LESSON 4: EARTH'S CORE

SUPPLIES

MAIN BIN
- Play-Doh (20)
- Clear boba straws (30)

HANDOUTS FOLDER
- Earth's Layers Handout (20)
- Printer paper (20)

PENCIL BOX
- Rulers
- Pencils

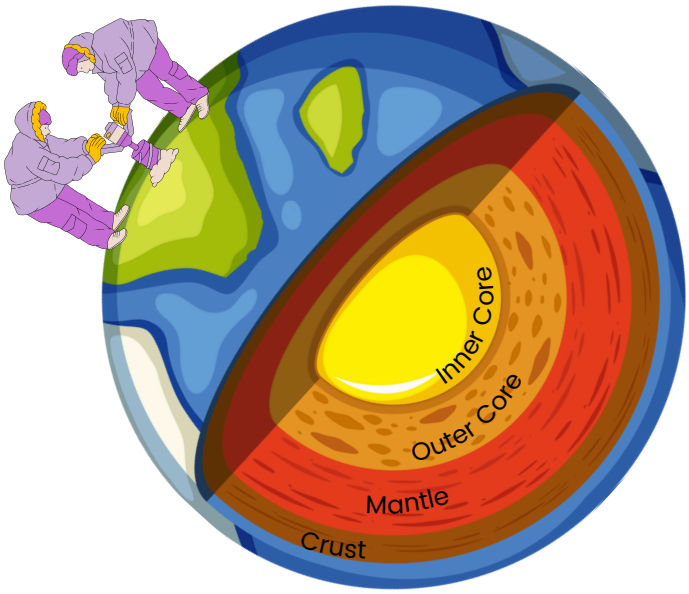
OBJECTIVES

- [x] Learn about the earths layers
- [x] Create a core sample of a play-doh model planet earth

HOOK

2 min

- What is the Earth made of? Did you know that the earth has different layers, like an onion? What else has layers?
- How many layers do you think the earth has?



INTRODUCTION

3-5 min

Did you know there are trees existing today that are hundreds and even thousands of years old? Trees grow a new ring in their trunk for every year they are alive. One way to determine the age of trees is by doing a core sample. A long, strong, hollow tube is twisted through the trunk. When they pull the tube out, scientists have a section of the tree to study. They can tell a lot about the tree by the rings! If the rings are really close together it might mean the tree didn't grow much that year.

Coring can be used in the ground in rock layers to tell us the history of an area. When different layers are uncovered, we can tell what was happening at a certain point in time. For example, if a core sample has a layer of volcanic ash, there's a good chance there was a volcanic eruption in that area in the past!

Coring was even used on the Indianapolis Speedway to show the layers of years of pavement materials that were used on the track! This sample went from gravel and limestone to brick to asphalt.

Because the Earth also has layers, we can create core samples of a model planet earth using play-doh! The different layers will be represented by different colors of play-doh.

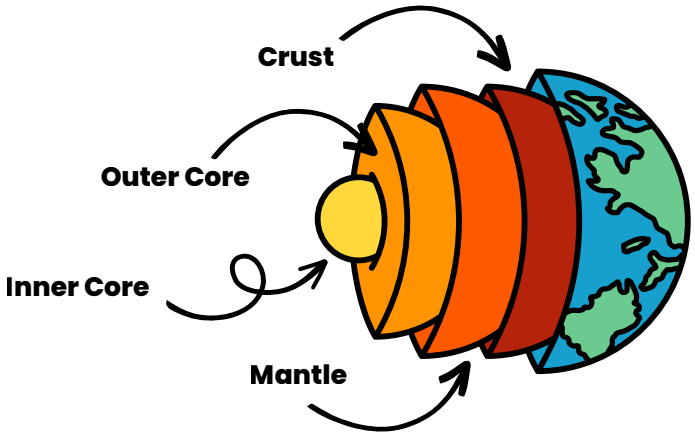
EARTH'S CORE

DISCUSSION

3-5 min

In real life, we couldn't take a core sample of the entire Earth. The Earth is way too big, and the core sample would contain some dangerous layers! Before starting the activity, ask students if they know what we call the Earth's four layers.

