



Learning from the Ice Age

Dear Educator,

The heroes of the hit animated feature film *Ice Age* are back to face new challenges in the changing world of *Ice Age The Meltdown*—and award-winning curriculum specialists Young Minds Inspired (YMI) and Fox Home Entertainment are right along with them, with a new teaching program based on the upcoming DVD release of the film.

Designed to help students in grades 3 to 5 learn more about a fascinating era that holds important lessons for today, the program offers a variety of activities to promote creative thinking while supporting national standards in **earth science, history, geography, and language arts**. The hilarious adventures of the already famous characters will engage students' curiosity and imagination, as well as their sense of humor.

The activities can be used whether or not students see *Ice Age The Meltdown*. Make as many photocopies of these copyrighted materials as necessary to suit the needs of your students, and please share them with fellow educators.

Sincerely,



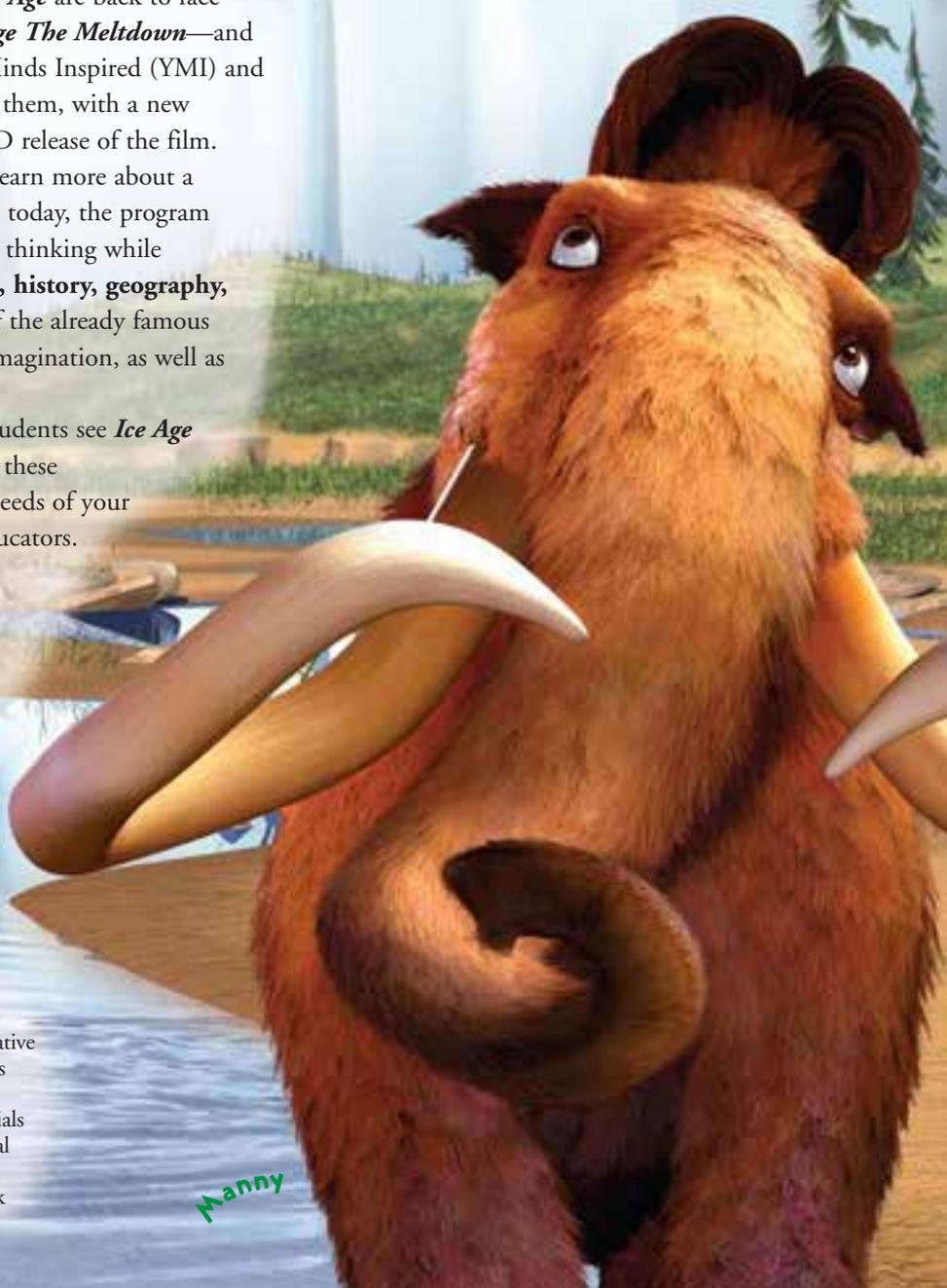
Roberta Nusim
Publisher and former teacher

