

# Egg Carton Mammoth & Mastodon Molar Models

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Students can learn, with a hands-on model, about the differences between mammoth and mastodon teeth. The model is an empty egg carton.

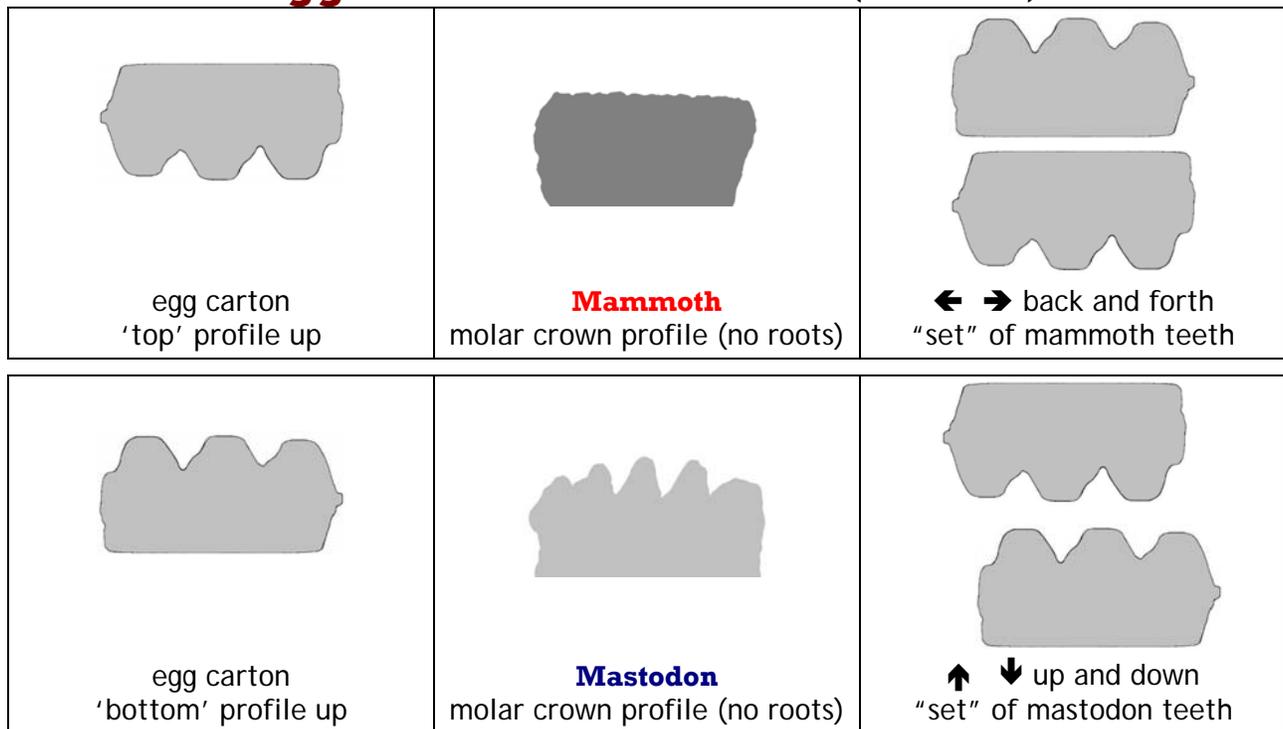
Each student will need:

- an empty (polystyrene or paper) egg carton that would hold twelve eggs.
- a pair of scissors - students will carefully cut the egg carton into two parts, each part would hold six eggs, arranged in two rows of three.

Have students hold egg-carton-halves so the flat sides (carton 'tops') are together (see diagram below). This is the mammoth tooth model - broad, flat tooth surface which move in a back and forth motion that is well suited for grinding grasses and other soft vegetation.

