

Objective:

Students will learn about the layers of the Earth and create a model that illustrates the four layers.

Arkansas State Standards Addressed:

English Language Arts

RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

RI.3.4 Determine the meaning of *general academic* and *domain-specific* words and phrases in a text relevant to a Grade 3 topic or subject area.

Science

ESS.8.3.6 Describe the layers of the Earth: crust, mantle, inner core, outer core

Learning Goals:

Students will...

Understand that the Earth is a solid, with layers deeper than the crust, the layer on which we spend all our time	
Know the four layers of the Earth - crust, mantle, inner core, outer core – and their characteristics	Do a hands-on project where a model of the Earth is created

Materials Needed:

- 3 copies of the black and white Earth Fan worksheet for each student (attached, but also found online: <http://spaceplace.nasa.gov/earth-fan/en/>)
- Scissors, one pair per student
- Glue stick, one per student
- 2 jumbo popsicle sticks for each student
- Red, orange, yellow and brown crayons or colored pencils, enough for each student
- 1 copy of the *Parts of Earth* reading passage and questions for each student (attached)
- A diagram or illustration of the Earth's layers to show the class (one great illustration can be found here: <http://tampabaylighteningdiv1.weebly.com/earths-layers.html>)

Procedures:

1. Hand out a copy of the *Parts of Earth* passage and questions to each student.
2. Introduce the topic to students: Today we are going to talk about the Earth. If you dug a hole all the way to the center of the Earth, what do you think you would find? Do you think it would be the same all the way down? The Earth is made up of different layers – let's read the passage together to learn more about them.
3. Read the passage aloud to the students, having them follow along with their own copy. Show students a diagram or illustration of the Earth's layers and point them out as you read about

each one. Another great description of the Earth's layers can be found on the Rosen PowerKnowledge Earth and Space Science database, accessible on BPL's Student Portal.

4. Then, instruct students to answer the questions to the best of their ability. Give them time to work independently, then after most, or all, of the students have finished, go over the answers to each question.
5. Hand out the materials to create the Earth fan. Each student should have 3 copies of the black and white Earth Fan worksheet, one pair of scissors, one glue stick, and 2 jumbo popsicle sticks.
6. Go over the instructions for creating the Earth Fan. These are available with pictures online: <http://spaceplace.nasa.gov/earth-fan/en/>:
 - a. First, students will color in the layers of the Earth on each of their Earth Fan worksheets: yellow for the inner core, red for the outer core, orange for the mantle, and brown for the crust.
 - b. Next, students will cut out each square shape from the worksheet and then fold each square shape back and forth along the dotted line, like a fan.
 - c. Then, have students fold each fan in half, gluing the inside of the fold together to create three small fan sections.
 - d. Glue the first section to the popsicle stick with the fold at the top of the stick. Glue the next fan section on top, making sure the fan folds point in the same direction. Finally, glue the last fan section on top.
 - e. Glue the other popsicle stick on top of the third fan layer. Press down to get a good seal.
 - f. Once the glue has dried, open the fan and see the layers.

Additional activity ideas for this topic include:

- Inside Earth science worksheet from *The Mailbox*:
<https://www.themailbox.com/magazines/science-worksheet-layers-of-the-earth/inside-earth/#%2Finside-earth>
- Layers of the Earth cut-and-paste worksheet from *The Owl Teacher*:
<https://drive.google.com/file/d/0B3KUCrcRjzzJTkOejU0d3dfN2M/view>

Additional Resources at Bentonville Public Library

The following resources are specifically about Earth and earth science. Accelerated Reader levels are included when available and call numbers for location purposes are included in brackets. Online resources are available through BPL's Student Portal: <http://www.bentonvillelibrary.org/student-portal/>

Books

- *Earth* by J.P. Bloom. Non-Fiction. AR Reading Level: 1.9. [ENF 550 BLO]
- *Earth* by Charnan Simon. Non-Fiction. AR Reading Level: 3.4. [JNF 525 SIM]
- *Earth* by Steven L. Kipp. Non-Fiction. AR Reading Level: 3.7. [ENF 550 KIP]
- *Earth* by Alexis Roumanis. Non-Fiction. AR Reading Level: 2.2. [ENF 525 ROU]
- *Earth's Core and Crust* by Barbara J. Davis. Non-Fiction. AR Reading Level: 7.7. [JNF 551.1 DAV]
- *Exploring Earth* by Carmen Bredeson. Non-Fiction. AR Reading Level: 3.6. [JNF 525 BRE]
- *How to Make a Planet: A Step-By-Step Guide to Building the Earth* by Scott Forbes. Non-Fiction. AR Reading Level: 6.7. [JNF 550 FOR]
- *Investigating Fault Lines* by Miriam Coleman. Non-Fiction. AR Reading Level: 5.1. [JNF 551.8 COL]
- *Planet Earth* by Tom Jackson. Non-Fiction. AR Reading Level: 5.5. [JNF 550 JAC]