P.S. Be among the first 50 teachers to return the enclosed reply card and receive a free copy of the *Ice Age The Meltdown* DVD.



is the only company developing free, creative and innovative classroom materials that is owned and directed by award-winning former teachers. All YMI teaching materials are approved by our exclusive Educational

Advisory Board. E-mail us at feedback@ymiclassroom.com or visit our Web site at www.ymiteacher.com to send feedback and download more free programs.



Manny

About the DVD *Ice Age The Meltdown*

Manny, Sid and Diego return in this action-packed sequel to Fox's 2002 animated hit feature, *Ice Age*, but the world as they know it is changing. While the resulting meltdown of the ice initially has its perks—a primitive water park with water slides and sun-bathing animals—the realization that a disastrous flood is coming creates a panic and a new journey for the friends. Their story—in hilarious fashion—helps the characters realize once again the trust and friendship they share.

Program Objectives

- To reinforce concepts about the Ice Age and the mammals from that era.
- To strengthen students' cognitive and critical thinking skills in meeting national standards in earth science, history, geography, and language arts.
- To promote student comprehension, imagination, and creative writing skills.

Program Components

- This educator's guide
- Three reproducible activity masters
- A colorful wall poster designed to reinforce knowledge of Ice Age mammals
- A reply card for your important feedback. **The first 50 teachers to return the enclosed reply card will receive a free copy of the *Ice Age The Meltdown* DVD.**



(L to R) Diego, Sid, Ellie, Crash and Eddie, and Manny

How To Use the Teacher's Guide

Display the poster before beginning **Activity 1**. Each activity requires one activity master and pencil per student. Additional materials are noted. Modify the activities as needed.

How To Use the Poster

Refer students to the character descriptions on the poster as you work with **Activity 1**. Then have student groups research other

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Ice Age mammals and list their findings on the poster. Use the research to conduct the activity extension idea in **Activity 1**.

Background Information

Ice Age The Meltdown is set against the backdrop of the global changes at the end of the last great Ice Age that occurred in North America and Eurasia—between 100,000 and 10,000 years ago. During the Ice Ages, large areas of the earth's surface were covered with ice sheets. Glaciers both waxed and waned over millions of years, and they were at their maximum during a shorter cycle of tens of thousands of years. The warming and cooling cycles, coupled with animals' ability to travel from the polar regions to the equator, made it possible for animals to adapt to a variety of habitats. In between the times when the ice sheets covered large amounts of land in what is now Northern Europe, South Africa and North America, the weather became much warmer than today, spurring the growth of forests.

No one knows for sure why some animals became extinct at the end of the last Ice Age. Theories include the advance of humans and human hunting skills, as well as diseases brought by humans. But one theory, particularly relevant to today's world, is the modification of weather to a warmer climate.

Activity 1 Meet the Stars of the Ice Age

Additional Materials Needed: Internet, books for research

Part A. Display the poster and distribute the activity sheets. Tell students they will be learning about Ice Age mammals with the help of the fun characters from the new DVD, *Ice Age The Meltdown*.

