Information for Teachers

The following resources were developed to support your learners in their exploration of teeth and the different types of food that animals eat.

Resources:

- Lesson Plan: Animal Adaptations: African Elephant, Woolly Mammoth, and Mastodon Teeth
- Images for Lessons

Larger image resources for lessons can be found at the end of this document. All images were found under creative commons license, clip art or Canva packages, or from the Smithsonian Early Enrichment Center's private collection

Animal Adaptations: African Elephant, Woolly Mammoth, & Mastodon Teeth

This lesson is about the extinct relatives of the modern elephant: woolly mammoths and mastodons. By looking at the teeth of these extinct animals, scientists can learn more about what they ate and about how these species were similar and different.

Children look closely at images of teeth from the African elephant, woolly mammoth, and mastodon and describe the similarities and differences they notice. Then, children explore how tooth shape impacts the type of food that animals eat. To finish the lesson, children make mammoth, mastodon, and elephant puppets and take them out to eat.

OUTCOMES

After participating in this "look, talk, experiment, play" lesson, students will be better able to understand how the tooth shapes of different animals help them eat different types of food.

OBJECTIVES

During this play invitation or station, students will:

- Compare a familiar animal (an African elephant) with unfamiliar animals (American mastodon and woolly mammoth)
- Explore how different tooth shapes relate to the types of food an animal eats.
- Identify and communicate similarities and differences and predict why some traits are better for specific environments

STANDARDS ADDRESSED

This lesson supports the following Early Learning Outcomes Framework (ELOF) standards:

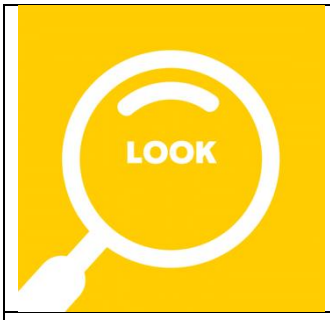
- Goal P-SCI 2. Child engages in scientific talk.
- Goal P-SCI 3. Child compares and categorizes observable phenomena.
- Goal P-SCI 6. Child analyzes results, draws conclusions, and communicates results.

MATERIALS

- Printouts of pages 9-17 for students to observe and discuss
- Printouts of pages 12-14 for puppet making (1 per student recommended)
- Popsicle sticks
- Tape
- Small, thin branches/twigs
- Child-safe scissors
- Fresh grass
- Access to grass and trees outside
    - (Or cardboard and paper to create grass and trees inside: see Teacher Tip, pg 8)

LESSON ACTIVITY SUMMARY

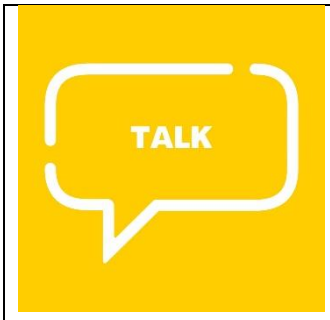
- **Look**: Compare and contrast an American mastodon tooth, a woolly mammoth tooth, and an African elephant tooth.
- **Talk**: Talk about how different tooth shapes are better at breaking down different types of food. American mastodons, woolly mammoths, and African elephants each have different diets, so their teeth are all different.
- **Experiment:** Let's figure out why mastodons have pointy teeth, while mammoths have flat teeth, and elephants have teeth that are both pointy and flat! Children will use their bodies and use science tools to recreate and test out the flat teeth of the woolly mammoth and the pointy teeth of the mastodon.
    - Children will pretend that their hands are the flat teeth of the woolly mammoth. They will roll the blades of grass in their hands and notice how grass breaks apart so the mammoth can swallow it, but sticks do not.
    - Children will then compare pointy mastodon teeth to scissors and then carefully use scissors to break thin branches so a mastodon could swallow it.
- **Play:** Using paper puppets, children will look for grass to feed their woolly mammoth, branches fed their mastodon, and both grass and branches to feed their African elephant.



Look Closely at Each Image

What do you see?
What do you think?
What do you wonder?

