



KinderTown Summer Camp: Wonders of Water

June 12th–18th
Focus: Science and Art



Overview

Family Activity

- 🔗 **Water Tasting:** Conduct a taste test to find out if the members of your family (and maybe even your friends) think that all types of water taste the same. Graph the results and draw conclusions. (Science and Math)
➡ See Activity Guide | Page 2–3

Pre-kindergarden – Early Elementary Activities

- 🔗 **Evaporating Art:** Experiment to see how sun, shade, and wind affect water evaporation. This activity works best on a warm, sunny day. (Science and Art)
➡ See Activity Guide | Page 4
- 🔗 **Water Absorption Activity:** Gather materials, make predictions, and test to see which materials absorb or do not absorb water. Discuss the results. (Science)
➡ See Activity Guide | Page 5
- 🔗 **Colored Cubes:** Make red, yellow, and blue ice cubes using food coloring and water. Place two different cubes at time in sealed plastic bags and observe as the colors change as they melt. (Science and Art)

Elementary Activities

- 🔗 **Diffusion Art:** Gather some paper (heavier weight works best), watercolor paints, and some brushes. First, either quickly dip the entire paper in water or allow the children to paint or spray the paper with water. Next, paint with watercolors and watch the colors “explode” or diffuse onto the paper. (Science and Art)
- 🔗 **Wet Chalk Art:** Soak some chalk in a bowl of water for about 10 minutes. Let your child draw with the wet chalk on pavement or paper. The colors will appear more vibrant. Then allow him to use dry chalk. Compare the results of the art work. (Science and Art)
- 🔗 **Confection Water Cycle Model:** Research, talk about, or review the parts of the water cycle and make a sweet 3D model. (Science and Art)
➡ See Activity Guide | Page 6–7

Upper Elementary Activities

- 🔗 **3D Water Molecule:** Introduce the Periodic Table of Elements and learn about the structure of a water molecule by creating a model from marshmallows. (Science and Art)
➡ See Activity Guide | Page 8–10
- 🔗 **Water Filtration Experiment:** Construct and test a model of a filtration system to demonstrate how some water treatment plants purify water for drinking. For detailed instructions visit–
http://water.epa.gov/learn/kids/drinkingwater/upload/2005_03_10_kids_activity_grades_4-8_waterfiltration.pdf
(Science)
- 🔗 **Design a Water Wheel:** Introduce the principles of engineering and show how water power is used to turn machinery and power entire factories. For more instructions visit– <http://www.videojug.com/film/how-to-make-a-water-wheel>
(Science)



Synopsis

- Conduct a taste test to find out if the members of your family (and maybe even your friends) think that all types of water taste the same. Graph the results and draw conclusions.

Materials

- Samples of water: tap water, seltzer water, bottled water, club soda, mineral water (flat or carbonated), distilled water, tonic water
- Cups
- Paper, graph paper, or poster board
- Taste Testing Form (1 per person, provided)
- Pencils, pens, markers

Directions

1. Explain that your family (and maybe some friends, too!) will conduct a taste test of different types of water.
2. Determine the different types of water that you want to include in the test.
3. Gather samples of the water for test.
4. Label the cups to distinguish them from one another (numbers, letters, or colored dots). One person should be designated to know which samples represent each type of water.
5. Give each person a taste test form (or develop your own) to rank the water samples from favorite to least favorite throughout the test.
6. Begin the activity by having each person observe each sample before tasting. Questions to consider are:
 - ▶ How does the water look?
 - ▶ Does it have an odor?
7. Next, have each person taste one sample at a time. Have each person think about the taste and texture of the water. Questions to consider are:
 - ▶ How does the water taste?
 - ▶ How does it feel in your mouth?
8. Circle the rating on the taste test form continuum for that sample.
9. Discuss the results as a family. See some of the questions under “Extension” to get started.
10. Reveal type of water for each sample.

