clementaged.weebly.com

Name: _____ EVEN Period: _____

Week: 23–26 Dates: 2/1–2/26 Unit: Ocean Properties & Movement

Monday	Tuesday	Wednesday	Thursday	Friday
1 O *Clement Gone	2 E *Vocabulary *Ocean Floor Notes *14.2 Crossword *Clement Gone	3 O *Clement Gone	4 E *Aliens of the Deep Vocab Foldable	5 O * Ocean Circulation Notes *Late/Absent Work due by 2pm
8 E *Flex Day *Ocean in Motion	9 O	10 E *Ocean Currents/ Climates Lab	11 O	12 No School
15 No School	16 E *Diversity of Ocean Life Notes *TerraMar Project	17 O *Creed Contest 3:30pm AG	18 E *Ocean Productivity Notes	19 O
22 E *Composition of Seawater Wrksht *14.2 Vocabulary *Clement Gone	23 O	24 E *Study Guide & Review	25 O	26 E *Unit Quiz *Packet Due

Assignment	Your Score	Total Points Possible
Good to Know Vocabulary Words		40
Ocean Floor Features Notes		40
14.2 Crossword Puzzle		20
Aliens of the Deep Vocab Foldable		40
Ocean Circulation Notes		40
Ocean in Motion Lab		40
Oceans Currents and Climate Lab		60
Diversity of Ocean Life Notes		40
Terra Mar Project		40
Ocean Productivity Notes		40
Composition of Seawater Worksheets		40
14.2 Vocabulary		20
Study Guide		40
TOTAL		500

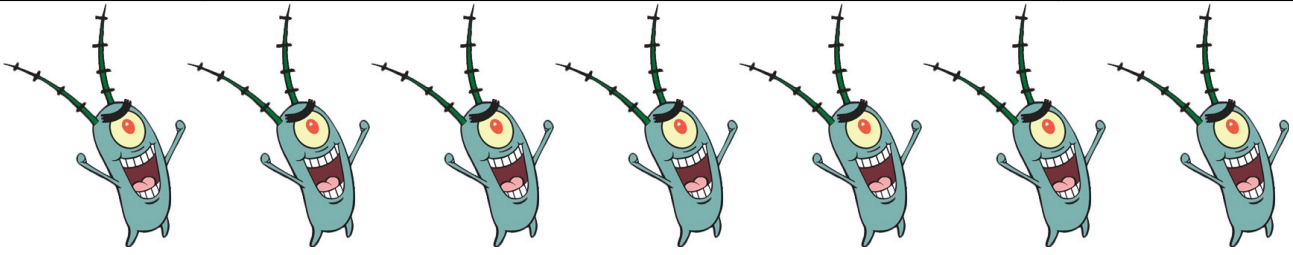
Ag Earth Science Fact of the Week

Aquaculture (also known as fish farming or fish culture) is the production and husbandry of aquatic plants and animals in controlled environments.

GOOD TO KNOW VOCABULARY WORDS

Word	Definition	Example or Picture
Mid Ocean Ridge		
Sea Floor Spreading		
Seamount		
Guyots		
Ocean Current		
Surface Current		
Coriolis Effect		
Density Current		

Word	Definition	Example or Picture
Food Chain		
Food Web		
Photosynthesis		
Chemosynthesis		
Trophic Level		
Salinity		
Phytoplankton		



Cue Column (titles, vocab, big ideas, test questions)	**OCEAN FLOOR FEATURES** Pages 401-405

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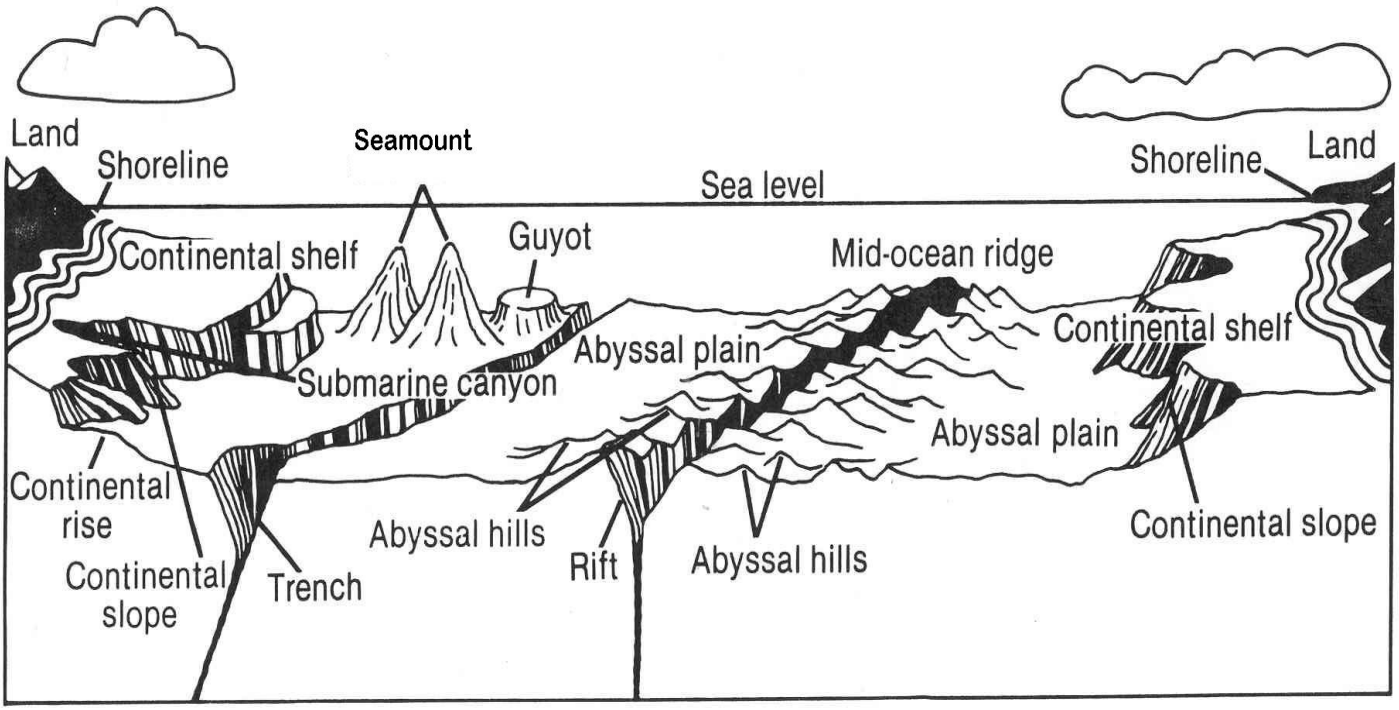
Cue Column (titles, vocab, big ideas, test questions)	**OCEAN FLOOR FEATURES** Pages 401-405

Summary
(briefly describe the main concepts, major points)