Essential Questions: Do the items in these pictures look like teeth? Why or why not? How do these teeth compare to your teeth? How are these teeth the same? How are these teeth different? What type of animal might have these teeth? What might that animal eat?	 Mastodon Tooth	 Woolly Mammoth Tooth	 African Elephant Tooth
	This tooth is pointy. This tooth belonged to an American mastodon. These teeth are great for eating leaves, twigs, and branches. Animals with teeth like this are probably **browsers** that ate leaves, twigs, and branches.	This tooth is broad and flat. This tooth belonged to a woolly mammoth. These teeth are great for eating grass. Animals with teeth like this are probably **grazers** that ate grass.	This tooth is broad and somewhat flat. It is more pointy than the woolly mammoth tooth while less pointy than the mastodon tooth. This tooth belonged to an African elephant. These teeth are good for eating branches and twigs as well as grass. Animals with teeth like this are probably **browsers** and **grazers**.



Talk About Teeth and Food

By studying teeth, scientists can learn more about the type of food that different animals can eat. Many animals use teeth to break down their food so they can swallow it, just like you!

Essential Questions:

Why do mastodons and mammoths have different teeth?

What might you be able to discover about an animal by looking at its teeth?

What type of food do you think mastodons ate? What type of food do you think mammoths ate? What type of food do you think that African elephants eat?

How can flat teeth help break down grass?

How can pointy teeth help break twigs and branches?

How are mastodons, mammoths, and elephants the same?

How are mastodons, mammoths, and elephants different?

Mastodon

Mastodon Food

Mastodons were browsers. Browsers eat leaves, twigs, and branches. Mastodons had more pointy teeth (refer to picture of mastodon teeth).

Mastodons lived long, long ago during the Ice Age. They lived in forests where they ate branches and trees.

Woolly Mammoth

Woolly Mammoth Food

Mammoths were grazers. Grazers eat grass. Mammoths had flat teeth (see picture of mammoth tooth) and chewed in a circular motion.

Mammoths also lived during the Ice Age. They lived in the coldest climates, where it was so cold that no trees grew, so they ate grass.

Mammoths had larger tusks since they had to dig in the frozen soil.

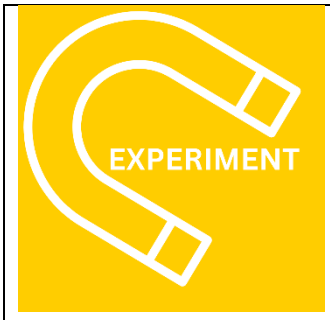
African Elephant

African Elephant Food

African elephants are both browsers and grazers. They have teeth that are flat, but less flat than the mammoth's teeth were.

African elephants share our planet with us today. They live in warmer climates in Africa. Both grasses and trees grow where African elephants live and they have teeth that allow them to eat both.

		Mammoths also had small ears, more fur, and special fat storage to keep their bodies warm.	



Let's Figure Out Why

Why did mastodons have pointy teeth? Why did mammoths have flat teeth? Why does the African elephant have teeth that are a little bit smooth and little bit pointy?

Teacher Tips	Watch this video with your students	Start with the mammoth comparison	Careful / caution with scissors
	Grazer: Mammoths  Teeth like flat hands	Browsers: Mastodons  Teeth like scissors	Grazer-Browsers: African Elephant  Teeth like scissors and flat hands

Woolly Mammoths:

- "Let's pretend our hands are mammoth teeth. Let's make our hands flat like mammoth teeth."
- Give each child some longer blades of grass.
- "Let's try to chew this grass with our "flat teeth" or hands held flat."
- Encourage the children to roll the blades of grass between their hands.
- Have the children observe what happens.
- "Notice how the grass bunched up and broke apart as we rolled it in our hands. Now, if we were mammoths, we could swallow this grass and eat it."