Online Resources

- *Rosen PowerKnowledge Earth and Space Science*, a database specifically geared toward young learners, has an informational section all about Earth and Earth's layers. It can be found under Rocks and Minerals/Beneath Earth's Surface.

Explore Space Exhibit Information:

Explore Space: A Cosmic Journey, a traveling exhibition for libraries, is part of the STAR Library Education Network (STAR_Net) led by the National Center for Interactive Learning at the Space Science Institute. Exhibit partners include the American Library Association, the Lunar and Planetary Institute, and Afterschool Alliance. Explore Space is supported through a grant from the National Science Foundation.



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Make an Earth Fan

Fan yourself with Earth's layers!

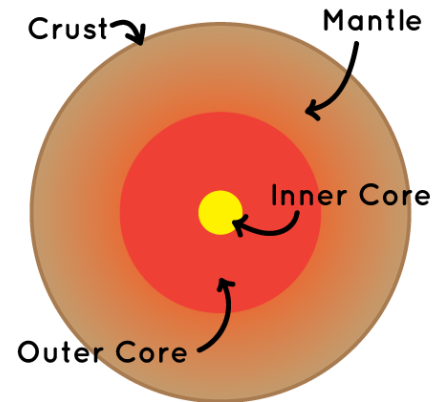
We spend pretty much all our time on Earth's **crust**. It's where all the land and oceans are. But below the crust, there's a lot going on.

The crust is just like the skin on an apple. It doesn't go very deep. But it's still deeper than you could ever dig. It's 18.6 miles (30 km) deep on land. At the bottom of the ocean, the crust is still about 3 miles (5 km) deep.

Below the crust is Earth's biggest layer, the **mantle**. It's a hot soup of molten rock. The mantle goes 1,801 miles (2,900 km) deep. Below the mantle is the **outer core**; it's made of liquid iron and nickel. At the center of Earth is the **inner core**. It's a solid center made of iron and nickel metals.

To remember that Earth is much more than just the surface we see every day, make this Earth layer fan.

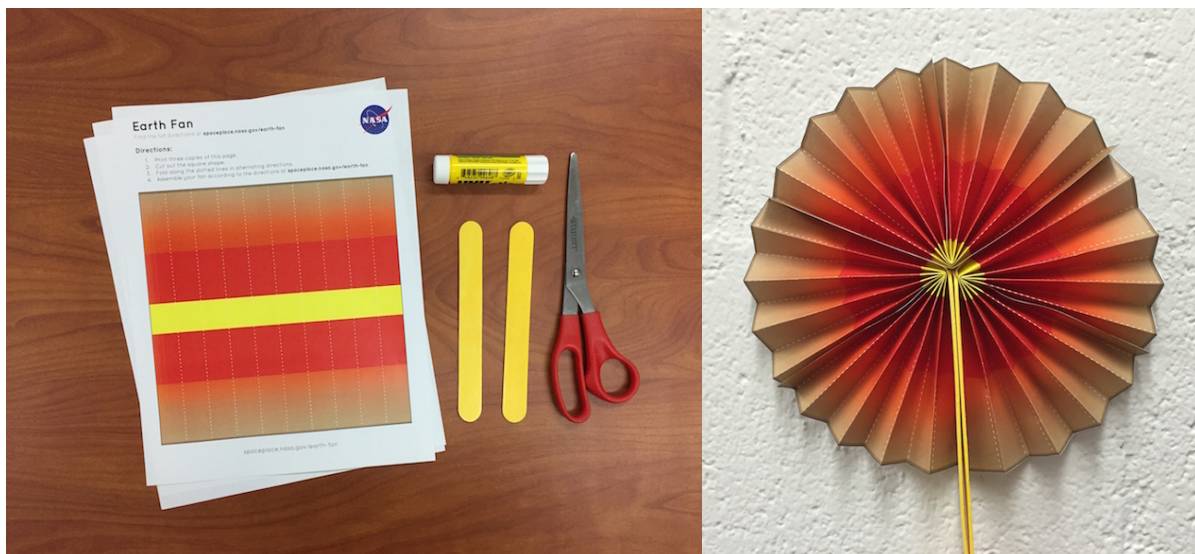
Earth's Layers



The colors in this diagram are the same colors used in the Earth Fan worksheet below. Remember what each color represents as you assemble and use your fan.

