Bright Path Sped



LAYERS OF THE EARTH

Label, Read, Sort - Grades 6-8

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This is a fillable PDF

- Open it in a PDF reader (Adobe Acrobat Reader, Preview, or your browser), click into a line or a box, type, and Save As.
- The name line, every answer box, every ruled work box and every check box on the student pages are type-in fields, and so are the tracker, class grid and family page. You can also print any page and write by hand.
- It works offline. No account, no subscription, no internet connection needed after you download it.

Print at 100 percent

Turn off fit to page and shrink to fit so the ruled lines stay 0.34 inch apart. Every student page is black and white inside a colored border, so it still reads when copied in black and white.

Student work

A filled-in tracker, class grid or family page carries a real student's name. Keep it in the data folder, and use a first name only on any page that leaves your hands.

Need help?

If a field will not behave or a page will not print the way you expect, use Ask a Question on the product page. Every question is read, and a fix ships as a free update.

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PREVIEW

How To Read a Page

The parts of a student page, then the page types in the order they come.

The parts of a page

- **The answer box.** A bordered box for a letter or a short word. Click it to type, or print and write in it.
- **The ruled work box.** Lines 0.34 inch apart. A short answer gets 4 lines; the main idea and why-it-mattered boxes get 3 and the paragraph page gets 18. It types and prints.
- **The cross-section.** A circle of Earth cut in half, drawn for this file in four flat colors. Each label page uses it a different way. It is not to scale.
- **The reading.** A short passage with a label at the top, a main idea box, a why-it-mattered box (Reading 2) and the checks.
- **The cut line.** Mat 1 has eight pieces (1.85 by 1.12 inches); mats 2 and 3 have six (2.4 by 1.25 inches). All touch edge to edge.

Page type	What it looks like	What the student does
Check and Words to Know	2 pages, 13 items	A five-question check for before and after; match eight words to their meanings.
Reading 1 and Reading 2 (A to D)	11 checks	Read, write the main idea (and why it mattered), answer the checks with a letter.
Three label pages	3 pages, 16 items	Name the four layers with a word bank, with none, and with a color clue; write solid or liquid.
Table, Thickness, Which Layer? A and B	4 pages, 34 items	Fill in state, heat and makeup; read numbers off a bar; write C, M, O or I.
Convection, Cause and Effect	2 pages, 4 labels, 4 causes	Label a loop of rock; write what each cause leads to.
Think It Through, claim-evidence-reasoning	3 questions	4 lines per question; a plan and an 18-line paragraph.
Quiz, Cut and Paste, Exit Tickets	12 items, 20 pieces, 4 tickets	A quiz in two parts, three cut-and-paste mats (layers, rock or metal, convection steps) and four exit tickets.

Untimed, unscored on the page

No student page has a timer or a score on it. The keys and the tracker are for you. The answer keys are on pages 30 to 34.

A short account, not a full textbook

Each reading is a summary in plain words with rounded numbers. It is not a complete Earth science course, and it is not tied to any particular standard. Add your own textbook, diagram or demonstration for more depth.

Printing and the type-in fields

Every page prints clean in black and white. Every name line, answer box, ruled box and check box is a type-in field in any PDF reader: click, type, then save. This is a fillable PDF, not a slideshow or a word-processor file.

Open answers

The table, cause and effect, short answers, exit tickets and paragraph are open. The keys give a sample and what to look for. Accept any answer that is true to the readings and explains its reason.

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Before and After Check



Write a letter in the Before box now and the After box when you finish.

Write the letter of the best answer. Guess if you are not sure. Fill in Before now, and After when you finish the unit.

1. How many main layers does Earth have?
   - A Four
   - B Two
   - C Six

   Before ☐ After ☐

2. Which layer do people live on?
   - A The crust
   - B The mantle
   - C The core

   Before ☐ After ☐

3. Which layer is at the very center of Earth?
   - A The outer core
   - B The inner core
   - C The mantle

   Before ☐ After ☐

4. Which layer is made of liquid metal?
   - A The crust
   - B The outer core
   - C The inner core

   Before ☐ After ☐

5. As you go deeper into Earth, what happens to the temperature?
   - A It gets colder
   - B It stays the same
   - C It gets hotter

   Before ☐ After ☐

One thing I already know about the inside of Earth is...

PREVIEW

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My name _____ Date _____

Reading 1: The Short Read



Read the story. Then write the main idea.