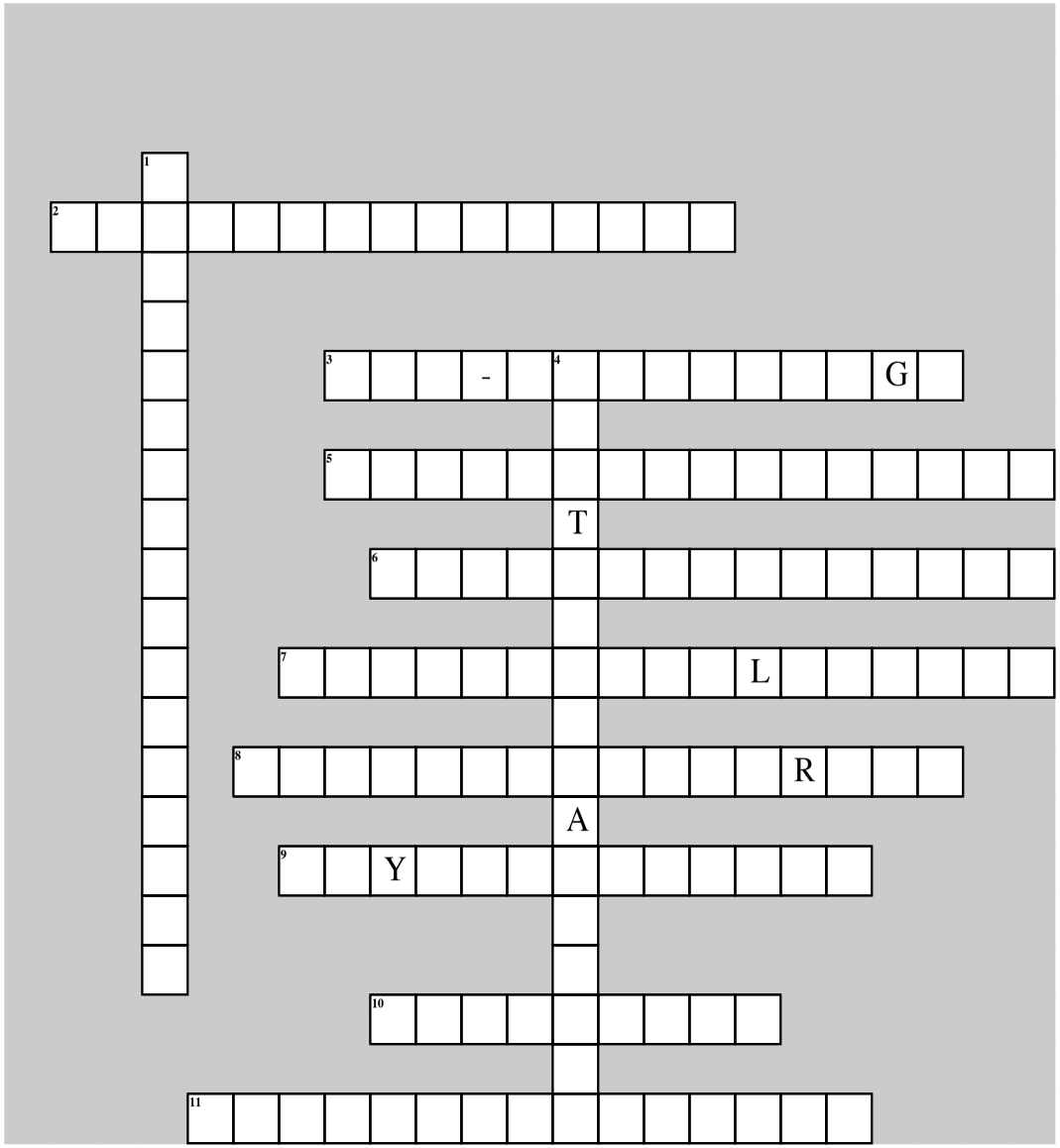


Name _____ Date _____

(Key # 1 - 353788)

Earth Science - Ch. 14.2

Complete the crossword puzzle.



TURBIDITYCURRENT
MID-OCEANRIDGE
SEAMOUNTS
CONTINENTALMARGIN
CONTINENTALSHELF
SUBMARINECANYON
CONTINENTALSLOPE
CONTINENTALRISE
ABYSSALPLAINS
SEAFLOORSPREADING
OCEANBASINFLOOR

Across

2 area of the deep-ocean floor between the continental margin and the oceanic ridge. (3 words)

3 a long mountain chain that forms on the ocean floor where tectonic plates pull apart; usually extends along the center of ocean basins (2 words)

5 The gently sloping shelf of land extending from the shoreline to the continental edge. (2 words)

6 the gently sloping surface at the base of the Continental slope (2 words)

7 Area where the underwater edge of a continent meets the ocean floor (2 words)

8 the very dense currents that carry sediments down the continental slope. (2 words)

9 very level area of the deep-ocean floor (2 words)

10 Underwater volcanic mountain on the ocean floor

11 a seaward extension of a valley that was cut on the continental shelf during a time when sea level was lower. (2 words)

Down

1 Process by which a new sea floor forms as tectonic plates move apart. (2 words)

4 The edge of the Continental shelf that slopes down to the ocean floor (2 words)

ALIENS OF THE DEEP VOCAB WORD

DIRECTIONS: Using the provided paper, create a foldable. Write your new vocab word and draw an icon on the outside to help you remember or describe the meaning of the word. Inside your foldable, research and write a high quality definition. Be prepared to share with the class. GLUE YOUR WORD FOLDABLE ON THIS PAGE FOR CREDIT!

