DRILL DOWN DEEPER INTO DEEP DARK LIFE

IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

What is microbe poop?

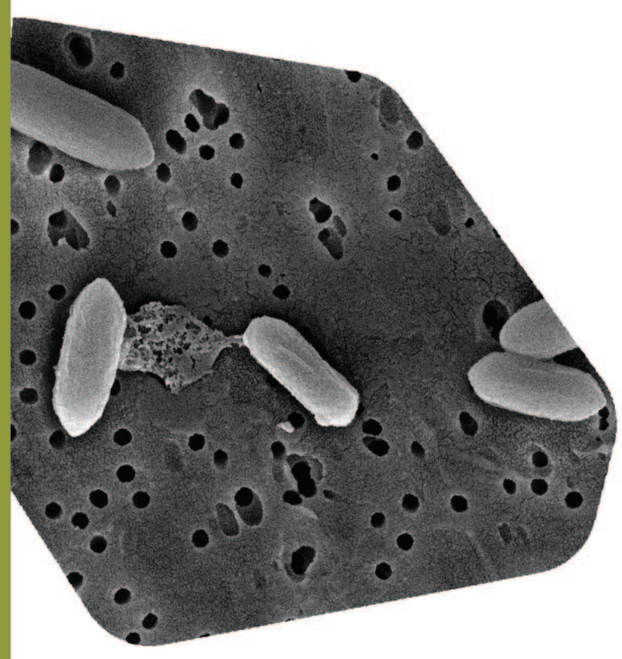
Microbes are tiny one-celled living things like bacteria and archaea. Like us, they need to eat and breathe to get the energy they need.

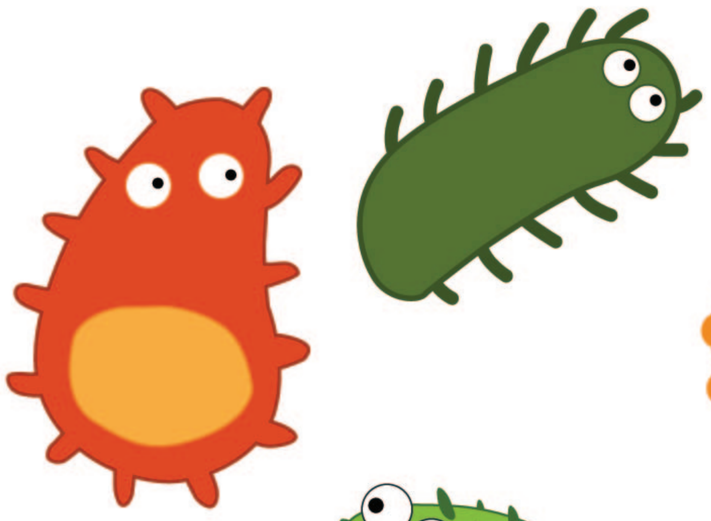
We eat plants and animals and breathe oxygen. Many microbes do too. The environments under the seafloor have little to no plant and animal remains or oxygen, so the microbes who live there eat and breathe things we would not consider food. Many of them eat the poop of other microbes.

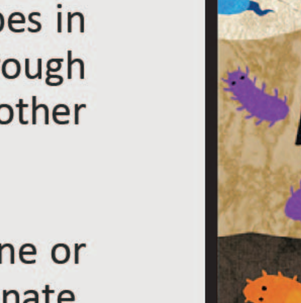
Microbe "poop" is not what we normally think of as poop. Microbes in the seafloor typically eat minerals, metals, and chemicals. Through digestion and respiration, they then turn these materials into other minerals, metals, and chemicals, which are then pooped out.

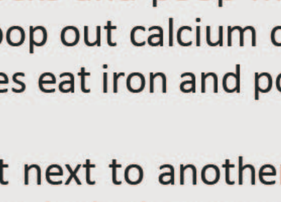
Some seafloor microbes eat minerals from rocks and poop methane or hydrogen sulfide. Others eat methane and poop out calcium carbonate, the stuff in seashells and chalk. Some microbes eat iron and poop rust.

One group of seafloor microbes will live right next to another group of microbes that is pooping out the metals or chemicals they need to eat. In some places, the species of microbes divide into layers where each species feeds on the chemical poop of the species above it.









Try this!

Check out the "Deep Dark Life" backpack from the front desk. Use the magnifier to see how many microbes live in one square inch on a variety of surfaces.

Learn more about how scientists are finding microbes in the seafloor at www.insearchofearthssecrets.com.

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DRILL DOWN DEEPER INTO DEEP DARK LIFE

Collect your *Deep Dark Life* passport sticker

What are some of the cool microbe species we've discovered living in the seafloor?

Pollution-eating bacteria

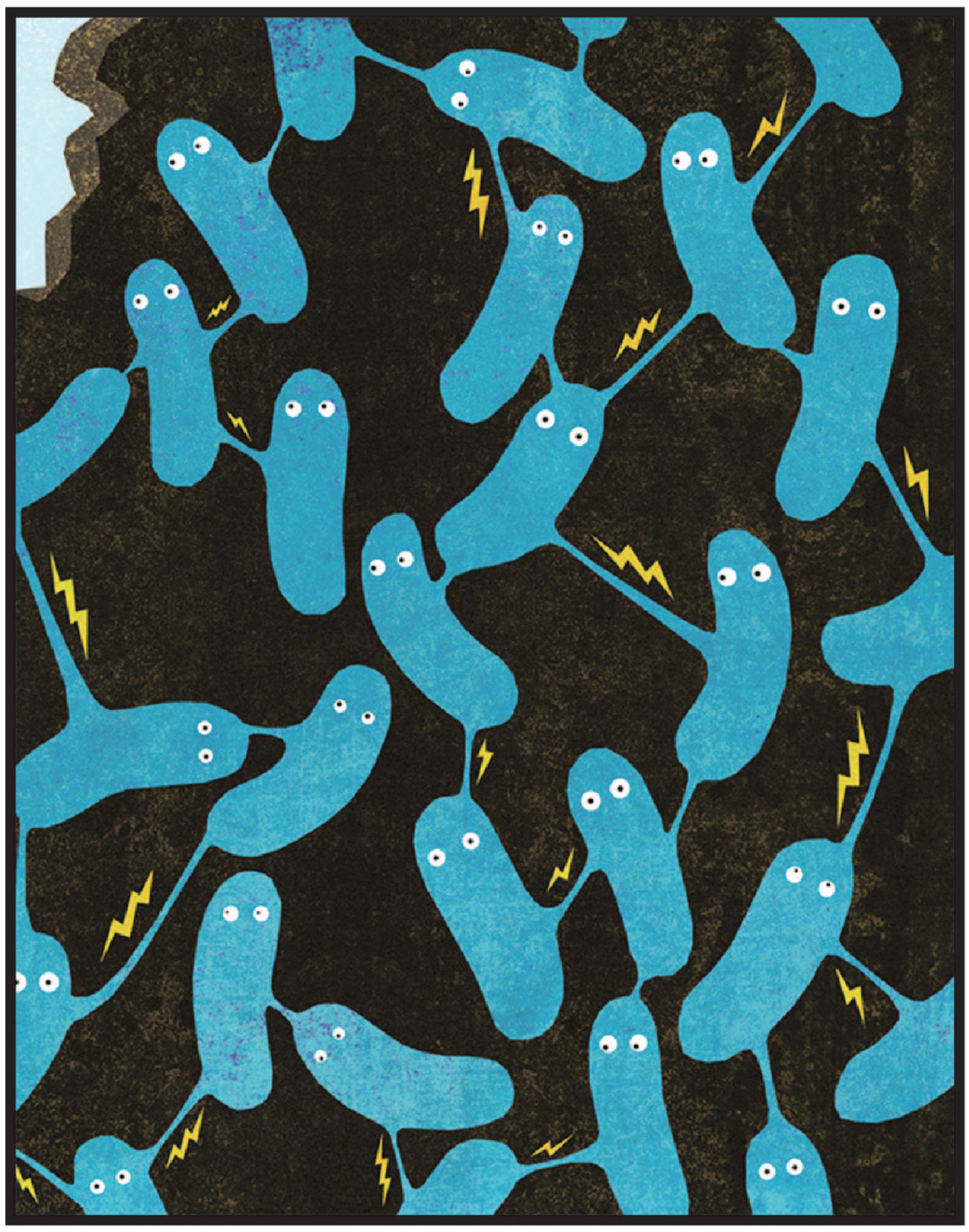
Some bacteria have been found in the seafloor that feed on oil and other chemicals and turn them into materials that are less toxic to wildlife. These bacteria can be used to cleanup oil spills or other forms of pollution.

Metal-making bacteria

Some bacteria poop-out chemicals that then attract metals that are valuable to people like copper, magnesium, zinc, and rare earth metals.

Electricity-generating bacteria

Some bacteria wire together to conduct electricity from the rocks in the seafloor. These bacteria can be used to make living batteries that generate electricity. They also create super strong, microscopic wires that may have industrial uses.



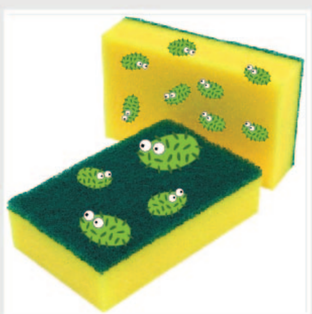
Everything is microbe habitat!

Try this!

Check out the "Deep Dark Life" backpack from the front desk. Use the magnifier to see how many microbes live in one square inch on a variety of surfaces.

