



Pathfinder's Name

Water Science

1. Making use of household products, build a 3-D model of the water atom. Explain its chemical composition.

Date completed _____

2. List and describe (verbally or orally) some characteristics of water that distinguish it from nearly all other elements?

Date completed _____

3. Making use of photos, diagrams or any other form of visual aid, illustrate the three states of water.

Date completed _____

4. Describe, illustrate or represent the difference between clouds, snow and rain.

5. Through photos or diagrams, identify and list the five (5) main types of precipitation.

Date completed _____

6. What is the boiling and freezing point of water?

7. Water Trivia: The following questions can be utilized in different forms to promote learning and understanding about water. Questions can be adapted for Jeopardy, Bingo and Wheel of Fortune, among many others. Creativity is strongly encouraged. What is the estimated weight of one gallon (4 liters) of water?

a. The human body consists of how much water?

b. What is the largest ocean on Earth?

c. What is the largest lake in the World?

d. What is the largest lake in North America?

e. Can sound travel faster through water or air?

f. What is the deepest point in the world's oceans?

g. What is the longest river on Earth?

h. How long can a person survive without water?

i. What makes water hard?

j. What uses the most water in households?

k. What is the word used to describe how much water vapor is in the air?

l. What is the name of the canal that connects the Pacific Ocean with the Atlantic Ocean?

m. Which conducts heat more efficiently, water or air?

n. How much water do you need to drink daily?

o. What chemical is added to water to kill harmful germs?

p. How many gallons/liters of water are used in a five-minute shower?

q. What is the longest navigable river in your country?

r. T or F: Water is often called the universal solvent because many things can be dissolved in it.

8. How much of the earth is covered by water?

9. How much of the earth's water is fresh water?

10. Where is water found on earth?

11. Select three (3) of the following and discuss at least one way water is used.

- a. Agriculture
- b. Washing
- c. Drinking
- d. Fire Extinguishing
- e. Transportation

Date completed _____

12. What is a body of water? Through photos, diagrams or sketches, be able to illustrate the following bodies of water below, naming one that can be found in your city, town, county or state, if possible.

- a. River
- b. Lake
- c. Sea
- d. Ocean
- e. Rapid
- f. Canal
- g. Creek
- h. Basin
- i. Glacier
- j. Gulf
- k. Harbor
- l. Lagoon
- m. Reservoir

Date completed _____

13. Discuss with a group the biblical context of at least three (3) of the following texts as each relates to the significance of water in the Bible.

a. Genesis 1:20

b. Exodus 14:21

c. Matthew 28:19

d. John 3:5

e. John 4:14

f. Revelation 22:1

Date completed _____

14. Demonstrate a technique that can be used to convert salt water into clean drinking water.

Date completed _____

Water Science, Advanced

- 1. Have the Water Science Honor.
- 2. Illustrate and briefly describe how each physical state of water contributes to the earth's climate?

- 3. Discuss with a group the effects of water by flooding and erosion.
Date completed _____

- 4. Explain the following terms with reference to changes in water state.

- Condensation

- Evaporation

- Freezing

- Melting

- Desublimation

- Sublimation

5. Be able to explain and illustrate making use of photographs, diagrams or sketches the following types of water:

- Filtered Water
- Soft Water
- Distilled Water
- Rain Water
- Snow Water
- Deionized Water
- Raw Water
- Hard Water

Date completed _____

6. What is a watershed? Discuss with a group the importance of watersheds.

7. How does filtering water make it clean

8. On your own or with a group, perform the following experiment and explain in your results what can be done to keep clean water sources?

Investigating Pollution

There are many ways that water can become polluted. Aside from natural pollution such as soil, leaves and living organisms, people cause the most serious pollution. From agricultural fertilizers and pesticides to urban runoff and industrial waste, pollutants can seep into groundwater that is often used as a source for drinking water. Follow the instructions in this experiment to make polluted water and observe what pollutants may do to water supplies.

Materials:

- 8 one-pint jars (four with tight-fitting lids)
- Masking tape
- Funnel
- Cotton
- Motor Oil
- Vinegar
- Laundry detergent
- Soil
- Plastic Cups

Procedure:

- Label two sets of jars. Number four of the jars (1,2,3 and 4) with masking tape. Make sure these four jars have lids that will fit tightly. Fill this set of jars half full of water. Number the other four jars (5,6,7 and 8) with masking tape and set them aside.
- Observe the water in jar #1. Record your observations.
- Put one tablespoon of motor oil in jar #2. Tighten the lid and shake the jar carefully. Record your observations.
- Put a tablespoon of vinegar in jar #3. Tighten the lid and shake the jar carefully. Record your observations.
- Put a tablespoon of detergent in jar #4. Tighten the lid and shake the jar carefully. Record your observations.
- Place a piece of cotton in the funnel and then add some soil. Place the funnel on empty jar #5.
- Pour the contents of jar #1 (water only) into the funnel and let it drip through the funnel into jar #5.
- Move the funnel with the cotton and soil to empty jar #6. Pour the contents of jar #2 (oil and water) into the funnel and let it drip through the funnel into jar #6. Observe and record your observations.
- Move the funnel with the cotton and soil to empty jar #7. Pour the contents of jar #3 (vinegar) into the funnel and let it drip through the funnel into jar #7. Observe and record your observations.
- Move the funnel with the cotton and soil to empty jar #8. Pour the contents of jar #4 (detergent) into the funnel and let it drip through the funnel into jar #8. Record your observations.

Making Discoveries:

- If these substances were added to a real water source, how might they affect the water?
- How might animals and people be affected?
- Can you think of instances where materials such as these (oil, chemical detergent, etc.) might have been spilled or dumped and possibly endangered a water supply?
- What measures might a community take to prevent such accidents?

Date completed _____

9. Develop a spiritual application from water and share it with your group.

Date completed _____