Paste vocab foldable so it fits on this page

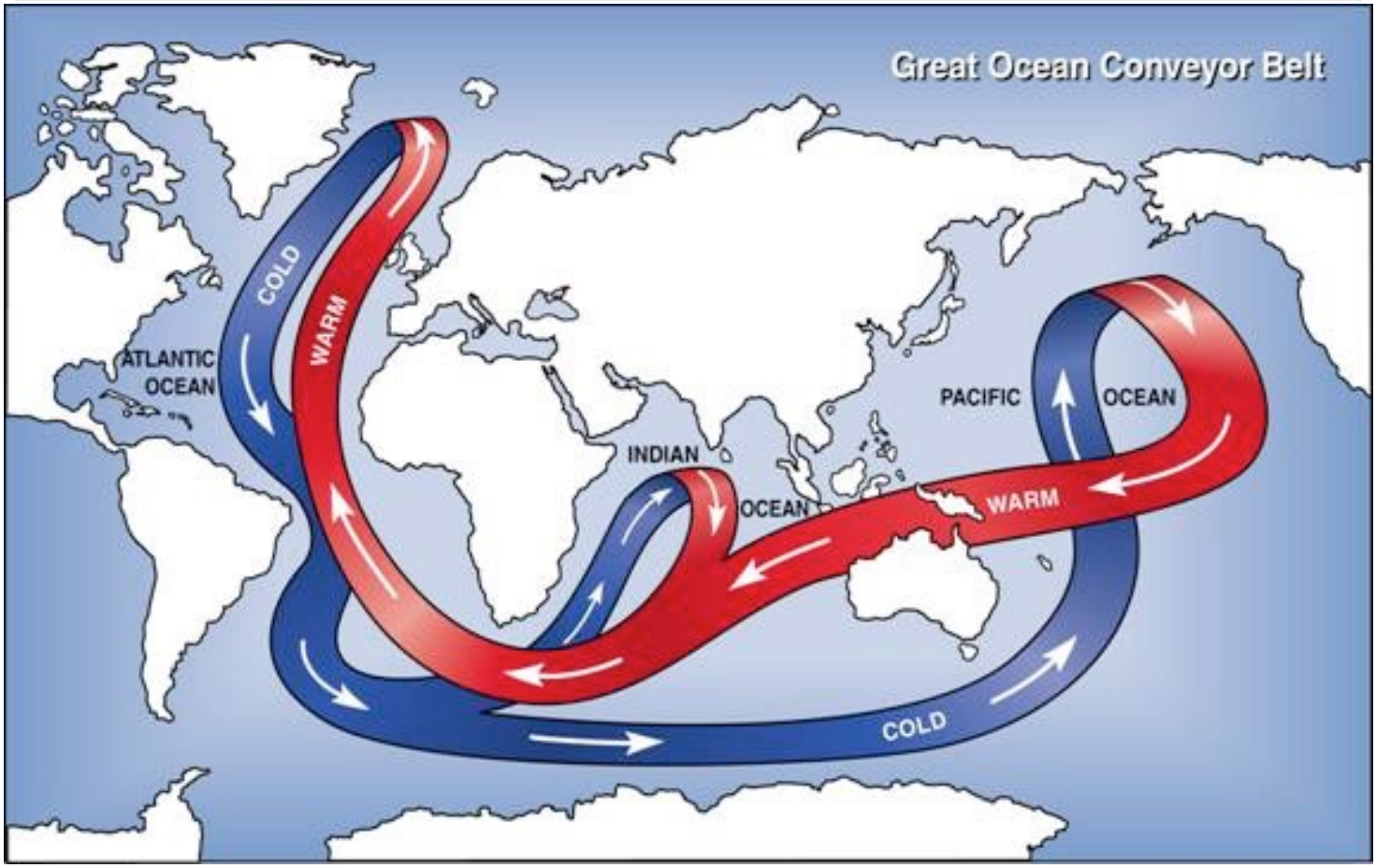
Cue Column (titles, vocab, big ideas, test questions)	**OCEAN CIRCULATION** Page 448-453

Cue Column (titles, vocab, big ideas, test questions)	**OCEAN CIRCULATION** Page 448-453

Cue Column (titles, vocab, big ideas, test questions)	**OCEAN CIRCULATION** Page 448-453

Cue Column (titles, vocab, big ideas, test questions)	**OCEAN CIRCULATION** Page 448-453

Summary
(briefly describe the main concepts, major points)

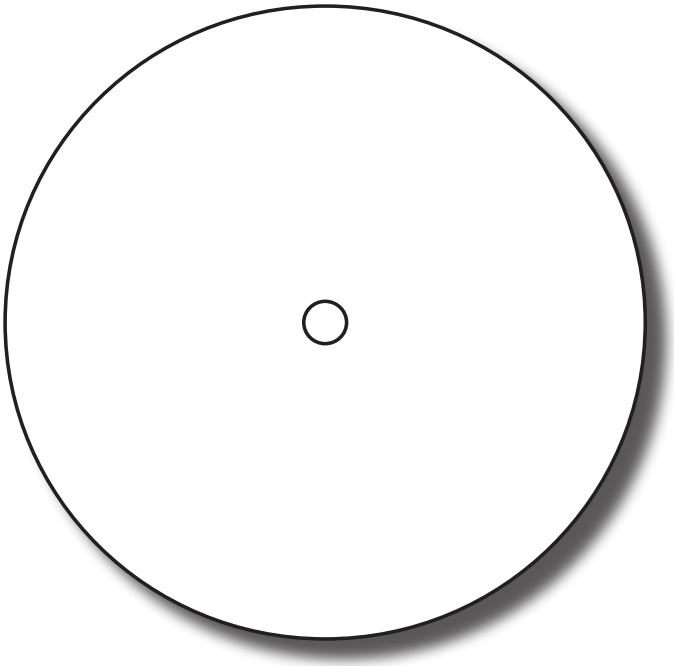


The Ocean in Motion
Data Sheet - Page 1

Name: _____

1. What direction will you spin your model? On both circles, use an arrow to show the direction.
2. What path do you predict the water will take when you spin the model? Draw your prediction in Circle A.
3. After doing the experiment, draw the actual path in Circle B.

A. Predicted Path



I predict that...

_____

_____

_____

_____

I predicted this because...

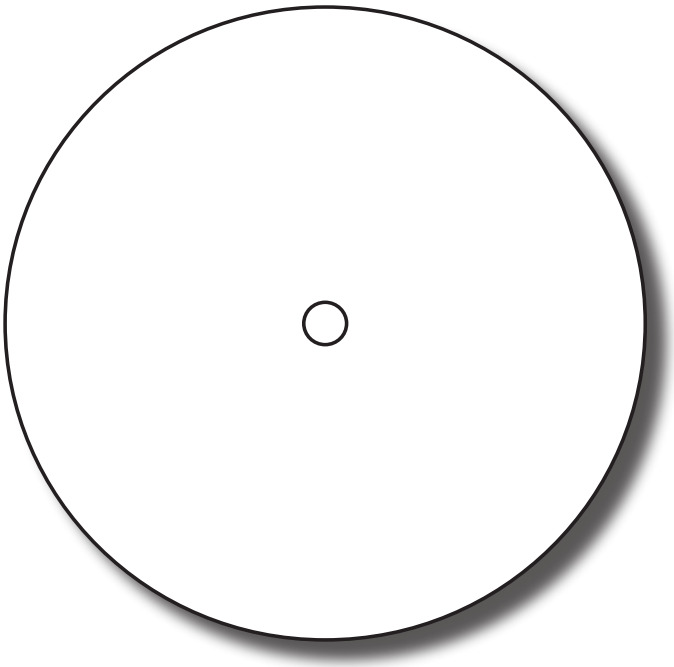
_____

_____

_____

_____

B. Actual Path



I observed that...

_____

_____

_____

_____

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The Ocean in Motion

Data Sheet - Page 2

Name: _____

What did you observe?

How is your predicted path the same as or different from the observed path?

What do you think?

