

UNCOVERING EARTH'S SECRETS

Science and Adventure
on the *JOIDES Resolution*

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People are curious. We like to explore.
We've traveled the land and to every shore
on ship and canoes, by horse and balloon.
We've ridden on rockets and walked on the moon!



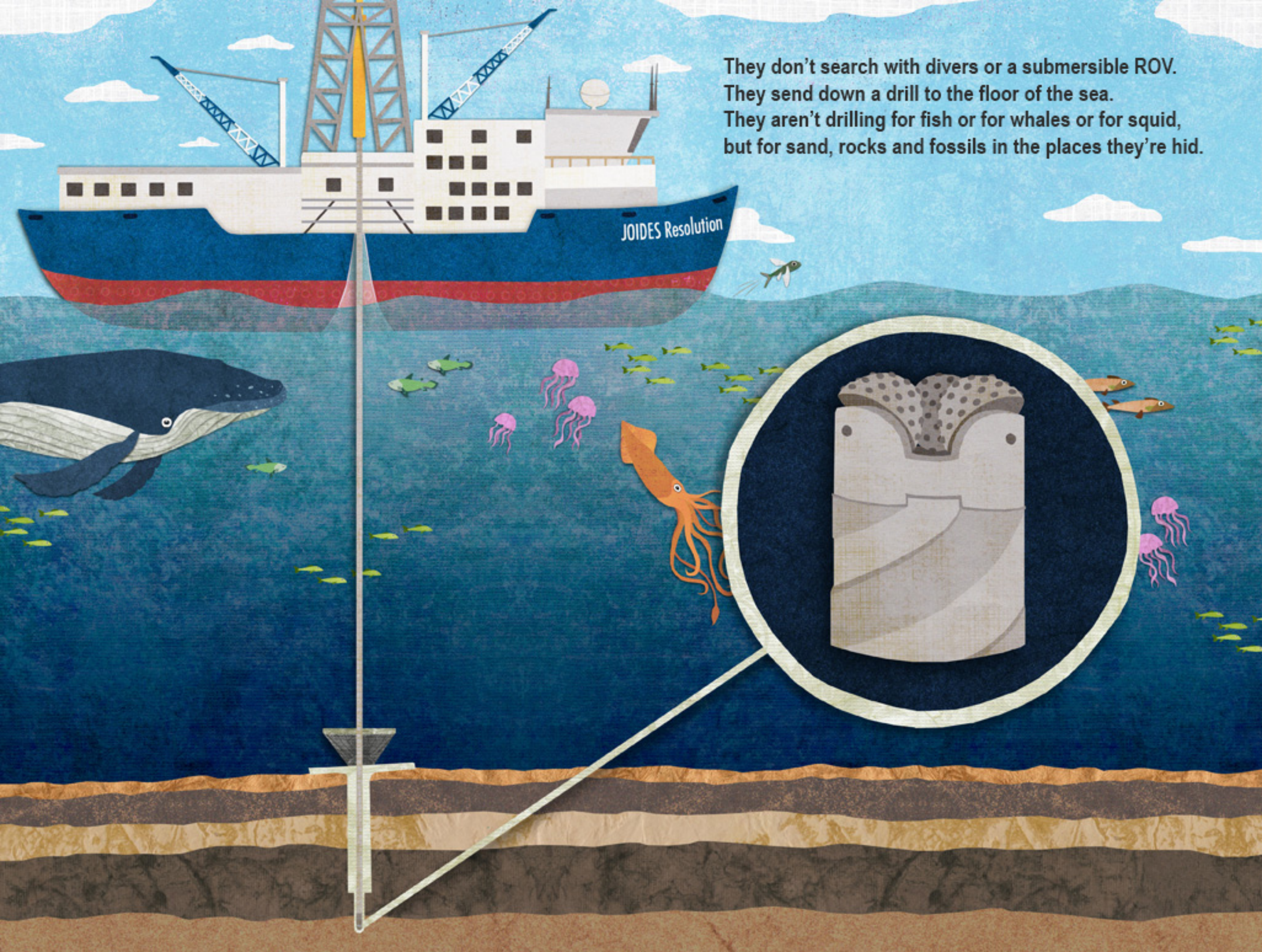
We curious people who like to explore,
are beginning to discover what's in the seafloor.
One way that scientists make a contribution
is by exploring the deep on the *JOIDES Resolution*.