- The Crust: the outermost layer is called the crust, and contains everything on the ground. The dirt, rocks, minerals, and mountains are all part of the crust! The crust is a very thin layer, between 3 and 43 miles thick. If the earth was an apple, the crust would be the apple skin!
- The Mantle: Underneath the crust is the mantle, which is full of molten rock that is very thick and moves very slowly.
- The Outer Core: underneath the Mantle is the Outer core, which is full of liquid metal like iron. All of this iron gives our planet it's magnetic poles!
- The Inner Core: and lastly, the very center of the earth, underneath the Outer core, is called the Inner Core. This central layer is solid and under extreme pressure from the surrounding layers.



PROJECT PREP

3 min

1. Have students get into groups of 3
2. Pull out the handouts from the folder for this lesson,
3. "Earth's Layers," and make sure each student gets one Pass out 4 containers different colored play-doh to each group of students.
4. Pass out boba straws to each student group and a few pairs of scissors for them to share.

ACTIVITY DIRECTIONS

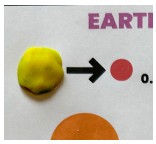
35 min

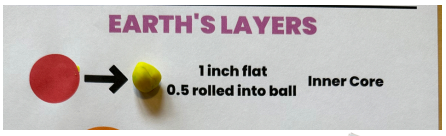
1. Use the Earth's Layers handout and squish a small amount of one color play-doh into the small 1-inch circle

2. Peel off the squished playdoh, roll into a ball

3. Using the second color you choose, squish and flatten a piece of playdoh onto the "Outer Core" of the Handout. LEAVE FLAT.

4. Repeat STEP 3 on the other sections of the hand out labeled "Mantle" and "Crust" with the last two unique colors you choose. Leave these play-doh disks flat as well.

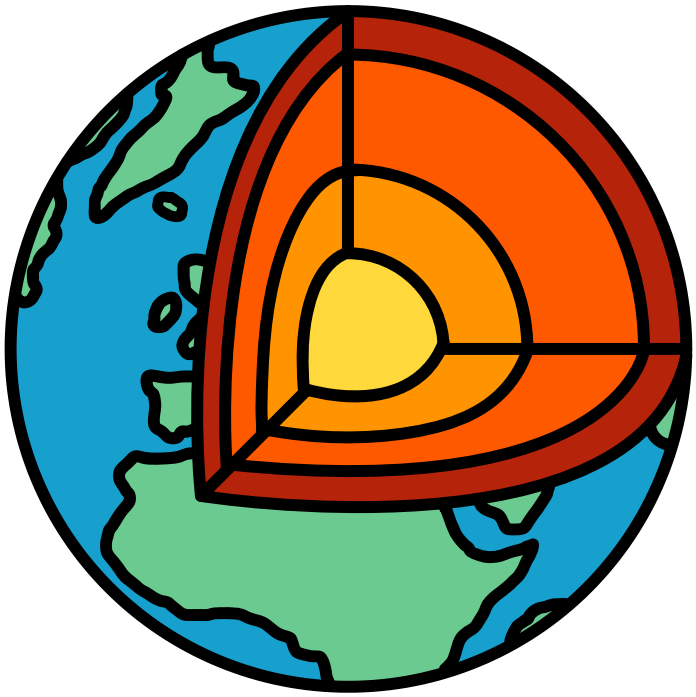




EARTH'S CORE

ACTIVITY DESCRIPTION CONT.

5. Stack up the four layers, from top to bottom: Inner Core, Outer Core, Mantle, Crust.
6. Pinch together the sides like a dumpling to wrap the outer layers around the Inner Core.
7. Roll the ball between your hands to make it more smooth.
8. Take a straw and push it through the center of the "Earth," and all the way through, then remove.
9. When you have cored out the play-doh, you can use the scissors chop off the part of the straw that has the sample. This will allow for multiple core extractions
10. Have students view the layers and guess which layer is which part of Earth.