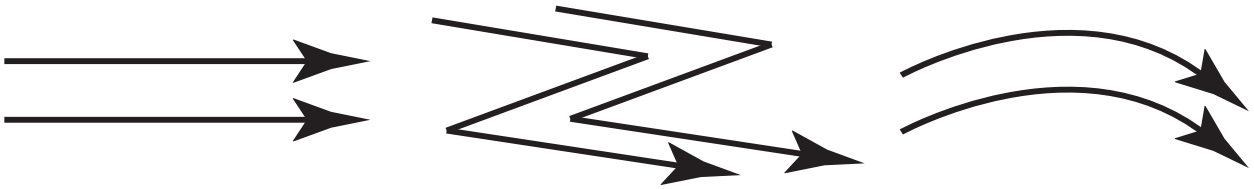
What caused the water to move in the path that you observed?

I think this because...

What do you think?

Do you think that ocean currents move in

Straight paths? Zigzags? Curves?



I think this because...

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OCEAN CURRENTS AND CLIMATE LAB

Purpose

The purpose of this lab is to visualize ocean current movement based on temperature, salinity and wind.[1]

Procedure

Materials

1. Baby food jars (4)
2. Index card
3. Salt
4. Food Coloring
5. Stirring Rod
6. Tray
7. Triple beam balance

Sequence of Steps

1. Read background information in “observations”.
2. Develop your hypothesis and record in “observations”.
3. Fill two baby food jars completely full with water. (The water should be “bubbled up” over the top.)
    a. Add a drop of red food coloring.
    b. These jars will represent fresh water.
4. Fill two baby food jars ¾ full with water.
    a. Dissolve 10 g of salt in two of the jars.
    b. Add a drop of blue food coloring.
    c. These jars will represent salt water.
    d. Add water to make certain all jars are completely full. (The water should be “bubbled up” over the top.)
5. Predict what will happen when you invert the salt water over the fresh water. Record in “observations” by coloring what you think the result will be.
6. DO THE NEXT PART OVER THE TRAY.
    a. Place an index card on top of the salt water.
    b. Holding the card against the top of the jar, turn the jar over and place it on top of the fresh water.
    c. Have a lab partner carefully remove the card. Record results by coloring what you see.
    d. If the layers mixed or inverted, indicate that in your observations.
    e. LEAVE THESE JARS STACKED IN THE TRAY FOR LATER.
    f. BE CAREFUL NOT TO KNOCK THEM OVER.
7. Predict what will happen when you invert the fresh water over the salt water. Record by coloring what you think the result will be.
8. DO THE NEXT PART OVER THE TRAY.
    a. Place an index card on top of the fresh water.
    b. Holding the card against the top of the jar, turn the jar over and place it on top of the salt water.
    c. Have a lab partner carefully remove the index card. Record results by coloring what you see.
    d. If the layers mixed or inverted, indicate that in your observations.
    e. LEAVE THESE JARS STACKED IN THE TRAY FOR THE NEXT PART OF THIS ACTIVITY.
    f. BE CAREFUL NOT TO KNOCK THEM OVER.
9. Predict what will happen if you turn both sets of jars horizontal (sideways.) Record by coloring what you thing the result will be.

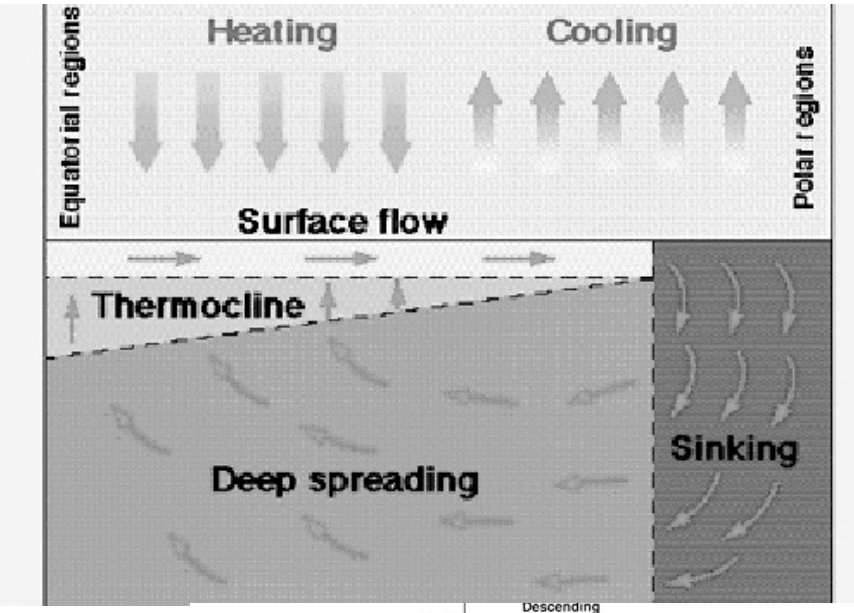
---

[1] Looper, Jim (2008). *Ocean Currents and Climate, Lab*. Sheldon High School.

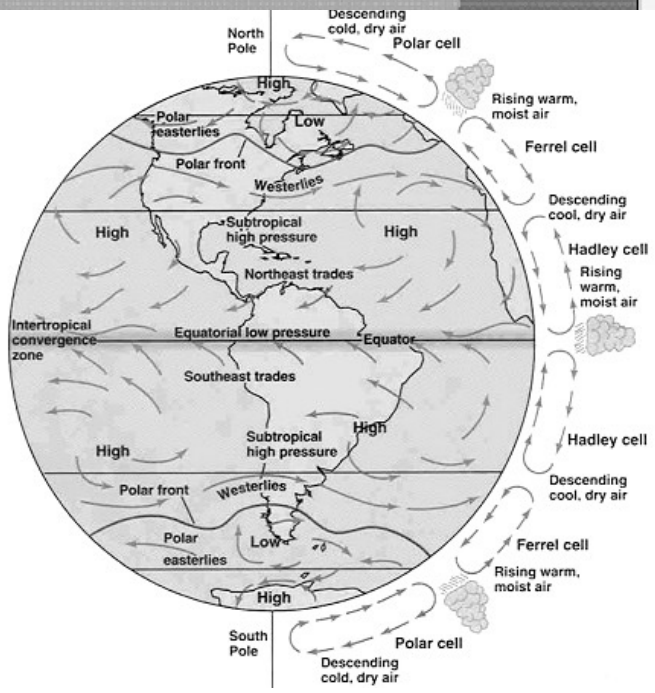
10. Carefully and slowly turn both sets of jars so that they are horizontal.
    a. DO NOT ALLOW THE JARS TO SEPARATE. (You will need to hold the jars the entire time.)
    b. Record your observations by coloring what you see. If the layers mixed or inverted, be sure to indicate that in your observations.
11. Clean up by pouring all water down the drain and thoroughly rinsing out all jars, so that all salt has been washed away.
12. Dry all materials and clean up according to your teacher's instructions.