Refer students to the poster as you write *woolly mammoth*, *giant sloth*, and *saber-tooth tiger* on the chalkboard, along with *size*, *characteristics*, and *animals of today*. Challenge students to share their ideas about each animal featured on the activity sheet—its size, characteristics, and which of today's animals it resembles—before having them do research to complete their answers to **Part A: 1. 6, 8, 40, 600 2. 6, armadillo 3. 4, 7, slowly 4. squirrel, rat 5. pouched, Australia** (The *scrat* is real only in the film.)

Part B. First provide students with the **Background Information** from this guide. Answers to **Part B:**

- Most animals living in the **icy tundra** ate plants and bushes that grew in the ice, while others were meat-eaters. The animals grew thick coats that kept them warm.

National Education Standards: Grades 3-5

Activity 1: Meet the Stars of the Ice Age

Language Arts: Developing research skills; applying language skills.

Science: Diversity and adaptations of organisms.

Activity 2: Ice Age Science

History: Historical comprehension.

Science: Science as inquiry; changes of properties in matter.

Activity 3: Pictures of Our World

Geography: Using maps to acquire, process and report information from a spatial perspective.

Earth Science: Science and technology in society.

Poster: The Ice Age: Mammals Before the Meltdown

Language Arts: Developing research skills; communication skills.

Science: Populations and ecosystems.

- Melting snow and ice created **river valleys and grasslands** that provided water and abundant vegetation. Many animals migrated to these milder regions to feed there.



- The modification of the climate and growth of **forests** enabled animals such as hippos and lions to live in areas such as North America and Europe.

Extended Activity: Have students create their own new animal characters for a sequel to *Ice Age The Meltdown* by selecting two mammals from their poster research and combining their physical characteristics, behaviors and names. Then have the class sketch and assemble their new cast of characters and create a plot about what happens after the meltdown.

Activity 2 Ice Age Science

Additional Materials Needed: dictionary, chalk, chalkboard, 8-10 ice cubes, glass or bowl, water, measuring cup, paper towels, globe or atlas

Part A. Have students find the term *Pleistocene epoch* in the dictionary after you write it on the chalkboard. Then read aloud the *About the DVD* section from this guide to help students understand the dilemma the characters face as the ice melts. Distribute the activity sheets.

Have students share their ideas for the answers to **Part A**. Then tell them that in the warmest part of Antarctica, the Antarctic Peninsula, temperatures average around 23° F (-5° Celsius). During a few months of the year, temperatures there are above freezing, and this has caused increased melting and the appearance of some floating ice shelves. Then tell them that scientists believe the average global temperature on Earth during the Ice Age was around 50° F (10° C). Explain that, on average, Earth was only around 39-41° F (4-5° C) colder than it is today. *Note: Most students will remember that water freezes at 32° F or 0° C.*

Part B. Explain that, in its frozen state, water expands, taking up more space. This is why the ice cubes floated when placed into water. As they floated, the ice that was under water took up the same amount of space as the water would have taken had it been in liquid form. When the ice melted, it took up that space again, so the glass did not overflow.

This experiment shows how the melting of ice sheets floating in water *does not* create an increase in sea level. Explain that the melting of land ice, or ice frozen on top of a land mass, *does* cause the sea level to rise because the water is not displaced; rather, it affects the existing land mass by flooding it, particularly in areas where land and water meet.

Extended Activity: Suggest that students cut out newspaper or locate Internet articles about global warming each day for a week, then bring them to school to discuss as a class.

Activity 3 Pictures of Our World

Additional Materials Needed: Globe or atlas

Part A. Distribute the activity masters. Have students draw and label the continents and oceans, then use their completed maps and a globe or atlas to compare ice coverage of today's world to that of the Ice Age.

Introduce **Part B**, then use the following to discuss the answers.

