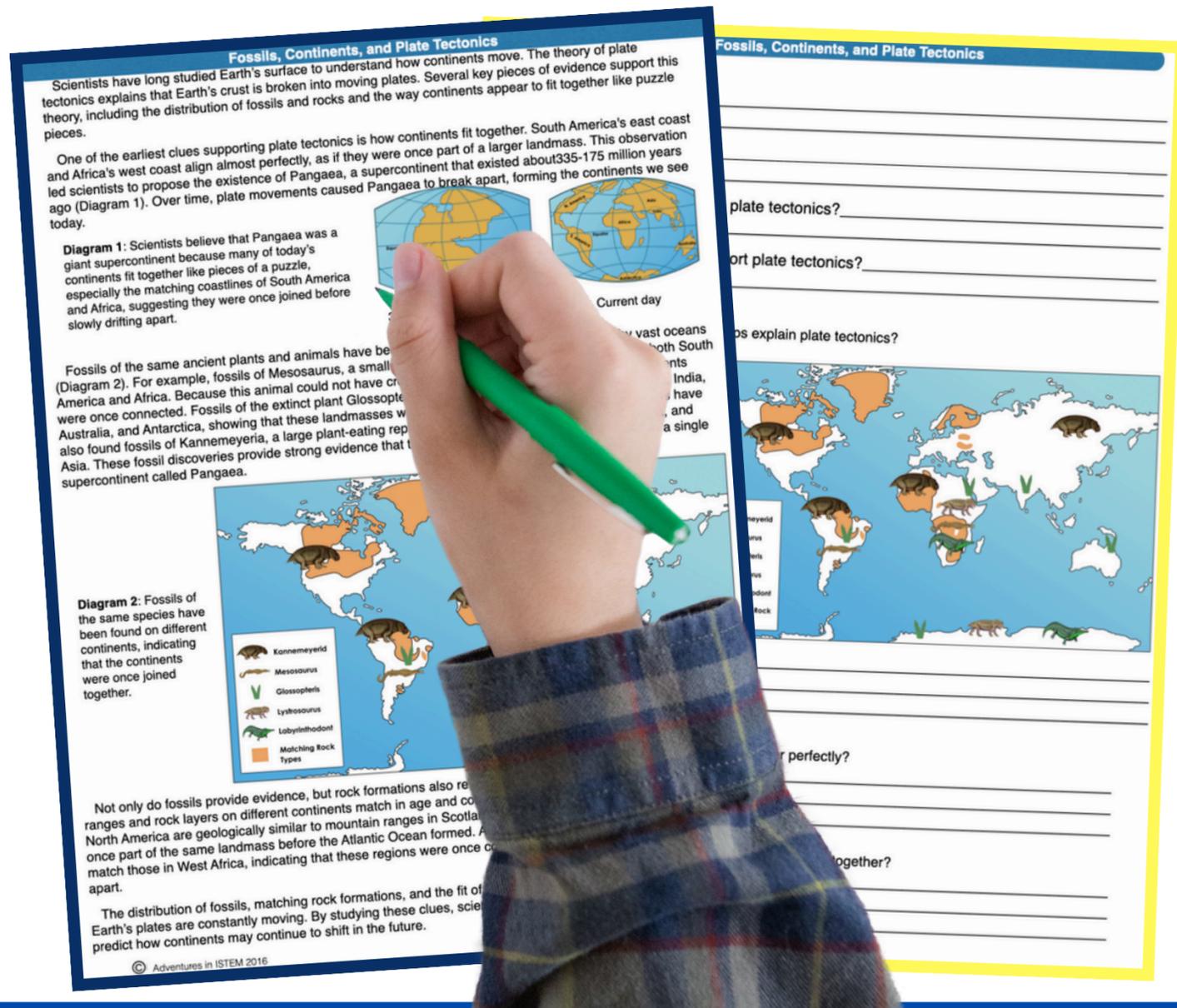


PLATE TECTONICS

Science Reading



Topics Included

✓ **Plate Tectonics: Types of Boundaries**

✓ **Seafloor spreading, subduction, and Plate Tectonics**

✓ **Fossils, Continents, and Plate Tectonics**

Each topic *includes*

- ✓ **One page science reading passage to teach the topic.**
- ✓ **Notes with questions to guide their reading**
- ✓ **Comprehension worksheets to review the information using multiple levels of questioning**
- ✓ **Task cards to extend their learning and for extra review**
- ✓ **Answer keys to easily check the student knowledge**
- ✓ **Digital version for more flexibility on how to use the lesson**
- ✓ **Lesson Design to help you differentiate the lesson in your classroom**