All four layers

Earth is made of four main layers. We live on the crust, the thin, rocky outer layer. Under the crust is the mantle, a thick layer of hot rock that flows very slowly. Below the mantle is the outer core, a layer of liquid iron and nickel. At the very center is the inner core, a solid ball of iron and nickel. The deeper you go, the hotter it gets and the greater the pressure becomes. From the surface to the center is about 6,400 kilometers. No one has ever dug or drilled anywhere near that far, so scientists learn about the layers in other ways. They study waves from earthquakes, which speed up, slow down and bend as they travel through different materials inside Earth.

Main idea: What is this reading mostly about?

Check what you read. Write the letter in the box.

1. What is the thin, rocky outer layer called?
   - **A** The mantle
   - **B** The crust
   - **C** The inner core

2. What is at the very center of Earth?
   - **A** A solid ball of iron and nickel
   - **B** A layer of liquid rock
   - **C** A layer of ice

3. How do scientists learn about the layers?
   - **A** By digging to the center
   - **B** By looking through a telescope
   - **C** By studying waves from earthquakes

PREVIEW

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My name _____ Date _____

Reading 2B: The Mantle



Read the story. Then write the main idea and why it mattered.

The thick middle layer

The mantle lies between the crust and the core. It is about 2,900 kilometers thick, which makes it the thickest layer and most of Earth's volume. The mantle is made of hot rock, and it is hotter toward the bottom than the top. Most of it is solid, but over a very long time it flows, a few centimeters a year, a little like a thick putty. Melted rock under the surface is called magma, and it forms in parts of the upper mantle. Heat from the core warms the bottom of the mantle. Hot rock is less dense than cool rock, so it rises. When it nears the crust it cools, becomes more dense and sinks again. This loop of rising and sinking rock is a convection current.

Main idea: What is this reading mostly about?

Why it mattered: Why is this important for understanding Earth?

Check what you read. Write the letter in the box.

1. Which layer is the thickest? ☐
   - **A** The mantle
   - **B** The crust
   - **C** The outer core

2. What happens to hot rock in the mantle? ☐
   - **A** It rises because it is less dense.
   - **B** It sinks to the core.
   - **C** It turns into the crust at once.

PREVIEW

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My name _____ Date _____

Reading 2D: The Inner Core



Read the story. Then write the main idea and why it mattered.

The solid center

The inner core is the center of Earth. It is a ball with a radius of about 1,200 kilometers, and it is made mostly of iron and nickel. It is the hottest layer, with temperatures of thousands of degrees Celsius. You might expect something that hot to be a liquid, but the inner core is solid. The reason is pressure. The weight of all the layers above squeezes the center of Earth so hard that the metal atoms cannot move apart to flow, even at that heat. The inner core sits inside the liquid outer core, a little like a solid ball floating in a larger ball of liquid. Heat from the inner core flows outward to the layers above it.

Main idea: What is this reading mostly about?

Why it mattered: Why is this important for understanding Earth?

Check what you read. Write the letter in the box.

1. Why is the inner core solid even though it is so hot?
   - **A** The pressure there is very high.
   - **B** It is made of ice.
   - **C** It is very cool.

2. Where is the inner core?
   - **A** At the center, inside the outer core
   - **B** Just under the crust
   - **C** Between the crust and mantle

PREVIEW

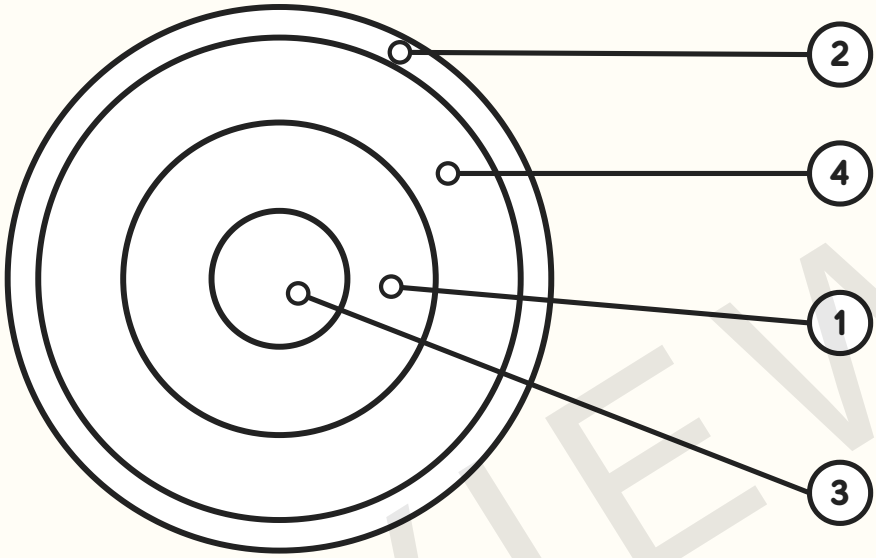
Preview - Bright Path Sped

My name _____ Date _____

Color and Label the Layers



Read each clue. Color the layer. Write its name.



