



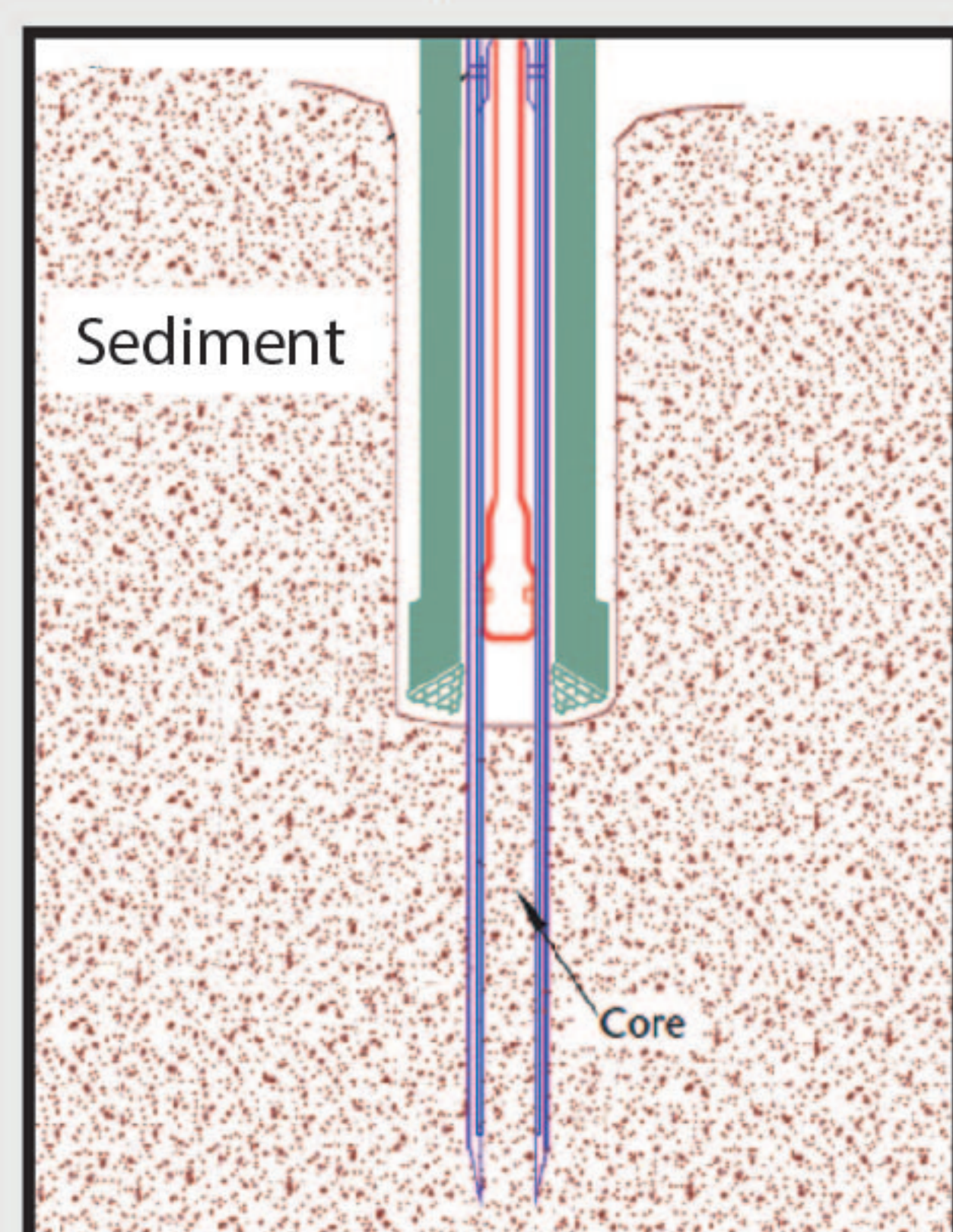
DRILL DOWN DEEPER INTO DRILLING THE DEEP

How do drill bits cut through the seafloor?