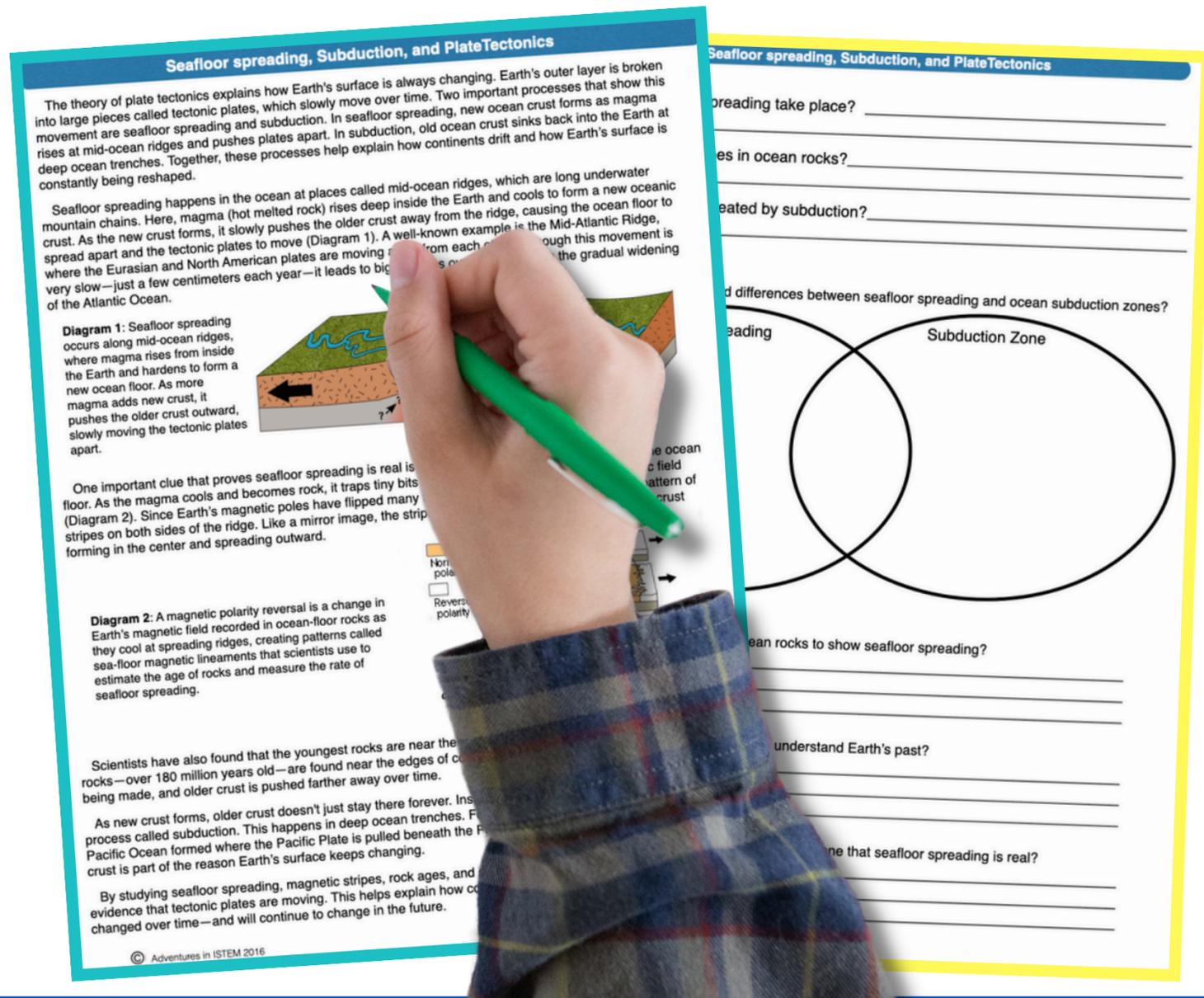
The image displays a collection of educational resources for the topic of plate tectonics. At the top, a worksheet titled "Plate tectonics" features a "Define / Describe:" section with six numbered questions: 1. What is plate tectonics?, 2. What is the difference between the lithosphere and the asthenosphere?, 3. What is subduction?, 4. Describe divergent boundaries., 5. Describe convergent boundaries., and 6. Describe transform boundaries. Below these is an "Identify:" section with a seventh question. To the right, a "Notes" page is visible with a header for "Class:" and "Date:" and a large area of horizontal lines for writing.