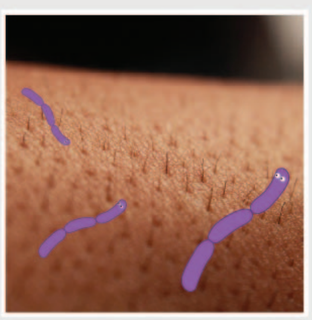
Our planet's surface is covered with microbes, but some surfaces are better habitats than others. Use the magnifier to see the average number of bacteria per square inch on each of these four habitats. Which is the best microbe habitat? Why? (Hint: microbes need to eat, drink, and breathe in their habitats).

About 100 million bacteria on a square inch of soil



About 135,000 bacteria on a square inch of sponge

About 64 bacteria on a square inch of keyboard



About 50 million bacteria on a square inch of skin

PS: Before you get too grossed out, almost all of the microbes on each of these surfaces are harmless to people.

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Learn more about the amazing things seafloor microbes can do at www.insearchofearthssecrets.com.

IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

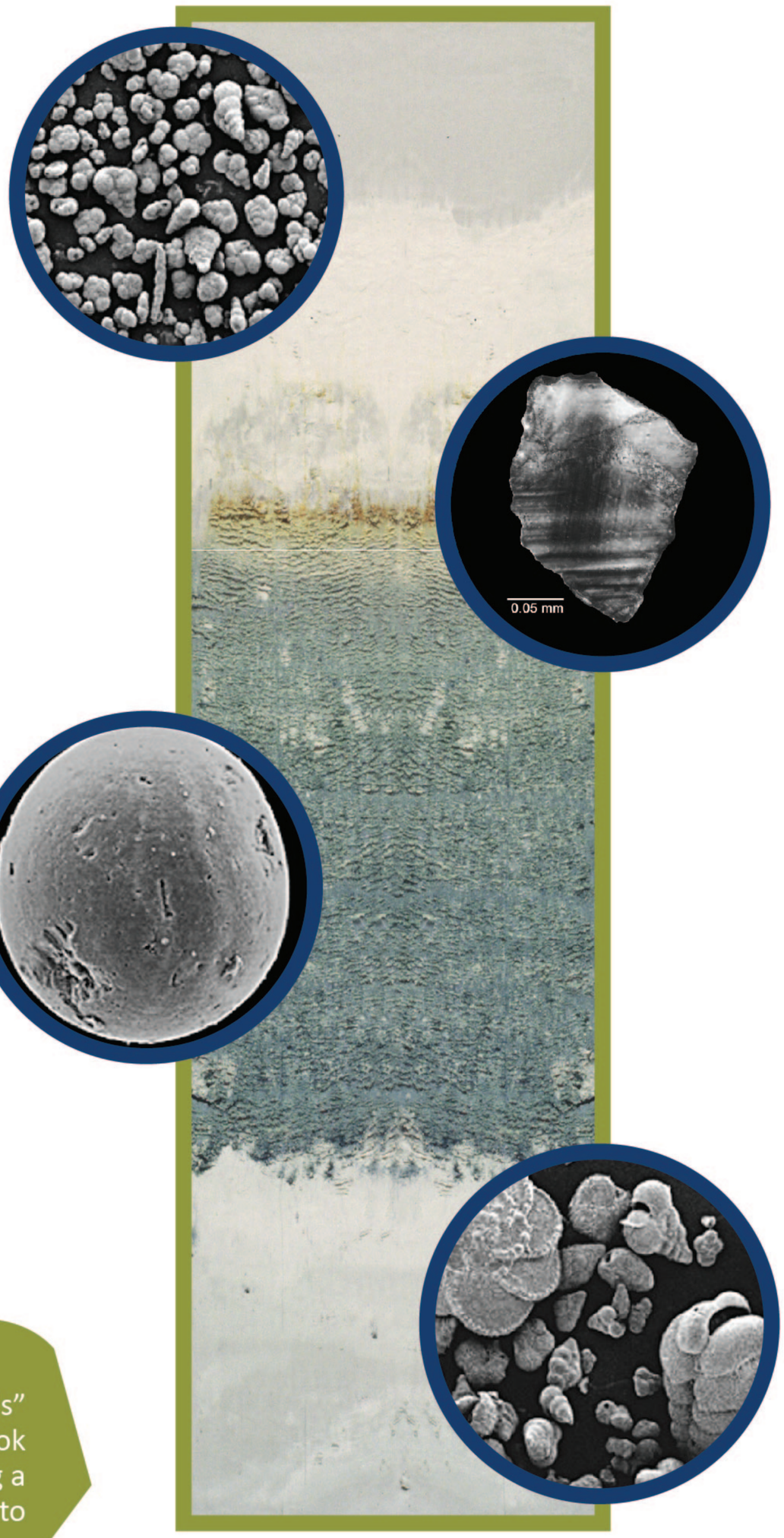
DRILL DOWN DEEPER INTO DEEP SEA FOSSILS

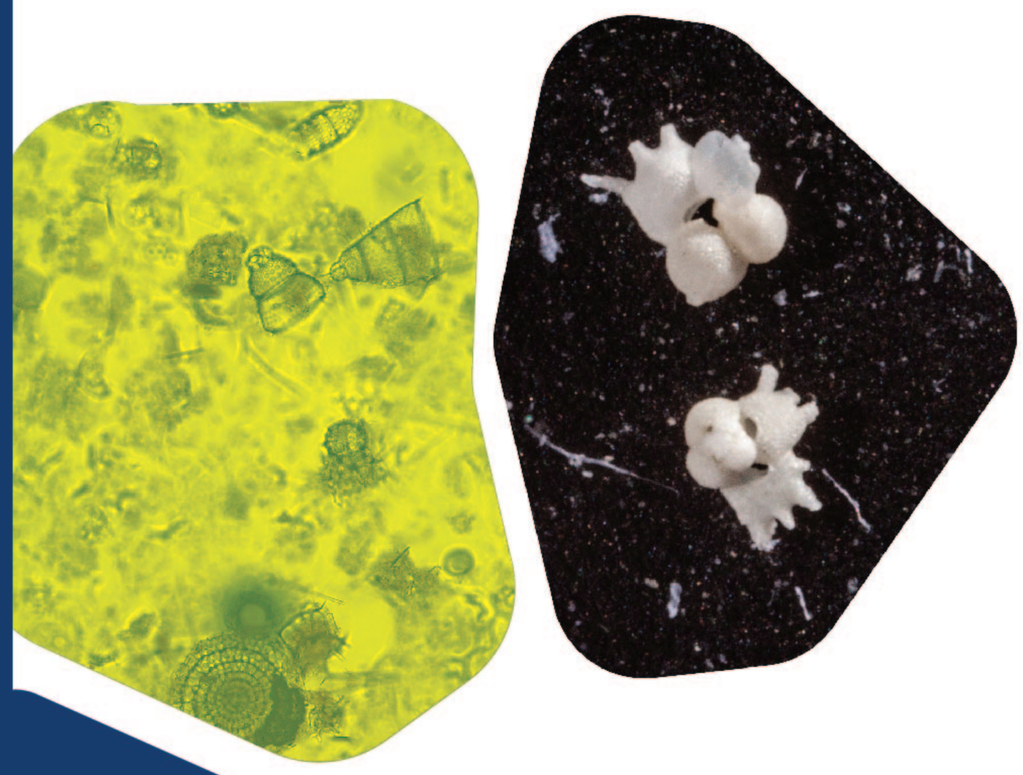
Where do microfossils come from?

Most of the seafloor is not covered with sand. It is covered with tiny fossils. You will only find seafloor covered with sand near coastlines. The sand comes from bits of land rocks that were carried to the sea by rain and rivers.

The fossils that cover the rest of the seafloor are rarely from a plant or animal. They are usually shells so small that you need a microscope to see them in detail (which is why they are called "microfossils"). The fossil shells come from tiny creatures in the ocean like diatoms, which are one-celled algae, and forams, which are one-celled amoebae.

The ocean is filled with these tiny creatures. When they die, their shells pile-up on the seafloor. This has been happening for millions of years. In many places in the ocean, the layers of ancient microfossils on the seafloor are hundreds of feet thick.





Try This!

Check out the "Deep Sea Fossils" backpack from the front desk to look at actual seafloor microfossils using a magnifying glass. You can also try to measure them with a ruler.

Learn more about the different kinds of microfossils at www.insearchofearthssecrets.com.

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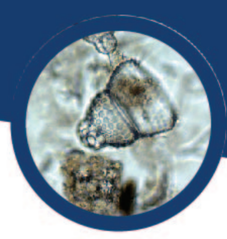
DRILL DOWN DEEPER INTO DEEP SEA FOSSILS



Collect your *Deep Sea Fossils* passport sticker

How do microfossils teach us about past climates?

Fossils that are smaller than a pinhead may not sound as exciting as a T. Rex skull or a megalodon shark tooth, but scientists love seafloor microfossils.

Fossils of large animals are hard to find. Their remains often get eaten or washed away by wind and rain before they turn into fossils. This makes it almost impossible to find a place that has a continuous collection of fossils on land showing how large animal have changed over millions of years.