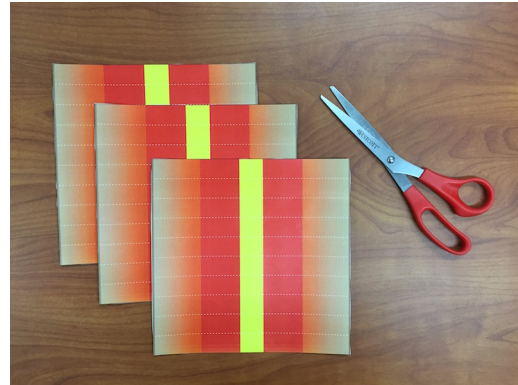
What you need:

- 3 copies of the Earth Fan Worksheet
- Scissors
- Glue stick
- 2 jumbo popsicle sticks

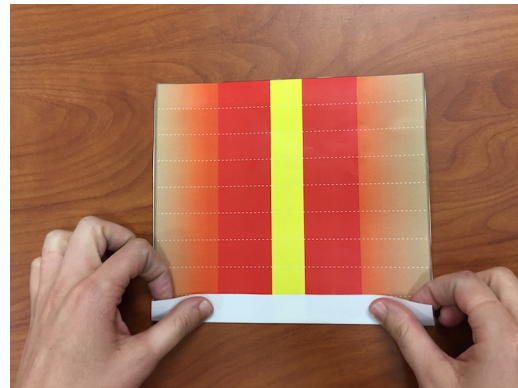


What to do:

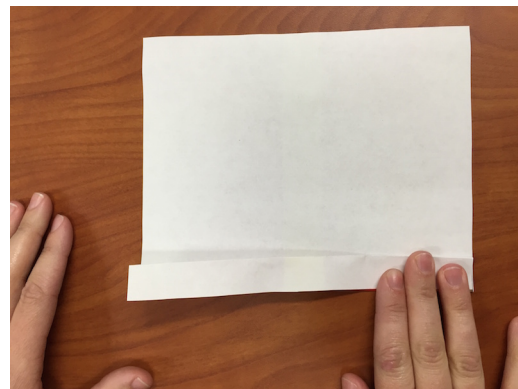
1. Cut out the three square shapes.



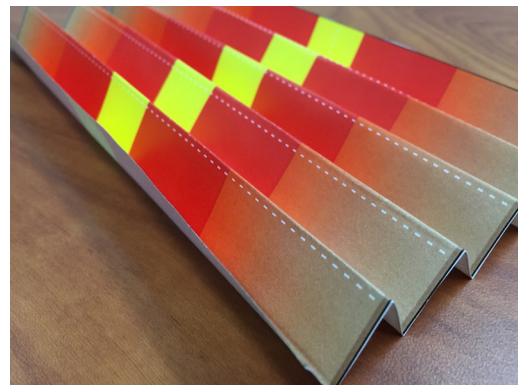
2. Fold along the first dotted line.



3. Flip over the paper and fold to the next dotted line.



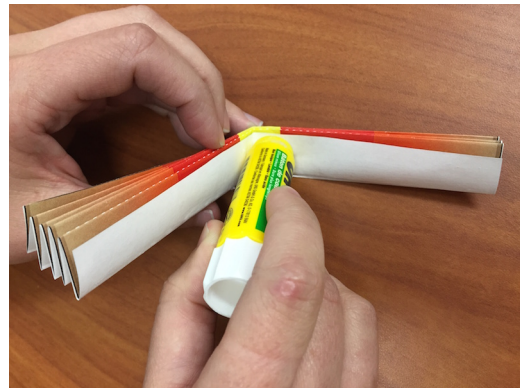
4. Keep folding, turning the paper over after each fold, until you've folded a fan.