True/False Statements and Answers

- True.** Trees help absorb greenhouse gases from sources such as carbon dioxide, methane, and fossil fuels. Greenhouse gases trap energy from the sun, much like a greenhouse for plants, allowing the sun's heat and energy to reach the earth's surface but not to escape back into the atmosphere. This generates more heat and warms the planet. Saving the rainforests reduces the amount of greenhouse gases that cause global warming.
- False.** Worldwide, the sea level has risen 6-8 inches over the last 100 years. Scientists believe that melting glaciers due to the warming of the earth's atmosphere are contributing to this increase.
- True.** All of these activities require electricity from power plants that use fossil fuels like coal and oil, which release greenhouse gases into the air.
- False.** Cars and other vehicles are necessary, but we can carpool so there's less pollution and purchase cars that use less fuel. We can also walk, ride bikes and use public transportation whenever possible.
- False.** Planting just one tree in your yard or school is better than not planting at all!
- True.** As trash in a landfill decomposes, it releases methane into the air. The more you recycle, the less trash is sent to a landfill.
- True.** Long, hot showers use more electricity.
- True.** Climate change can cause flooding in some areas and drought in others, harming people, plants, crops and wildlife.



Extended Activity:

Challenge students to create posters to help educate fellow students about how they can take action to prevent global warming.

Internet References

www.iceagemovie.com
www.kokorodinosaurus.com/icephoto.html (Ice Age mammals)
www.antarctica.ac.uk/About_Antarctica/FAQs/faq_02.html (Antarctica and global warming)

www.physicalgeography.net/fundamentals/7x.html (Earth's climatic history)

www.scotese.com/earth.htm (ice coverage during the Ice Age)
<http://education.arm.gov/teacherslounge/lessons/floatingice.stm> (floating ice experiment)

<http://nicholasacademy.com/scienceexperiment215meltingicebergs.html> (melting icebergs)

<http://epa.gov/globalwarming/kids/gw.html> (EPA site for kids)

<http://geocities.com/TimesSquare/1848/global.html> (effects of global warming)

http://tiki.oneworld.net/penguin/global_warming/climate9.html (actions to reduce global warming)

www.ymiteacher.com



Meet the Stars of the Ice Age

Part A. The Ice Age occurred many thousands of years ago when giant glaciers covered much of Europe and North America. Many amazing animals roamed the earth. Some of them play featured roles as the stars of the new DVD, *Ice Age The Meltdown*. It's a funny story about Manny, Sid, and Diego—the prehistoric trio of friends from the film *Ice Age*—who are forced to deal with some pretty rapid climate changes.

Do some research to fill in the missing information below. One character in the story was real only on screen. Who was it? _____

1. In *Ice Age The Meltdown*, **Manny**, the woolly mammoth, is ready to start a family. But fearing he's the last of his kind, he may never get his wish—until he meets **Ellie**, a female mammoth who was raised by a family of possums. She has no idea that she is a mammoth just like Manny. She's a fun-loving free spirit who constantly challenges Manny's rigid sense of order.



Woolly mammoths like Manny and Ellie weighed between _____ and _____ tons and needed at least _____ gallons of water and _____ pounds of vegetation a day in order to survive.

2. **Sid**, the sloth—so eager for respect, yet so incapable of earning it—meets some new friends who, incredibly, worship him.



The sloth, about _____ meters in length, was a relative of the present-day _____ and small tree sloths of Central and South America.

3. **Diego**, the saber-tooth tiger who was once a fearsome predator, is harboring a big secret in the new DVD.



This tiger had very strong front legs, short hind legs and a short tail. Its teeth ranged from _____ to _____ inches long. Because it ran _____, it preferred to lie in wait until an animal such as a young mammoth or a mastodon crossed its path.

4. **Scrat** is back from the film *Ice Age*, still chasing the ever-elusive acorn—this time through a watery, muddy mess, as his world begins to melt around him. Only now, he gets to play a more heroic role.



This film star, who gets his name from a combination of a _____ and a _____, is based on the earliest mammals, which were as small as mice.

5. **Crash and Eddie**, possum “brothers” to Ellie, are daredevils who will try anything, and often get into trouble because of it.

But they both love and protect Ellie, no matter what.



Possums were part of a group of marsupials, or _____ animals. Although we think of marsupials such as kangaroos as being found in _____, possums are the only marsupials native to the United States.