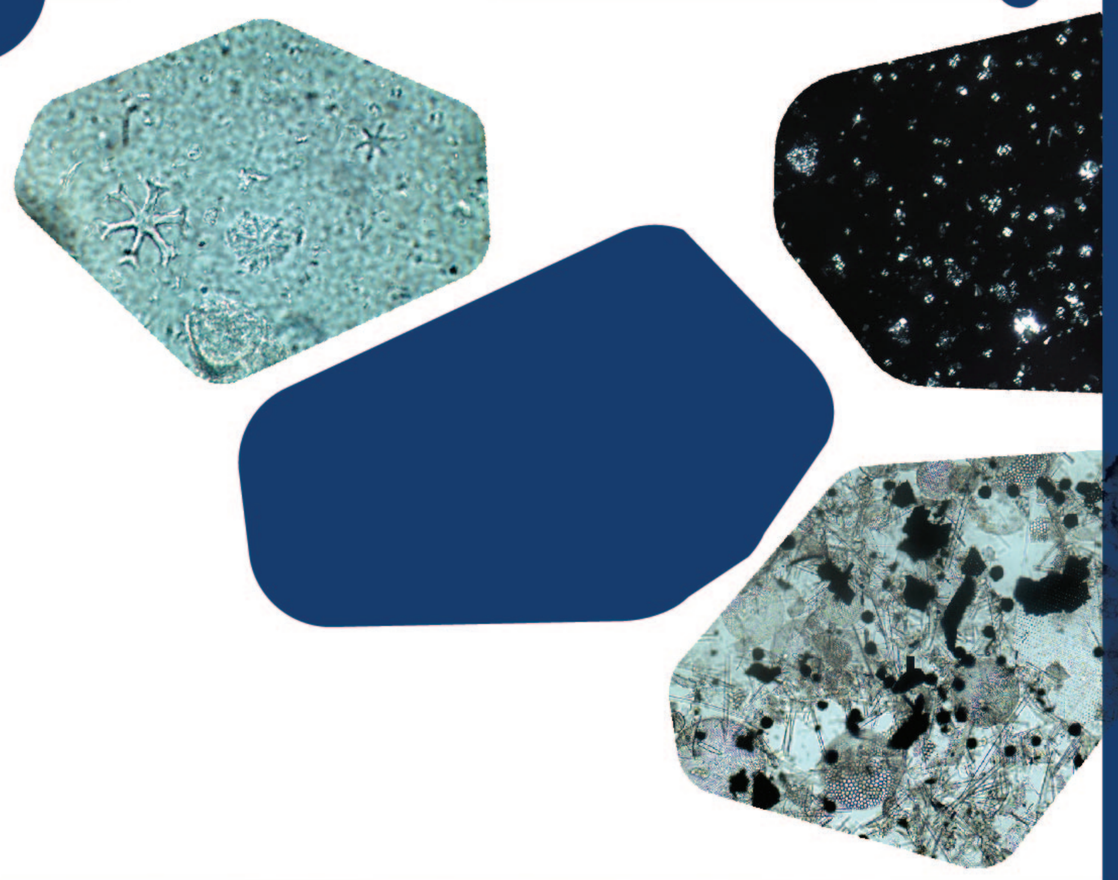
There are no rivers or rain under the ocean and few creatures there eat really tiny shells. This makes microfossils abundant on the seafloor. They provide scientists an unbroken record of how things have changed on Earth for over 100 million years.

One of the changes scientists see by studying microfossils is how climate has changed in the past. Just like large animals, the tiny creatures that microfossils come from are adapted to live in only certain habitats and climates. Scientists know which of these creatures need to live in warm climates and which ones need to live in cold climates.

During warm periods, the most abundant microfossil species in the ocean are the ones that do well in warm temperatures. Their shells will cover the seafloor during this time.

If the climate get colder a couple million years later, the warm water species will disappear and be replaced by species that do well in cold water. The shells from the cold water species cover the layer of shells deposited earlier by warm water species.

When scientists see the layers in the seafloor change from mostly warm water species to mostly cold water species, it is an indication that climate changed at that time.



Try This!

Check out the "Deep Sea Fossils" backpack from the front desk to get a closer look at some enlarged 3D models of microfossils.

Learn more about what scientists learn from microfossils at www.insearchofearthssecrets.com.

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DRILL DOWN DEEPER INTO DINOSAUR DOOMSDAY

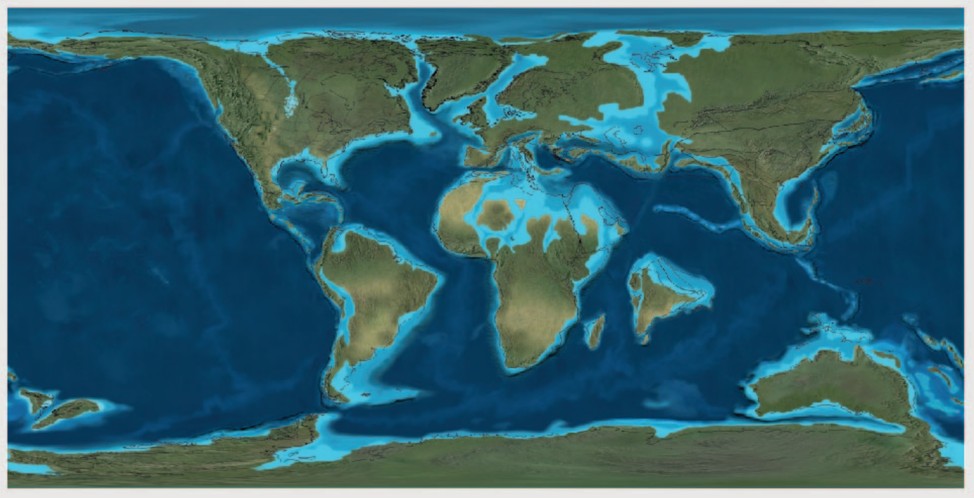
IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

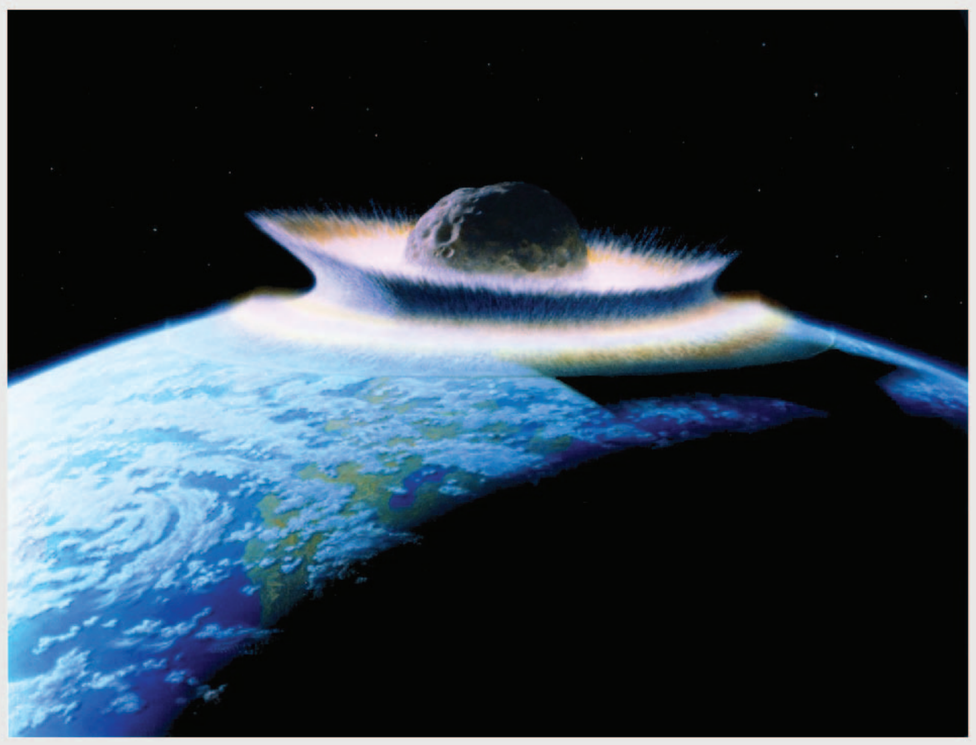
How did that asteroid kill the dinosaurs?

The asteroid that impacted the Earth 66 million years ago was bigger than Mt Everest. Something that big would obviously kill everything beneath it where it hit, but how did it kill animals around the world?

The asteroid impact was so big that it triggered a series of natural disasters around the world. The asteroid landed in shallow ocean water and created tsunamis that travelled thousands of miles in multiple directions to devastate coastal areas. The impact created an explosive blast that would have killed everything in its path for hundreds of miles. The impact may have shaken the Earth enough to cause massive earthquakes, and even volcanic eruptions, across the planet. The impact shot bits of rock into the atmosphere, which heated up as they rained back down and made the air hot enough to roast a turkey. That heat would have set off forest fires around the world.

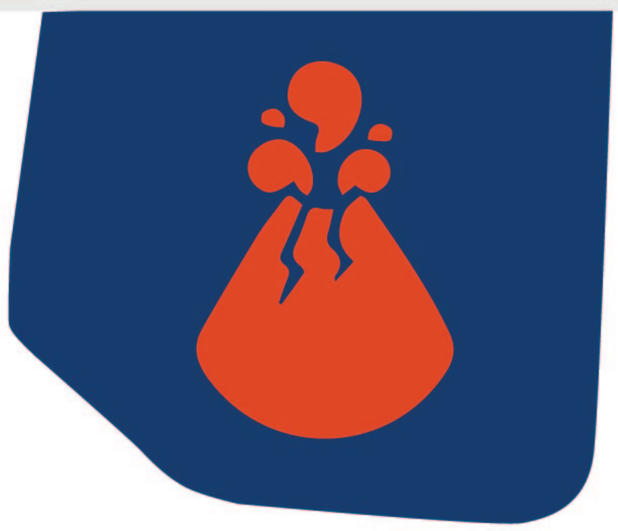
As devastating as all those events were, the biggest killer was likely the dust released in the atmosphere by the impact. The dust was light enough to float in the air and block out the sun possibly for years. This created freezing winter conditions all year long around the world. The lack of sunlight killed the plants, which then caused many animals that depended on plants for food to die. About 75% of species went extinct at the time of the asteroid impact, including species of plants, plankton, mammals, and dinosaurs.