Have students hold egg-carton-halves so that the cup shaped sides (carton 'bottoms') are together (see diagram below). This is the mastodon tooth model - teeth with cusps work something like scissors to cut up food. Foods other than grass can be broken up with this type of tooth and an up and down jaw action.

## Egg Carton vis-à-vis Teeth (not to scale)



## Comparison of Mammoths, Mastodons & Elephants

SPECIES →	Woolly <b>Mammoth</b> <i>Mammuthus primigenius</i>	American <b>Mastodon</b> <i>Mammuth americanum</i>	African <b>Elephant</b> <i>Loxodonta africana</i>	Asian <b>Elephant</b> <i>Elephas maximus</i>
Height	2.75-3.4 m (8.5 to 10 feet)	2.4-3 m (8 to 9 feet)	3-3.4 m (9 to 10 feet)	2.4-3 m (8 to 9 feet)
Weight	4-6 tons	4-5 tons	4-6 tons	3-5 tons
Back shape	sloping	straight	saddle-shaped	humped
Fur	dense	probably dense	very sparse	sparse
Head	high, single dome	low, single dome	low, single dome	double dome
Ears	very small	likely small	large	medium
Tusks	long, curved and twisted	shorter, rather straight	gently curved	gently curved
Teeth	Flat for grinding	With cusps for chewing	Flat for grinding	Flat for grinding

# Questions Mammoths, Mastodons & Elephants

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1. What kind of natural teeth do people have?

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2. How many sets of natural teeth do you get in your life time?

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3. How many sets of natural teeth does an elephant get?

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4. What is the advantage for an elephant to have six pair of teeth in its lifetime?

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5. Which way did mastodon teeth/jaws move?

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6. Which way did mammoth teeth/jaws move?

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7. What did mastodons eat?

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8. What did mammoths eat?

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9. IF an elephant needs 250 kilograms of grass per day and they can eat 0.5 kilograms per minute how much time per day is spent eating?

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10. How much food do you eat in a day?

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11. How much time do you spend per day eating food?

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12. Elephants need about 150 liters of water each day. How many 20 liter buckets would that fill?

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13. If a liter of water weighs 1 kilogram, how much does the water weigh?

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14. How much water does the average American use each day?

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15. Elephants have broad flat topped teeth. Based on this information would you say the elephant is more closely related to mammoths or mastodons?

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16. Elephants have rather straight tusks. Based on this information would you say the elephant is more closely related to mammoths or mastodons?

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17. Elephants have large ears mammoths and mastodon had small ears. Why do you think this is the case?

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18. Elephants have very little hair while mammoths and mastodon had thick fur. Why?

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19. Are tusk more closely related to toe nails, bones, teeth, or horns?

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20. Were mammoths and mastodon the only ice age animal to become extinct?

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21. Did any Pleistocene ice age megafauna (large critters) survive?

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22. Are elephants bigger or smaller than mastodons?

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23. Are elephants bigger or smaller than mammoths?

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# Paper Mammoth & Mastodon Molar Models

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 **PRINT** or copy the following sheet for each student or have them work in teams of two. Printing or copying what will be cutout on to a heavy paper stock may be advised in some cases.

 **CUT** out along the Thick line to make 2 smaller rectangular pieces, one for each animal.

 **FOLD** down or away from you along the thinner solid lines. Make folds over the edge of a ruler (or other straight surface) is advised before making the last four cuts.

 **CUT** along the dashed lines. (on top of a thin line)

 **FOLD** down or away from you along the long sides of the gray boxes. Make folds over the edge of a ruler (or other straight surface)