Extension

1. Create a graph of the results. Your family can decide which type of graph would be best to display the data (bar graph, pictograph, circle graph, or line plot) and then discuss the following:
 - ▶ Is there an overall favorite or dislike?
 - ▶ Is there a tie?
 - ▶ What characteristics of the water may have influenced your decision to rate a sample higher or lower on the scale?
 - ▶ Might the container they are stored in affect taste? Why or why not?
 - ▶ How could the experiment be improved?
2. Research the different types of water that your family tested. Try to find information about how the water is collected, produced, and manufactured (i.e., what might be added, such as sodium, that could make them taste slightly different).



Taste Testing Form

Water Sample	☹️				😊	Type of Water (fill-in after taste testing is completed)
	1	2	3	4	5	
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						



Synopsis

- Experiment to see how sun, shade, and wind affect how water evaporates. This activity works best on a warm, sunny day.

Materials

- Paint brushes, sponge brushes, or sponges
- Bucket or open container to hold water
- Water
- Pavement or stone (playground, driveway, sidewalk, or large rocks)

Directions

1. Dip a brush or sponge into the water and paint a picture on the pavement in a sunny area.
2. Ask the child to predict what will happen in 5 minutes to his picture.
3. “Act out” evaporation with your child. Have him follow along with you. Crouch down and explain that you are all the water molecules in his painting. Next, say that the sun comes out. All the molecules “getting excited” and “jump” into the air. As you say this, stand up and jump into the air with your arms extended up and say “evaporate”.
4. Ask him the following questions:
 - ▶ What do you see?
 - ▶ Describe what is happening to the water.
 - ▶ Is the water soaking into the pavement?
 - ▶ Is some of the water evaporating? How can you tell?
 - ▶ What do you think your painting will look like in _____ minutes? (Select a time you feel is reasonable here)
5. Repeat the steps above, but have them paint a picture:
 - ▶ on the same surface in a shady area.
 - ▶ on the same surface in a shady area, but have him blow on it or fan it.
6. Ask him what happened to the water painting. Discuss the differences he saw between his paintings when in the sun, when in the shade, and when he added wind.

Extension

1. Continue to experiment with different surfaces (wood, siding on the house, a toy) to see what happens to the water.
2. Have the child paint on the back of his hand or on his arm.
 - ▶ Have him blow on it or fan it.
 - ▶ Then ask the following questions:
 - » What is happening to the water?
 - » How does your hand/arm feel differently?
 - ▶ Explain when water evaporates that heat escapes with it. This is why it feels cooler when the air makes contact with our skin. As the water on our skin evaporates, some of our body’s heat goes with it.



Synopsis

- Gather materials, make predictions, and test to see which materials absorb or do not absorb water. Discuss the results.
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Materials

- 2-4 items that will absorb water, such as a paper towel, construction paper, sponge, piece of fabric, cotton ball, coffee filter, baby diaper, or tissue paper
 - 2-4 items that do not absorb water, such as aluminum foil, foam, wax paper, plastic wrap, plastic straw, marble, or coin
 - Medicine dropper or pipette
 - Small bowl of water
 - Food coloring (one color)
 - A pan in which to test items or place small samples of each item in the sections of a muffin tin or ice cube tray
-

Directions

1. Display the items to be tested in no particular order.
 2. Place a few drops of food coloring in the water. This makes the absorption easier to see.
 3. Explain that absorption is the act of taking in small particles through holes or small openings. Demonstrate this concept with a tissue or other item.
 4. Before testing each item, ask your child to predict if he thinks it will absorb the water.
 5. Have him place a few drops of water on the item.
 6. Ask him to describe what he sees.
 7. When finished, review which items absorbed the water and those that did not.
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Extension

- Place a stalk of celery (with the leafy greens attached), leaf of cabbage (Napa works well), or a carnation in a jar or vase full of colored water to demonstrate water absorption in plants. Have your child predict what will happen. Check back daily to observe changes. It may take a few days to see the full effect.



Synopsis

- Research, talk about, or review the parts of the water cycle and make a sweet 3D model.