The circle is a cross-section: Earth cut in half, so you can see inside. Use the clue to find each layer. Not drawn to scale.

1. Color it yellow.
   The layer of liquid iron and nickel.

   _____
   layer name

2. Color it brown.
   The thin, rocky outside layer.

   _____
   layer name

3. Color it red.
   The solid ball at the center.

   _____
   layer name

4. Color it orange.
   The thick layer of hot, slow-moving rock.

   _____
   layer name

Which layer is the biggest part of your picture? Tell how you know.

PREVIEW

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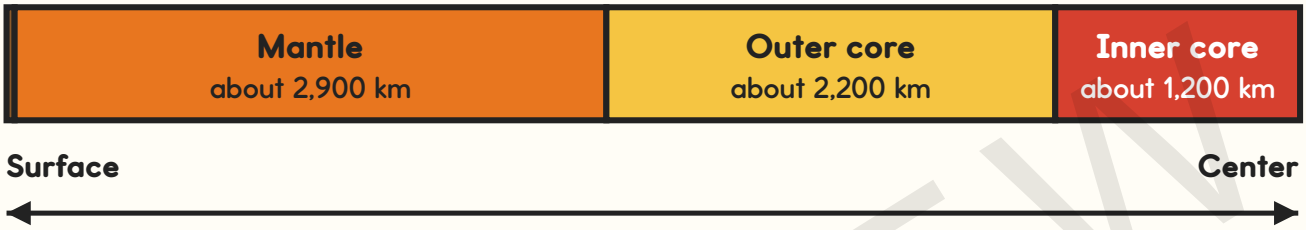
My name _____ Date _____

How Thick Is Each Layer?



Look at the numbers. Answer each question.

Crust: about 30 km (a hairline)



From the surface to the center: about 6,400 km

The bar shows how far it is from the surface to the center of Earth, cut into the four layers. The crust is thinner than a line here. It is from about 5 to 70 km thick in real life, so 30 is a middle number for this page.

1. Which layer is the longest part of the bar? _____

2. Which layer is the shortest part of the bar? _____

3. How many kilometers thicker is the mantle than the outer core? _____

4. Add all four thicknesses. How many kilometers is the total? _____

Show your work for questions 3 and 4.

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

Which Layer? Part B



Which layer is it? Write C, M, O or I.

C = Crust M = Mantle O = Outer core I = Inner core

Decide which layer each one tells about. Use the readings to help you.

1. About 2,900 kilometers thick ☐
2. Between about 5 and 70 kilometers thick ☐
3. About 2,200 kilometers thick ☐
4. Its radius is about 1,200 kilometers ☐
5. Cooler than any other layer ☐
6. The hottest layer of all ☐
7. Rock here moves in convection currents ☐
8. Its moving metal helps make the magnetic field ☐

Pick one that was tricky. Tell how you decided.

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

Cause and Effect



Read each cause. Write what happened because of it.

A cause is why something happens. An effect is what happens because of it. The cause is already written for you.

Cause
The inner core is squeezed by the weight of all the layers above it.

→

Effect

Cause
Heat moves from the core into the bottom of the mantle.

→

Effect

Cause
Hot rock rises to the bottom of the crust and cools.

→

Effect

Cause
Liquid iron and nickel in the outer core swirls and moves.

→

Effect

PREVIEW

My name _____ Date _____

Claim, Evidence, Reasoning

Plan your answer. Write a claim, evidence and reasoning.



Question: The inner core is the hottest layer. Is it solid or liquid?

Use facts from the readings, pages 7 to 11.

The inner core is ____ because ____. For example, ____. This shows that ____ because ____.

Claim: Is the inner core solid or liquid?

Evidence: Give two facts from the readings.

Reasoning: Explain how your facts prove your claim.

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Quiz, Part B

Read each one. Write the letter of the best answer.

Take your time. Guess if you are not sure.

7 Which layer is the thickest and flows very slowly?

A The crust
B The mantle
C The inner core

8 In a convection current, what does cool rock do?

A It rises to the crust.
B It sinks, because it is more dense.
C It stays still.

9 Which layer helps make Earth's magnetic field?

A The outer core
B The crust
C The inner core

10 Why is the inner core solid?

A It is the coolest layer.
B It is made of rock.
C The pressure is very high.