Observations

Background Information: Due to the nature of water, warm water carries with it a lot of energy. Warm water will release some of its thermal energy and warm the air above it. Therefore, where there is warm water, there is warm air. The movement of warm water and warm air help to distribute heat around the earth. Ocean currents are the second major factor affecting climate, after latitude. Water in the upper part of the ocean (at the surface) moves somewhat independently from the water in the deeper part of the ocean. However, both have some affect on climate.



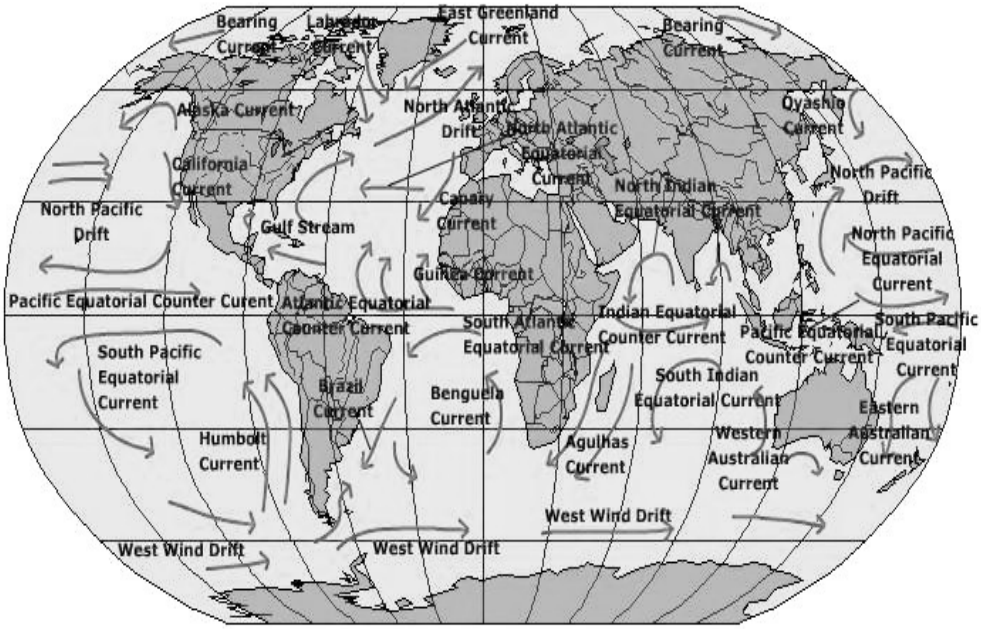
<u>SURFACE CURRENTS</u> – Surface ocean currents are generated when global winds blowing over the water for a long period of time, causes the water to move in the same direction. Observe the two pictures below: one of global wind patterns and the other of surface ocean currents. Notice how the two are similar.



Global Winds

Ocean Surface Currents

Notice that the global wind patterns and currents on the surface of the ocean are very similar, but not exactly alike. The differences are caused by the continents. Wind in the atmosphere can continue to blow right over the land, but the water in the oceans has to turn when it hits t he land.



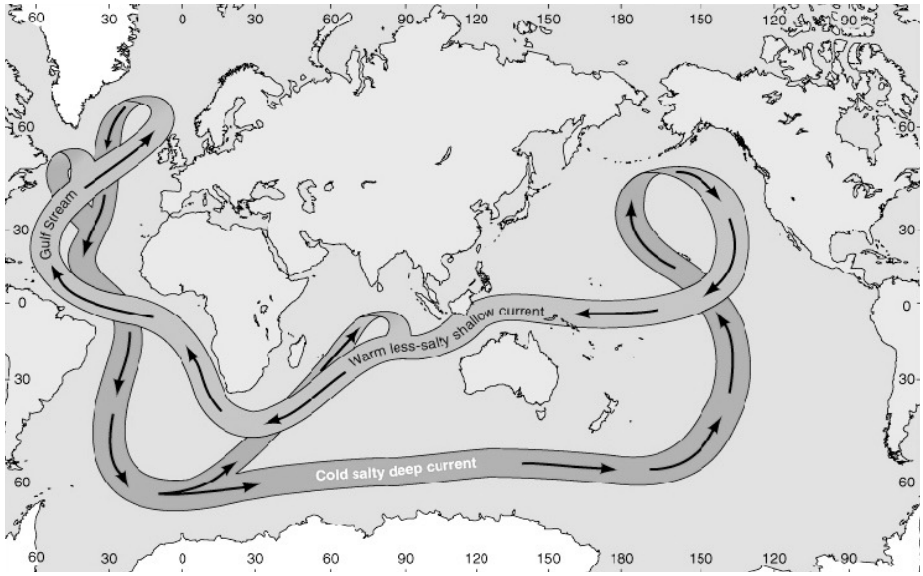
Surface ocean currents adjust the climate of an area only slightly. For example, if you look at the western coast of North America (near California), you will see that the California Current is brining water from the nearer the pole towards the equator. This means that cold water and cold air are moving by the California coast. This will adjust the climate and make it a little more cool and a little more dry than it otherwise would be based on latitude alone. Conversely, on the eastern coast of North America (near Florida, etc.), the Gulf Stream is brining water from nearer to the equator towards the pole. This means that warm water and warm air are moving by the east coast of the United States. This will adjust the climate and make it a little more warm and a little more wet (humid) than it otherwise would be based on latitude alone. Therefore, even though Sacramento, California and Washington, D.C are at approximately the same latitude (38^{o} North latitude), the two cities have slightly different climates. Sacramento will be a little cooler and drier, while Washington, D.C. will be a little warmer and wetter.

<u>DEEP OCEAN CURRENTS – The Global Conveyer Belt</u>

Deep ocean circulation based on density is called thermohaline circulation. *Thermo* meaning heat and *haline* meaning salinity (saltiness.) It is easy to presume that all ocean water has the same salinity. That is, the same amount of salt is dissolved in all ocean water. However, this is not true.

Water near the equator is warmed by the sun. As this water is warmed, some of it evaporates. The salt does not evaporate and so stays in the water. This causes the warm water near the equator to increase in salinity (become more salty.) Although the density increases due to the increase in salinity, the water is still has a very low density because it is so warm. The warm water will then move away from the equator towards the poles.

Water near the poles is very cold and some of it even freezes. However, when the water freezes, the salt does not, and so stays in the water. Now, the water near the poles is very cold and very salty, making it very dense. This water will sink and move back towards the equator.



This whole cycle is called the global conveyer belt and is very important both in the cycling of nutrients and in regulating global temperatures. This cycle, although in constant motion, can take a thousand years to complete.

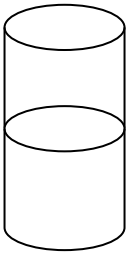
HYPOTHESIS: If ocean water is cool and salty, then it will have a _____ density and will _____.

