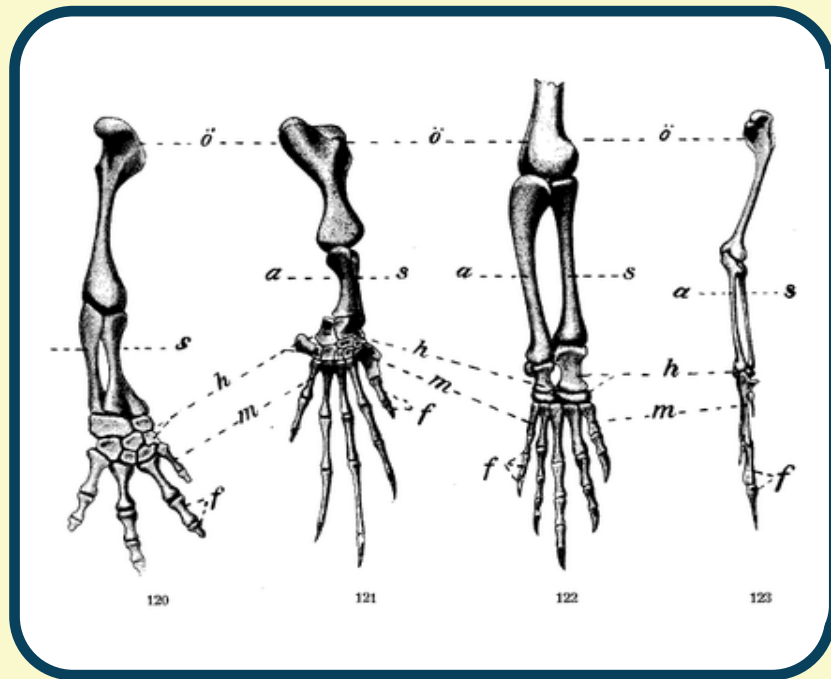


Homology



Homology

**Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.**

You use them every day. You gnaw with them. Tear with them. Grind with them. They're your teeth. Take the following brief quiz to see how much you already know about other vertebrates' teeth and their homology. See the bottom of page 4 to check your answers.

1. How many teeth does an adult mole normally have?
 - a. 20
 - b. 28
 - c. 32
 - d. 44
2. Which of the following typically has cuspid (canine) teeth?
 - a. female horses only
 - b. male horses only
 - c. both female and male horses
 - d. neither female nor male horses
3. Unlike humans, dolphins have a set of teeth that all have the same shape and size.
 - a. true
 - b. false
4. A fossilized rhinoceros's tooth was discovered in 2021 and believed to be the oldest tooth from which DNA was extracted. How old was this fossilized tooth?
 - a. 17,000 years old
 - b. 170,000 years old
 - c. 1.7 million years old
 - d. 1.7 billion years old
5. Which vertebrate has the most teeth in its jaw?
 - a. shark
 - b. catfish
 - c. alligator
 - d. bear



Cat Teeth

The process of evolution not only enhances the size and presence of some structures in animals over time, but the process can also reduce or eliminate other structures. For instance, the tail bone in humans has been greatly reduced in size over time. Structures that are lost or reduced due to evolutionary pressures are called vestigial structures. Cuspid teeth in carnivores are necessary for grabbing and holding prey in the mouth of the animal. Can the size of the cuspid teeth be used to identify domesticated versus wild or prehistoric cats? Get started now before the cat is out of the bag.

Materials Required

Centimeter ruler



a.



b.



c.

Procedure

1. Use a ruler to measure the length of the large cuspid and incisor for each of the cat skull images.
2. Record these measurements in Table 1.
3. Calculate how much longer the cuspid is than the incisor for each skull. Do this by dividing the cuspid tooth length by the incisor tooth length.
4. Record these measurements in Table 1.
5. Use this information to identify each cat skull out of the choices domestic cat, Bengal tiger, or saber-toothed tiger.

Table 1. Feline Skull Measurements

Skull	Cuspid Length (cm)	Incisor Length (cm)	Cuspid length/Incisor length	Identification

Questions

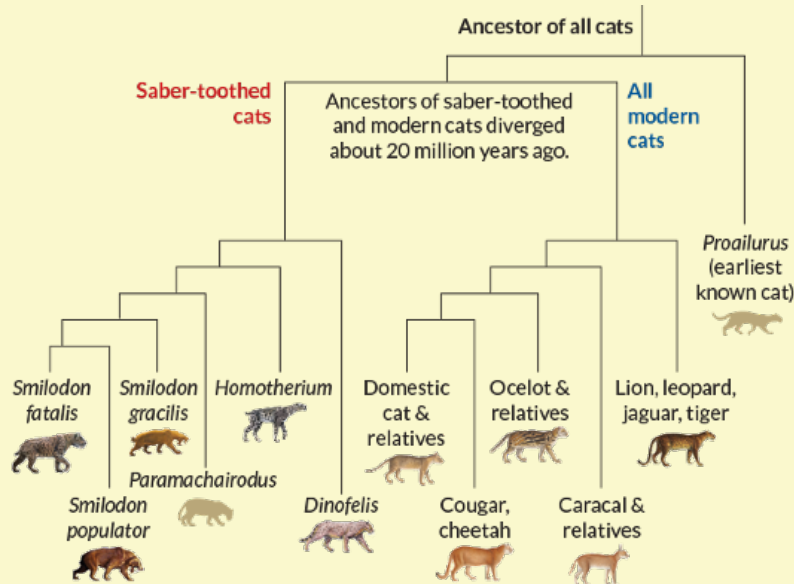
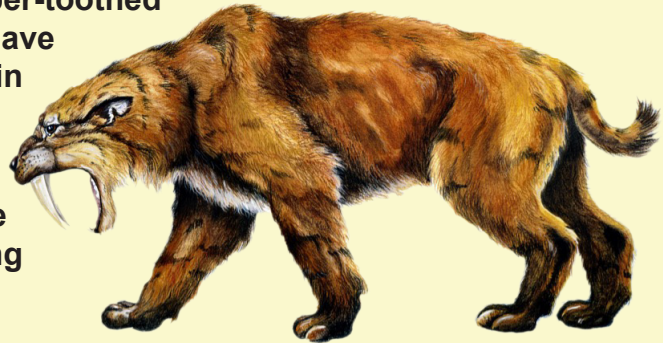
1. Propose a reason for the difference in cuspid to incisor lengths of the various cats.
2. Are large cuspid teeth in domesticated cats becoming a vestigial structure? Provide a reason to support your answer.

Homology

Cat Tree

About 20 million years ago, the saber-toothed tigers and domestic cats diverged from a common ancestor. About 10,000 years ago, the saber-toothed tiger became extinct, yet many of its relatives have become our pets and animals that currently are in the wild.

The tree below shows the relationships between the various members of the cat family, both those from the past and those still alive and prospering today.



What is interesting about the tree is that the cougar and cheetah are closer relatives to the domestic cat than to big cats such as lions, tigers, leopards, and jaguars. This is because true big cats are capable of roaring, while cougars, cheetah, and domestic cats do not have vocal structures that allow this unique sound.

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since they must hunt and capture their food.

Answers: Page 2 Answers: (1) d, (2) b, (3) a, (4) c, (5) b. Page 3 Answers: Cat Teeth: a = saber toothed tiger, b = domestic cat, c = Bengal tiger. (1) Do-estic cats no longer must hunt for food, so they do not need long cuspid teeth. (2) Possibly in domestic cats, but they are still needed in Bengal tigers

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