EARTH SCIENCE Lesson Plan

Quarter 3, Week 2, Day 1

Outcomes for Today

Standard Focus: Earth Sciences 3.a "*students know the features of the ocean floor (magnetic patterns, age and sea-floor topography) provide evidence of plate tectonics"*, 3.c *"students know the principal structures that form the three different plate boundaries"*, 3.d *"students know why and how earthquakes occur and the scales used to measure their intensity and magnitude"*, and 3.f *"students know the explanation for the location and properties of volcanoes that are due to hot spots and the explanation of those due to subduction"*.

PREPARE

1. Background knowledge necessary for today's reading.

Subduction zones are thought to be areas of destruction for various reasons. The relative young age of the ocean crust compared to that of the landmasses, island arcs and deep-sea trenches were considered early evidence. Other evidence was the less than expected gravitational field over a subduction zone because of the extra crust where the two plates overlap.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

theory of plate tectonics **plate boundaries** **divergent boundaries** **rift valley**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 17.3, pp. 455-456

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- There are a dozen or more tectonic plates that move in different directions and at different rates.
- Each type of boundary has different characteristics and processes associated with it.
- Most divergent boundaries are found on the ocean floor where they form ocean ridges.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: The Plate Tectonic Story – A Scientific Jigsaw

Procedure: Students read and answer the questions based on the article.

Discussion: Discuss Wegener's theory of continental drift

Key question: Explain the theory of plate tectonics

Source:
http://www.chemsoc.org/networks/learnnet/jesei/onmove/home.htm

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

EARTH SCIENCE Lesson Plan

Quarter 3, Week 2, Day 2

Outcomes for Today

Standard Focus: Earth Sciences 3.a, 3.b, 3.d. and 3.f

PREPARE

1. Background knowledge necessary for today's reading.

Deep-focus earthquakes are the strongest evidence of subduction. Earthquakes have been detected nearly 700km below the surface. These deep-focus earthquakes are thought to occur in the still cool and solid portions of the subducted plate rather than in the mantle.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

convergent boundaries **subduction** **transform boundary**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 17.3, pp. 457-459

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- There are three types of convergent boundaries which are classified by the type of crust involved: oceanic – oceanic, continental – continental, and oceanic – continental.
- A deep-sea trench is created by subduction.
- At transform boundaries where plates slide horizontally against each other, the crust fractures and fault exist.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Plate Tectonics

Procedure: Students use data from underwater earthquakes to outline the location of plate boundaries

Discussion: Discuss the location of plate boundaries on maps

Key question: Did their boundaries align with those of the USGS?

Source: http://www.vims.edu/bridge/archive0902.html

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

EARTH SCIENCE Lesson Plan

Quarter 3, Week 2, Day 3

Outcomes for Today

Standard Focus: Earth Sciences 3.a and 3.b

PREPARE

1. Background knowledge necessary for today's reading.

Convection currents in the mantle are thought to create plate movement. Convection currents have lateral as well rising and downward motions. The Earth's internal heat is generated by the decay of radioactive elements and remnant heat from Earth's formation

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

mantle **convection current** **asthenosphere**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

17.4, pp. 460-461

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Convection currents are thought to be the driving force of plate movement.
- Convection currents result from the heating and cooling of matter that causes a rising and falling motion.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: The Biggest Plates on Earth

Procedure: Students use a map to decide on the type of boundary that exists between plates.

Discussion: Discuss the characteristics of divergent, convergent, and transform boundaries

Key question: What energy transfers are involved in plate motions, earthquakes, and volcanoes?

Source:
http://oceanexplorer.noaa.gov/explorations/02force/background/education.media

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

EARTH SCIENCE Lesson Plan

Quarter 3, Week 2, Day 4

Outcomes for Today

Standard Focus: Earth Sciences 3.a and 3.b

PREPARE

1. Background knowledge necessary for today's reading.

There are four major forces at work along plate boundaries. Slab pull forces act on the cooling, sinking edge of the subducting plate. The subduction suction force pulls on the edge of the overlaying plate. The ridge push force cause lateral pressure in the oceanic plates near ocean ridges. Mantle drag force acts on the base of a moving plate.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

ridge push **slab pull** **lithosphere**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 17.4, pp. 461-462

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Ridge push occurs when the uplifting of a ridge pushes a plate towards a subduction zone.
- Slab pull occurs when the subducting plate's weight pulls the plate into a subduction zone.
- There are still many unanswered questions about plate tectonics.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: The Biggest Plates on Earth

Procedure: Students will use data to draw inferences about the divergent boundary of the Juan de Fuca plate

Discussion: Discuss the size and location of the Juan de Fuca plate

Key question: What would account for interruptions in the magnetic anomalies?

Source: See Day 3

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

EARTH SCIENCE Lesson Plan

Quarter 3, Week 2, Day 5

Outcomes for Today

Standard Focus

PREPARE

1. Background knowledge necessary for today's reading.

The global Positioning system is a U. S. space-based radio-navigation system that provides positioning, navigation, and timing services to civilian users worldwide. The GPS is made up of at least 24 satellites orbiting Earth broadcasting signals that are picked up by GPS receivers. Each receiver provides location information (latitude, longitude, and altitude) plus the time.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

GPS **receiver**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 17, p. 466

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- GPS was originally developed for the military.
- GPS has many uses for everyday life.
- There are many scientific applications of GPS as well.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Relative and Absolute Directions, Step 10

Procedure: Students use coordinates to locate a ship in distress

Discussion: Discuss the use of latitude and longitude as a reference for location

Key question: Were you able to locate the missing ship?

Source: http://archive.globe.gov/tchg/gps_la_part2.pdf?sectionId=50

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world