In the center, a reading passage titled "Plate tectonics" explains the scientific theory of how Earth's outer layer, the lithosphere, is broken into large pieces called tectonic plates. It describes how these plates move, shaping Earth's surface over millions of years. The passage includes three diagrams: Diagram 1 shows a divergent boundary where tectonic plates move away from each other, creating space and magma rises to form a new crust (Mid-Atlantic Ridge). Diagram 2 shows a convergent boundary where tectonic plates move toward one another, leading to subduction and the formation of deep ocean trenches. Diagram 3 shows a transform boundary where tectonic plates slide past each other horizontally, creating friction and pressure that can lead to earthquakes. The passage also discusses how plate tectonics helps scientists explain how Earth's surface changes over time and how it helps in predicting natural disasters like earthquakes.

At the bottom, a digital tablet displays a digital version of the comprehension worksheet. It features a "Define / Describe:" section with six numbered questions, each followed by an "Add text" box. To the right of these questions are three 3D diagrams of plate boundaries (divergent, convergent, and transform) with "Add text" boxes next to them. Below the diagrams is an "Elaborate / Extend:" section with two numbered questions: 8. What are some real-world examples of what can be created at the three different types of plate boundaries? and 9. How might plate tectonics change Earth's surface in the future? Each question has an "Add text" box.

PLATE TECTONICS

Science Reading



What Are *students* Doing?

- ✓ **Marking the text**
- ✓ **Filling in the guided note-taking template**
- ✓ **Reviewing and applying their knowledge**
- ✓ **Reinforcing their understanding**

PLATE TECTONICS

Science Reading

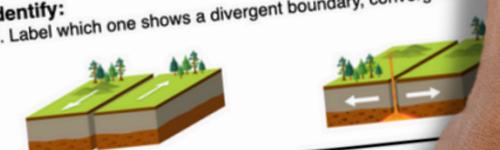
Plate tectonics

Define / Describe:

1. What is plate tectonics?
2. What is the difference between the lithosphere and the asthenosphere?
3. What is subduction?
4. Describe divergent boundaries.
5. Describe convergent boundaries.
6. Describe transform boundaries.

Identify:

7. Label which one shows a divergent boundary, convergent boundary, or transform boundary.



Elaborate / Extend:

8. What are some real-world examples of where these boundaries occur?

9. How might plate tectonics affect the future of our planet?

Plate tectonics

Have you ever wondered why earthquakes happen or how mountains are formed? The answer lies in plate tectonics—the scientific theory that explains how Earth's outer layer, the lithosphere, is broken into large pieces called tectonic plates. These plates constantly move, shaping Earth's surface over millions of years.

Earth is like a giant puzzle made of different layers. The lithosphere is the rigid outer layer, and it's divided into tectonic plates. These plates float on a softer, semi-molten layer beneath them called the asthenosphere. Although they move only a few centimeters per year, their slow movements cause major changes, such as the formation of mountains, earthquakes, and volcanoes.

At divergent boundaries, tectonic plates **move away from each other**, creating space between them. As they separate, magma from the **mantle** rises to fill the gap and cools, forming a **new crust** (Diagram 1). This process happens under the ocean, creating long underwater mountain chains called **mid-ocean ridges**, such as the **African Rift**, where the ground is slowly stretching and cracking apart. On land, divergent boundaries can form wide rift valleys where the continent gradually splits apart and how new parts of Earth's surface are formed.

At convergent boundaries, tectonic plates move toward one another, and their collision leads to powerful changes on Earth's surface. When an oceanic plate and a continental plate collide, the denser oceanic plate is forced under the other in a process called **subduction**, which can trigger volcanoes, earthquakes, and the formation of deep ocean trenches (Diagram 2). One of the deepest places on Earth, the Mariana Trench, was formed this way. Neither plate easily sinks when two continental plates collide, so the land is pushed upward, forming tall mountain ranges. A famous example is the Himalayas, which formed when the Indian Plate slammed into the Eurasian Plate—and they are still rising today as the plates continue to push against each other. These intense interactions at convergent boundaries help explain the creation of dramatic landforms and the occurrence of natural disasters in those regions.

Diagram 2: At convergent boundaries, tectonic plates move toward each other and bump into one another. If two land plates crash together, the ground gets pushed up, forming mountains.

Tectonic plates slide past each other horizontally at transform boundaries, moving in opposite directions along the plate edges. This movement creates friction as the plates catch and stick, preventing smooth motion. Over time, pressure builds up until it is suddenly released, causing the ground to shake in an earthquake (Diagram 3). These quakes can range from small tremors to major events that cause severe damage. A well-known example is the San Andreas Fault in California, where the Pacific and North American plates grind against each other. This fault is responsible for frequent seismic activity in the region and is closely monitored by scientists to understand better and predict future earthquakes.

