

Clayton Valley Charter High School

Chemistry

Semester 1 Final

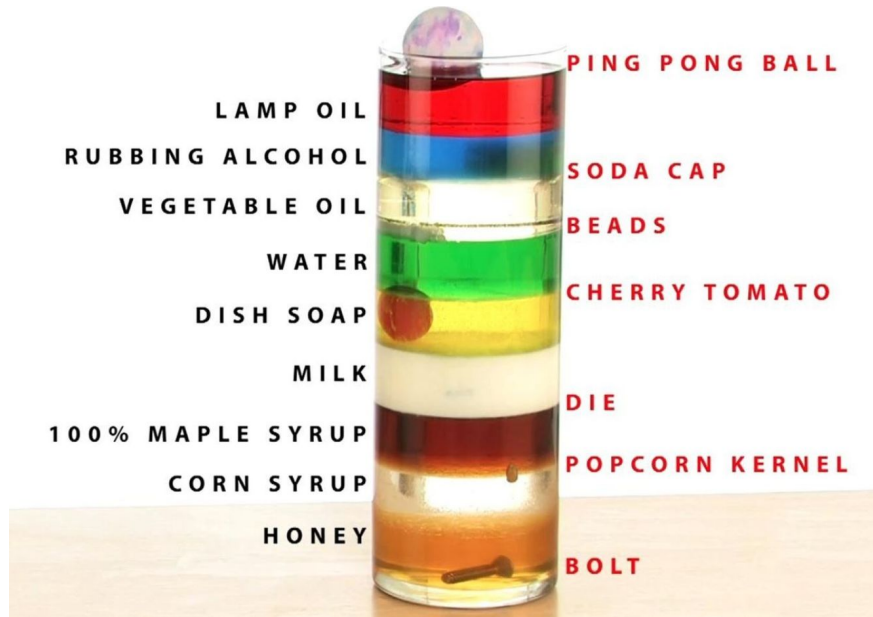
STUDY GUIDE (part 2)

2017-2018

Name: _____ Period: _____

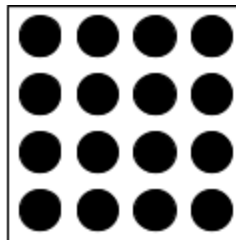
Part 1: Plate Tectonics and Movement of Energy

HS-ESS2-3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.



1. Scientists use density when studying Earth's interior and plate tectonics. Given the image above, list the materials from the **least** to the **most** dense

2. Below is a particle model of milk. Draw two more particle models: one of vegetable oil, and one of honey.

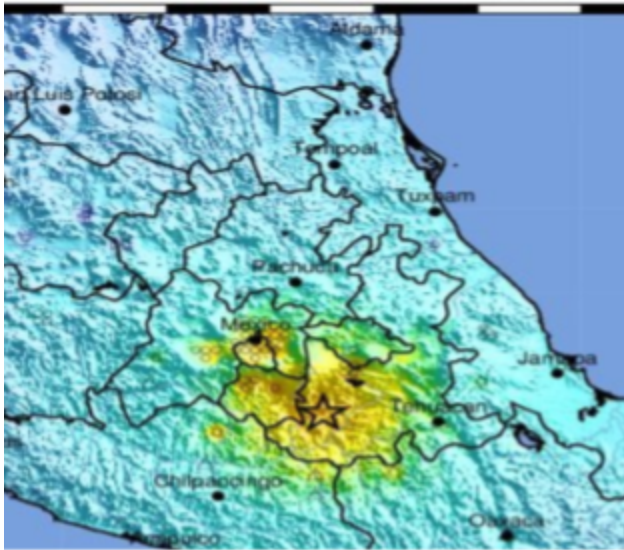


Vegetable oil

Milk

Honey

3. Please describe plate tectonics role in the Earth's movement of the energy.



(LEFT) An image of a recent earthquake that occurred near Mexico City on September 19, 2017.



(RIGHT) An image with plate boundaries drawn in and the dot is the approximate location of the earthquake.