Try this!

Check out the "Dinosaur Doomsday" backpack from the front desk to look with your magnifier at bits of rock drilled from the Chicxulub Crater.



Learn more about the devastation of the Chicxulub asteroid impact at www.insearchofearthssecrets.com.

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DRILL DOWN DEEPER INTO DINOSAUR DOOMSDAY

Collect your *Dino Doomsday* passport sticker

Why do we think that those layers in cores were created by the Chicxulub asteroid?

Scientists have found the layer of debris created by the Chicxulub asteroid impact in deep sea cores drilled around the world. We concluded that these layers were caused by this impact for a number of reasons.

The layers all have iridium in them.

Iridium is a metal that is very rare on Earth, but common in space. Because of this, iridium on Earth is almost always found in the remains of meteorites. Since these layers in the seafloor contain a lot of iridium, they are likely to have come a large object from space like a huge asteroid.

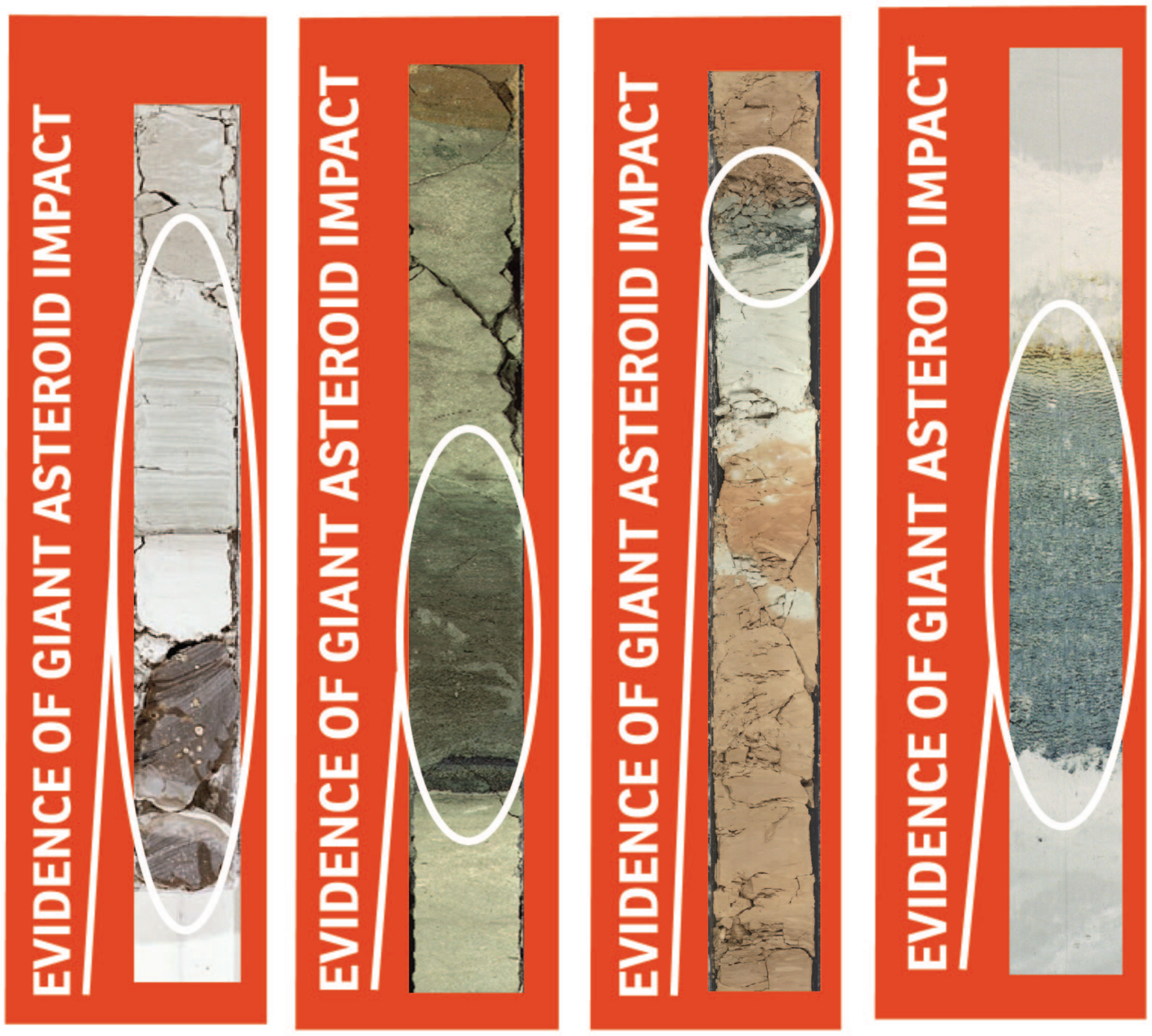
The fossils beneath these layers are different from the fossils above the layers.

We know the asteroid impact caused the mass extinction of a lot of different living things. When scientists look with a microscope at cores that have the impact layer, they find the older layers beneath the impact layer have fossil shells from a wide variety of plankton species. The newer layers above the impact layer contain fossils from only a handful of species. The rest of the species are gone, indicating a mass extinction occurred at the same time the impact layer was created.

The layers are all the same age as the Chicxulub Crater.

These layers and the Chicxulub Crater are 66 million years old. We know this because many rocks contain tiny, radioactive "clocks." These clocks are radioactive elements that change into different elements at a constant rate. Scientists know how to read these microscopic clocks to figure out the age of a rock.

Since these layers contain iridium, mark a boundary for a mass extinction, and are the same age as the creation of the Chicxulub Crater, we can conclude they were all caused by the same asteroid impact event.



Try this!

Check out the "Dinosaur Doomsday" backpack from the front desk to look with your magnifier at bits of rock drilled from the Chicxulub Crater.

Learn more about how scientists learn from cores at www.insearchofearthssecrets.com.

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IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

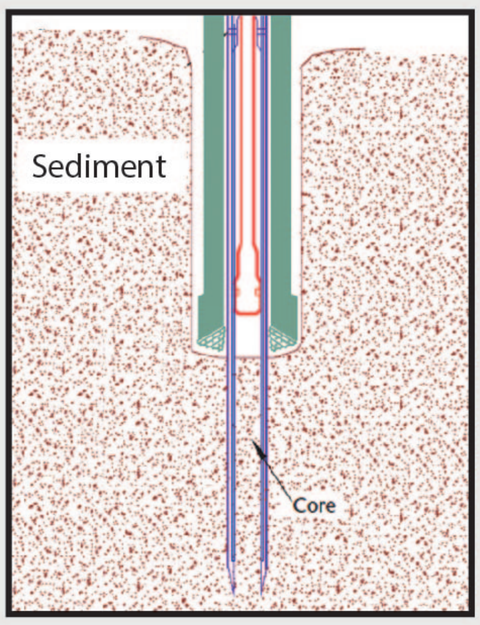
DRILL DOWN DEEPER INTO
DRILLING THE DEEP

How do drill bits cut through the seafloor?

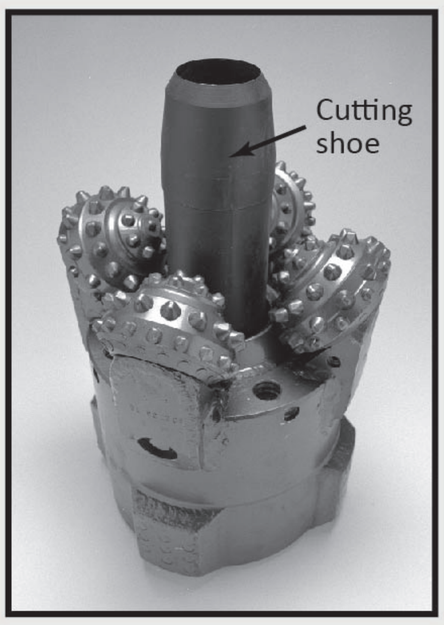
The seafloor is not the same from top to bottom. Softer sediment lies ontop of the hard rock crust. The *JOIDES Resolution* must use different kinds of drill bits for the different materials in the seafloor.

Drilling through sediment

The *JOIDES Resolution* uses *Advanced Piston Core (APC)* bits to drill through sediment. APC bits work like a cookie cutter. The *JOIDES Resolution* pushes the APC bit into the sediment and a hole in the middle of the bit collects the sediment layers.



APC bit cutting through seafloor



APC bit (shown upside down)

How big is a cutting shoe? Find out by checking out the "Drilling the Deep" backpack from the front desk.

Try This!

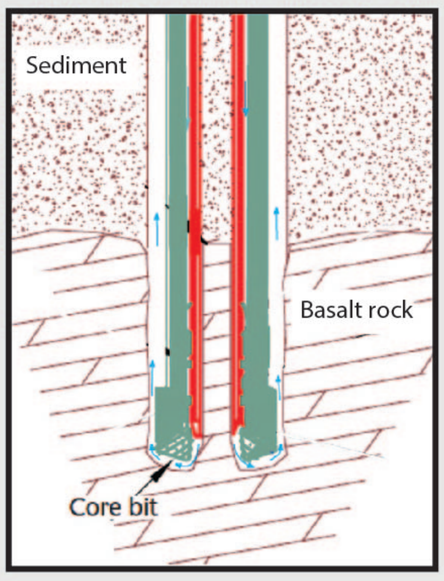
Roll up a piece of paper and place one end in the center of the drill bit replica at the "Drilling the Deep" kiosk. Let the paper roll expand to fill the center of the drill bit.