RESULTS:

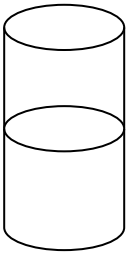
SALINITY AND DEEP OCEAN CURRENTS

Salt water over fresh water.

Prediction (color what you think the result will be):

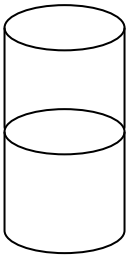


Observations (color what you see and describe):

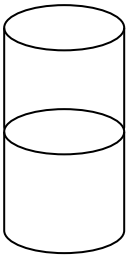


Fresh water over salt water.

Prediction (color what you think the result will be):

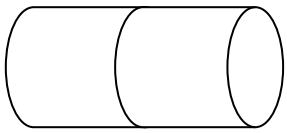


Observations (color what you see and describe):

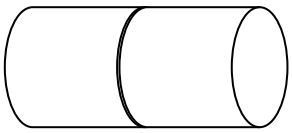


Salt water over fresh water turned horizontal.

Prediction (color what you think the result will be):

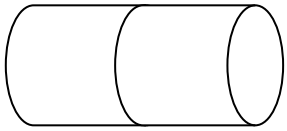


Observations (color what you see and describe):

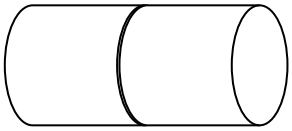


Fresh water over salt water turned horizontal.

Prediction (color what you think the result will be):



Observations (color what you see and describe):



ANALYSIS: (Answer using complete sentences and actual data.)

1. Is salt water or fresh water more dense? Explain how you know and why you think this is.

2. Taking into account, only salinity, where would you expect the most dense water to be? Explain.

3. Taking into account only temperature, where would you expect the most dense water to be? Explain.

4. Taking into account both salinity and temperature, where would you expect the most dense water to be? Explain.

5. Do you think it is possible for the direction of deep ocean currents to be reversed? Explain.

Application to Agriculture

"An estuary is a partially enclosed body of water along the coast where freshwater from rivers and streams meet and mix with salt water from the ocean. Estuaries are protected from the full force of ocean waves, winds, and storms by barrier islands or peninsulas.

Estuaries are very productive environments! They create more organic matter each year than comparably sized areas of forest, grassland, or agricultural land. They support unique communities of plants and animals, specially adapted for life at the margin of the sea."[2]

Using this information and your own knowledge, describe the advantages and challenges of using an estuary for production agriculture.

[2] National Estuary Program; About Estuaries. Retrieved December 4, 2008, from United States Environmental Protection Agency Web site: http://www.epa.gov/nep/about1.htm

Name _____ Class _____ Date _____

Chapter 15 Ocean Water and Ocean Life

Section 15.1 The Composition of Seawater

This section describes substances found in seawater, the temperature profiles of oceans, and the density profiles of oceans.

Reading Strategy

Previewing Before you read, preview the figures in this section and add three more questions to the table. As you read, write the answers to your questions. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Questions About Seawater	Answers
What processes affect seawater salinity?	a.
b.	c.
d.	e.
f.	g.

1. Circle the letter of each sentence that is true about seawater.

a. Seawater contains dissolved substances that give it a salty taste.

b. Sodium chloride, other salts, metals, and gases are dissolved in seawater.

c. Every known naturally occurring element is found in at least trace amounts in seawater.

d. Seawater is suitable for drinking and irrigation of crops.

Salinity

2. Is the following sentence true or false? The average salinity of seawater is 35 percent. _____

3. Most of the salt in seawater is _____, or common table salt.

4. What are two sources of dissolved substances in the ocean? _____

_____

5. How do elements from Earth's interior get into seawater?

_____

_____

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Name _____ Class _____ Date _____

Chapter 15 Ocean Water and Ocean Life

Ocean Water and Ocean Life

6. What are four ways in which fresh water is naturally added to seawater, decreasing its salinity? _____

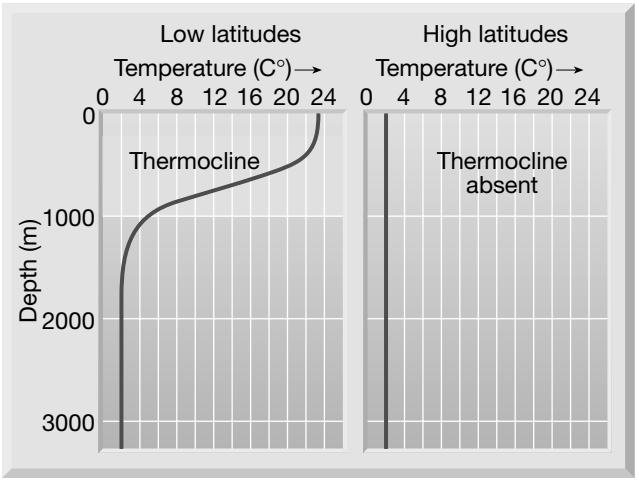
_____

7. What are two natural processes that increase the salinity of seawater? _____

Ocean Temperature Variation

8. Is the following sentence true or false? The ocean's surface water temperature varies with the amount of solar radiation received, which is primarily a function of longitude. _____

9. Using the following graph, what temperature is seawater below 1500 m in the low latitudes? _____



10. What is the temperature profile of seawater in the high latitudes, according to the graph? _____

Ocean Density Variation

11. Circle the letters of the two main factors that influence density of seawater.

a. salinity b. temperature

c. pycnocline d. thermocline

12. Circle the letter of the ocean layer where there is a rapid change of density with depth.

a. surface zone b. thermocline

c. pycnocline d. transition zone

Ocean Layering

13. Is the following sentence true or false? Oceanographers generally recognize a three-layered structure in most parts of the open ocean: a shallow surface mixed zone, a transition zone, and a deep zone. _____