Mastodons:

- "Let's try breaking twigs using our flat mammoth teeth."
- Observe what happens.
- "Can we make the twigs small enough to swallow? The flat teeth don't break up the twigs."
- "It is hard to make our hands pointy like a mastodon's teeth, so let's use another tool instead."
- Look closely at the blades of scissors.
- "What do you notice about the scissors? Are they flat or pointy?"
- Notice how the blades get pointy and sharp.
- "Let's pretend our scissors are mastodon's pointy teeth."
- Let each child try to cut twigs with the scissors. Note: Adults may need to assist for safety.
- Have the children observe what happens to the twigs when cut with scissors.
- "Notice how when you cut the twigs, they become smaller. Now, if we were mastodons, we could swallow these twigs and eat them."

African Elephants:

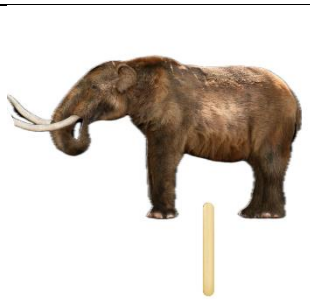
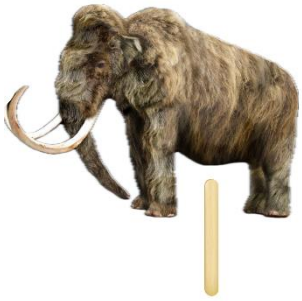
- African elephant teeth are like a mixture of both flat hands and scissors.
- They can eat both twigs and grass.

PLAY

Take Your Mastodon, Mammoth, and Elephant Out to Dinner

Bring your mastodon, mammoth, and African elephant puppets to different locations where they can find food. Look for both trees and grassy areas if possible.

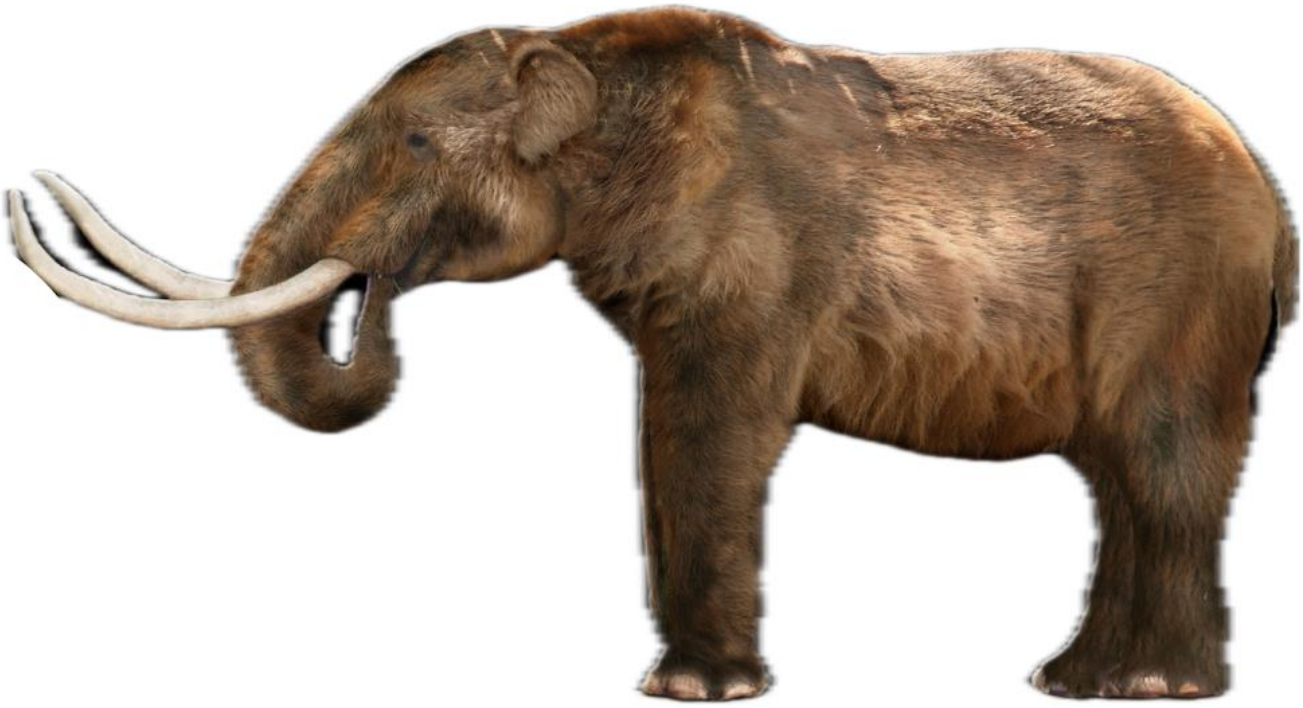
Teacher Tip: If there is not an outdoor area where your class can play, you can create a pretend play area where the animals can eat by cutting trees out of cardboard boxes and grass out of leftover printer or construction paper. Encourage your students to help you color and create the trees and grass and set it up around the classroom.

