Week 1 Virtual Binder Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per \_\_\_\_

Objectives: Text Key Concepts

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| 1. Describe & use evidence to explain how land, atmosphere, & oceans changed throughout Earth’s history. | GS 22.1- 22.3P. 387- 388 | Cyanobacteria, Supercontinent, Differentiation, Outgassing, Meteoroid, Red bed |
| 2. Illustrate how the geosphere, hydrosphere, atmosphere, & biosphere interact on earth. | GS 1.1p. 7-9 | Biogeochemical cycles |
| 3. Outline the properties of water which make it unique and important to life on Earth. | GS25.4p. 669- 670 | Polarity, Heat capacity, Expansion upon freezing, Universal solvent |

Week 1 Virtual Binder Objective Work:

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| Objective 1: |
| Objective 2: |
| Objective 3: |

**Objective 1 Tasks:**

* Watch the video [“How Was the Earth Formed?”](https://live.myvrspot.com/iframe?v=fMzRlYTBkNGYxM2U2MmIwYWZmOWUxYjQ4ZmJmY2ZhNDM)
* Complete [Earth’s History Reading Q’s](https://docs.google.com/document/d/1pkJOSfY354TZHeTVNbcl4LHxQSlC8FZMVyrQJsCUgTU/edit?usp=sharing) using Ch 22.1-22.3, p. 387-388 in your Geoscience book as a reference.
1. According to your reading, what is the age of the Earth?
2. Describe the evidence used to determine the age of the Earth.
3. Describe early Earth’s major heat sources (3). Why is this important to our discussion?

4. Describe the formation of the crust.

1. What was the first supercontinent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Which supercontinent became North America? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Which was the most recent supercontinent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Describe Earth’s early atmosphere. What was abundant, what was missing, etc.?
3. Describe the significance of stromatolites?
4. What are red beds, and why are they significant?
5. Where do scientists believe the water that formed the oceans came from? pg 588
6. Describe the formation of the oceans.

**Objective 2 Tasks:**

* Read Ch 1.1 (pages 7-9)
* Complete [Spheres Interactions WS](https://docs.google.com/document/d/1m4fB9qxmNCH6fVifcx-aVpg2psbSjyy2_pxhBywPFPM/edit?usp=sharing)

The spectacular eruption of a volcano destroying the magnificent scenery of a tropical forest and the destruction caused by a hurricane are all part of Earth’s spheres interacting with one another. The **HYDROPSHERE** is composed of the liquid that is continually on the move from the oceans to the atmosphere, precipitating back to the land, and running back to the ocean. The **ATMOSPHERE** is composed of all the gases that surround our earth. The atmosphere is a thin blanket of air that provides us with the air we breathe but also protects us from the sun’s intense heat and dangerous radiation. The **GEOSPHERE** is composed of the solid earth. It is divided into three parts: the core, mantle, and crust. The **BIOSPHERE** includes all life on Earth.

1. List ways the spheres interact with each other.

 A. GEOSPHERE & ATMOSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 B. GEOSPHERE & BIOSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 C. GEOSPHERE & HYDROSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

D. GEOSPHERE & GEOSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

E. BIOSPHERE & BIOSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

F. BIOSPHERE & ATMOSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

G. BIOSPHERE & HYDROSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

H. ATMOSPHERE & ATMOSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I. ATMOSPHERE & HYDROSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

J. HYDROSPHERE & HYDROSPHERE

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Create or find a picture containing the 4 different spheres. Label the spheres, and write a brief narrative describing the interactions. You may use the interactions you described above to help you.

**Objective 3 Tasks:**

* Read Ch 25.4 (pages 669-670) and watch the video [“Water: Liquid Awesome”](https://live.myvrspot.com/iframe?v=fMDljNzRmOGRhNGYyN2I1MDlmM2RlZTliMmJkMDEyYjY)
* Complete [Water Properties WS](https://docs.google.com/document/d/1owQwOxBI5umucGp8T7CjnFwjD7QsoKff6rUTC9k36dw/edit?usp=sharing)

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| Word Bank: Covalent solvent deposition dissolve cohesion surface cooler universal  tension polar viscosity condensation negatively adhesion positively sublimation  |

1. The hydrogen and oxygen atoms are held together by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds.

2. The electrons are not shared equally creating a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecule.

3. The polarity of water allows it to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_most substances. Because of this

it is referred to as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. Water molecules stick to other water molecules. This property is called\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. Hydrogen bonds form between adjacent water molecules because the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

charged hydrogen end of one water molecule attracts the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charged

oxygen end of another water molecule.

6. Water molecules stick to other materials due to its polar nature. This property is called

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ creates the skin-like surface

formed due to the polar nature of water.

8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the tendency for fluids to resist flow.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ water is more viscous than warmer water, allowing floating

organisms to use less energy to keep from sinking.

9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when water changes from a gas to a liquid.

10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when water changes from a solid directly to a gas.

11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when water changes from a gas directly to a solid.

12. Why does ice float?

13. List the properties that ocean water has due to the fact that it contains salt.

Life as we know it could not exist without water. All the chemical reactions of life occur in aqueous solution. Water molecules are polar and are capable of forming hydrogen bonds with other polar or charged molecules. As a result, water has the following properties:

A. H20 molecules are cohesive; they form hydrogen bonds with each other.
B. H2O molecules are adhesive; they form hydrogen bonds with polar surfaces.
C. Water is a liquid at normal physiological (or body) temperatures.
D. Water has a high specific heat.
E. Water has a high heat of vaporization (energy needed to evaporate).
F. Water’s greatest density occurs at 4°C.

Explain how these properties of water are related to the phenomena described below. More than one property may be used to explain a given phenomenon.

14. During the winter, air temperature in the northern United States can remain below 0°C for

months; however, the fish and other animals living in the lakes survive.

15. Many substances – for example, salt (NaCl) and sucrose – dissolve quickly in water.

16. When you pour water into a 25-ml graduated cylinder, a meniscus forms at the top of the

water column.

17. Sweating and the evaporation of sweat from the body surface help reduce a human’s body

temperature.

18. Water drops that fall on a surface tend to form rounded drops or beads.

19. Water drops that fall on your car tend to bead up or round up more after you polish (or

wax) that car than before you polished it.

20. If you touch the edge of a paper towel to a drop of colored water, the water will move up

into (or be absorbed by) the towel.