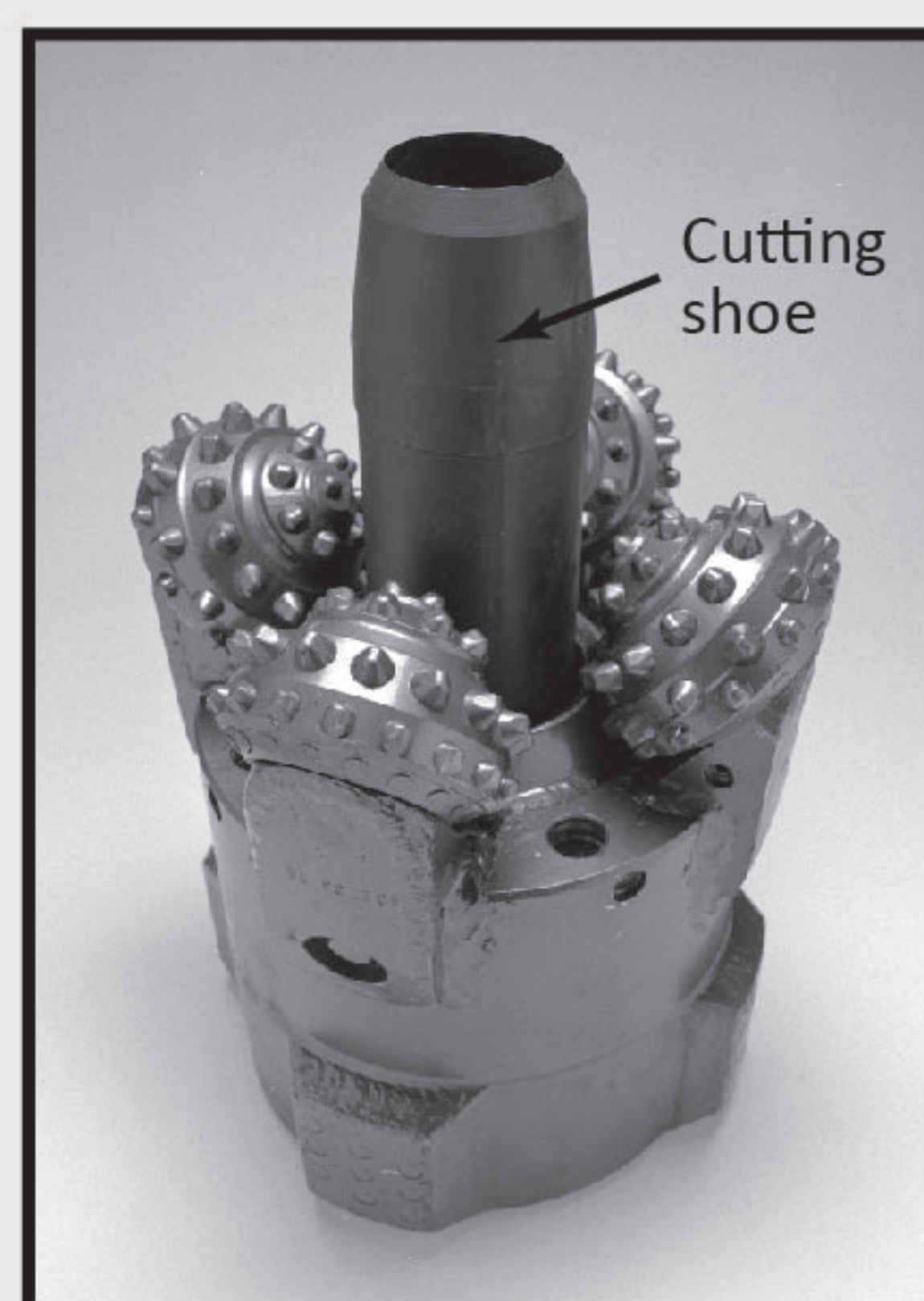
The seafloor is not the same from top to bottom. Softer sediment lies on top of the hard rock crust. The *JOIDES Resolution* must use different kinds of drill bits for the different materials in the seafloor.