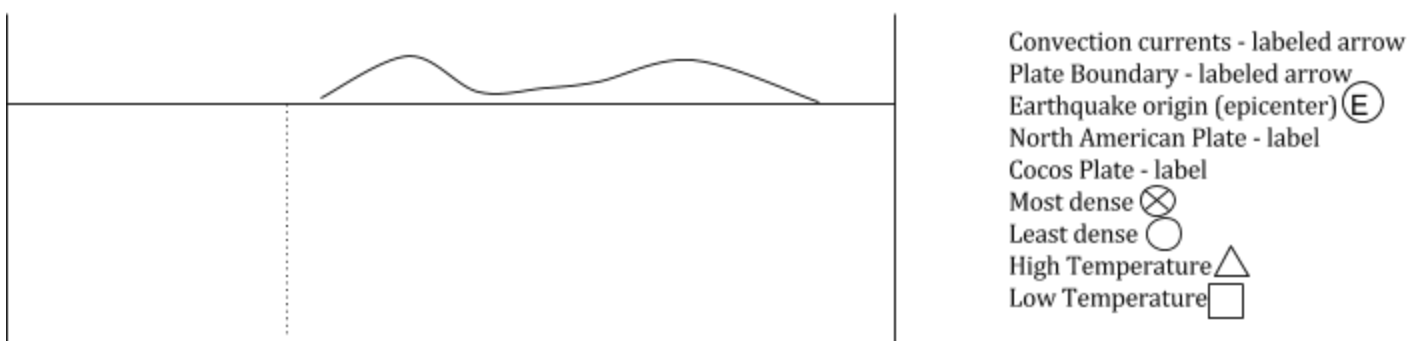
Use these images and your knowledge of plate tectonics, convection currents, and density to answer the questions that follow.

4. In the picture on the right, what kind of plate is the North American plate (in brown where the dot is), and what kind of plate is the Cocos plate (in blue)?

5. Draw two diagrams, one of convergent boundaries and one of divergent boundaries

6. Explain how plates move on Earth's surface using the concepts of **density** and **convection currents**.

7. The images on the previous page depict a convergent plate boundary between the North American and Cocos plates on the map. Use the image below and the key to the right to create a model to show how matter is moving in Earth's interior to create the phenomenon of this convergent boundary that resulted in the earthquake in Mexico City.



Part 2: The Atom

HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-2 Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

8. Fill in the following table using the Periodic Table.

Element	Chemical Symbol	Atomic Number	Number of Protons	Number of Electrons	Number of Neutrons	Average Atomic Mass
Magnesium						
						30.97
	I					
			3			

a. Explain why, in a *neutral atom*, the number of protons and electrons is always equal?

- b. Look at Magnesium. Add the number of protons and the number of neutrons: _____. Why is this number *not* the same as the average atomic mass?

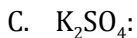
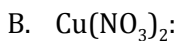
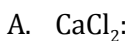
9. Fill in the chart showing the progression of the model of the atom (see workbook 3.1).

Scientist	Experiment	Findings	<u>Model</u> that resulted from Experiment & Findings
J. Dalton	-----		Solid Sphere Model
J.J. Thompson			
E. Rutherford			
N. Bohr			

10. Draw a simple atomic model for an atom of aluminum.

The table to the right can be used to complete the following problems.

11. What color flame will the following substances produce:



Metal flame	test color
barium	pale green
calcium	yellow
copper	blue
lithium	red
potassium	purple

