

Virtual Field Trip Teacher's Guide

OVERVIEW

Welcome to a virtual field trip to the Gottesman Hall of Planet Earth! This activity is designed for middle school students to explore how plate tectonics explains specific Earth formations.

This activity is modular to give teachers flexibility in how they assign components to their students. The Virtual Hall Tour and Student Investigation are the core assignment. The extension activities are meant to provide opportunities for deeper student engagement and could be assigned over several days.

CORE ACTIVITY

Virtual Hall Tour and Student Investigation

Students will use [Google Arts and Culture](#) to explore the “Why are there ocean basins, continents, and mountains?” section of the Gottesman Hall of Planet Earth. Have them use the map find the exhibits on Plate Tectonics, Explosive Volcanism, Effusive Volcanism, Earthquakes and Mountain Building.

Supports for synchronous instruction:

- After students have completed their worksheets, put them into jigsaw groups and have them share and discuss their findings.

Supports for asynchronous instruction:

- Have students have a flip grid recording of their worksheet so that they can view each other's videos and learn about different specimens.

Common Core State Standards:

WST.6-8.2, WST.6-8.8, WST.6-8.9
RST.6-8.1, RST.6-8.2, RST.6-8.4,
RST.6-8.7, RST.6-8.10

New York State Science Core Curriculum:

PS 2.2f

Next Generation Science Standards:

PE MS-ESS2-3
DCI ESS2.B: Plate Tectonics and Large-Scale System Interactions
Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.

Instructional Modalities

This activity was designed for both synchronous or asynchronous instruction.

For **synchronous instruction**, we recommend a platform that allows both for whole class discussion and for students to interact in small groups.

For **asynchronous discussion**, we provide suggestions for teachers to provide additional video support for the activities and for students to share their work with each other.

EXTENSION ACTIVITIES

To deepen student engagement with this content, you may choose to add one or more of the following extension activities:

Reading Assignment

Students can prepare for their virtual visit by reading a non-fiction text about plate tectonics titled “Earth’s Dynamic Machine: Basics of Plate Tectonics.” This reading can help introduce the topic or serve as a content refresher to help frame their investigation.

Supports for synchronous instruction: Student Reading

- As they read, have students write notes in the large right-hand margin. For example, they could underline key passages, paraphrase important information, or write down questions that they have. They may also use this space for drawings or diagrams of the tectonic processes they’re reading about.
- After reading, ask students to come up with definitions for the following words as they are used in the article: tectonics, divergent, convergent, and transform. Working in pairs or small groups, they should use context clues from the reading to develop their definitions. During discussion, remind students to use evidence from the text to explain their thinking, and to use specific examples.
(Answers may vary, but should include: Tectonics refers to the motions of the plates, divergent means spreading or moving apart, convergent means coming together, and transform usually means change, but in this case it may refer to movement in different directions that changes a landscape.)
- Then, have them create a chart (such as a multi-columned T-chart) to compare and contrast the four different types of plate boundaries described in the reading (divergent, convergent between oceanic and continental plates, convergent between two continental plates, and transform). Have them include illustrations of the processes they describe. See included Sample Student Chart for an example of how students could format their charts.

Supports for asynchronous instruction: Student Reading

- Film a video of yourself reading “Earth’s Dynamic Machine: Basics of Plate Tectonics” This will allow students to pause or relisten to the reading so that they have time to take notes, paraphrase important information, or write down questions that they have.

Hall Videos

These videos are featured in the sections of the Gottesman Hall of Planet Earth that the students are exploring on their virtual field trip. Students can watch them to learn more about each of the processes and the role that scientists play in helping us understand them. Note that total video watch time is 28 minutes. As an alternative, you may ask students to only watch the Mantle Convection Video and the Tectonic Process that pertains to the specimen they selected for their investigation (9 minutes).

Writing Task

This informational writing task asks students to draw on the reading and observations recorded during the virtual field trip, to write an illustrated history of their selected rock specimen. The writing task should only be assigned as culminating work, if students have also completed the reading and answered the questions from the student investigation. A student checklist and teacher rubric are included.

Student Writing Task

Based on your reading and your exploration of the Gottesman Hall of Planet Earth write an illustrated history of the rock specimen you chose to study during your visit. Be sure to:

- define “plate tectonics”
- explain the plate boundary processes that were involved in your specimen’s formation or structural change
- include a labeled illustration of the specimen as it appears today
- include a labeled illustration of the processes that the specimen has undergone in its formation or change

Support your discussion with evidence from the reading and the Gottesman Hall of Planet Earth.

Supports for synchronous instruction: Writing Task

- Re-read “ Earth’s Dynamic Machine: Basics of Plate Tectonics” with students. Ask what they saw in the hall that helps them understand how plate tectonics explains specific rock formations.
- Allow time for students to read their essay drafts to a peer and receive feedback based on the Student Writing Guidelines.

Supports for asynchronous instruction:

- Ask students to re-watch the video of the teacher reading of “Earth’s Dynamic Machine: Basics of Plate Tectonics” While they view it, ask them to write down how what they saw in the hall helps them understand how plate tectonics explains specific rock formations.
- You can use padlet so that students can share work with one another.

Sample Student Chart

Plate boundary name	Description of plate movement	Processes that occur there	Diagram of plate movement
<i>Divergent</i>	<i>Plates move away from each other</i>	<i>Ocean basins created, volcanism, small shallow earthquakes occur</i>	<i>[students should sketch in this space]</i>
<i>Convergent (oceanic and continental)</i>	<i>Plates collide, oceanic plate moves under continental plate (subduction)</i>	<i>Volcanic mountain chains and oceanic trenches form</i>	<i>[students should sketch in this space]</i>
<i>Convergent (continental and continental)</i>	<i>Plates collide, both plates are pushed up, one overrides the other</i>	<i>High mountain ranges and plateaus form</i>	<i>[students should sketch in this space]</i>
<i>Transform</i>	<i>Plates slip past each other</i>	<i>Strong earthquakes occur, pull-apart basins and ridges are formed</i>	<i>[students should sketch in this space]</i>