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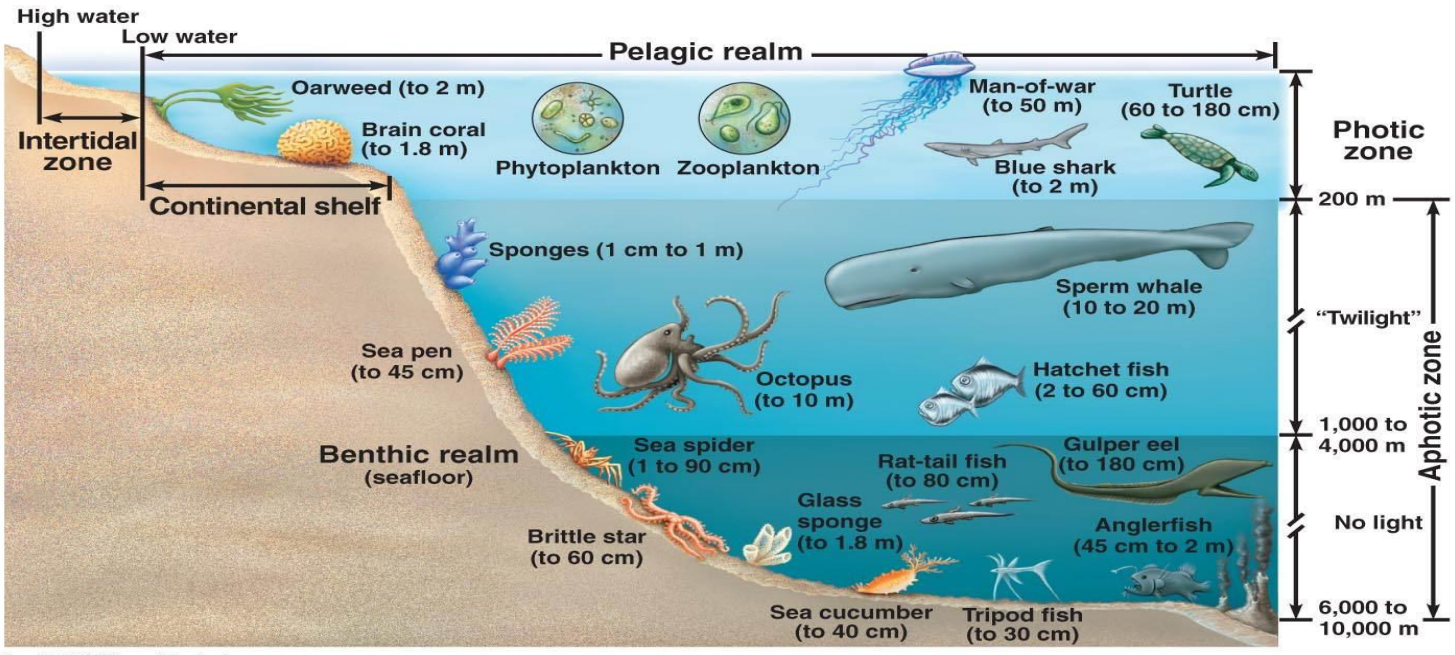
Cue Column (titles, vocab, big ideas, test questions)	**DIVERSITY OF OCEAN LIFE** Pages 428-432

Cue Column (titles, vocab, big ideas, test questions)	**DIVERSITY OF OCEAN LIFE** Pages 428-432

Cue Column (titles, vocab, big ideas, test questions)	DIVERSITY OF OCEAN LIFE Pages 428-432

Summary
(briefly describe the main concepts, major points)



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Name _____ Date _____

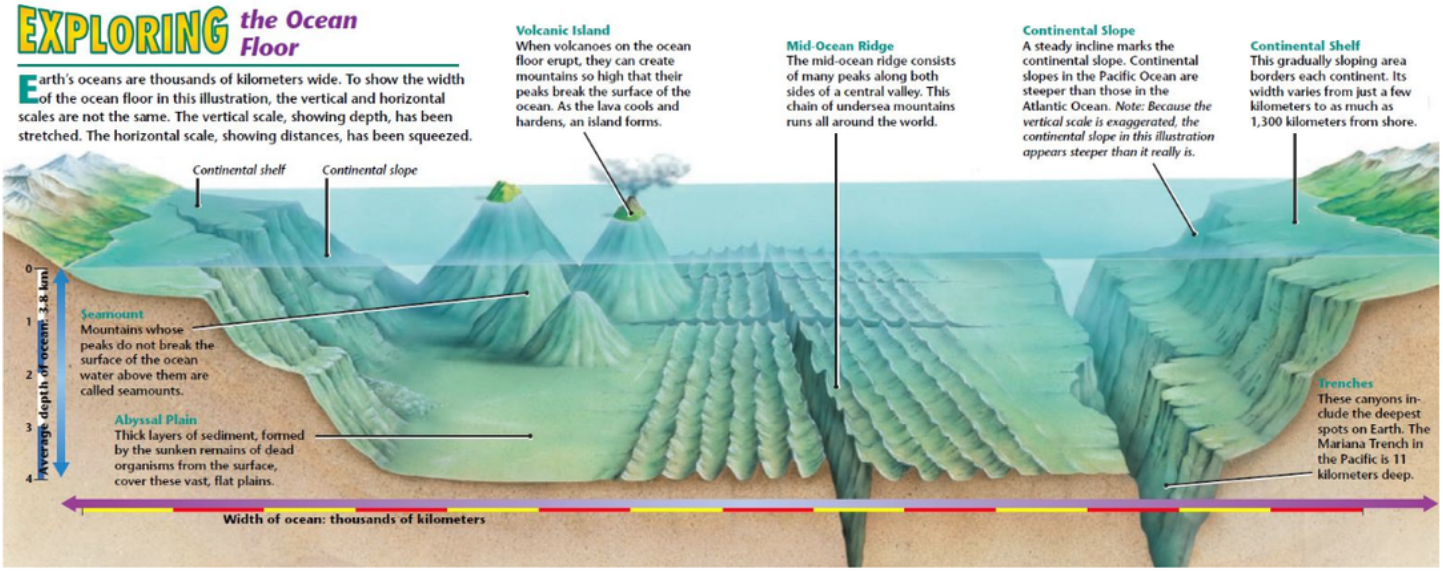
Ch 14.2 Vocabulary

mid-ocean ridge	**continental margin**	**ocean basin floor**
continental shelf	**abyssal plains**	**submarine canyon**
continental slope	**seafloor spreading**	**seamounts**
turbidity current	**continental rise**	

Matching

Match each definition with a word.

1. _____ the gently sloping surface at the base of the Continental slope
2. _____ a long mountain chain that forms on the ocean floor where tectonic plates pull apart; usually extends along the center of ocean basins
3. _____ very level area of the deep-ocean floor
4. _____ area of the deep-ocean floor between the continental margin and the oceanic ridge.
5. _____ The edge of the Continental shelf that slopes down to the ocean floor
6. _____ Underwater volcanic mountain on the ocean floor
7. _____ the very dense currents that carry sediments down the continental slope.
8. _____ The gently sloping shelf of land extending from the shoreline to the continental edge.
9. _____ Process by which a new sea floor forms as tectonic plates move apart.
10. _____ a seaward extension of a valley that was cut on the continental shelf during a time when sea level was lower.
11. _____ Area where the underwater edge of a continent meets the ocean floor



TERRAMAR FRIEND A SPECIES PROJECT

http://theterramarproject.org/species/

DIRECTIONS: Follow the weblink and select an ocean creature to research. Complete the “Specie Profile” below.