They come from all over and work as a team,
to accomplish a worthy and wonderful dream:
to study the Earth that's under the seas
from tropical oceans to seas where you freeze.

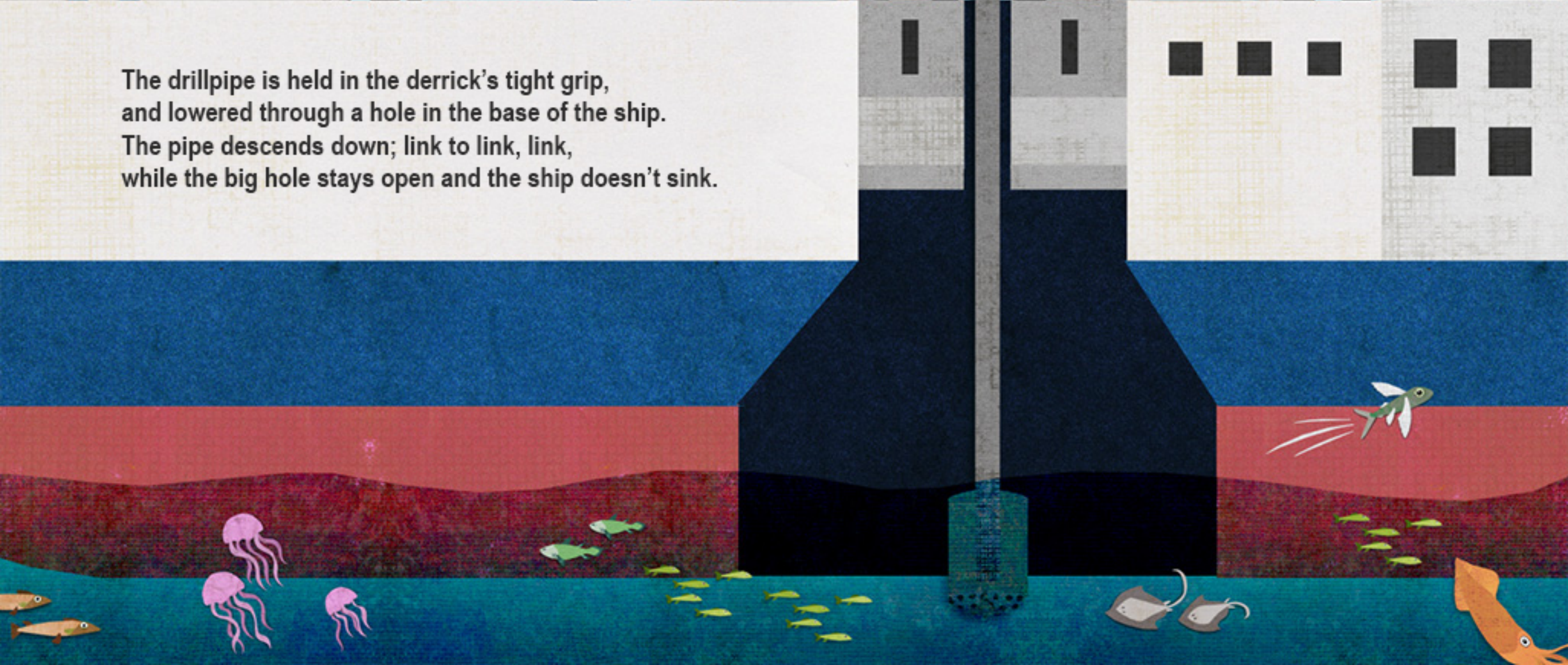


They don't search with divers or a submersible ROV. They send down a drill to the floor of the sea. They aren't drilling for fish or for whales or for squid, but for sand, rocks and fossils in the places they're hid.