Materials

- Disposable tray, pan, cookie sheet, or piece of paper
- Yellow sprinkles
- Blue sprinkles
- Mini marshmallows
- Blue fondant or blue icing (in a tube or icing bag)
- Glue
- Markers

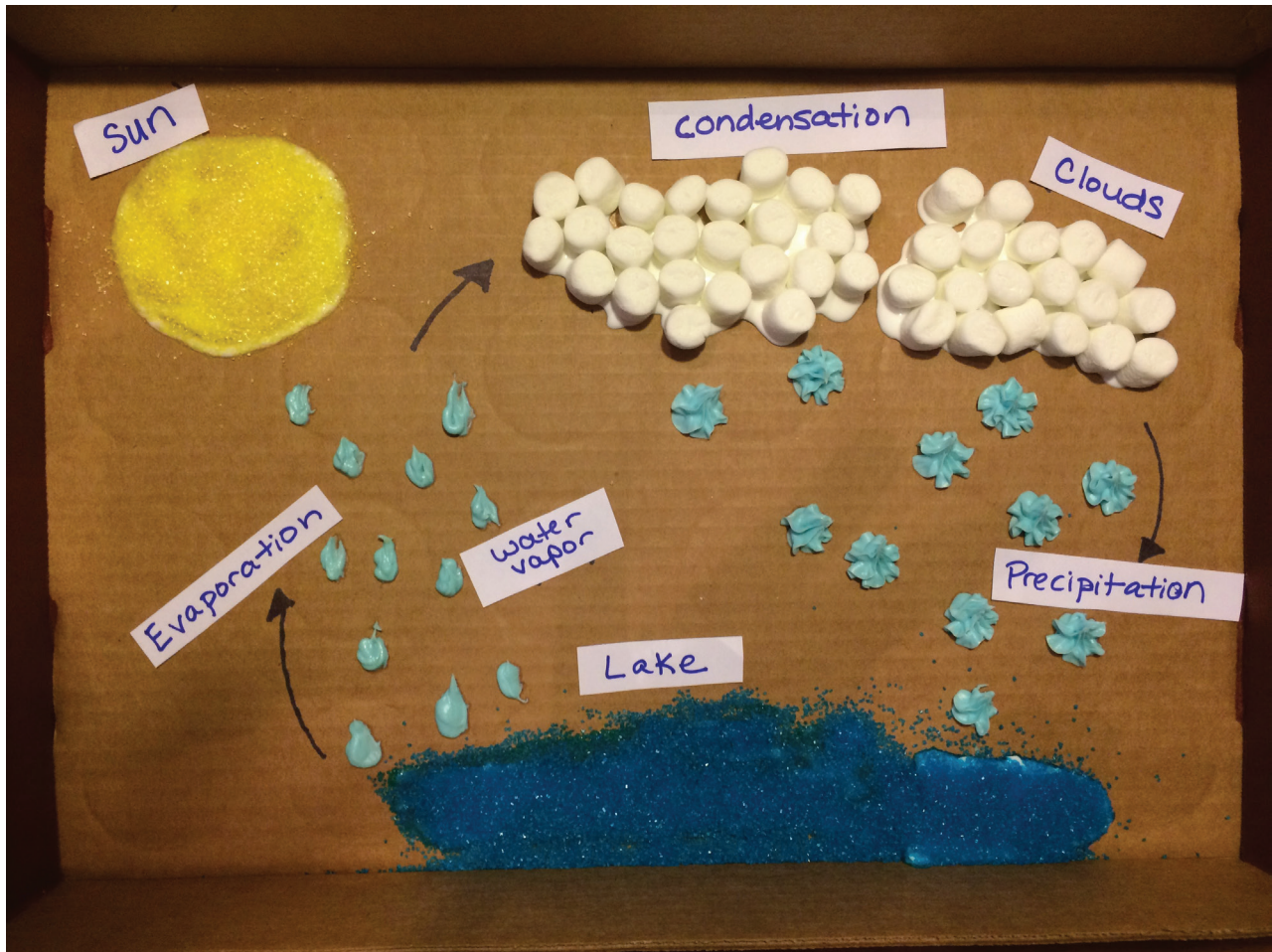
Directions

1. Review the process of the water cycle (read a story, watch a video, or conduct a demonstration). A brief video presentation of the water cycle is available here: <http://www.turtlediary.com/kids-videos/water-cycle.html>
2. In part of the tray, pan, cookie sheet or on paper form a body of water with glue. Then coat with the blue sprinkles. Ask your child to share what type of water it represents (ocean, sea, lake, pond, river, puddle).
3. Next, in another area, place the glue where the sun will be and cover with the yellow sprinkles. Discuss the connection of these two elements to the water cycle.
4. Form droplets of water using the fondant or icing to represent evaporation from the body of water (blue sprinkles).
5. Show that the water droplets condense and form clouds with the mini marshmallows (glue these to the model)
6. Illustrate precipitation with the blue fondant or icing coming from the clouds. Ask him what type of precipitation it represents (rain, snow, hail, or sleet)
7. Optional: label the parts of the water cycle when complete.
8. Ask him to describe and “teach back” the process of the water cycle to you using his model.
9. Take a picture of the completed model to share!
📷 *See next page for a photo example*

Extension

- Research and learn more fun facts about water to share. Here are few to get you started.
 - ▶ Frozen water, or ice, is lighter than water. This is why ice tends to float in water. Think about this when you put an ice cube in your lemonade.
 - ▶ The dewdrops seen on leaves are actually moisture in the air condensed due to low temperature during the night.
 - ▶ About 97% of the water on Earth is salt water found in the oceans.

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Synopsis

- Introduce the periodic table of elements and learn about the structure of a water molecule by creating a model from marshmallows.

Materials

- Large marshmallows (to represent atoms)
- Mini marshmallows (to represent atoms)
- Toothpicks (represent bonds between atoms)
- Markers (for labeling)