11 Which kind of crust lies under the oceans?

A Oceanic crust, which is thinner
B Continental crust, which is thicker
C Mantle crust

12 How do scientists learn about layers no one can reach?

A They dig to the center.
B They look in a telescope.
C They study earthquake waves.

PREVIEW

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My name _____ Date _____

Cut and Paste 2: Rock or Metal

Cut out the six pieces. Paste each one in the right box.

Each piece tells about a layer made mostly of rock or mostly of metal. Paste it in the right box.

Rock layers (crust and mantle)	Metal layers (outer core and inner core)

PREVIEW

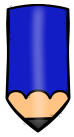
Cut on the dashed lines: six pieces, one straight cut across and two down.

A layer of liquid iron and nickel	A thick layer of hot, slow-moving rock	A solid ball of iron and nickel
The rocky skin we stand on	The hottest part of Earth	A thin, rocky outer layer

Which piece was hardest to place? Why?

My name _____ Date _____

Exit Tickets



Answer the exit tickets before you leave.

Each ticket takes about two minutes. Your teacher may collect them at the door.

1. One thing I learned about Earth's layers today is...

2. Name the layer that is liquid, and tell what it is made of.

3. Why is the inner core solid even though it is so hot?

4. One question I still have about the inside of Earth is...

PREVIEW

Answer Key: Labels, Table, Numbers

Pages 12, 13, 14, 15, 16 and 19. In question 4 on the thickness page the total is 6,330, a little under the 6,400 the page gives, because every number is rounded.

Label the Layers (Word Bank) page 12

#	Layer name	State
1	Crust	solid
2	Mantle	solid
3	Outer core	liquid
4	Inner core	solid

Label the Layers (No Word Bank) page 13

#	Layer name
1	Mantle
2	Inner core
3	Crust
4	Outer core

Color and Label the Layers page 14

#	Layer name	Color
1	Outer core	yellow
2	Crust	brown
3	Inner core	red
4	Mantle	orange

Convection Current page 19

#	What is happening
1	rock is heated
2	hot rock rises
3	rock cools
4	cool rock sinks

Layer Properties Table page 15

Layer	State	How hot?	Made of
Crust	solid	coolest	rock
Mantle	solid, but flows slowly	hot	hot rock
Outer core	liquid	hotter	liquid iron and nickel
Inner core	solid	hottest	solid iron and nickel

How Thick Is Each Layer? page 16

#	Starts with	Answer
1	Which layer is the longest …	Mantle
2	Which layer is the shortest …	Crust
3	How many kilometers thicker is …	700
4	Add all four thicknesses. How …	6,330

Reading the label keys

The numbers are in a different order on each label page, so read the number, not the row. Accept any right name for a layer (for example, the center for the inner core). Color words are the ones in the cross-section on the label pages.

PREVIEW

Answer Key: Written Answers

Main idea boxes (pages 7 to 11; Reading 1 has no why-it-mattered box), cause and effect, Think It Through and the paragraph pages (22, 23). These are samples, not the only right answers.

Main idea and why-it-mattered boxes

Reading	A good main idea box says	A good why-it-mattered box says
Short Read	Earth has four layers, the crust, mantle, outer core and inner core, and scientists learn about them from earthquake waves.	It gives the big picture in order from the outside in, and it shows how we know about places no one can visit.
Crust	The crust is the thin, cool, solid rock layer we live on, and with the top of the mantle it forms the lithosphere.	It shows that the layer we live on is only a very thin skin over a much larger planet.
Mantle	The mantle is the thickest layer, made of hot rock that flows slowly in convection currents.	It shows that rock inside Earth moves, and that heat from the core drives the movement.
Outer core	The outer core is a layer of hot, liquid iron and nickel, and its movement helps make Earth's magnetic field.	It shows that a layer no one can see changes things we use, like a compass pointing north.
Inner core	The inner core is a hot, solid ball of iron and nickel at the center, kept solid by very high pressure.	It shows that heat alone does not decide whether something is solid or liquid: pressure matters too.

Cause and Effect page 20

#	Cause (printed)	A good effect says
1	The inner core is squeezed by the weight of all the layers above it.	The metal stays solid, even though it is the hottest layer.
2	Heat moves from the core into the bottom of the mantle.	The hot rock becomes less dense and rises in a convection current.
3	Hot rock rises to the bottom of the crust and cools.	The cooler rock becomes more dense, so it sinks back down.
4	Liquid iron and nickel in the outer core swirls and moves.	It helps make Earth's magnetic field, which makes a compass needle point north.