VOCABULARY:

Coring

Coring is when scientists use a special tool to take a long, round piece from the ground, like a straw full of dirt or ice. This piece is called a core, and it shows the layers inside the Earth. By looking at the core, scientists can learn what the Earth was like a long time ago.

EARTH'S CORE

OBSERVE & EXPLAIN:

When we look at the different colors in our models or imagine the layers of the Earth, we can see that each color represents a different part of Earth's inside. The layers formed because, long ago, heavier materials like iron sank to the center and lighter rocks floated toward the top. That's how we ended up with the four main layers we see today.

First is the crust, the thin, rocky outer layer where we live. Below that is the mantle, made of hot, slowly moving rock that causes volcanoes and earthquakes. Next comes the outer core, a layer of melted metal that moves around and creates Earth's magnetic field. At the very center is the inner core, a solid ball of iron and nickel that stays solid because of the extreme pressure.

These layers show us that the Earth is not just solid rock all the way through—each layer has unique properties and plays an important role in how our planet works!

Exit Ticket

Q: What are the different layers that make up earth?
Q: What layer do we live on? A: The crust

CLEAN UP AND DISMISSAL 3-5 min

Have students bring their Play-Doh Earth models to the front table one at a time. Make sure they separate the Play-Doh by color and put it back in the correct containers. Throw away any leftover scraps of Play-Doh stuck to paper or desks. Wipe down the tables to remove any bits of Play-Doh or crumbs.

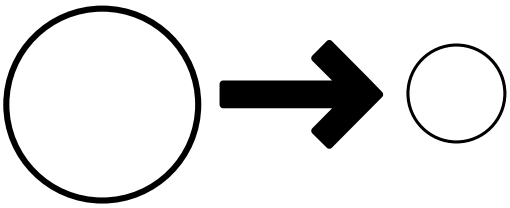
INSTRUCTOR TIP

Make a small ball of playdough and use it to pick up any hard-to-grab crumbs or tiny bits.
When you're done, sweep the area and wipe down any surfaces as needed.

iSTEAM After School

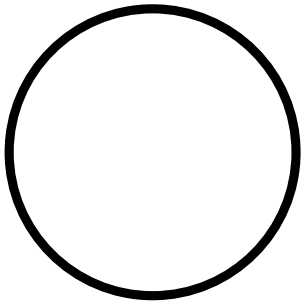
EARTH'S CORE

EARTH'S LAYERS TEMPLATE



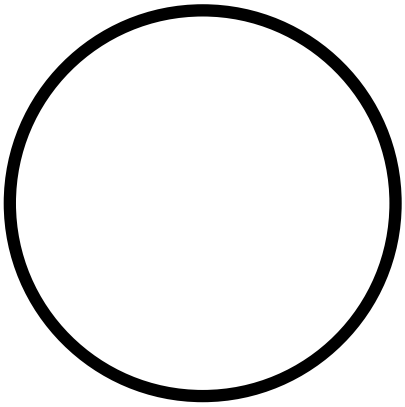
1 inch flat
0.5 rolled into ball

Inner Core



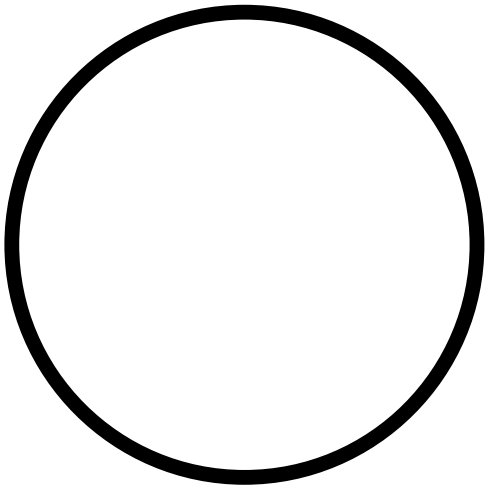
1.5 inches flat

Outer Core



2 inches flat

Mantle



2.5 inches flat

Crust