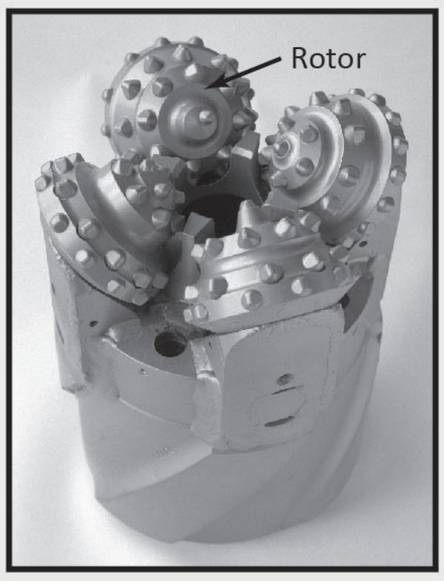
This is the width of a cutting shoe. Use the ruler to measure the diameter. Compare this to the width of the core replica at the "What is a Core?" kiosk.

Drilling through rock

Most of the upper seafloor is made of a hard volcanic rock called *basalt*. An APC bit would fall to pieces if it tried to drill these layers. When the *JOIDES Resolution* reaches basalt, the drillers switch the bit on the drill to a *Rotary Core Barrel*.

Rotary Core Barrel bits have four *rotors* made of tungsten carbide, a metal that is twice as strong as steel. The rotors spin to grind through the rock, while a hole in the center of the bit collects the rock layers.





RCB bit (shown upside down)

If a layer has really hard rock, the *JOIDES Resolution* will use a Rotary Core Barrel with rotors tipped with diamonds to cut through the rock.

If a layer has softer rock, the Rotary Core Barrel will include a cutting shoe. The cutting shoe fits in the middle hole. It helps to cut through the seafloor while also protecting the core from the water blasting out of the rotors.

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To learn more about the science and technology of ocean drilling, visit www.insearchofearthssecrets.com.

DRILL DOWN DEEPER INTO DRILLING THE DEEP

Collect your *Drilling the Deep* passport sticker

What is it like to live on the *JOIDES Resolution*?

When the *JOIDES Resolution* goes out on a research expedition, the 130 or so people who make up the scientists and crew are typically at sea for eights week straight!

Work

Everyone on the ship works twelve hours a day, seven days a week, for the entire eight weeks at sea. Half the people work a midnight to noon shift. The other half work a noon to midnight shift.

Sleep

Everyone gets a room that they share with a roommate who is on the opposite work shift. Each roommate gets the room to themselves for twelve hours a day. The rooms have bunk beds, two dressers, and two desks.

Safety

Everyone onboard has to do regular safety drills to learn what to do if the ship starts sinking. They learn how to board the lifeboats and how to put on their safety suits. The safety suit will keep someone warm, dry, and floating if they have to be in the water for long periods of time as they wait for rescue.

Food

The cooking staff needs to bring enough food to feed about 130 people for eight weeks straight. This includes about 300 pounds of butter, 1,400 pounds of potatoes, and 10,000 eggs! They need to prepare four meals everyday to feed the people on both work shifts.

Fun

There is a movie room and an exercise room for people to use when they have a break. People on the ship also find creative ways have fun, like seeing who can make the best kite using materials found on the ship.

Try This!

You can try on an actual saftey suit by checking out the “Drilling the Deep” backpack from the front desk! Tweet a photo of yourself in the suit to @TheJR.

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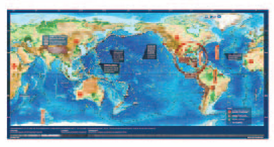
Learn more about life on the *JOIDES Resolution* at www.insearchofearthssecrets.com

IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

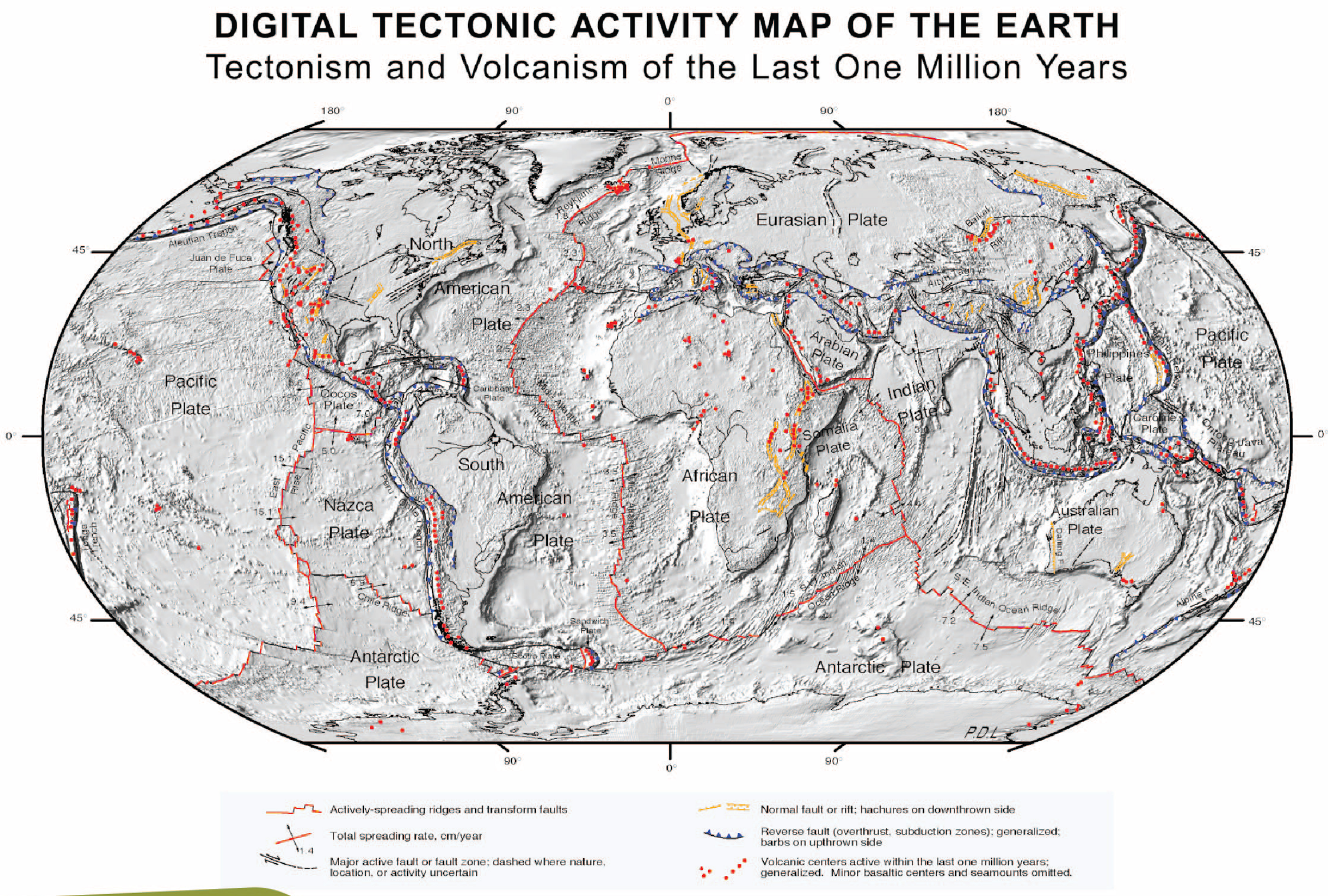


DRILL DOWN DEEPER INTO GEOLOGY UNDER THE SEA

What is plate tectonics?

Have you ever noticed that South America and Africa look like puzzle pieces that fit together almost perfectly? People have observed this for hundreds of years, but assumed it was impossible for them ever to have been actually once stuck together and now split apart.

We now know South America and Africa were once joined. All the continents are slowly moving. They have combined and broken apart at various times in the Earth's history. The ocean floor is moving too. Though the Earth's hard outer layer that we stand upon may seem as one solid shell, it is broken up into many large pieces, called plates. These plates are being pulled apart and pushed together as they ride the currents of hot fluid rock deep within the ocean. This understanding of how our planet works is called plate tectonics.



Try This!

Check out the "Geology Under the Sea" backpack from the front desk to see if you can put together the pieces of the plate tectonics puzzle.

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Learn more about how plate tectonics shapes our planet at www.insearchofearthssecrets.com.