	Browsers: Mastodons	Grazer: Mammoths	Grazer-Browser: African Elephant
			
	What type of food would a mastodon with its pointier teeth like to eat (refer to picture of mastodon tooth)?	What type of food would a mammoth with its flat teeth like to eat (refer to picture of mammoth tooth)?	What type of food would an African elephant with its smooth and pointy teeth like to eat (refer to picture of elephant tooth)?
Puppets			

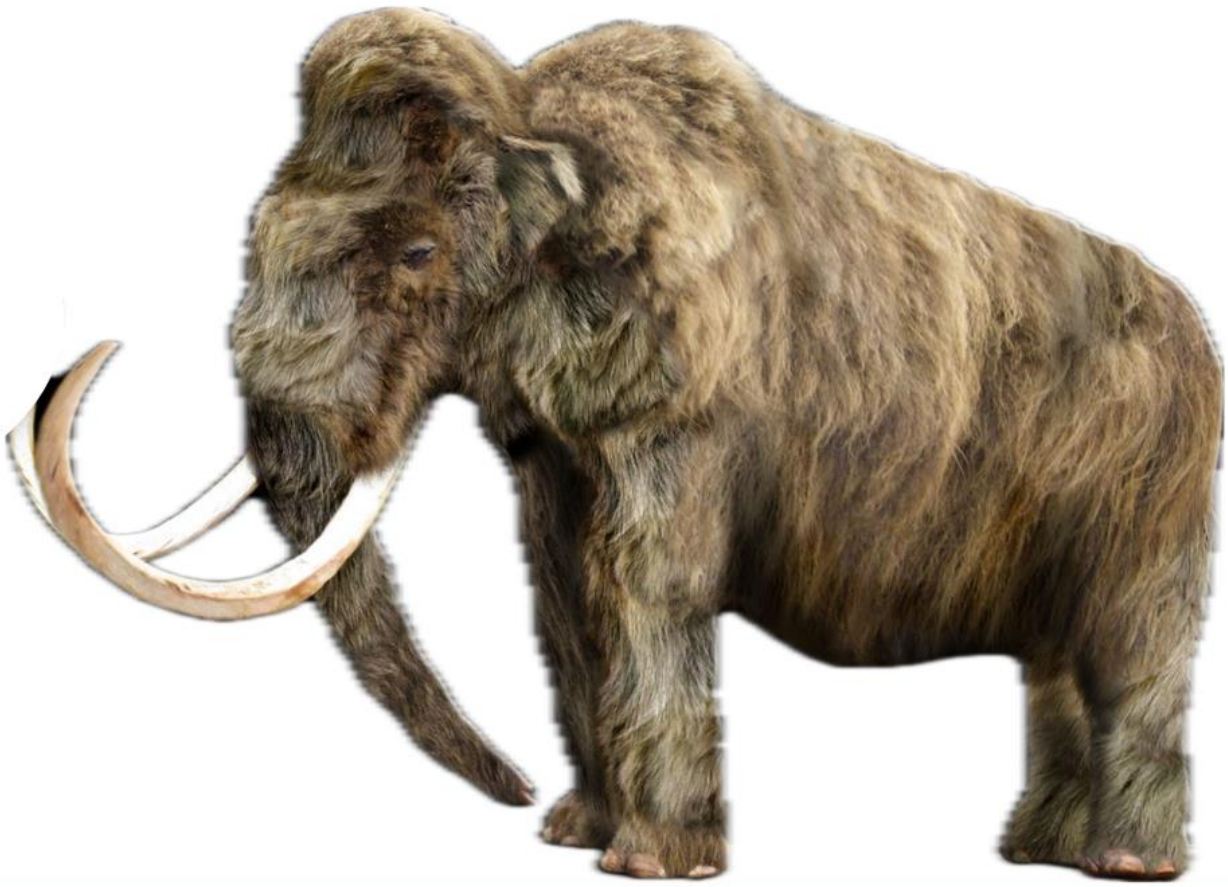
Mastodon Tooth

Woolly Mammoth Tooth

African Elephant Tooth



Mastodon



Woolly Mammoth

African Elephant

Mastodon
Food

Woolly Mammoth Food

African Elephant Food

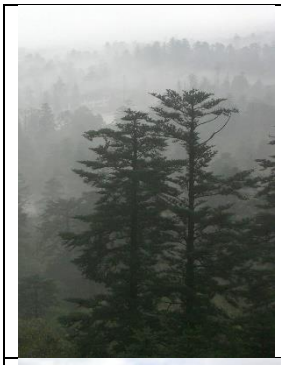
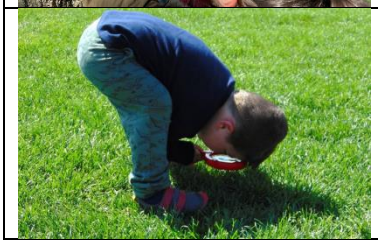
Browsers: Mastodons

Grazer: Mammoths

Grazer-Browser: African Elephant

Image Index

	Mastodon Tooth Daderot, CC0, via Wikimedia Commons https://upload.wikimedia.org/wikipedia/commons/d/dd/Mastodon_tooth_from_Mattapoisett_River_-_Robbins_Museum_-_Middleborough%2C_Massachusetts_-_DSC03767.jpg
	Mammoth Tooth James St. John, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons James St. John, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons
	African Elephant tooth is the top tooth. (The middle tooth is an Asian elephant tooth and the bottom tooth is a mammoth tooth) DagdaMor, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons https://upload.wikimedia.org/wikipedia/commons/2/2b/Teeth_of_elephants.jpg