5. Fold the fan in half.



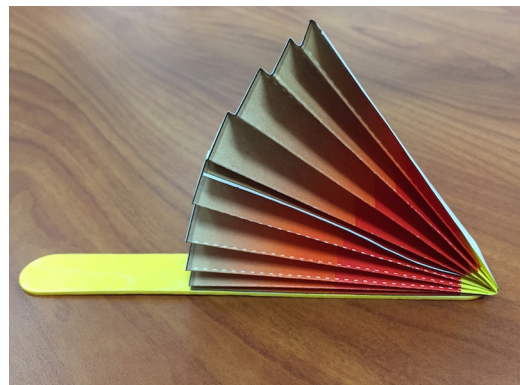
6. Glue the inside of the fold together to create a small fan section.



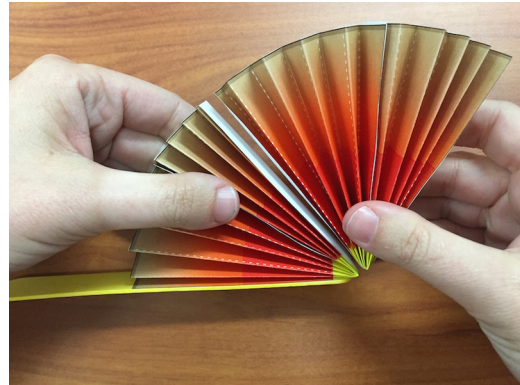
7. Repeat steps three through seven with the other two printouts. Now you have three small fans.



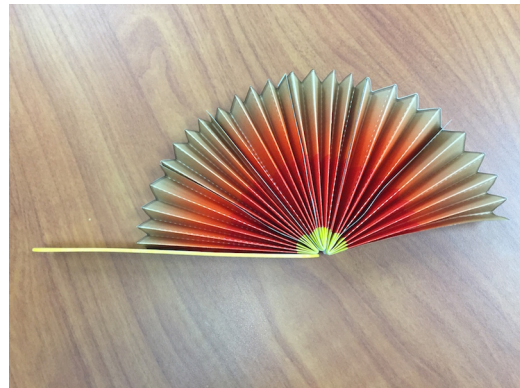
8. Glue the first section to your popsicle stick with the fold of the fan touching the top of the popsicle stick.



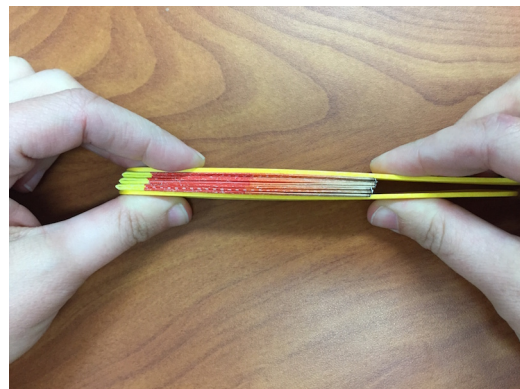
9. Glue the next fan section on top.
Make sure the fan folds point the
same direction.



