

Student Page

Name _____
Period _____

Title: Properties of Water

Introduction: Water composes about 70% of most living things and is essential to live as we know it. Water has properties that make it useful in living things. In this series of activities you will experiment with the properties and apply them to how they influence life.

Question: Name as many properties of water as you can:

Procedures:

1. Listen as your teacher describes the location of the 6 stations you will visit. You will work in a group and travel from station to station together.
2. Each station contains directions on how to perform each test. Follow them carefully and write down your data. You may have time to start answering the questions or you may need to move on quickly to the next station.
3. As you finish, start or continue to answer the questions for each. Write conclusion that contains one sentence about each property.

Data:

Station 1-Heat Capacity

Data: time for air to cool _____ time for water to cool _____

Analysis:

1. Heat capacity describes the ability of a substance to gain and lose heat energy. How is water's heat capacity different than that of air?
2. How might the heat capacity of water affect living things?
3. If our cell were full of air instead of water, what problem would we have in maintaining homeostasis in our body temperature?

Station 2-pH

Data:

Test	pH	Color of litmus paper
Tap water		
With 4 drops of acid		
Number of drops of base to return to original pH		

Analysis:

1. How are acids related to bases?
2. Living things can tolerate only a narrow range of pH, near 7 or neutral. What does this experiment show about changing pH?
3. Our body has a group of chemicals called buffers that help keep pH in the correct range. Why is this necessary?

Station 3: Capillary Action

Data:

Substance	Height in capillary tube

Analysis

1. Rising up the capillary tube requires the liquid to stick to the sides of the tube (adhesion). Another factor, cohesion makes the liquid molecules want to stay together. Which liquid had the most adhesion? Why so you think so?
2. Which had the most cohesion? Why do you think so?
3. In a tree, capillary action can pull water to enormous heights. What would happen if one of the substances you tested were in the place of water?

Station 4: Cohesion, Adhesion and Surface Tension

Data:

1

2

3

Drawings:

Penny with one drop at its highest angle:

Penny with as many drops as it will hold:

Penny with water mound and a small object placed on top:

Analysis:

1. Which test shows the property of surface tension? Why?
2. Which test shows adhesion? Why?
3. Which test shows cohesion? Why?

Station 5: Surface Area and Evaporation

Data: water left in cylinder A _____ cylinder B _____ cylinder C _____

Analysis:

1. Which “leaf” was largest? Which had the most water evaporate?
2. Write a sentence that compares the amount of evaporation with the size or surface area of a leaf:
3. What size leaves would you expect desert plants to have?

Station 6: Water as a Solvent

Data:

Substances (dissolved? Yes/no)

Solvent					
Water					
Alcohol					

Analysis:

1. Which was a better solvent water or alcohol?
2. Do water and alcohol look different? Smell different?
3. Alcohol is composed of non-polar molecules, water is composed of polar molecules. Why might a polar solvent (the water) be better at dissolving most substances?

Conclusion: (one summary statement for each station)