Think It Through page 21

#	Starts with	A good answer includes
1	Name the four layers of …	Crust, mantle, outer core, inner core (in that order).
2	How is the outer core …	The outer core is a liquid and the inner core is solid; the inner core is hotter; the outer core is thicker (about 2,200 km against a radius of about 1,200 km). Accept any two.
3	Why do scientists use earthquake …	No one can dig or drill deep enough to reach them. Waves from earthquakes travel through the layers and change speed or direction, which shows what the layers are like.

Sample: Claim, Evidence, Reasoning (page 22)

- **Claim:** The inner core is solid.
- **Evidence:** The reading says the inner core is a ball of iron and nickel that is solid, even though its temperature is thousands of degrees Celsius. It also says the pressure at the center is very high.
- **Reasoning:** Heat alone would melt the metal, but the weight of all the layers above squeezes the inner core so hard that the atoms cannot move apart to flow. Pressure keeps it solid, so the hottest layer is still solid.

Exit Tickets (page 29): what to look for

- **Exit tickets:** a fact from the readings, the outer core as the liquid layer made of iron and nickel, pressure as the reason the inner core is solid, and a real question.

PREVIEW

Class Progress Grid

Every student on one grid: items right by page type.

Class or group _____ Month _____

Student	Check (of 5)	Words (of 8)	Readings (of 11)	Label (of 16)	Table (of 12)	Sorts (of 18)	Thickness, loop (of 8)	Quiz, cut (of 32)

PREVIEW

How to fill this in

For each column, add up how many items that student has right with no prompt (the tracker rows). One glance across a row shows which skill is easiest and which is next.

Grouping for small-group time

Students low in Readings can start with Reading 1 (page 7) read aloud and the main idea boxes done together. Students low in Label or Sorts need the layer cut-and-paste (page 26) and the table (page 15). Students near full marks can move to the convection page (page 19) and the claim, evidence and reasoning pages (22, 23). Use the check on page 5 before and after to see growth.

Riley's Tracker (Invented Student)

Riley M. is invented; nothing on this page describes a real student. The blank tracker is on page 35.

Student: Riley M. (an invented student)

Teacher: Ms. Patel (invented)

Month: September to October

Page	Page type and set	Items	Right	Date	Notes
5	Before and After Check	5	3	9/22	Guessed on the temperature question
6	Words to Know	8	6	9/24	Mixed up density and convection
7	Reading 1: The Short Read	3	3	9/25	-
8	Reading 2A: The Crust	2	2	9/26	-
9	Reading 2B: The Mantle	2	1	9/29	Chose the crust as the thickest layer
10	Reading 2C: The Outer Core	2	-	-	-
11	Reading 2D: The Inner Core	2	-	-	-
12	Label the Layers (Word Bank)	8	7	10/1	Wrote liquid for the mantle
13	Label the Layers (No Word Bank)	4	4	10/3	-
14	Color and Label the Layers	4	-	-	-
15	Layer Properties Table	12	-	-	-
16	How Thick Is Each Layer?	4	-	-	-
17	Which Layer? Part A	10	8	10/6	Mixed up outer core and inner core
18	Which Layer? Part B	8	-	-	-
19	Convection Current	4	-	-	-
24	Quiz, Part A	6	-	-	-
25	Quiz, Part B	6	-	-	-
26	Cut and Paste 1: Four Layers	8	-	-	-
27	Cut and Paste 2: Rock or Metal	6	-	-	-
28	Cut and Paste 3: Convection Steps	6	-	-	-

How to read it

Riley M. has done **8 of 20** scored pages and got **34 of 42** items right with no prompt. **3** pages were all right and **5** carry a note. Every number comes from the table.

What the table points to

The lowest page is Reading 2B: The Mantle (1 of 2). That is where the next practice goes. The 12 pages left blank are not tried yet, never wrong.

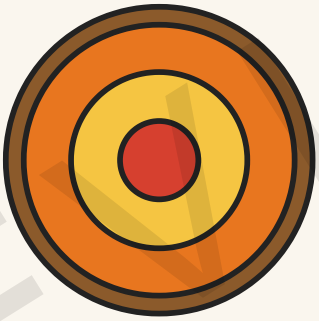
PREVIEW

Binder Cover

Slide this into the front of a binder. Type a name in the two fields or write it by hand. The divider tabs and a spine label to cut out are on the next page (page 41).

Science - Earth Science

LAYERS OF THE EARTH



Readings, Labels and Practice

Crust | **Mantle** | **Outer core** | **Inner core**

Teacher _____

Class or student _____

PREVIEW