EARTH SCIENCE Lesson Plan

Quarter 2, Week 9, Day 1

Outcomes for Today

Standard Focus: Earth Sciences 5.d

PREPARE

1. Background knowledge necessary for today's reading.

The Earth's polar seas are the source for all the cold bottom water masses in all of the Earth's oceans. Salt ions from sea water that freezes accumulates beneath the sea ice. The water beneath the ice is saltier and denser than the surrounding sea water and sinks. This saltier water migrates towards the equator along the ocean floor.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

deep water masses

- 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. 15.2, pp. 397 - 398

RESPOND

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

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

Students might mention:

- Three major water masses account for most of the deep water in the Atlantic.
- Antarctic Bottom Water is the densest and coldest deep water mass.
- The ocean can be divided into 3 layers based on water temperatures.

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: Density Dynamics

Procedure: Students demonstrate the formation of deep water masses in the ocean

Discussion: The relationship of density and temperature

Key question: How does the formation of cold deep water masses relate to the spring and fall turnover in lakes and ponds?

Source: http://www.sea.edu/academics.k12/asp?plan=densitydynamics

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 2, Week 9, Day 2

Outcomes for Today

Standard Focus: Earth Sciences 5.a, 5.b, 5.d, 6.a

PREPARE

1. Background knowledge necessary for today's reading.

The oceans are in constant motion. Waves, which are produced by winds, are the most visible motion. A wave is a rhythmic movement that carries energy through matter or space, in this case water. Waves cause relatively small water movements. The water in an ocean wave moves up and down as the energy moves forward.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

Wave **crest** **trough** **wavelength** **breakers**

- 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. 15.3, pp. 399 - 400

RESPOND

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

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

Students might mention:

- The highest point in wave is the crest and the lowest is the trough.
- Wave height depends on wind speed, wind duration, and fetch, the expanse of water the wind blows over.

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: Learning Lesson – Moonlight Serenade

Procedure: Student will observe how different angles between the sun, moon and earth affect the phases of the moon

Discussion: Discuss the difference in gravity between the earth and moon, and the distances between the sun and moon from earth.

Key question: What causes tides to be strongest at certain times of the month?

Source: http://www.srh.noaa.gov/jetstream/ocean/ll_moonphase.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 2, Week 9, Day 3

Outcomes for Today

Standard Focus: Earth Sciences 5.a, 5.b, 5.d, 6.a

PREPARE

1. Background knowledge necessary for today's reading.

Tides are the periodic rise and fall of ocean waters caused by the gravitational attraction of the Moon and the Sun. Several factors, such as the phase of the Moon, the time of year, latitude, and the topography of the seafloor, affect the difference between the maximum level of water (high tide) and the minimum level (low tide).

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

tides **tide range**

- 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. 15.3, pp. 400 - 401

RESPOND

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

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

Students might mention:

- High tide refers to the highest level to which water rises. Low tide is the lowest level.
- The tide range varies from place to place because of topography and latitude.
- Generally a daily cycle of high and low tides takes 24 hours and 50 minutes.

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

One possible activity: Of Tides and Time

Procedure: Students chart the relationship between tides and the phases of the moon

Discussion: Discuss the changes in water level between high and low tides and the effects

Key question: What patterns did you notice?

Source: http://www.mos.org/oceans/motion/graphingtides.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 2, Week 9, Day 4

Outcomes for Today

Standard Focus: Earth Sciences 5.a, 5.b, 5.d, 6.a

PREPARE

1. Background knowledge necessary for today's reading.

While both gravitational forces from the Moon and the Sun affect tides on Earth, the moon's influence is stronger because of its relative closeness compared to that of the Sun. The gravitational attract of the moon pulls the ocean towards on the side facing the moon crating a bulge. Another bulge forms on the opposite side of the Earth caused by the inertia of the ocean water on the rotating Earth.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

gravitational attraction **lunar tides** **spring tides** **neap tides**

- 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. 15.3, pp. 402 - 403

RESPOND

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

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

Students might mention:

- Lunar tides are more than twice as high as solar tides.
- Depending on the phases of the moon, solar tides either decrease or increase the height of lunar tides.

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: Star Gardens

Procedure: Students will plot tidal curves using a tide table and create a tide calendar

Discussion: Discuss what tides provide and how they affect the natural environment and human activities.

Key question: Why is it important to know when tides will occur?

Source: http://www.pbs.org/oceanrealm/intheschool8/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 2, Week 9, Day 5

Outcomes for Today

Standard Focus: Earth Sciences 5.a, 5.b, 5.d, 6.a

PREPARE

1. Background knowledge necessary for today's reading.

Ocean waters circulate by means of currents. Density currents in deep water move colder waters from the polar regions towards the equator. Surface currents produced by global wind systems follow predictable patterns based on latitudes. Currents deflected by the continents and other large land masses form large, circular currents called gyres.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

density current **surface current** **gyre** **upwelling**

- 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. 15.3, pp. 403 – 405

RESPOND

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

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

Students might mention:

- Density currents move slowly in deep ocean waters. Surface currents are driven by global wind systems and affect the upper few hundred meters of the ocean.
- Upwelling waters are rich in nutrients and support abundant populations of marine life.

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: Coastal Upwelling – Monterey Bay California

Procedure: Students use data to infer impact on various occupations and agencies in the area

Discussion: Discuss factors involved in upwelling

Key question: How does upwelling affect the area?

Source: http://sealevel.jpl.nasa.gov/education/activities/ts2siac6.pdf

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