

1.14

A man living at the beach looks out his window and sees a full moon. What type of high tides can he expect in the next few days?

1.15

Would you expect to see greater overturn in the winter or summer months?

STUDY GUIDE QUESTIONS

1

Define the following terms:

TERM	DEFINITION
a. Oceanic crust	
b. Continental crust	
c. Plate tectonics	
d. Mid-ocean ridge	
e. Seafloor spreading	
f. Subduction	
g. Continental shelf	

- 4 If a specific location in the world is known for experiencing a large number of earthquakes throughout modern history, what would you propose is occurring in the earth's crust underneath that area?
- 5 Given that most of the deep-ocean trenches in creation are located in the Pacific Ocean, what is the main type of plate interaction that occurs in that ocean?
- 6 Ocean crust is constantly being destroyed and reformed. Considering the 4 large ocean basins in the world, which ocean has the most oceanic crust formation? Which has the most oceanic crust destruction?
- 7 Although there is a large surface area under the oceans of the earth, in which main region of the ocean bottom is most of the marine life?
- 8 What one major property of water helps it hold its molecules together, keeping it from having severely colder boiling and freezing temperatures?
- 9 If a marine organism lives in an area where there are drastic changes in the weather resulting in extremely high and low air temperatures, what property of water prevents the organism from feeling such changes?

OPTIONAL SUMMARY OF MODULE 1

Review the vocabulary words listed in question 1 of the study guide.
Fill in the blanks. Many blanks contain more than one word.

1 The 5 large oceans of the world are the _____, the _____, the _____, the _____, and the _____.

2 The part of the earth's crust that is covered with ocean is made up of _____ crust. This is composed mainly of _____, which is relatively dense solidified lava. The part of the earth's crust that is not covered with ocean is made up of _____ crust. It is composed mainly of _____, which is less dense than the crust under the ocean.

3 The crusts float on the earth's _____. The slow-flowing material that makes up the mantle is called _____ because it sometimes behaves like liquid and sometimes behaves like solid.

4 Scientists hypothesize that all the continents of the world were once part of a large supercontinent called _____. The plates of the earth's crust are believed to have drifted to their present locations via a process known as _____.

The Oceans of Our Planet

EXPERIMENT 1.1: MOUNTAIN FORMATION FROM PLATE MOVEMENT

Purpose:

To explore the interaction of an oceanic plate with a continental plate

Materials:

- A rectangular clear plastic or glass container, approximately 4 inches wide by 5 inches long (a disposable 24-ounce plastic container was used in the photos)
- Measuring cup
- 1 cup of salt
- 1 cup of unbleached sugar (Cinnamon sugar or a type of colored salt can also be used, as long as it is noticeably different in color than salt.)
- A spatula that is slightly smaller in width than the container width (You can substitute a sturdy piece of cardboard cut to the appropriate size.)

Question:

What happens when a denser plate sinks below one that is less dense?

Hypothesis:

Write down your hypothesis about what happens to the less-dense plate.

Procedure:

1. Measure $\frac{1}{2}$ cup salt and pour into the container. Gently shake the container side to side to allow the salt to settle so the surface becomes flat.
2. Measure $\frac{1}{2}$ cup dark sugar and pour over the salt, trying to disperse it evenly. You are attempting to create even layers. Gently shake the container side to side to help it settle more evenly.
3. Measure $\frac{1}{2}$ cup salt and pour over the sugar, again trying to disperse it evenly. Again, gently shake the container side to side to help it settle.

4. Measure $\frac{1}{2}$ cup dark sugar and pour over the salt, evenly dispersing it. Shake the container side to side to help it settle.
5. You should now have 4 somewhat even layers of material in your container that look similar to the image below.



6. Carefully insert the spatula in one side of the container so that the blade is perpendicular to the table.
7. Gently drag the spatula toward the center of the container so that the layers of material begin to bunch up on one side. You should see something like this:



8. Note the shape of the layers formed. Make a sketch in your lab notebook of the result.
9. Clean up and return everything to the proper place.

Experiment 1.1: OBSERVATIONS AND CONCLUSIONS

DATE

Hypothesis: What happens to the less-dense plate?

Note the shape of the layers formed after step 8 in the procedures. Sketch what you see in the space below.

Observations

Sketch

Discussion and Conclusions

What did you observe? What happened to the layers as the spatula pushed toward them? Take the time to summarize what you learned in this experiment and make connections to the information you have covered so far in your textbook.