	African Elephant This image was produced by me, David Castor (user:dcastor). The pictures I submit to the Wikipedia Project are released to the public domain. This gives you the right to use them in any way you like, without any kind of notification. This said, I would still appreciate to be mentioned as the originator whenever you think it complies well with your use of the picture. A message to me about how it has been used would also be welcome. You are obviously not required to respond to these wishes of mine, just in a friendly manner encouraged to. (All my photos are placed in Category: Images by David Castor or a subcategory thereof.), CC0, via Wikimedia Commons https://upload.wikimedia.org/wikipedia/commons/4/40/Frilagd_elefant-gr%C3%A5_bakgrund.jpg
	A Woolly mammoth (left) and an American mastodon (right) facing each other, showing the physical differences between the two animals. Dantheman9758 at the English Wikipedia, CC BY-SA 3.0 <http://creativecommons.org/licenses/by-sa/3.0/>, via Wikimedia Commons https://commons.wikimedia.org/wiki/File:MammothVsMastodon.jpg

	Fir Trees Avlxyz on Flickr, CC BY-SA 2.0 <https://creativecommons.org/licenses/by-sa/2.0>, via Wikimedia Commons https://upload.wikimedia.org/wikipedia/commons/9/91/Abies_fabri_in_mist.jpg
	Grass in Iceland No machine-readable author provided. Roger McLassus 1951 assumed (based on copyright claims)., CC BY-SA 3.0 <http://creativecommons.org/licenses/by-sa/3.0/>, via Wikimedia Commons https://upload.wikimedia.org/wikipedia/commons/a/a8/Grass_covered_house_in_Iceland_1972.jpg
	Tarangire National Park in Tanzania ProfessorX, Public domain, via Wikimedia Commons https://upload.wikimedia.org/wikipedia/commons/5/5a/Tarangire-Natpark800600.jpg
	Smithsonian Early Enrichment Center
	Smithsonian Early Enrichment Center