Directions

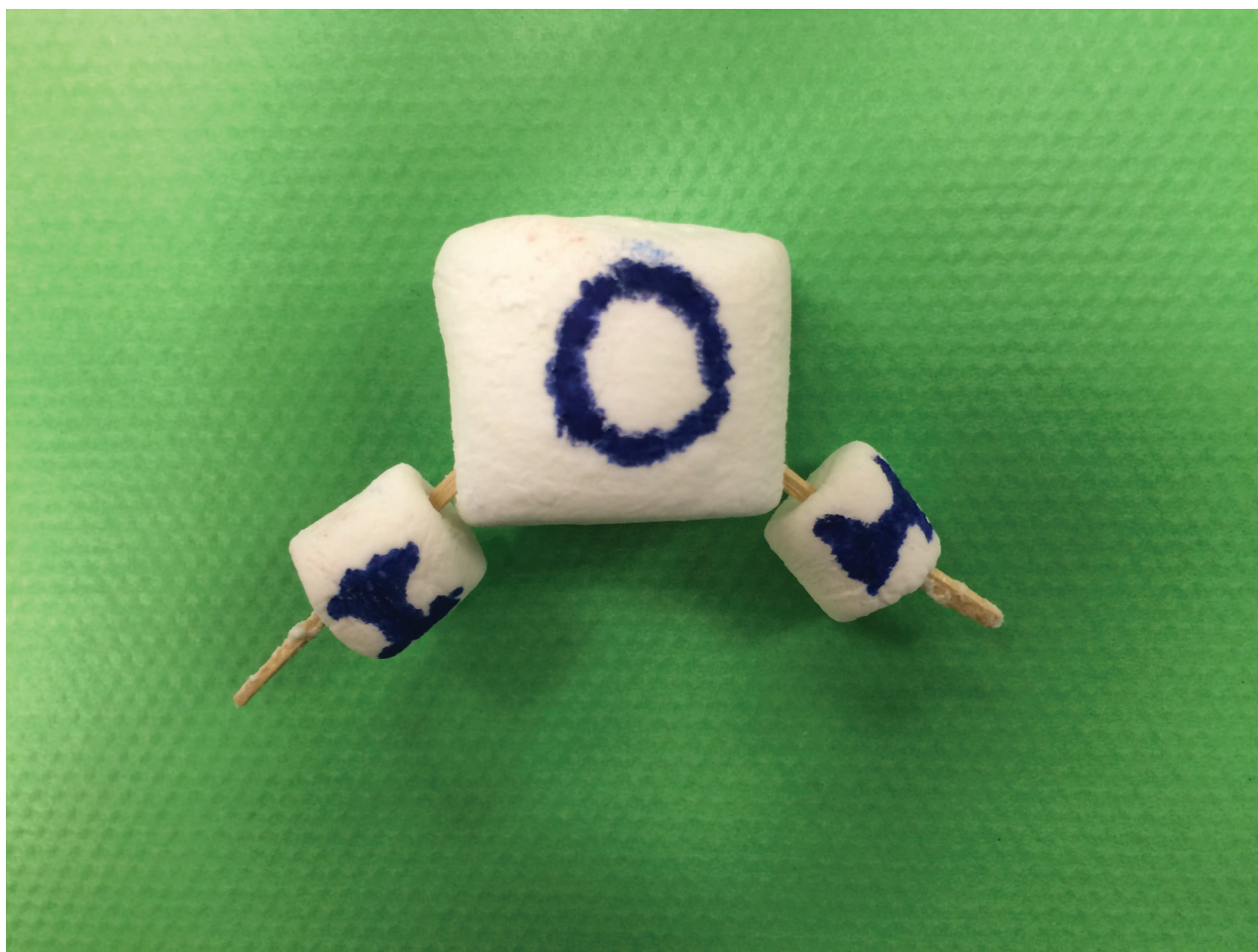
1. Introduce the periodic table of elements (*see page 10 for attached*) to your child. Explain that everything in the world is made up of these elements. Share several items from the periodic table he may come across in everyday life. Some examples may include:
 - **Gold** — If possible, show them a piece of gold jewelry. Explain that it is made out of gold. Point to the “Au” square on the periodic table that represents gold.
 - **Helium Balloon** — Show them a balloon that rises and tell them it has helium in it. Show them the “He” square on the periodic table that represents helium.
 - **Vitamin and Mineral Supplement** — If you give your child a multivitamin and mineral tablet each day, explain that it includes the minerals iron (Fe), calcium (Ca), and zinc (Zn) - and point those elements out on the periodic table.
 - **Sterling Silver** — If you have sterling cutlery or other items, show your child silver (Ag) on the periodic table.
 - **Thermometer** — If you have a thermometer that contains mercury, show it to your child and point to the “Hg” or mercury square on the periodic table.
2. Explain that two (or more) elements can sometimes bond to produce a molecule. This can result in a new substance.
 - **Table Salt** — Point to the “Na” (sodium) and “Cl” (chlorine) squares on the periodic table. The combination of the two elements becomes NaCl, called sodium chloride, commonly referred to as salt.
3. Water is also a combination of two elements, hydrogen and oxygen, known as H₂O. It is made up of two hydrogen atoms and one oxygen atom. Explain that even though water molecules are too small to see, he can make a model to represent one.