DRILL DOWN DEEPER INTO GEOLOGY UNDER THE SEA

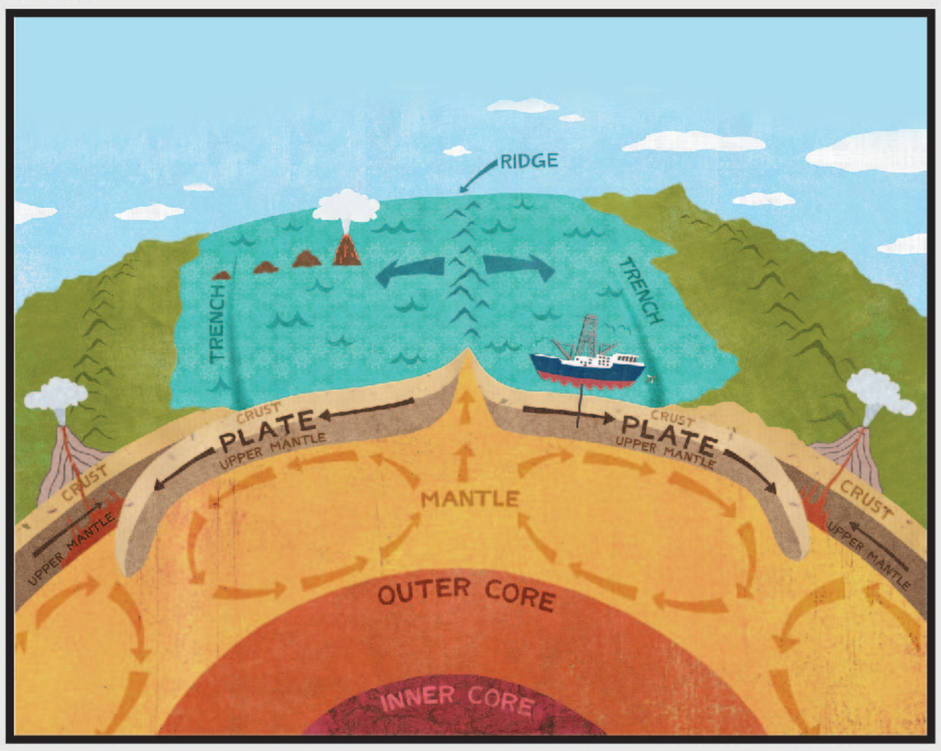
Collect your *Geology Under the Sea* passport sticker

What is seafloor spreading?

One of the ways scientists were able to prove that plate tectonics was real was by drilling the seafloor. Scientists knew that there were the chains of volcanoes on the seafloor called mid-ocean ridges. They are the longest mountain ranges on Earth. When scientists began drilling deep sea cores, they found that the youngest rocks in the seafloor were always right near these mid-ocean ridges and the farther they got away from the ridges, the older the seafloor rock was. This showed that new seafloor was regularly being created at the ridges and the seafloor was spreading out from there (think about a sea floor conveyor belt).

Mid-ocean ridges are places where two currents of molten rock deep inside the Earth are pulling the seafloor apart. Magma rises up in the opening in the seafloor and creates the volcanoes of the mid-ocean ridges and new seafloor rock.

If the seafloor is spreading than why isn't the Earth getting bigger? To find out the answer to that, check out the Drill Down Deeper sheet for the Quakes and Waves kiosk.



EQUATOR

Try This!

Check out the "Geology Under the Sea" backpack from the front desk to see if you can put together all the oceanic and continental pieces of the Earth's plate tectonics puzzle.

Learn more about the science of seafloor spreading at www.insearchofearthssecrets.com.

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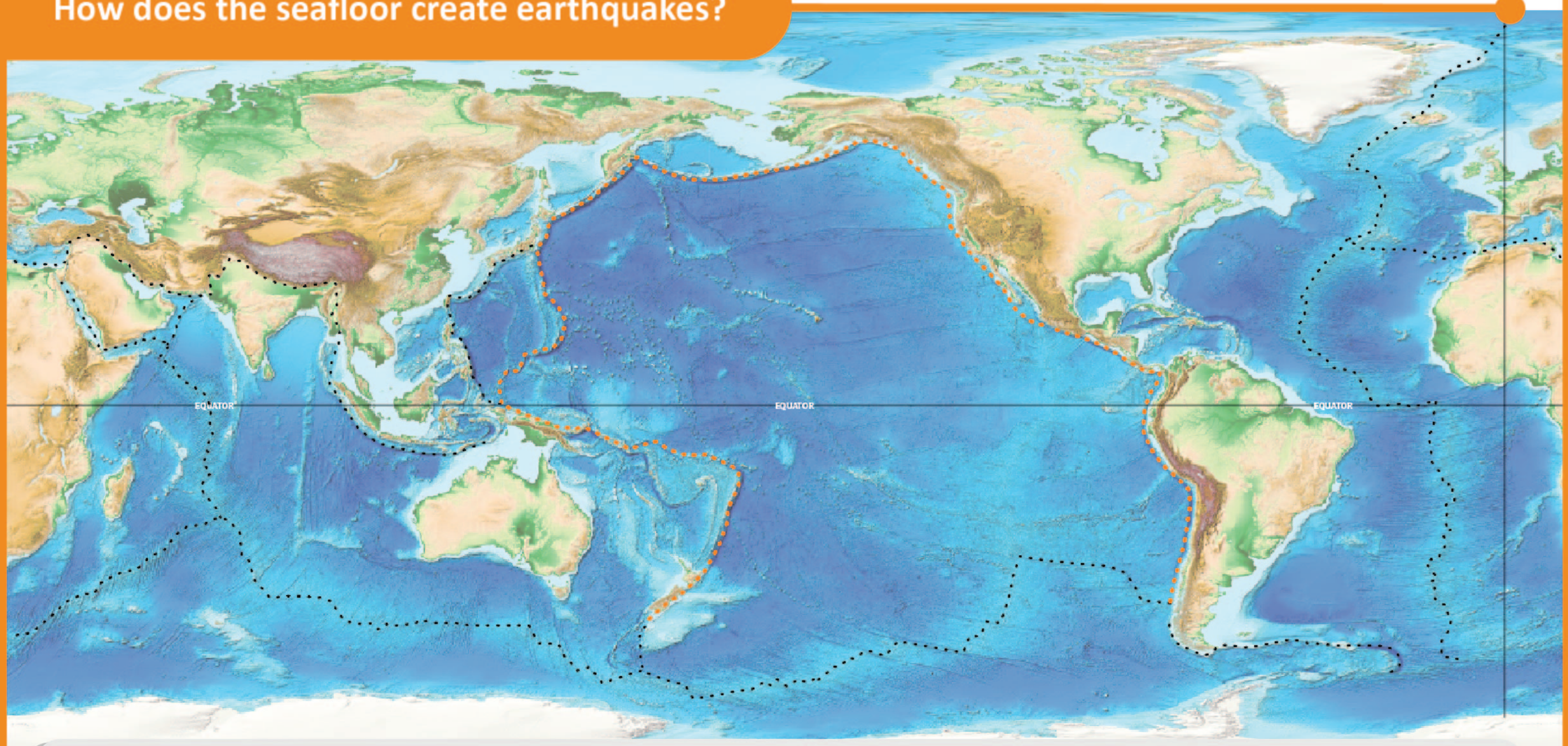
IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

DRILL DOWN DEEPER INTO QUAKES AND WAVES

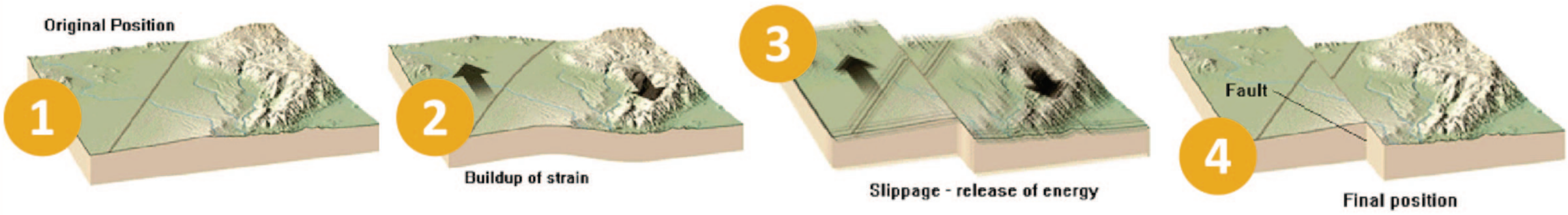
How does the seafloor create earthquakes?



The Earth's crust is broken up into many large pieces, called plates. The plates under both the ocean and in the continents are moving. Earthquakes and tsunamis happen where these huge plates of rock collide.

Many of the places where plates meet are in the ocean where ocean collide with continental plates or other ocean plates. The plates that collide often get caught on each other. Even though they are stuck, the plates keep pushing against each other.

Potential energy builds and builds until there is enough energy for both plates to break free. As the plates suddenly lurch past each other, they release huge amounts of energy and cause earthquakes that can devastate coastal regions.



Try This!

Check out the "Quakes and Waves" backpack from the front desk to look at a 3D model of the ocean and continental plates. See if you can find a place where an ocean plate is colliding with a continental plate that may be a potential source of earthquakes and tsunamis.

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Learn more about how plates move and how the JOIDES Resolution helps us learn about earthquakes and tsunamis at www.insearchofearthssecrets.com.

