

What Does It Eat?

Nature of Science: Ask testable questions and make a falsifiable hypothesis about using properties in perform separations, and design a method to find an answer. (DOK 2-4)

****Be sure to refer to the “Students will know” section of your unit plan for crucial concepts that should be a part of teaching and learning in this unit.**

Background Knowledge:

This activity is designed to connect students to the natural history of the Grand Valley. Students will be able to make connections between modern and prehistoric ecosystems in regards to predators and prey, as well as understand that different types of teeth have evolved to eat different foods.

<p>Grade Level: 7</p>	<p>Learning Event: Using casts of teeth to determine what animals of the past ate.</p>
<p>Learning Objective/Target: Just like today, animals of the past consumed different foods. The different dental adaptations between animals living in the same time and place enabled them to eat different food sources, allowing them to thrive, reproduce, and pass their genes down to the next generation.</p> <p>S2 C1 EO a. Develop, communicate, and justify an evidence-based explanation for why a given organism with specific traits will or will not survive to have offspring in a given environment (DOK 1-3)</p> <p>S2 C1 EO b. Analyze and interpret data about specific adaptations to provide evidence and develop claims about differential survival and reproductive success (DOK 1-3)</p> <p>S2 C1 EO c. Use information and communication technology tools to gather information from credible sources, analyze findings, and draw conclusions to create and justify an evidence-based scientific explanation (DOK 1-2)</p> <p>S2 C5 EO a. Interpret and analyze data from the fossil record to support a claim that organisms and environments have evolved over time (DOK 1-2)</p> <p>ELA 1.2 - Small and large group discussions rely on active listening and the effective contributions of all participants</p> <p>ELA 4.1 Answering a research question logically begins with obtaining and analyzing information from a variety of sources</p> <p>ELA 4.2 Logical information requires documented sources</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> • What similarities do the dinosaurs share with modern animals? • How can understanding the present help us interpret the past? • How can small variations in physical characteristics lead to large changes in survival?

<p>Materials/Resources: - <i>Allosaurus</i> tooth casts (CPW 1, CPW 2)</p>	<p>Assessment Options:</p> <ul style="list-style-type: none"> • Presentation of diet hypothesis to class
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- *Camarasaurus* tooth casts (CPW 8, CPW 9, CPW 10, CPW 11)
- *Ceratosaurus* tooth casts (CPW 3, CPW 4, CPW 5)
- *Apatosaurus* tooth cast (CPW 6, CPW 7)
- Types of teeth presentation (on PPT – slides 65-67 on “The Grand Valley – Paleontology.pptx”)
- Plants of the past (on flash drive – “Plants of the Past.pptx”)
- *Camarasaurus* Skull” PDF
- Measurement worksheet (on flash drive “Measurement Worksheet.docx”)
- *Students need copies of measurement worksheet
- Ruler template (on flash drive “Ruler – printable.png”)
- *Students need copies of ruler template
- Video about dinosaur diets (on flash drive – “DJ Teeth”)

- Peer review of diet hypotheses by classmates

PREPARE AHEAD OF TIME:

Review the appropriate fossil casts and the PPT going over dietary choices before going out to Mygatt-Moore Quarry. There is also a brief video on the flash drive associated with the activity that reviews the animals and plants from the Jurassic of the area. Students will use casts of fossils from the Morrison formation in groups. Students should use rulers or paper scale bars (the template for the second is provided on the flash drive).

Suggested Procedure:

1. Background: Describe how teeth can be used to determine what animals used to eat.
 - a. Ask students to explain what herbivore and carnivore teeth look like
 - b. Give examples of modern organisms and their teeth
 - c. Explain how animals that eat similar things can have different-shaped teeth to take advantage of different prey or different plants/parts of the same plant
 - d. Show students how to measure and describe the teeth
2. Take students to Mygatt-Moore and review the fossils in the kit on-site
 - a. Explain to students that they will have to examine and measure the teeth provided with the kit
 - i. Examinations will occur in the field, measurements will happen in the classroom after the field trip
 - b. Walk Trail Through Time to the *Camarasaurus* skeleton
 - c. Have students identify which teeth in the kit are from *Camarasaurus*, based on the teeth impressions (see “*Camarasaurus* Skull” PDF)
 - d. Have students explain orally to each other and to instructor why non-*Camarasaurus* teeth belong to different animals
 - e. Have students justify their conclusions about the teeth of *Allosaurus*, *Apatosaurus*, and *Ceratosaurus* (i.e. serrations, size, shape, pointed tip, etc.).
 - f. Have students begin to formulate general ideas about whether *Apatosaurus* and *Camarasaurus* were eating the same types of plants; similar discussions should be had about *Allosaurus* and *Ceratosaurus*.
3. Back in classroom:
 - a. Each group should receive copies of the measuring worksheet and a ruler/scale print out
 - b. Students need to first sort the teeth into broad categories (carnivore, herbivore) based on fieldtrip activities
 - c. Review the “Plants of the Past” PowerPoint with the class
 - d. Students then need to hypothesize what specific food sources the animal was eating (specific animals or types of plants, based on their work with the fossils in the kit and the PPTs)

- e. Students should mark their measurements down on their measurement worksheets
- 4. Ask students/groups to justify their hypotheses to each other.
- 5. Explain to students that science isn't about 100% agreement all the time (as students will likely have disagreements about things). Students should take away that tooth shape can be used by paleontologists to interpret diet, and that small differences in tooth shape can indicate a big difference between two closely related species diets.

Resource Links:

- Video on Flash Drive.

Speaking & Listening Connections:

- Students should be presenting their diet hypotheses to the class
- Students should be critically listening to their classmates in order to assess the strength of their arguments

Extension:

- Students write a letter to biologist or paleontologist, explaining why they think a certain prehistoric animal they studied ate what it did.

Teacher Notes:

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