The drillpipe is held in the derrick's tight grip,
and lowered through a hole in the base of the ship.
The pipe descends down; link to link, link,
while the big hole stays open and the ship doesn't sink.

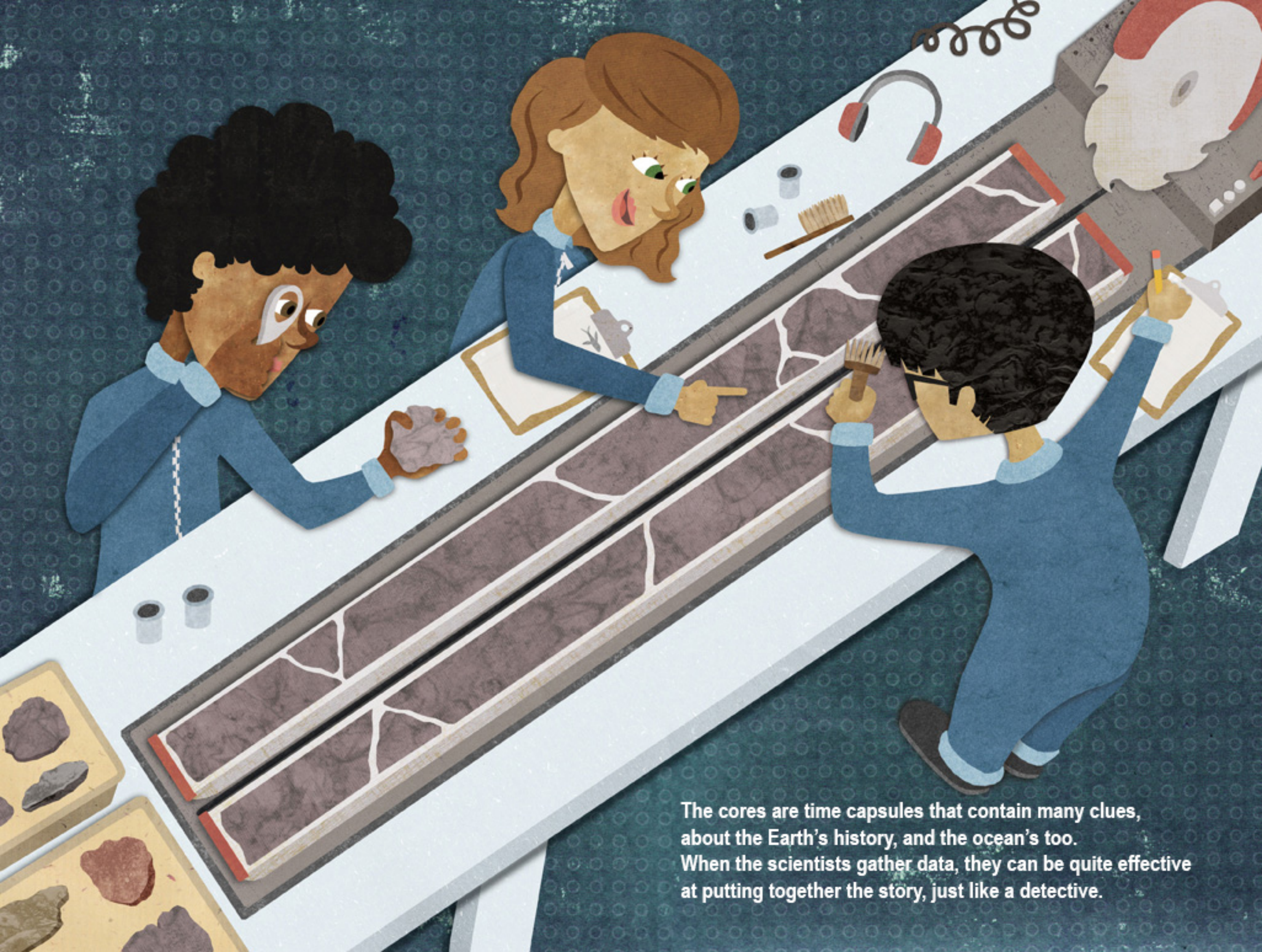




