Name: _____ Period: _____

ISOSTASY LAB

Part A: Does the Earth's Crust Float?

1. You have one block of oak (dark color) & one block of pine (light color). They are the same volume, but different densities.

Which block does your group think is denser? **(OAK / PINE)** *Circle One*

2. Using the balance and a metric ruler, find the densities of each block:

mass of Pine = _____ g

mass of Oak = _____ g

Volume = L x W x H in centimeters:

length = _____ cm

width = _____ cm

height = _____ cm

$$Density = \frac{Mass}{Volume}$$

Volume = _____ cm^3

Density of Pine = _____ g / cm^3

Density of Oak = _____ g / cm^3

3. Which block is denser? **(OAK / PINE)** *Circle One*

4. Substances will float in a liquid of a greater density. Water has a density of 1.0 g / mL. Will the blocks float on water?

(YES / NO) *Circle One*

5. a) Which block will float higher? **(OAK / PINE / NEITHER, THEY WILL SINK)** *Circle One*

b) If you chose oak or pine, why will this block float higher?

_____

Now put your hypothesis to the test. Carefully place your two blocks in the tub of water at your table.

6. To show your conclusion, carefully measure and record the height of each block that is floating above the surface of the water.

Height of pine above the water = _____ cm

Height of oak above the water = _____ cm

7. a) In a liquid that is denser than water, such as syrup, the blocks would float **(higher / lower)** than in water.

b) Would one block still float higher than the other? **(YES / NO)** *Circle One*

In this activity, the blocks of wood represented the earth's crust, and the water represented the upper mantle.

The density of the mantle = 3.4 g / mL
The density of the continental crust = 2.7 g / mL
The density of the oceanic crust = 2.9 g / mL

8. a) Which block represented the continental crust? _____

b) Which block represented the oceanic crust? _____

9. Why does the earth's crust float on the mantle?

_____

Part B: How does the thickness of a lithospheric plate vary? In this activity you will be using pine blocks to discover how the earth's crust varies in thickness. Follow the steps below, record your measurements in the data table, and then answer the questions.

1) Float one pine block in the water and measure the height of the block above water **and** the depth below the water.

2) Place a second pine block on top of the first and make the same measurements for the whole stack.

3) Stack a third pine block on the other two and measure again.

4) If you were to take the top block off of the stack, what does your group hypothesize will happen to the other two? _____

Try it and see.

	Height Above Surface of the Water (cm)	Depth Below Surface of the Water (cm)
1 Pine Block		
2 Pine Blocks		
3 Pine Blocks		

Answer the following questions:

1) One block represented a continental plain or flat land, and the stack of 3 blocks represented a mountain range. How does the depth in the mantle of a lithospheric plate under a mountain range compare to the depth of the plate under the rest of the continent?

_____

_____

2) Mountains are constantly being eroded by weather. Based on what you observed in Step 4 above, why does it take so long for a mountain range to erode away?

_____

_____