12. Would LiCl and KCl produce the same color flame? Why or why not?

13. What is the difference between *luminescence* and *incandescence*?

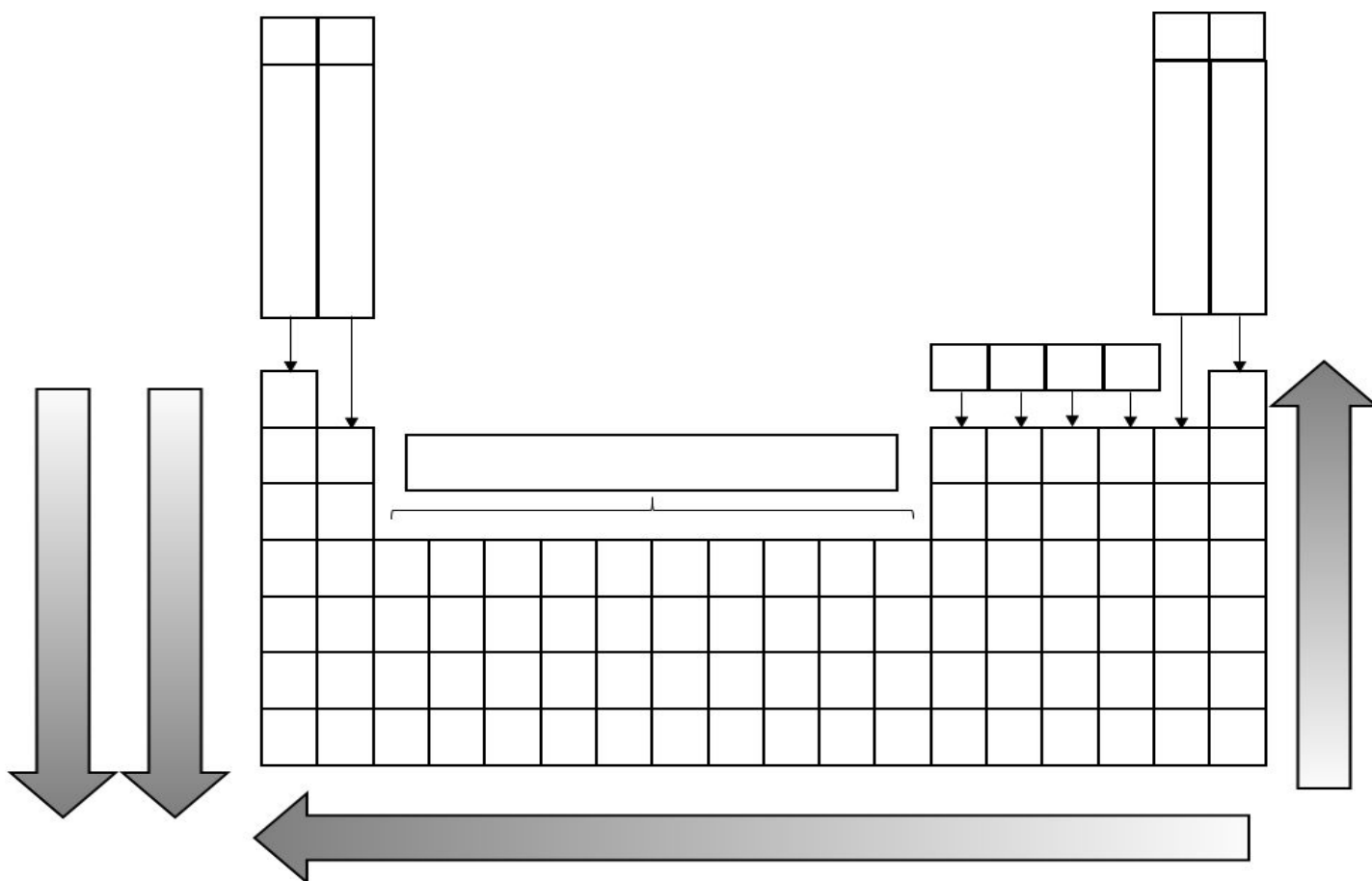
Part 3: Periodic Table and Trends

HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-2 Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

14. Label/Color the following on the Periodic Table below.

- Element Groups: Alkali Metals, Alkaline Earth Metals, Transition Metals, Halogens, Noble Gases
- Group Numbers: 1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A
- Reactivity Trend
- Atomic Radius Trend
- Color the area where metals are found yellow.
- Color the area where non-metals are found green.
- Color the area where metalloids/semi-metals are found blue.



Part 4: The Mole

HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

15. Write Avogadro's Number three different ways.

16. Use your knowledge of scientific notation to write the following numbers in a different form.

a. 0.00000745

g. 1.8×10^{15}

b. 9,457,000,000,000

h. 2.24×10^{-6}

c. 0.00341

i. 5.8×10^2

d. 1,400,000

j. 8.324×10^{10}

e. 140

k. 1.59×10^{-12}

f. 0.1

l. 5.0×10^0

17. Calculate the molar mass:

a. NaCl

b. FeBr₂

c. HF

18. Use the molar masses you calculated in #17 to answer the following.

a. How many moles are in 17 grams of NaCl?

b. How many grams are in 2 moles of FeBr₂?

c. How many moles are in 5.0 grams of HF?