Name of Specie: _____

Description:

-
-
-
-
-

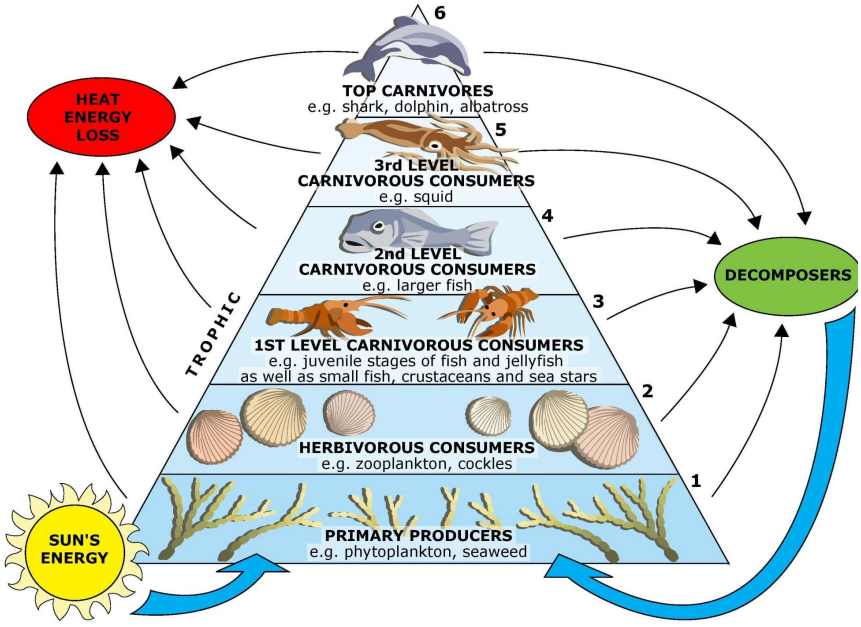
Geography:

Ecosystem:

Conservation:

Threats:

Cue Column (titles, vocab, big ideas, test questions)	OCEAN PRODUCTIVITY Pages 433-437



Cue Column (titles, vocab, big ideas, test questions)	**OCEAN PRODUCTIVITY** Pages 433-437

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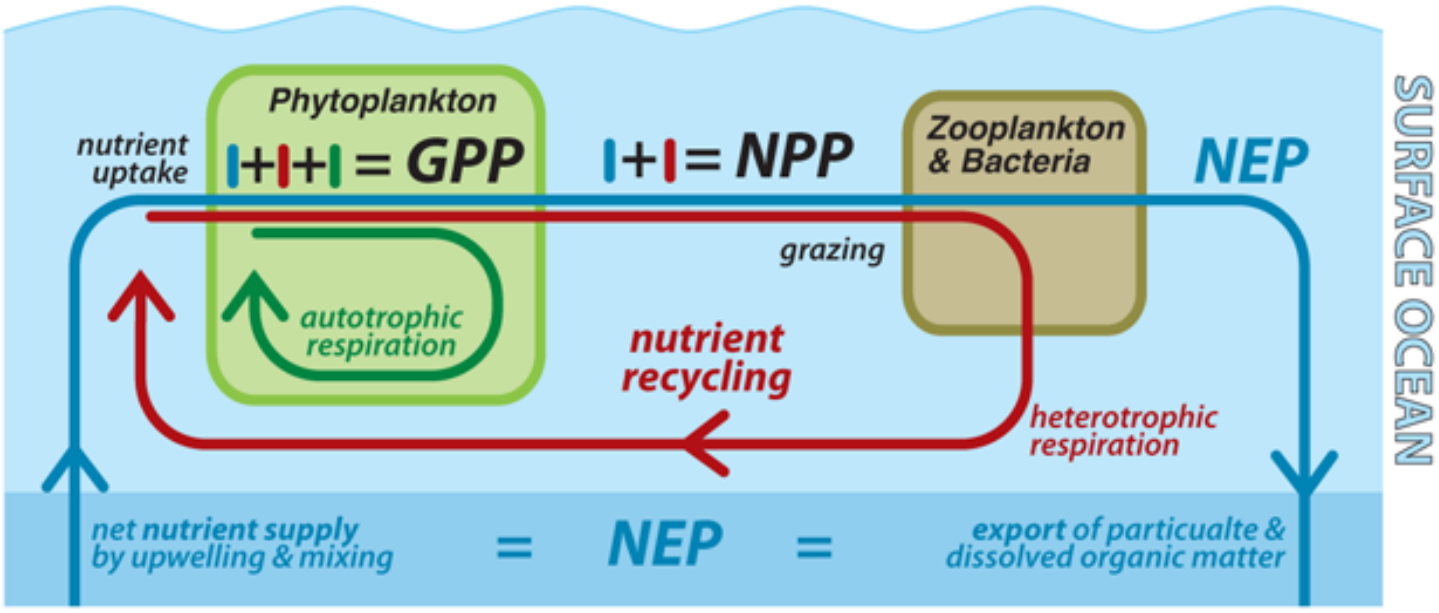
Summary
(briefly describe the main concepts, major points)



OCEAN UNIT STUDY GUIDE

Directions: **Answer the questions in complete sentences or phrases**. Attach pages to packet when done.

1. Which properties most determines water's vertical position in the ocean?
2. Where would you find the lowest density seawater?
3. Organisms that drift with ocean currents are called ____.
4.What term describes organisms that live on or in the ocean floor?
5. Marine organisms are classified according to how they ____.
6. Which of the following is a type of plankton?
7. Nekton include all animals that ____.
8. How do plankton differ from nekton?
9. How would best describe the ocean bottom?
10.Which ocean zone is characterized by high water pressure, low temperatures, and no sunlight?
11.The open ocean of any depth is called the ____.
12. Which ocean zone does sunlight penetrate?
13. What factors influence a region's photosynthetic productivity?
14. The use of light energy to convert water and carbon dioxide into energy-rich glucose molecules is called ____.
15. What is NOT a main producer of food in the ocean?
16. The transfer of energy between trophic levels averages about ____.
17. How would you describe energy transfer between trophic levels?
18. All the complex feeding relationships among a number of different organisms is known as a(n) ____.
19. A food chain is the passage of energy ____.
20. Where would a primary producer be located in a food chain?
21. The energy that drives surface ocean currents comes from ____.
22. Because of the Coriolis effect, ocean currents in the Northern Hemisphere are deflected to the ____.
23. Which force is involved in the development of surface currents?
24. Ocean currents that move toward the poles are ____. (temperature)
25. What causes surface ocean currents to be deflected?
26. The rising of cold water from deeper layers to replace warmer surface water is called ____.
27. Which of the following is NOT associated with upwelling?
    - increased plankton population
    - vertical water movements
    - horizontal water movements
    - increased nutrients at the ocean surface
28. Which process does NOT decrease the salinity of water?
    - runoff from land
    - formation of sea ice
    - melting of sea ice
    - precipitation
29. Density currents move ____. (which direction)
30. What can cause an increase in the density of ocean water?