Part B. Several different types of habitats existed simultaneously during the Ice Age, and affected the animals living during that time.

1. How did animals that did not migrate to warmer climates adjust to the icy tundra?

2. What effect did melting snow and ice have on the geography, and how did it benefit animals that migrated to these areas?

3. How did the warming of the earth between the Ice Ages affect the kinds of animals living in areas that became covered by forests?



See it before the ice melts!

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Activity 2

Ice Age Science

Reproducible
Master

The animals in *Ice Age: The Meltdown*, lived in an Ice Age world like that of the Pleistocene epoch. Let's learn more about the science of ice and water by first answering these "icy" questions. Then do your own icy experiment.



Part A. Icy Observations

1. Antarctica is the coldest continent on Earth today. Average temperatures in the warmest part of the Antarctic Peninsula average around ____° F.
2. Convert that temperature into Celsius: ____° C
3. What is the average winter temperature in Fahrenheit degrees where you live? ____° F (____° C)
4. How cold do you think Earth was, on average, during the coldest part of the Ice Age? ____° F (____° C)
5. How much colder was it during the Ice Age than it is now where you live? ____° F (____° C)
6. What is the temperature at which water freezes? ____° F (____° C)

Part B. My Icy Experiment

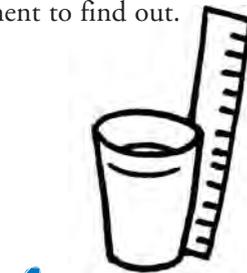
Does floating ice cause a container to spill over when the ice melts? Conduct this experiment to find out.

1. Place the ice cubes into the container.



2. Pour water one liter at a time to fill the container to the top. Do not let the water overflow.

3. Wait for the ice to melt.



4. Measure the total amount of water in the container.

Complete the chart below to compare your hypothesis, or what you think will happen, with your observations of the experiment.

	Hypothesis	Observations
☛ The time required for ice to melt		
☛ The water will or will not overflow		
☛ The total amount of water in the container will be the same, more, or less after the experiment		



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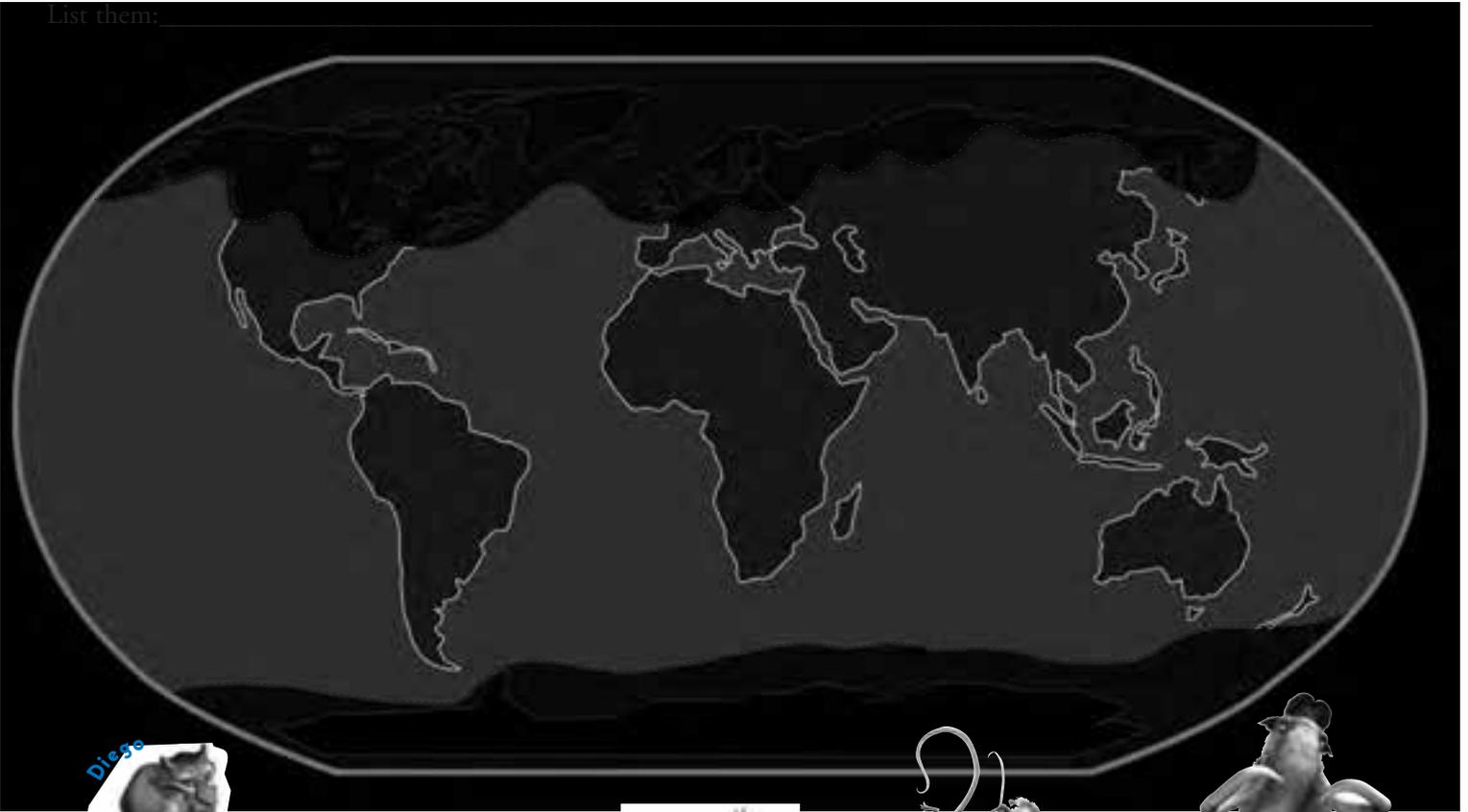
Now write two or three sentences to describe your conclusion about what you think the impact on sea level is when floating ice melts. _____



