

## Clay Hill Animal Sampling Unit

4<sup>th</sup> grade

Science/Math

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### Overview

Students will determine animal species, measure animal prints, estimate species' populations and predict future impact. At the end of the unit, students will create samples of animal prints, create animal study presentations, and compose a friendly letter.

### Major Focus

#### *Academic Expectations:*

- |         |   |
|---------|---|
| 1.5-1.9 | Students use mathematical ideas and procedures to communicate, reason, and solve problems.                      |
| 2.1     | Students understand scientific ways of thinking and working and use those methods to solve real-life problems.  |
| 2.10    | Students understand measurement concepts and use measurement appropriately and accurately.                      |
| 6.2     | Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences. |

#### *Program of Studies:*

Life Science

Students will understand that

- Organisms have basic needs and can only survive when these needs are met.
- Behavior of individual organisms is influenced by stimuli.
- Organisms' patterns of behavior are related to the nature of organisms' environments. There are many different environments on Earth that support different types of organisms.
- All animals depend on plants for food.
- Organisms change the environment. These changes may be detrimental or beneficial.

*Kentucky Core Content for Assessment:*

SC-E-3.1.2 Organisms have basic needs. For example, animals need air, water, and food; plants need air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met.

SC-E-3.3.1 Plants make their own food. All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.

SC-E-3.3.2 The world has many different environments. Distinct environments support the lives of different types of organisms. When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.

SC-E-3.3.3 All organisms, including humans, cause changes in the environment where they live. Some of these changes are detrimental to the organism or to other organisms; other changes are beneficial.

*Essential Content:*

- Linear Measurement
- Animal Identification
- Animal Classification
- Collecting Information
- Plotting Information

*Organizer:*

Animal Sampling and Recording Information

*Essential Questions:*

- Why do certain animals live at Clay Hill?
- What are indicators of animals' behaviors and how can I use this information?
- Can sampling animal prints be used to benefit the environment?

*Activities:*

Introduce the animal sampling unit by "leaving tracks" around the classroom. Have students try to figure out what animal they came from.

Begin a KWL chart labeled "Evidence of Animal Behavior".

Prior to Clay Hill visit, students should investigate animal groups and make comparisons. Below is a sample activity.

Animal Logic: Comparison of three animals

<http://www.acorns.k12.tn.us/StaffDev/Microsoft/classroom/anillogic.htm>

Here is another lesson to prepare students for tracking animals.

Examine Tracks and Explain What Happened

<http://www.carolina.com/redwolf/activities/attack.asp>

Prior to the Clay Hill visit, the classroom, teacher models creating casts. FOSS casting kits can be purchased from Delta Education for under \$10. There are six molds in a kit. Use the molds from the kits. Use the following list of materials for this activity.

### Casting Materials.

- ❑ FOSS molds
- ❑ Plaster of Paris
- ❑ A mixing stick
- ❑ A jar for storing the plaster
- ❑ Two tin cans (one for water and one for mixing)
- ❑ Water

Next, students work in groups of 2 to create their own molds.

Pre-selected student groups of 3-4 should have

- ❑ mapping tool
- ❑ animal track identification guides
- ❑ rulers
- ❑ data sheets
- ❑ pencils
- ❑ casting materials

Prior to this lesson, students have been introduced to the *GPS (Global Positioning System) Magellan SporTrak Map* tool which they will use for this activity.

Upon arrival, enter information center to distribute student materials.  
As a whole group, walk Clay Hill trails with students.

Along the way, record the location of all animal markings by using SporTrak Map.

Indicate on SporTrak Map only suitable tracks to cast. The tracks should be deep enough to produce a solid cast and clear enough to reproduce.

Break into small groups. Each group confers with teacher to select a location and returns to the designated site.

Use animal track guide to identify the animal.

Group creates a cast of animal track using following instructions.

### Casting Materials.

- ❑ Strips of waxed cardboard (cut from milk carton) to make a collar  $2\frac{1}{2}$  inches wide by 12 to 15 inches long.
- ❑ Plaster of paris
- ❑ A mixing stick
- ❑ A jar for storing the plaster
- ❑ Two tin cans (one for water and one for mixing)
- ❑ Water
- ❑ 2 Paper clips

Large, plastic, zip bag

Remove all sticks and debris around the track.

Make a circle around the print with the  $2\frac{1}{2}$  inch wide strip of cardboard; attach the ends with paper clips.

Press the cardboard about  $\frac{1}{2}$  inch into the ground. The cardboard serves as an outer mold for the plaster.

Pack some soil behind the cardboard for reinforcement. Next, in the tin can mix the plaster of paris with water while stirring with a stick until the mixture is the consistency of pancake batter.

Gently, fill the track with plaster, covering the inside mold to a depth of 1 inch below the top of the cardboard.

Wait for 10 minutes or more to allow it to set hard.

While waiting, complete the following information.

Interpret animal behavior through observation of area surrounding animal's tracks. Record hypotheses.

Answer questions on data sheet.

- ❑ What food does the animal eat?
- ❑ How does the animal get water?
- ❑ What is the animal's shelter?
- ❑ What are the predators of this animal?
- ❑ What are the characteristics of this environment?
- ❑ How has this animal changed the surrounding environment?
- ❑ Are the changes detrimental or beneficial? Why?
- ❑ Record frequency of identified animal tracks.
- ❑ Predict animal population.
- ❑ Discuss reasons for animal movement and population numbers.

Carefully, pick up the cast and place in plastic zip bag.  
Measure and record length, width, and depth of animal cast.  
Identify and record animal by using cast characteristics.  
Students regroup and discuss most significant findings.

Back in the classroom, finish the KWL chart.

Next, student groups will compile findings to create presentations that include animal characteristics, data representation, group's hypotheses of animal behavior, predicted population future, and human impact on the animal's environment. Teacher will assess presentations with a rubric.

Upon completion of group reports, class will decide if the sampling of animal prints can be used to benefit the environment.

After class discussion, students will respond to the following prompt.  
Teacher will assess with a rubric.

Based on your Clay Hill experience, compose a letter to the trustees of Clay Hill encouraging them to continue their preservation of Clay Hill and expand community awareness of these educational opportunities.

- A. Share findings and conclusions of population study.
- B. Recommend increased participation opportunities.
- C. Validate your suggestions with your personal experience.

The following unit compliments this unit.

Endangered Species

[http://rbcm1.rbcm.gov.bc.ca/end\\_species/pdf/grade4final2.pdf](http://rbcm1.rbcm.gov.bc.ca/end_species/pdf/grade4final2.pdf)

On-Line Tracking Lessons

<http://www.cincinnati-trackers.org/lessons.htm>

Examples of animal tracks and general tracking information

<http://www.bear-tracker.com/index.html>

Trail Techniques

<http://www.eagle-bluff.org/pages/animalsigns.html>

Animal Tracks Concentration

<http://columbiariver.fws.gov/games/concentration/tracksconcentration.htm>

Animal Track Investigation

[http://www.amnh.org/nationalcenter/online\\_field/cp/cptk/cptkmain.html](http://www.amnh.org/nationalcenter/online_field/cp/cptk/cptkmain.html)

Scat Rap

<http://www.k12.de.us/warner/SCATRAP.htm>

Related Literature

Treasure of Panther Peak by Mark Coyle

Whalesinger by Welwyn Wilton Katz

Animal Habitats: Discovering How Animals Live in the Wild (Facts on File Natural Science Library)