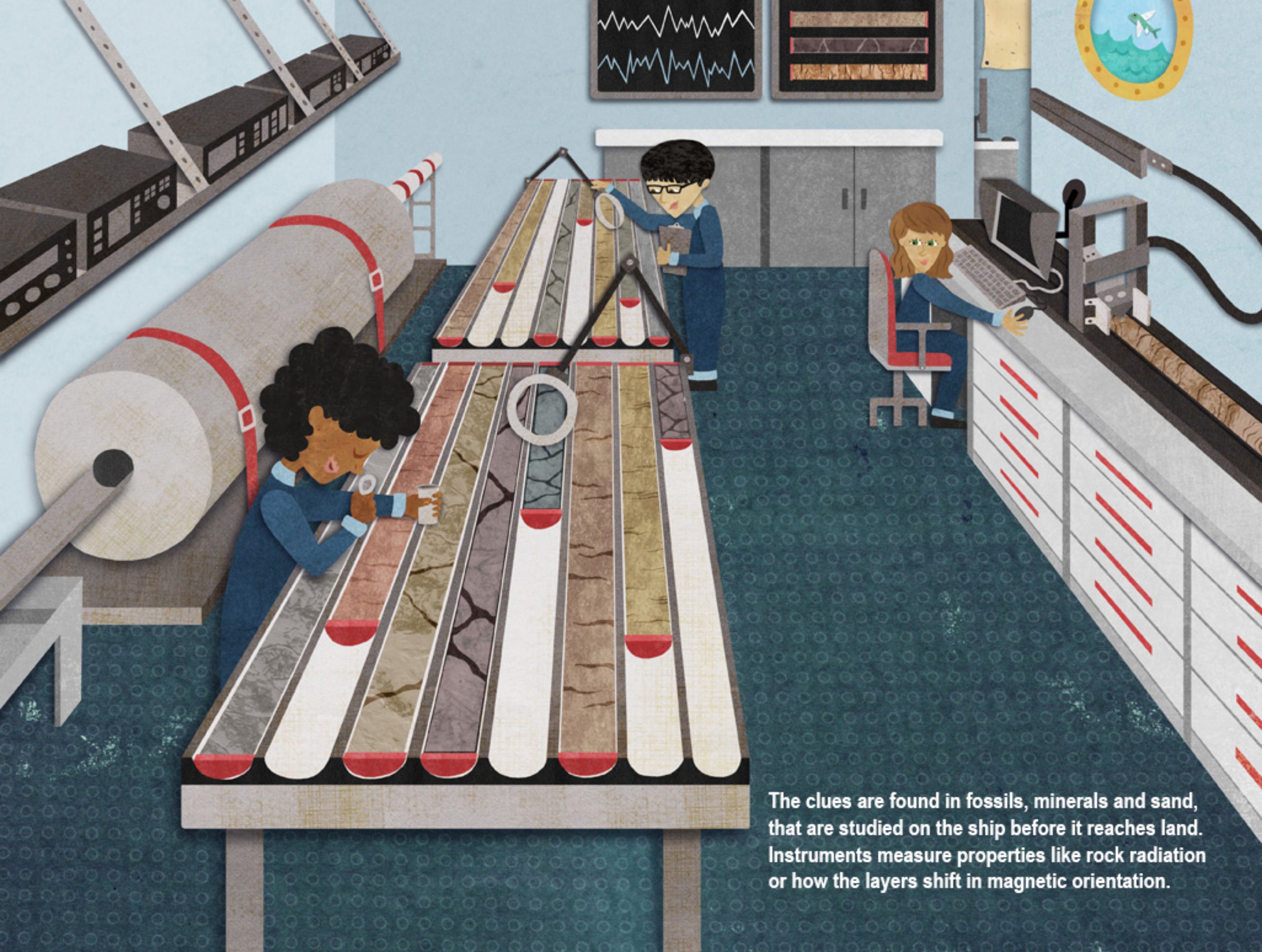
The seafloor is different from rocks found on land. It's covered by grains of fossils and sand. And some of the seafloor is almost brand new. Rocks form in places where magma comes through.