Pictures of Our World

Part A. This map shows the world inhabited by Manny, Ellie, Sid and Diego (stars of the *Ice Age The Meltdown* DVD) at the time of the Pleistocene epoch. Label the continents and oceans. What areas were covered with ice?

List them: _____



Part B. Many scientists believe the earth is experiencing global warming, but that we can help change the situation. Read these statements to learn more about it and what you can do to make a difference. Then mark each statement with a “T” for **True** or an “F” for **False**.

1. Saving the rainforests can make a difference in the earth’s climate.
2. The ice at the poles is melting very slowly.
3. If you turn off the lights, the television and the computer when you aren’t using them, you can help improve the earth’s atmosphere.
4. All cars are bad for the environment.
5. Planting a tree doesn’t make much difference in global warming.
6. Recycling makes a big difference when it comes to helping improve the environment.
7. Taking shorter showers with water that is not too hot can help reduce global warming.
8. Changes in climate can mean that some cities or regions have colder, warmer, wetter or drier weather than they usually experience.



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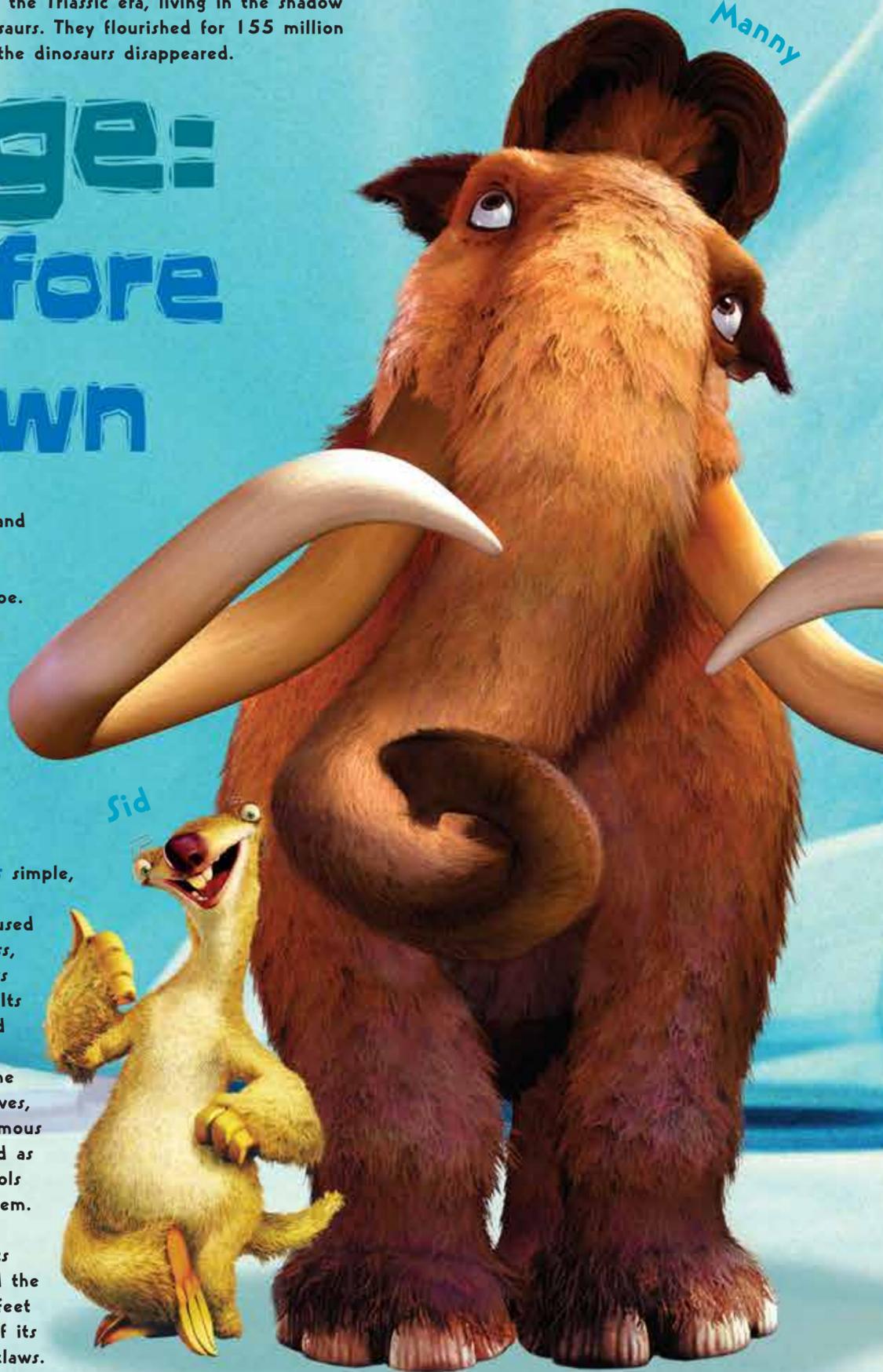


The Ice Age: Mammals Before the Meltdown



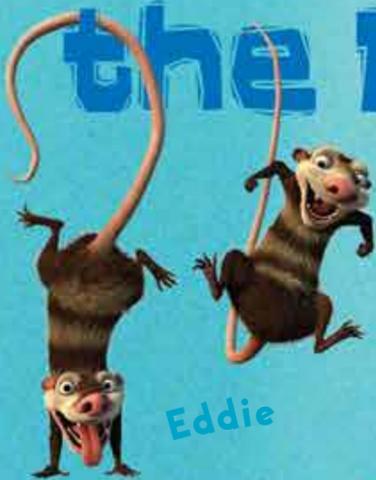
Scrat

Mammals similar to the character of Scrat first appeared in the Triassic era, living in the shadow of the dinosaurs. They flourished for 155 million years after the dinosaurs disappeared.