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

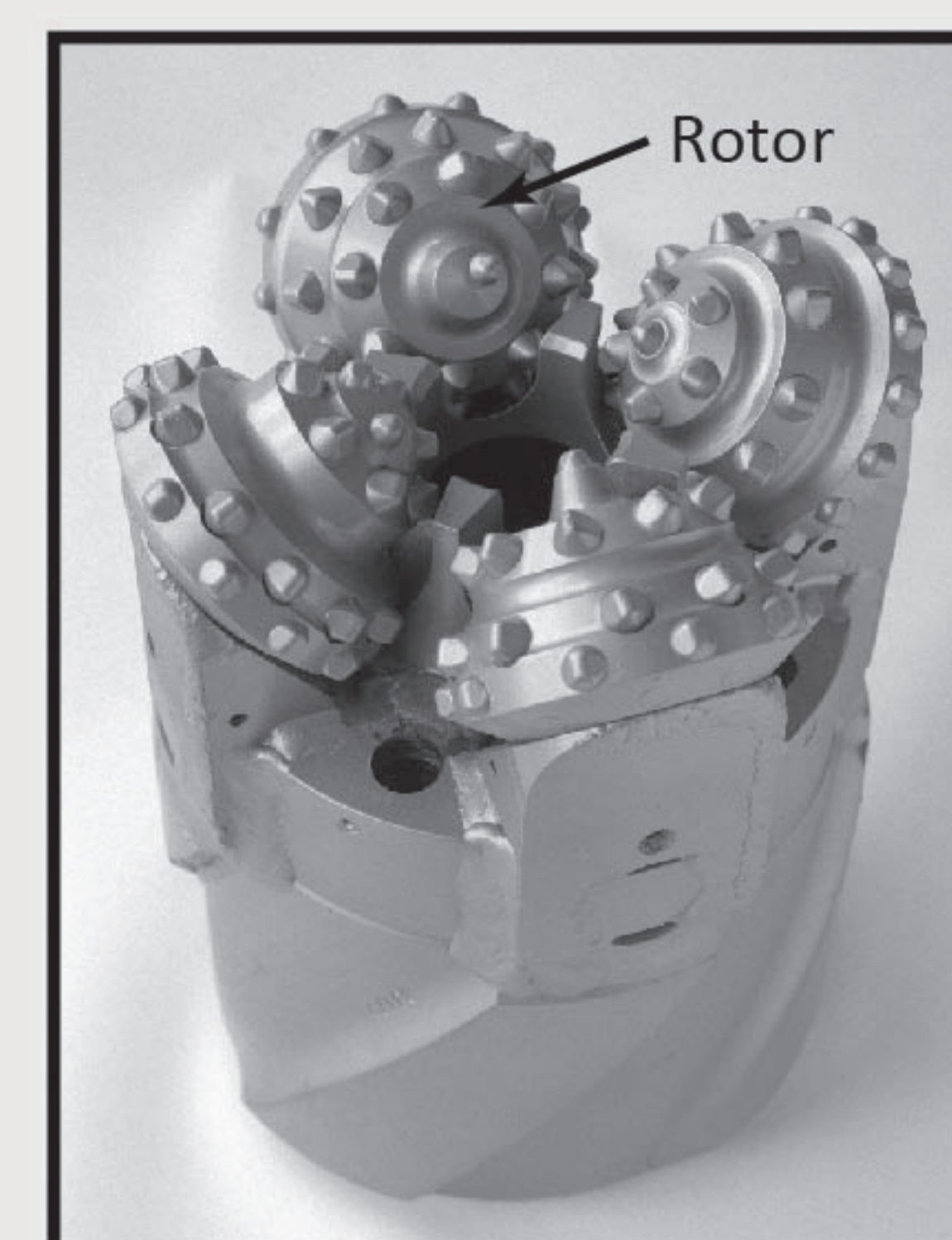
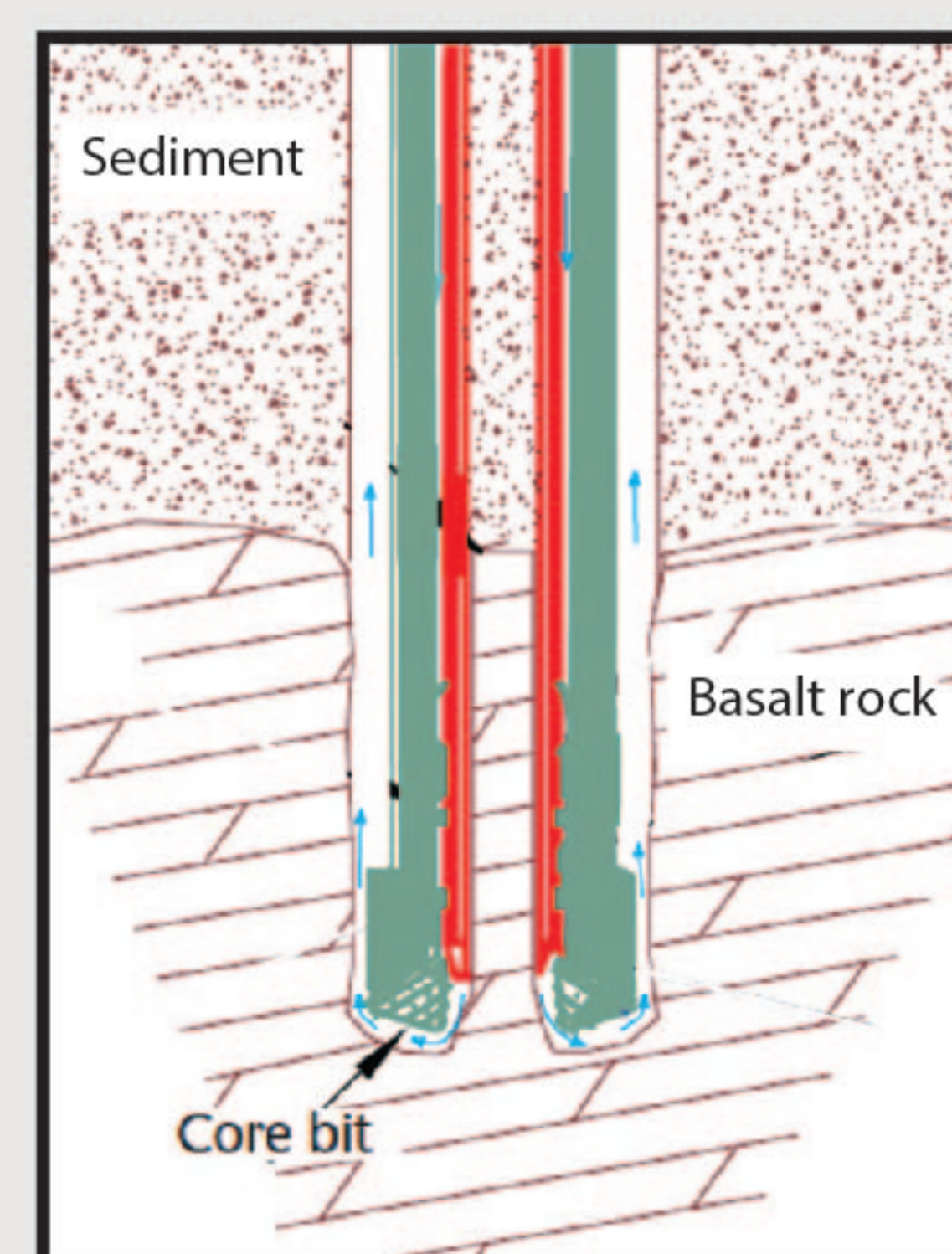


APC bit (shown upside down)

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.

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.



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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 eight weeks 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.

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.

Try This!

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

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.

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.

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.



IODP
INTERNATIONAL OCEAN
DISCOVERY PROGRAM

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