observe, record, and discuss stalagmite and stalactite model. **Evaluate: (DOK 2)** Students will construct a foldable of cave formation, cave zones and animals.

Day 4: **Elaborate: (DOK 3)** Students will discuss the importance of bats and guano to cave energy. **Evaluate: (DOK 2)** Students will continue to work on their foldable of cave formation, cave zones and animals.

Days 5: **Evaluate: (DOK 3)** Students will finish foldable and take a post test which includes constructive response MAP practice.

Lesson Narrative:

*Engage

Administer teacher created pretest over material. Read Limestone Cave by Wendy Davis or Animals with No Eyes, Cave Adaptation, by Kelly Regan Barnhill

to the students to review and extend the concepts of cave formation and cave life. Class can also watch United Streaming Video. Teacher will do a "think aloud" while reading this book, letting students know what questions they may have while reading. Teachers will also want to include some text-to-self connections they may make while reading.

*Explain

Students will record and illustrate vocabulary words in their science journals.

*Explore

The students will construct a model of Karst land and use water to stimulate cave formation. Students will use their Science Notebooks to record the experiment with words and illustrations.

*Explain

Students will participate in a classroom group discussion on the cave zones. Students will brainstorm animals that live in each zone and information will be recorded on chart paper. Students will discuss the source of energy for the cave and the importance of bats.

*Elaborate

Class will daily observe, record, and discuss model of stalagmites and stalactites to elaborate on their knowledge of cave formation. Their observations will be recorded in their journals.

*Evaluate

Students will use cave information to construct a foldable book with sections for cave formation and each cave zone. Students will use foldable to show knowledge about cave formation and cave life.

*Evaluate

Evaluation will be a tool used throughout this unit of study. Students will be taking a pretest to assess their level of understanding before beginning this unit. The same test will be used to assess their learning at the end of this unit. Teachers will continue to use formative evaluation with the students' Science Notebooks to assess the level of their learning.

Misconceptions:

While studying cave formation and cave life students often have the following misconceptions:

- Bats are birds because they fly
- Bats are blind
- All animals have eyes
- Bats are blood suckers
- Water only comes from above
- Caves occur everywhere and are not formed
- Only bears live in caves
- All caves are man made

Resources

Listing includes PDF files for activities and homework

Evaluations

 [Pre Test](#)

 [Foldable](#)

 [Post Test](#)

Explorations:

 [Karst Cave Experiment](#)

 [Create Stalactite Experiment](#)

Homework Sheets

 [Reading Comprehension-Bats..Helpful or Harmful](#)

 [Reading Comprehension-Where Have the Bats Gone?](#)

Vocabulary Worksheets

 [Word Matching](#)

 [Word Search](#)

***Extensions and Additional Resources**

This lesson can be extended to include watershed and pollution. There are numerous websites about caves and cave fauna that follow.

Digital Cave Picture CD for intro to caves.

Several good websites

www.goodearthgraphics.com/virtcave

<http://www.caves.org>

http://www.ed.uiuc.edu/YLP/96-97/96-97_mini_units/Bats_MClaeys/bat.html

<http://42explore.com/caves.htm>

<http://www.nps.gov/archive/ozar/skindeep.htm>

<http://www.karstwaters.org/educationlinks/plans.htm>

Literature links

Limestone Cave by Wendy Davis; Children's Press

Animals with No Eyes, Cave Adaptation, by Kelly Regan Barnhill; Capstone Press

Cave Animals, by Francine Galko

Peering into Darkness, by Rebecca L. Johnson

Caves, by Meredith Costain

Bats, Nature's Night Flyers, by Frankie Stout

Exploring Caves by Glen Phelan

Text book link(s)

Scott Foresman Text Book

Grade 4 Textbook – Page 238 (Cave) and Chapter 8 Pages 233-256 (Rock Formations)

Grade 5 Textbook - Page 262 (Cave) and Pages 170-173 (Adaptations)

Technology Connection: Scott Foresman Take it to the Net Games: "Inside a Cave" (Grade 4 Chapter 8, Grade 5 Chapter 9)

Key concepts: [cave](#) [karst](#) [stalactite](#) [stalagmite](#) [bats](#)

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