

Name: _____

Date: _____

Water Everywhere!

How do the special properties of water contribute to Earth's suitability as an environment for life?

Direction: complete each station and record data to answer station questions.

Station 1: Blue Planet!

Data Table

	0 min	5 min	10 min	15 min	20 min
Sand					
Water					

What changes did you notice between the temperature of the sand and water?

How does this behavior support life on Earth?

Station 2: Drawing power!

Sketch water on the penny. How many drops were you able to put without overflowing?

Sketch alcohol on the penny. How many drops were you able to put without overflowing?

Draw a diagram showing the shape of the water on the penny after one drop, when the penny is half full and just before it looks like it is going to overflow

1. What do you think can explain the behavior of the water on the penny?
2. Did the detergent have an effect on the outcome?
3. How does the detergent affect the water? (Look back at the definition for surface tension)
4. Explain how detergents act as cleaning agents and how it might be dangerous for the environment.
5. How does this behavior support life on Earth?

Station 3: Plants need water too!

Sketch celery stalk (before and after)

Draw what you think it happens to water molecules in the celery stalk.

What did you notice in the before and after of the celery stalk?
How could this behavior support life on Earth?

Station 4: Now you see it, now you don't!

Data Table

Solubility Test	Water		Oil	
	A	C	B	D
Sucrose				
Sodium chloride				

Record data using this chart:
+: not dissolved
++: partially dissolved
+++: dissolved

pH Test	Acetic Acid (E)	Ammonia (F)	Water (G)
3 ml			
6 ml			
9 ml			

Record data using pH scale included with testing strips kit.

Draw what you think is causing the behavior of the water when mixed with sucrose and sodium chloride compared to oil?

Draw what you think is causing the behavior of the ammonia and acetic acid when mixed with increasing amounts of water?

How does this behavior support life on Earth?

Station 5: Water is so polar

Before

After

What do you think is causing the behavior of the water stream when placed near the electrically charged plastic?

How does this behavior support life on Earth?

Station 6: **Walking on water!**

Sketch what happens to water molecules in the beaker with ice cube

Sketch what happens to water molecules in the beaker with ice cube and paper clip

How would you describe what happens to water molecules when you place the ice cube and paper clip in the water?

How does this behavior support life on Earth?

Summarizing

Create a concept map using as a title, “How do the special properties of water contribute to Earth’s suitability as an environment for life?”

Use the following key terms: water, polarity, adhesion, cohesion, and ability to moderate temperature, expansion upon freezing, versatility as solvent, capillary action, and surface tension.

(Write definitions and add drawing or written examples as well as summary to the answer)

Water Everywhere! Station Cards

Station 1: Water on fire!

1. Place the thermometers upright into the sand and water, submerging the ball of the thermometer into the material. Make sure the thermometers are upright and not receiving direct light.
2. Place the containers under the light source so that they all obtain equal amounts of light rays from it.
3. Record the temperature every 5 minutes for 20 min.



Station 2: Drawing power!

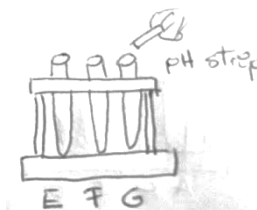
Predict how many drops you will be able to put on the penny before it overflows by having each person at your table guess. Now, let's see how many drops of water you can place on the surface of the penny before it overflows. Taking turns, drop water from the dropper onto the penny, keeping a careful count of each drop. How many total drops did you get on the penny? Record your observations in your worksheet. Now we are going to attempt the same with alcohol. Do you think you will get more or less drops on the penny? Now, With your finger, spread one drop of detergent on the surface of a dry penny. Predict how many drops you think this penny will hold after being smeared with detergent. Draw a diagram showing the shape of the water on the penny after one drop, when the penny is half full and just before it looks like it is going to overflow

Station 3: plants need water too!

1. Sketch and record observations of the celery stalks in colored water.
2. Observe the section of the colored celery stalk.

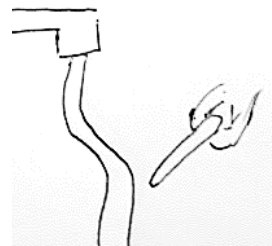
Station 4: Now you see it, now you don't!

1. Observe and record what you see in test tubes A- D
2. Add 3 ml of ammonia to test tube F.
3. Add 3 ml Acetic Acid to test tube E.
4. Add 12 ml of water to test tube G.
5. Use pH test strips to test the pH from samples E, F and G.
6. Add 3 ml of water to test tubes E and F.
7. Use pH test strips to test the pH from samples E and F.
8. Add 6 ml of water to test tubes E and F
9. Use pH test strips to test the pH from samples E and F.
10. Record observations.



Station 5: **Water is so polar**

1. Hold a plastic charged with a wool cloth or a Wandarama Wand in your hand.
2. Place charged plastic or Wandarama near a stream of water from a faucet or made up stream (pour water slowly from one beaker to another).
3. Record your observations.



Station 6: **Walking on water!**

1. Fill a 500 ml beaker with water.
2. Try to make the paper clip float. Why doesn't it float? Tear a piece of tissue paper about half the size of a dollar bill. GENTLY drop the tissue flat onto the surface of the water. GENTLY place a dry paper clip flat onto the tissue (try not to touch the water or the tissue). With some luck, the tissue will sink and leave the paper clip floating!
3. Record observations.