4. Take one large marshmallow and label it with an “O” to represent the oxygen atom.
5. Next, select two mini marshmallows and label them each with an “H” to represent the two hydrogen atoms.
6. Place a toothpick in each smaller marshmallow respectively and insert them into the bottom of the larger marshmallow.
 - 📎 *See next page for a photo example*
7. Explain that the model represents a basic water molecule. The marshmallows show the atoms, and the toothpicks represent the bonds that hold the atoms together to form the molecule.
8. Discuss the following questions with your student.
 - How is your model like a real water molecule?
 - Why do you think a large marshmallow was chosen to represent an oxygen atom, while a small marshmallow was chosen to represent a hydrogen atom?
 - Give an example of how water is used and found in nature.



Extension

1. Watch this animation to see how one molecule of water completes the water cycle.
<http://pmm.nasa.gov/education/videos/tour-water-cycle>
2. Create other marshmallow molecules such as:
 - ▶ Ammonia (NH_3)
 - ▶ Hydrogen sulfide (H_2S)—stinky!
 - ▶ Chlorine gas (Cl_2)—poisonous!
 - ▶ Carbon Dioxide (CO_2)—has a double bond

Photo Example

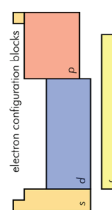


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[illegible]

electron configuration blocks



- as of yet, elements 113-118 have no official name designated by the IUPAC.
- 1 kJ/mol \approx 96.485 eV.
- all elements are implied to have an oxidation state of zero.