10. Glue the last fan section on top.



11. Glue the other popsicle stick on
top. Press down to get a good
seal.



12. Let the glue dry for a few minutes.

13. Open your fan and cool yourself
off.



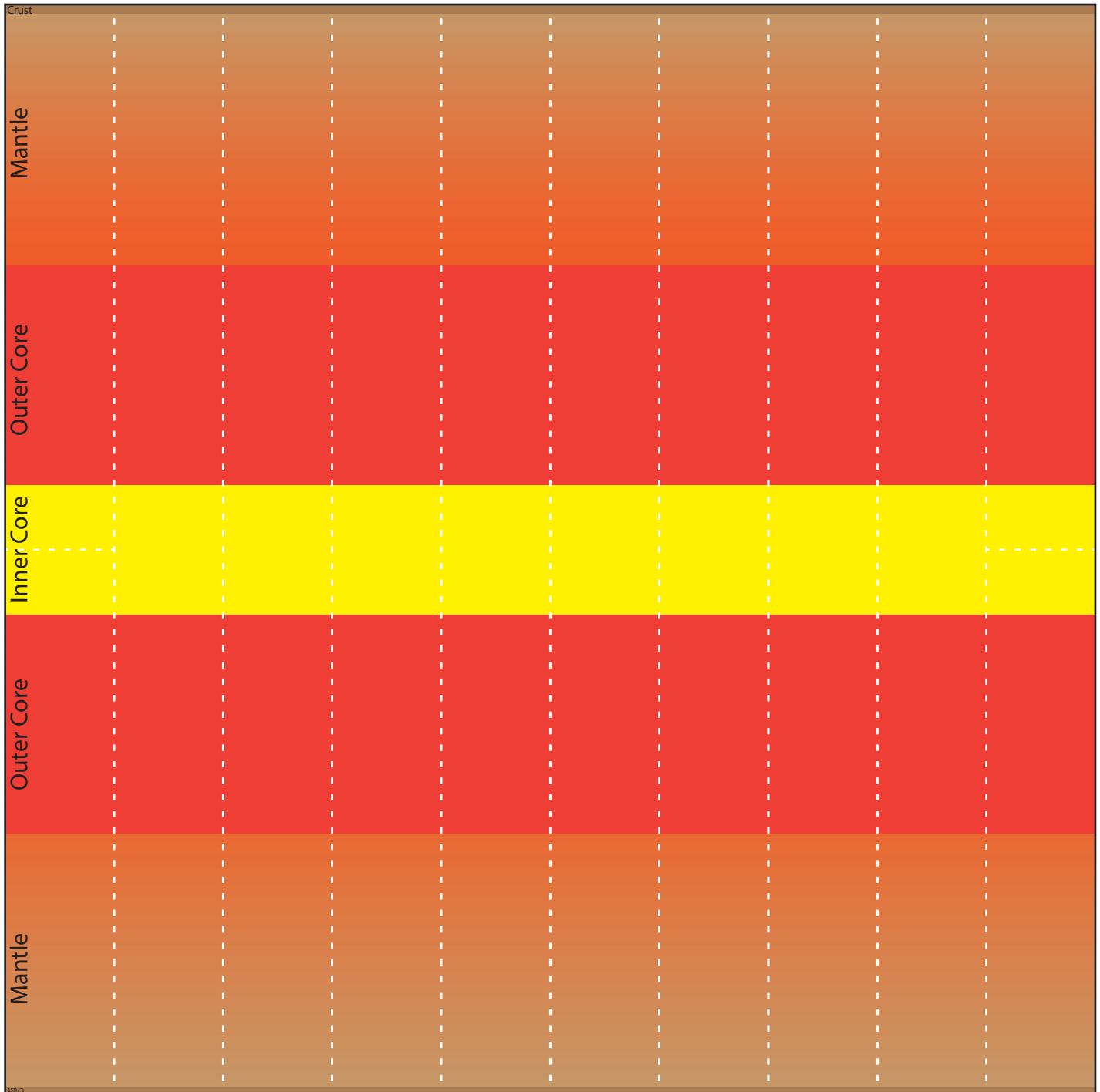
Earth Fan

Find the full directions at spaceplace.nasa.gov/earth-fan



Directions:

1. Print three copies of this page.
2. Cut out the square shape.
3. Fold along the dotted lines in alternating directions.
4. Assemble your fan according to the directions at spaceplace.nasa.gov/earth-fan



spaceplace.nasa.gov/earth-fan

Earth Fan

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Directions:

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Cut									
Mantle									
Outer Core									
Inner Core									
Outer Core									
Mantle									

Parts of Earth

Earth has three layers. The core is Earth's center. It is 2,200 miles (3,540 kilometers) thick. The temperature in the core may be up to 13,000 degrees Fahrenheit (7,200 degrees Celsius). The solid core, or inner core, is made of mostly iron. Some of this metal has melted because of the heat. The melted metal is the liquid core, or outer core.

The mantle surrounds the core. The mantle is about 1,800 miles (2,900 kilometers) thick. Heavy rocks make up this layer. Some rocks are partly melted by the heat.

The outer layer is the crust. This layer is made of lighter-weight rock. The crust is 5 to 25 miles (8 to 40 kilometer) thick. People, animals and plants live on Earth's crust.

The crust is broken into pieces called plates. Plates slide on the melted mantle rock. These plates move very slowly. Continents are on the plates. Continents are the seven large land areas of Earth. The plate movement is called continental drift.

Parts of Earth: Questions

What are the three layers of the Earth? Which layer do people, animals, and plants live on?

What are two differences between the crust and the inner core?

What was the author's purpose in writing this passage?

Using context clues and text evidence, what does *surrounds* mean?