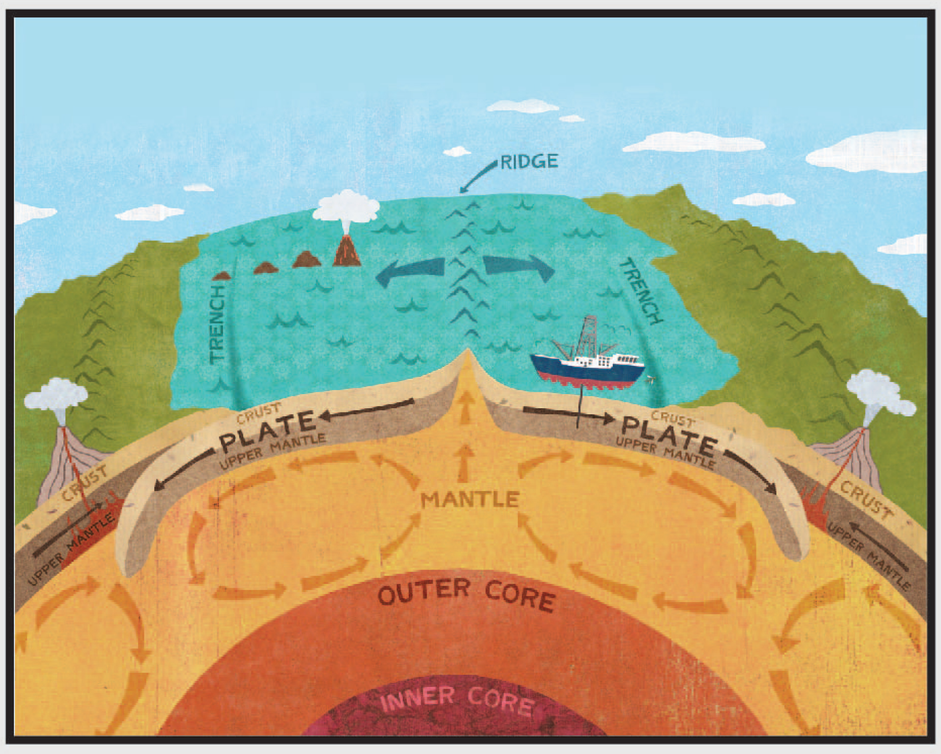
DRILL DOWN DEEPER INTO DRILLING THE DEEP

Collect your *Quakes and Waves* passport sticker

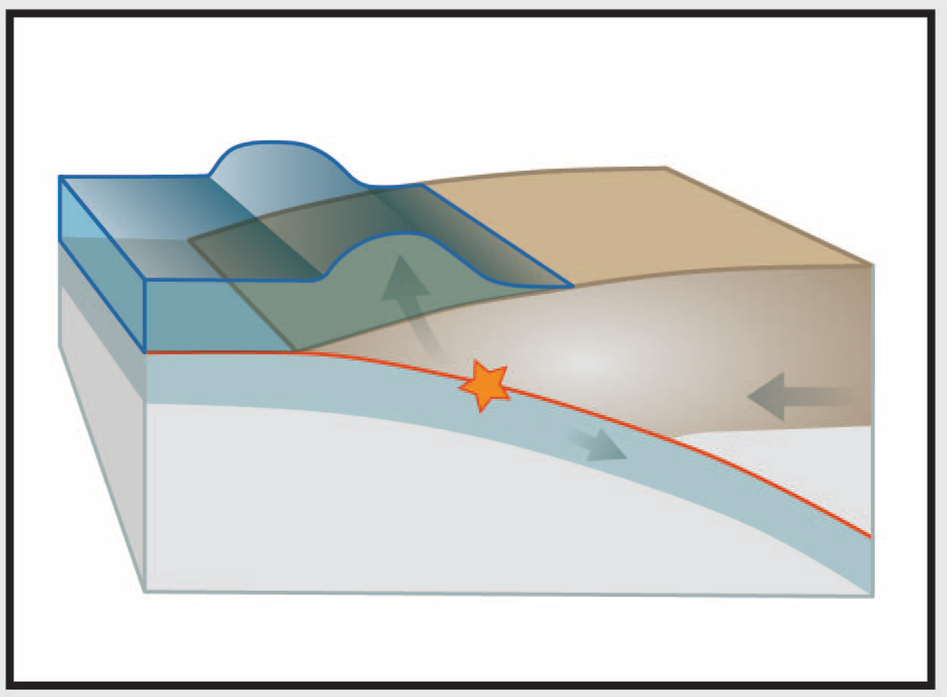
How does the seafloor create tsunamis?

The rock that covers the Earth is not one continuous shell. It is broken up into many large pieces, called plates. These plates sit above hotter but softer rock deep in the Earth. Motion of the softer rock slowly carries the plates, sometimes right into each other.

When a seafloor plate collides with a continental plate or another seafloor plate, it will sink underneath the other plate. This creates deep ocean trenches, like the Marianas Trench. These trenches, which are also called "subduction zones," are where many earthquakes and tsunamis happen in the ocean.



Tsunamis happen at subduction zones when the plates break free and the plate above that had been bent down springs upwards. The released plate causes an earthquake, but also pushes tons of water up to the ocean surface. The water bulges up and then spreads out in all directions as tsunamis that flood coastal areas.



Try This!

Check out the "Quakes and Waves" backpack from the front desk to look at a 3D model of the ocean and continental plates. See if you can find a subduction zone on the model.

Learn more about subduction zones and why ocean plates sink into the Earth at www.insearchofearthssecrets.com.

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DRILL DOWN DEEPER INTO STORIES FROM THE CORES: DEEP DARK LIFE

Now that you've gotten to know the microbe characters in the Deep Dark Life game, let's look at how they compare to the real thing. (Pictures on the back).

How are the characters similar to the actual microbes?

BODY SHAPE

Microbes come in three main shapes—round, rod-shaped, or spiral—but can also take weird shapes like squares or stars. Each microbe species has its own unique shape, determined by the types of proteins available to them.

NUMBER OF "TAILS"

The "tails" are called flagella and most microbe species have a specific number of them found in specific locations on their bodies. Very tiny, very complex motors attach the flagella to a microbe's body. The flagella twirl rapidly (up to 1,500 times per second!) to move the microbe in any direction.

NANOWIRES

Some species have microscopic threads that connect them to other microbes. These nanowires carry energy back and forth within the colony.

How are the characters different from the actual microbes?

SIZE

Microbes are really, really tiny—much smaller than the game characters. An average microbe is less than a millionth the width of a human hair! We can't see microbes with our naked eyes. We need powerful microscopes to see and study them.

EYES

Real microbes don't have eyes! They sense what is around them by detecting very tiny chemical changes over long distances. They can also sense light and move toward it.

COLORS

We made up our microbe characters' colors. Although some microbes produce pigments (and some glow!), microscopic images are generally black and white, so we don't know what colors the actual microbes are.

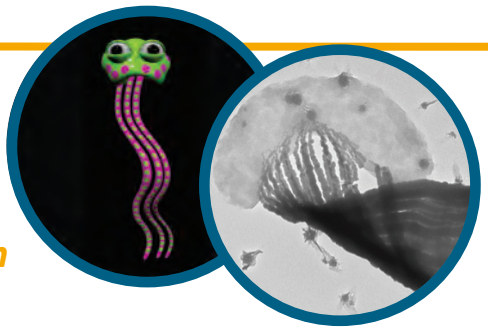
Try this!
Check out the "Stories from the Core" backpack from the front desk to make your own microbe!

DRILL DOWN DEEPER INTO STORIES FROM THE CORES: DEEP DARK LIFE

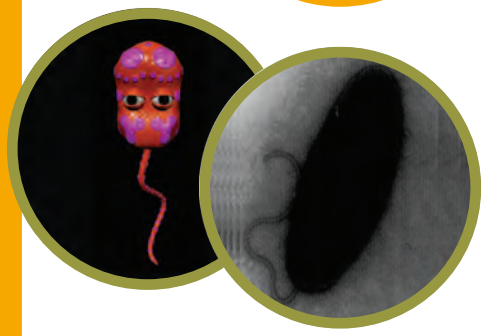
Collect your *Stories from the Cores* passport sticker

Meet the Real Microbes

Glow Bug is a *Photobacterium phosphoreum*

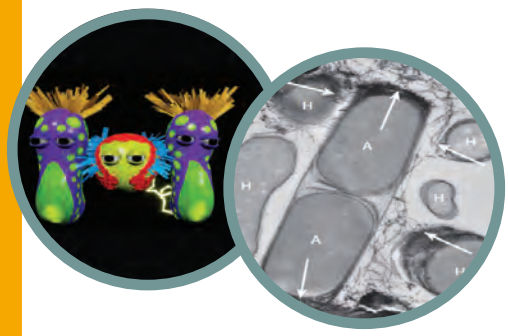


Mary is a *Mariprofundus ferooxydans*

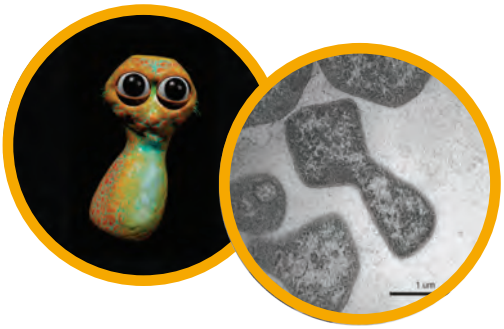


Klastos is a *Cycloclasticus pugetii*

Kiwi is a *Bacillus rigilliprofundi*

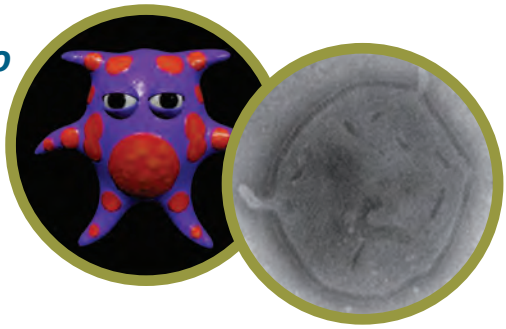


BFFs are bacteria and archaea connected by nanowires



Thanoc is a *Methanoculleus submarines*

Sulfo is a *Desulfovibrio profundus*



Sour Boy is a *Aciduliprofundum boonei*

Try this!
Check out the "Stories from the Core" backpack from the front desk to make your own microbe!

Learn more about how cores reveal the secrets of the deep dark life at www.insearchofearthssecrets.com.