The drillbit is hard! It can cut the seafloor and carve out the rock in the form of a core. The drillers and roughnecks who operate the drill, retrieve the long cores with incredible skill.



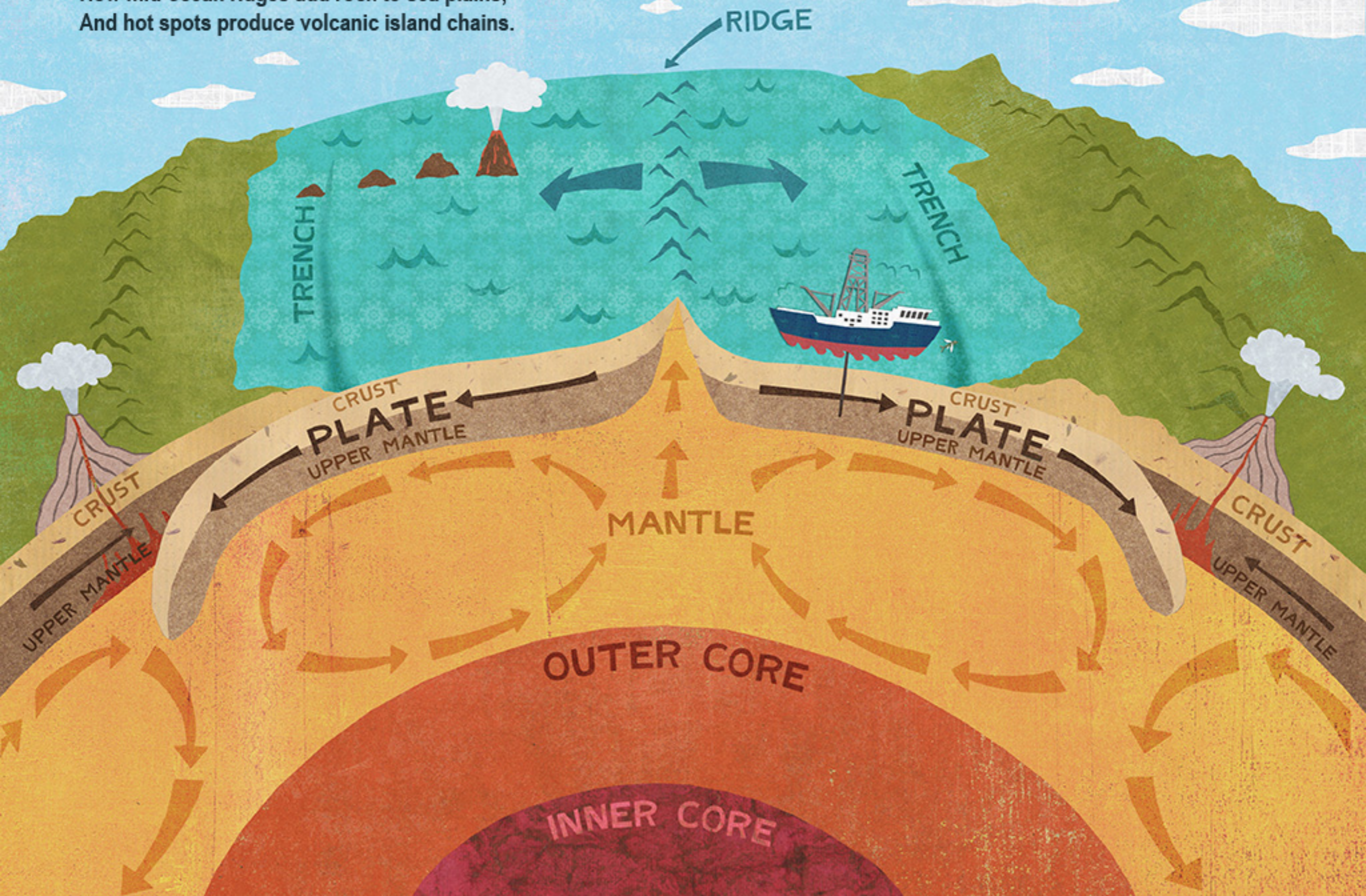


The cores are time capsules that contain many clues, about the Earth's history, and the ocean's too. When the scientists gather data, they can be quite effective at putting together the story, just like a detective.



The clues are found in fossils, minerals and sand, that are studied on the ship before it reaches land. Instruments measure properties like rock radiation or how the layers shift in magnetic orientation.

And what have they learned? So many things!
About plate tectonics and the changes it brings.
How mid-ocean ridges add rock to sea plains,
And hot spots produce volcanic island chains.



Clues in the cores helped us understand how some ocean floor sinks under the land. We now know better the disasters this makes from tsunamis, volcanoes and even earthquakes.



Cores helped us find a volcano so vast,
that giant Mauna Loa has now been surpassed.
This underwater volcano, made of basalts (not granites),
is almost the biggest on all the eight planets.





Or the mystery of the dinosaurs: how did they die?
We found evidence an asteroid fell from the sky!
Core layers from all over were each found intact,
with debris that was kicked up by the asteroid impact.



Paleontologists find fossils from the floor of the sea, that act as a record of Earth's changing history. Fossils from a species we know liked it hot show climate was once warmer at that very spot.



The folks on this ship were once kids just like you!
Being a scientist is what you could do too!
And like the explorers whose discoveries have worth,
you can search to uncover the secrets of the Earth.



THANK YOU!

We would like to thank the following for their tremendous help with answering our questions, reviewing this eBook and developing and sharing media:

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ABOUT THE AUTHOR