Diagram 3: At transform boundaries, tectonic plates slide past each other. As they move, they get stuck because of the rough edges between them. This causes friction and builds up pressure. When the pressure becomes too strong, it suddenly releases, causing an earthquake.

Understanding plate tectonics helps scientists explain how Earth's surface features form and how they continue to change. It also helps in predicting natural disasters like earthquakes and volcanic eruptions. Studying plate movement shows how continents have shifted over time and reminds us that Earth is a dynamic, ever-changing planet.

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Different ways to use the science readings

Substitute plan on days you will be out

Introduction of the material at the beginning of the unit

During the explain phase of the 5E model

As part of a science station

For reteach to reinforcing their understanding

During the review at the end of the unit

Why? SCIENCE READING PASSAGES?

- ✓ Increase science literacy in the classroom
- ✓ Simple passages to help students comprehend the information
- ✓ Note-taking template to help students interact with the reading
- ✓ Worksheets to review and apply their knowledge
- ✓ Reinforcement task cards to continue their understanding



“My students and I absolutely loved this resource!!! The way this was planned out with the reading, diagrams, and questions was perfect. I mainly used this with my students but they used it one day with a substitute and they wrote to tell me how great it was! (I think they thought I created it so I have to tell them otherwise!)” -

Nicole

PLATE TECTONICS

Science Reading

Fossils, Continents, and Plate Tectonics **Answer Key**

Define / Describe:

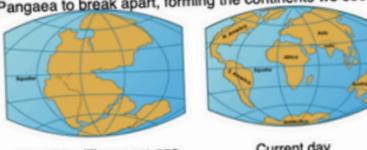
1. What is plate tectonics? The theory explains how Earth's outer layer is broken into moving plates.
2. What is Pangaea? A supercontinent that existed about 335-175 million years ago.
3. What fossil evidence supports plate tectonics? Fossils of the same species are found on continents now separated by oceans.
4. How do mountain ranges form? Mountain formations are found on continents.

Fossils, Continents, and Plate Tectonics

Scientists have long studied Earth's surface to understand how continents move. The theory of plate tectonics explains that Earth's crust is broken into moving plates. Several key pieces of evidence support this theory, including the distribution of fossils and rocks and the way continents appear to fit together like puzzle pieces.

One of the earliest clues supporting plate tectonics is how continents fit together. South America's east coast and Africa's west coast align almost perfectly, as if they were once part of a larger landmass. This observation led scientists to propose the existence of Pangaea, a supercontinent that existed about 335-175 million years ago (Diagram 1). Over time, plate movements caused Pangaea to break apart, forming the continents we see today.

Diagram 1: Scientists believe that Pangaea was a giant supercontinent because many of today's continents fit together like pieces of a puzzle, especially the matching coastlines of South America and Africa, suggesting they were once joined before slowly drifting apart.



335-175 million years ago Current day

Fossils of the same ancient plants and animals have been found on continents now separated by vast oceans (Diagram 2). For example, fossils of Mesosaurus, a small freshwater reptile, have been discovered in both South America and Africa. Because this animal could not have crossed an ocean, it suggests that those continents were once connected. Fossils of the extinct plant Glossopteris have been found in South America, Africa, India, Australia, and Antarctica, showing that these landmasses were once part of a larger land area. Scientists have also found fossils of Kannemeyeria, a large plant-eating reptile, in North America, South America, Africa, and Asia. These fossil discoveries provide strong evidence that the continents were once joined together in a single supercontinent called Pangaea.



Diagram 2: Fossils of the same species have been found on different continents, indicating that the continents were once joined together.

Changes have altered
would form,

Not only do fossils provide evidence, but rock formations also reveal clues about past connections. Mountain ranges and rock layers on different continents match in age and composition. The Appalachian Mountains in North America are geologically similar to mountain ranges in Scotland and Greenland, suggesting they were once part of the same landmass before the Atlantic Ocean formed. Additionally, unique rock types in Brazil match those in West Africa, indicating that these regions were once connected before the continents drifted apart.

The distribution of fossils, matching rock formations, and the fit of continents provide strong evidence that Earth's plates are constantly moving. By studying these clues, scientists can reconstruct Earth's history and predict how continents may continue to shift in the future.

