

Study Guide for the Unit 3 Test: The Hydrosphere

Use this study guide as you are preparing for the Unit 3 Test. You should rely heavily on your notes, worksheets, lab papers, and quizzes as you complete this study guide. Also take note of any concepts that you do not understand, and be sure to study those ideas even more (or get help if you need it).

1. How does the density of water change when it moves from a liquid to a solid? From a liquid to a gas?

2. How does the volume of water (liquid form) change when its temperature increases? Decreases?

3. How does the volume of water (liquid form) change when its temperature decreases?

4. What is the most abundant type of water on the Earth?

5. Define the following characteristics of water and provide an example of each.
 - a. Surface tension

 - b. Polarity

 - c. Adhesion

 - d. Cohesion

 - e. Specific Heat Capacity

6. What is the atomic structure of Hydrogen?

7. In what physical state(s) does water exist on Earth?

8. The movement of energy through the hydrosphere (and the regulation of global climate) is due to which property of water?

9. What is the original source of energy that drives the hydrologic cycle?

10. An aquifer can be recharged as a result of what action?

11. What is the relationship between the size of rock in an aquifer and the porosity of that aquifer? Explain.

12. Compare the data from the three different aquifers in a lab experiment. Which one(s) has a greater porosity? Show all of your calculations.

	A	B	C
Volume of Water (mL)	600	945	755
Volume of Zone of Saturation (cm³)	1800	1375	1175

13. Define the following terms associated with groundwater:
 - a. Aquifer

 - b. Aquitard

 - c. Zone of aeration

 - d. Zone of saturation

 - e. Plume

 - f. Porosity

 - g. Infiltration

14. If two wells have been tested and well A has been found to have 4ppm of a pesticide in it and well B has 1ppm, which well is more contaminated?

15. If a plume of contamination has been travelling for 25 years and has moved 1100 meters in that time. At what speed is this plume moving?

16. What types of contaminants can get into groundwater?

17. What are the energy transformations associated with a hydrogen fuel cell? A coal fired power plant?

18. What function does the PEM in a fuel perform?

19. What is the byproduct of a hydrogen fuel cell?

20. What are the benefits associated with the use of hydrogen in a fuel cell as a transportation fuel?

21. What is the definition of energy?

22. A 25g sample of water at 20°C is heated until its temperature changes to 80°C. How much energy is required to do this?

23. A 35g sample of metal requires 630J of energy to increase its temperature by 42°C. Calculate the metal's specific heat capacity.