Manny

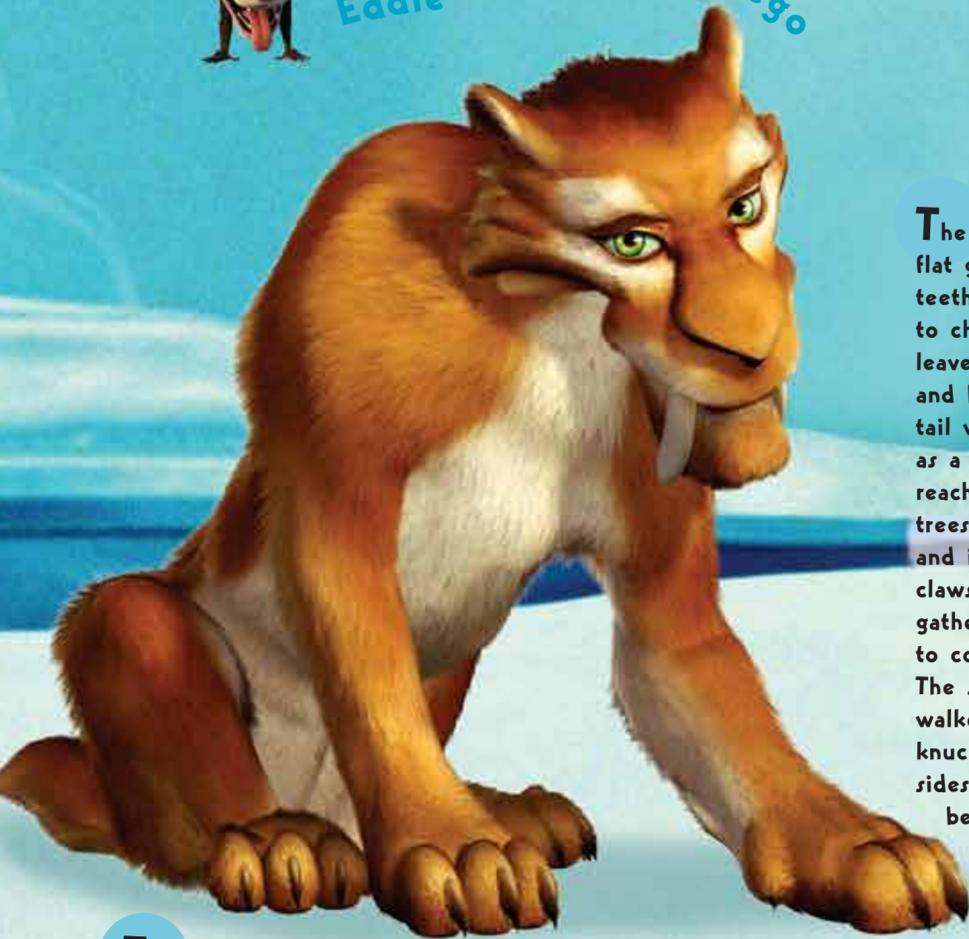
Crash



Eddie

Like other mammals common in urban and suburban areas who aren't picky about what they eat, **possums** have thrived despite human alterations to the landscape. You might see one in your backyard!

Diego



Sid

The **sloth's** simple, flat grinding teeth were used to chew grass, leaves, tubers and bushes. Its tail was used as a prop to reach into the trees for leaves, and its enormous claws worked as gathering tools to collect them. The sloth walked on its knuckles and the sides of its feet because of its large claws.



The giant sloth is an example of the many giant mammals, or megafauna, that roamed the earth during the Pleistocene epoch.

The **saber-tooth tiger** used its powerful forelimbs to pull down its prey and stab at the softer underside of the animal with its sabers, often as long as a human hand. Then it retreated until after the animal had died to escape the wrath of the mother and other animals of the herd.

The **woolly mammoth's** dense, shaggy coat, four inches of insulating fat, and hump of extra fat on its back, helped it adapt to the coldest of climates. Its large trunk had fleshy projections like fingers that wrapped around grasses and shrubs, its primary diet. Its tusks were used like ploughs to find food and water buried beneath the snow.

Ice Age Mammals We Discovered

Name	Size	Diet	Main Characteristic	Interesting Facts



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