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IN SEARCH OF EARTH'S SECRETS
A Pop-Up Science Encounter

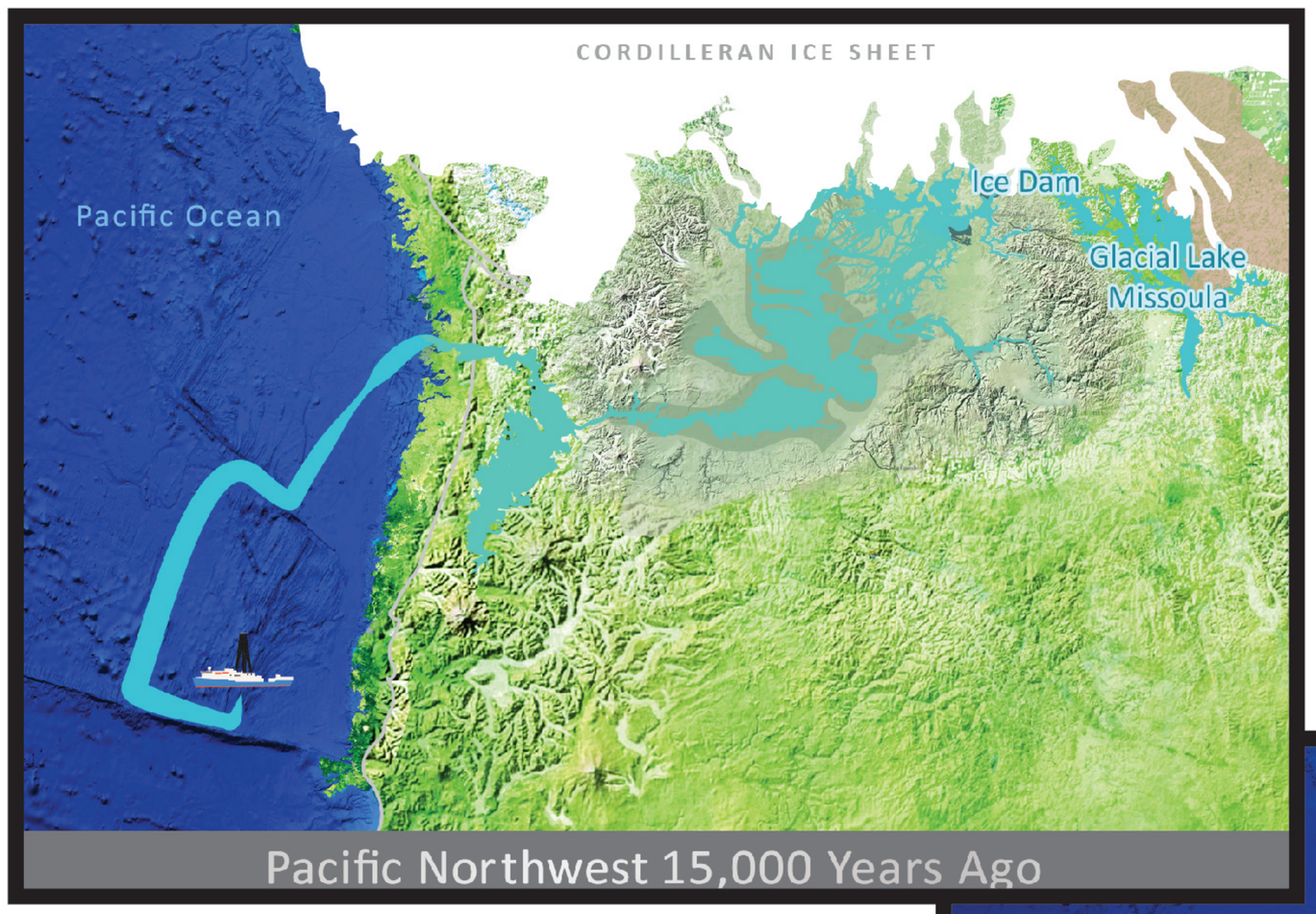
DRILL DOWN DEEPER INTO STORIES FROM THE CORES

Where and when were the glacial megafloods?

Between 22,000 and 11,000 years ago, a huge sheet of ice covered Canada and parts of the northernmost United States. Part of the ice sheet went across a valley near the border of Idaho and Montana. This glacier dammed up the Clark Fork River that ran through the valley. The ice dam created a huge body of water called Glacial Lake Missoula. This Ice Age lake covered parts of western Montana and was as big as Lake Ontario and Lake Erie combined.

The ice dam was not permanent. It periodically broke and released all the water in the lake (possibly 500 cubic miles worth of water, as much as half of Lake Michigan.) This water flooded over present day Washington and Oregon with enough force to carve deep canyons out of the rock and to carry boulders embedded in ice from Montana to the Western Oregon.

The flood had so much force that it did not stop when it entered the Pacific Ocean at the mouth of the Columbia River. The sediment from the flood kept flowing out into the ocean, some of it traveling over 700 miles from the coast.



Pacific Northwest 15,000 Years Ago

Pacific Northwest Today

Try this!
Check out the "Stories from the Core" backpack from the front desk to look at maps that tell the story of the glacial megafloods of the last Ice Age

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Learn more about how cores reveal the secrets of glacial megafloods at www.insearchofearthssecrets.com.

DRILL DOWN DEEPER INTO STORIES FROM THE CORES

Collect your *Stories from the Cores* passport sticker

Did anyone see the glacial megafloods of the last Ice Age?

It is quite possible. We know that there were indigenous people in North America at the time of at least some of these megafloods. The Umatilla people who live in the Pacific Northwest have ancient tribal stories of massive floods in the region. But no archaeological evidence of people in the flood zone has been found, so far.

We do know for sure that Ice Age animals like mammoths were in the area because their fossil remains have been found in the flood zone. Because of the massive power of the flood, it is very unlikely that any living thing in its path would have survived.

The powerful floods carved out channels and dropped giant boulders that still mark Oregon's landscape today.

Try this!

Check out the "Stories from the Core" backpack from the front desk to look at maps that tell the story of the glacial megafloods of the last Ice Age

Learn more about how cores reveal the secrets of glacial megafloods at www.insearchofearthssecrets.com.

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IN SEARCH OF EARTH'S SECRETS
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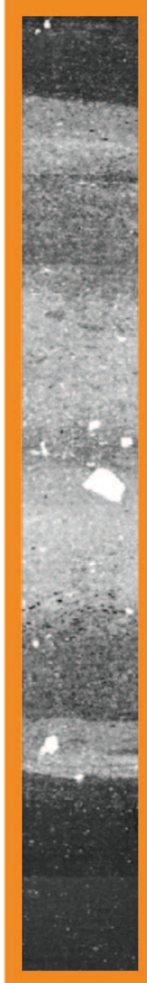
DRILL DOWN DEEPER INTO WHAT IS A CORE?

What are some of the coolest cores ever drilled?



The Catastrophic Flood Core

Drilled in the Inside Passage off the coast of western Canada, this core contains evidence of a huge glacial flood in British Columbia that occurred about 10,600 years ago.

The darker layer at the bottom of the core contains the tiny fossils of ocean creatures that we would expect to see in an ocean core.

The slate gray layer above it, though, contains pollen from land plants and fossils from freshwater creatures. These materials were carried to the ocean by a flood that rapidly drained an inland lake about 125 miles away.

The Acid Ocean Core

This core was drilled in the southern Atlantic Ocean near the Namibian coast in Africa. It is from a time about 55 million years, called the Paleocene-Eocene Thermal Maximum (PETM), when the ocean became so acidic that tiny creatures with chalky shells, like forams, practically disappeared.

The light layers at the top and bottom of the core are filled with tiny fossil shells from ocean creatures like forams. The dark layer between them, though, has almost no fossils and is primarily clay. This dark layer was deposited during PETM when the ocean was so acidic that the water dissolved almost all of the chalky shells.

The Ice Age Core

This core was drilled south of Greenland in the Atlantic Ocean. It helped build a timeline of climate change over the last several million years of Earth's history.

This data has provided invaluable insight into the most recent "Ice Ages" or glacial periods of cold climate with a lot of land and sea ice, and warmer periods of little to no ice called interglacial periods.

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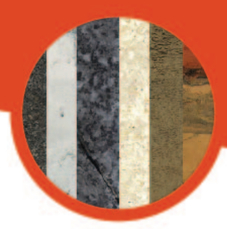
Learn more glacial floods, ice ages, acidic oceans, and cool cores at www.insearchofearthssecrets.com.

DRILL DOWN DEEPER INTO WHAT IS A CORE?



Collect your *What is a Core?* passport sticker

Why do scientists study the magnetic minerals in cores?

Magnetic Cores

The Earth is a giant magnet. You can see this by looking at a compass. The magnetic pull of the Earth makes the needle in your compass always point north. This would not happen if you were able to go back to 800,000 years ago. At that time, your compass needle would have pointed south. But go back 1,000,000 years ago and your compass would point north again.

The magnetic pole has switched back and forth between the North and South Poles throughout Earth's history. Cores drilled from the seafloor contain records of these magnetic pole reversals. When magma cools into seafloor rock, the magnetic iron particles in the magma freeze in place. They remain forever pointing in the direction of wherever the magnetic pole was the day they turned into rock. Some areas of the seafloor point north while others point south.

Today

800,000 years ago

1,000,000 years ago

Scientists laying a core onto the track of a magnetometer

Tools of the Trade

Scientists use an instrument called a magnetometer to detect which direction the magnetic particles in a core are pointing. This provides useful information in a lot of different ways. Scientists know when all the magnetic polar reversal in the past occurred, so looking at which direction the magnetic particles are pointing can help them determine the age of the core. These magnetic particles also help scientists understand how the seafloor spreads.

Try this!

Check out the "What is a Core?" backpack from the front desk to learn more about magnetic properties. See if a compass always points north and then use a magnet to make it point south. See if you can use a magnet to get iron filings to all point in the same direction, like they do in seafloor rock.

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Learn more the magnetic properties of the seafloor, and when the next magnetic reversal may occur, at www.insearchofearthssecrets.com