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Check out what teachers just like you have said about the science reading products:



“I love using reading passages in my science classes because I am able to reinforce all the learning strategies they have learned in the past and give the students more understanding of the information provided.” – Suzzane



“I was really glad to find a bundle that included so many of our objectives since we do not have a curriculum” – Amanda



“This article kept my 8th graders engaged while reviewing this topic” Brower Power Science

HOW TO USE THE RESOURCE IN

3 simple steps

1

Print the PDF version, make copies, and hand out to students

2

Use the digital version by clicking the titles in the RED BOX to make your own copy (found at the end of the PDF)

3

Share the resource with your students using your favorite LMS (Google Classroom, Powerschool (schoolology), Canva...)

Interactive Digital Flip Book

Teachers Guide

What You Will Need To Get Started:

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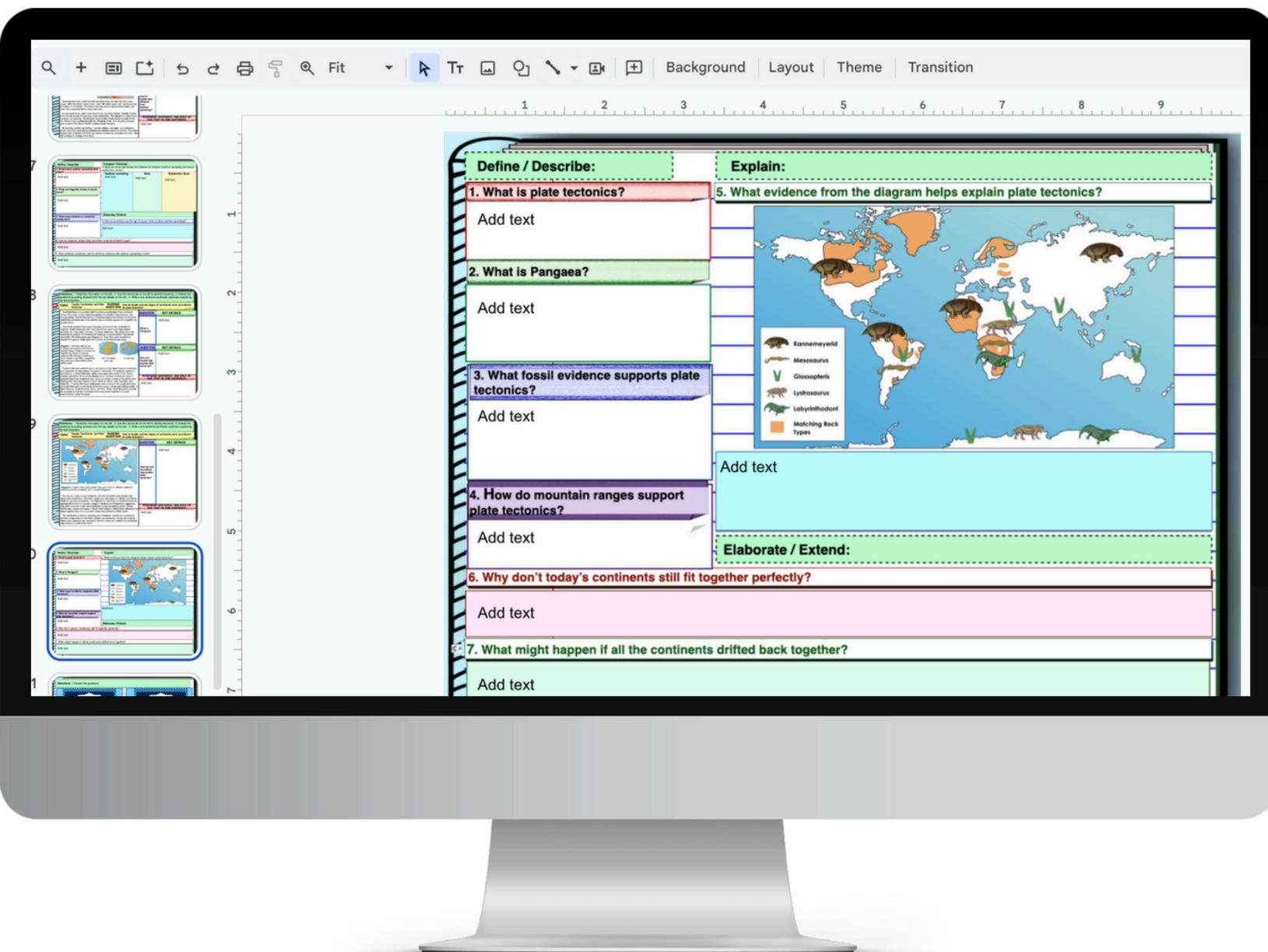
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Life Science Standards

Integrated Model by Grade Level

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Molecules to Organisms

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Full Year

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Waves

NGSS MS-PS4

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- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

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NGSS MS-PS2

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

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- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

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