Kevin Kurtz is the author of the nonfiction children's books *A Day in the Deep*, *A Day on the Mountain* and *A Day in the Salt Marsh*. He has been onboard the *JR* for School of Rock educator workshops and as the Education Officer during a research expedition in the South Pacific. You can learn more about Kevin's books and author school programs by visiting <http://kevinkurtz.homestead>



ABOUT THE ILLUSTRATOR

Alice Feagan specializes in traditional and digital cut paper illustration. She has illustrated picture books, chapter books, children's wall art, and products for clients such as National Geographic Kids Magazine, Kids Can Press, and World Book Encyclopedia. She was onboard the *JR* for a School of Rock educator workshop as the ship traveled from Curacao to Bermuda. To view Alice's portfolio, visit <http://alicefeagan.com>.

Learn more about the *JOIDES Resolution*!



Fun Kids' Stuff!

The *JOIDES Resolution* website has lots of cool stuff that can help you uncover even more secrets about the *JOIDES Resolution*. There are videos where you can meet scientists, engineers and other people who live on the ship. Other videos introduce you to hot spot volcanoes or show what happens to cores after they are drilled. There are games, virtual tours of the ship, models of the ship you can make out of paper, and even a place to send questions to *JOIDES Resolution* scientists!

Educator Resources

There are also resources that teachers can use to fully integrate *Uncovering Earth's Secrets* into their classroom curriculum. The *JOIDES Resolution* website includes a list of grade specific Next Generation Science and Common Core curriculum standards reached by the book, as well as activity lesson

plans, and even ways to borrow core replicas for the classroom. There are also opportunities for students to video chat with scientists who are onboard the *JOIDES Resolution*.

Downloading the eBook

Uncovering Earth's Secrets is an eBook that can be downloaded for free. It can be read on iPads and other tablets and computer devices, including interactive whiteboards. Let all your friends and the people at your school know they can download a free copy of *Uncovering Earth's Secrets* too!

You can find all of these free resources by visiting: <http://joidesresolution.org/node/2998>