 **TAPE** or **GLUE** your model. The final results is a rectangular solid with an open base.

## Yet more questions ...

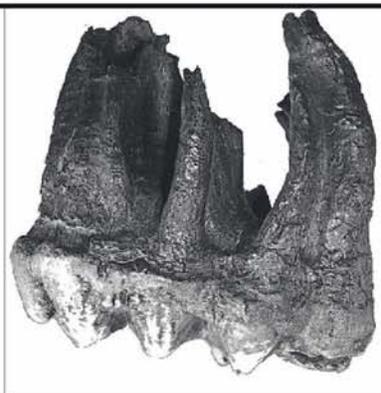
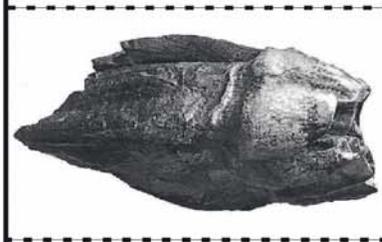
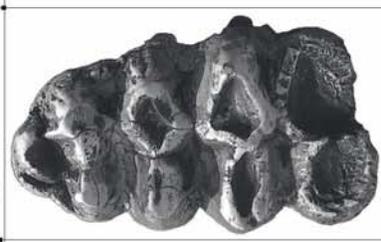
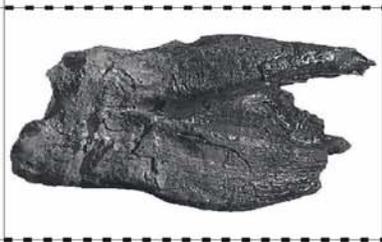
- A ..... Which model represents the tooth of a MAMMOTH?
- B ..... The long dimension of the crown of the original tooth is 14 cm
- C ..... How long is this graphic on the model?
- D ..... What is the scale?
- E ..... Is this graphic enlarged or reduced compared to the original?
  
- f ..... Which model represents the tooth of a MASTODON?
- g ..... The long dimension of the crown of the original tooth is 153 mm.
- h ..... How long is this graphic on the model?
- i ..... What is the scale?
- j ..... Is this graphic enlarged or reduced compared to the original?

Activity / Extension: Working in teams of two or make two models of each tooth. Put one tooth model on one finger of one hand and the same model on the other hand. Move your hands to show the appropriate jaw motions that would be used (up & down versus front to back / side to side).

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Do you have any **questions**, **comments**, **suggestions** and or **corrections**?

Please email Steven E. Wilson [wilsons15@michigan.gov](mailto:wilsons15@michigan.gov). **Thanks!**

<p>fold gray area under this part of the model</p>		<p>fold gray area under this part of the model</p>
		
<p>fold gray area under this part of the model</p> <p>© 2006 Steven E. Wilson</p>		<p>fold gray area under this part of the model</p>

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<p>fold gray area under this part of the model</p> <p>© 2006 Steven E. Wilson</p>		<p>fold gray area under this part of the model</p>

# *Answers* to Questions about **Mammoths, Mastodons & Elephants**

## *Answers* to Yet more questions ...

For an answer sheet please email Steven E. Wilson @ [wilsons15@michigan.gov](mailto:wilsons15@michigan.gov)  
please include  school name(s)  class level(s) and  number of students

**If you should find a site with mammoth, mastodon or other vertebrate fossils - contact a Museum or University before you remove any fossils or other materials.**

## **Internet Resources**

Michigan Department of Environmental Quality home page @  
<http://www.michigan.gov/deq>

Michigan Geological Survey home page @  
[http://www.michigan.gov/deq/0,1607,7-135-3306\\_57064-87386--,00.html](http://www.michigan.gov/deq/0,1607,7-135-3306_57064-87386--,00.html)

Geology in Michigan page - resources For Michigan earth science students, educators and thinkers @  
<http://www.michigan.gov/deqgeologyinmichigan>  
(deq geology in michigan - all lowercase - no spaces)

Geological Survey Digital Geology Library Catalog - out-of-print-publications are available on-line @  
[http://www.michigan.gov/documents/deq/GIMDL-Catalog-2010-01-20\\_307979\\_7.pdf](http://www.michigan.gov/documents/deq/GIMDL-Catalog-2010-01-20_307979_7.pdf)

Please send your questions, comments, corrections or ideas to  
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