Aqua Bodies

Adapted from *Project WET Curriculum and Activity Guide*
by the Western Upper Peninsula Center for Science, Mathematics & Environmental Education and The Sustainable Futures Institute at Michigan Technological University

Subject/Target Grade
Science and Social Studies
Lower Elementary (K-1)

Duration
One class period

Materials
per group:

- Need dried and fresh examples of same items:
  (enough for students to sample)
  - Apples
  - Grapes/Raisins
  - Plums/Prunes
  - Potato / Potato chips
- Tray
- 7 gallon milk jugs
- Bags/ or boxes of dry food (crackers, cereals, etc.)
- Newsprint paper (2' wide and 4-5 feet long per student)
- Four 8-oz. cups of water
- 1 cup of salt water for one student to taste.
- Paint-Dotters or washable markers (1 per student)

Michigan Content Standards

- Describe the basic requirements for all living things (SCI. III. 5.E.3).
- Describe how water exists on earth. (SCI.V. 2.E.1).
- For a list of GLCS addressed, see the end of the document.

Lesson Overview
Students consider how long humans can live without water. Students compare weight of dried and fresh food. Students trace their bodies and color portions to represent the amount of water their bodies contains.

Essential Questions
Where is water found on Earth?
Why do we need water?
How is salt water different from freshwater?

Objectives
Students will be able to:
1. Give examples of foods that contain water.
2. Explain why water is essential for the survival of plants, animals and humans.
3. Explain why drinking water is an important part of human health.
4. Compare salt water and fresh water and where they are each found.

Advance Preparation
1. Prepare 4 cups of tap water and one cup of salt water.
2. Cut up dried/fresh fruit and vegetables for student to sample.

Making Connections
People drink water every day, but rarely think about how much of their body is made up of water. Learning how much of their bodies are made of water encourages students to appreciate life's dependence on water and the need for plenty of clean drinking water. Children should drink 4 cups of water each day to maintain healthy bodies. Water is used in almost every bodily function: digestion, blood circulation, growth, etc.

Active living organisms are at least half water. This is true whether they live in a desert (certain cacti have 90% water content) or live in the oceans (body water content of many whales is 75%). The human body is about 65-70% water. If humans lose more than 8% of their body water, they will die. Where is this water located? About 67% of the water in the body is located within cells; about 25% is located between cells; and the rest, about 8% is located in the blood.

WATER CONTENT OF SOME FOODS

Food	**% Water**
Potato Chips	2%
Pizza	49%
Ice Cream	61%
Bananas	74%
Grapes	81%
Oranges	87%
Carrots	88%
Tomatoes	94%
Lettuce	96%

Procedure
(Note: K-1 students **do not understand the concept of percent or fractions.** You will have to visually demonstrate quantities for them, and keep the reference to percentage to a minimum.)

1. What do all living things need to survive?
Ask Students what the requirements for all living things are. [Air to breathe, food to eat, shelter and **water** to drink.] "**Every living thing contains water**. In fact **all** living things, whether they be plants or animals, are over one-half water. Which weights more 20 grapes or 20 raisins?" [Hand a bag of grapes and a bag of raisins (same number in each) to a student for their evaluation.] "The grapes, of course. What is the difference between a raisin and a grape?

WATER!!! What is the difference between the fresh potato and the chip? WATER! Water is in most everything.

2. How long can we live without water?
Let's say that two people are stranded in the desert. One has a basket full of tasty food including cereal, crackers, etc. (displayed on one table) and the other has 7 gallons* of water (displayed on another table). Which would you choose to best help you to survive? Which of these will help you to survive longer? The fact is we can live without food for up to one month, but we can only live for about three days without water."
*a one-month supply of water

"Do you think water is important to people? How much of a person is made up of water: less than half, more than half? People are **over half water!** In fact each person is almost three-quarters water (show a pie divided into fourths to illustrate 3/4s). That's like having a pizza cut into four equal slices, and three of them are made up of water!"
"Here is a figure of a first-grader that weighs about 45 pounds. But since he/she is ¾ water (remember the water pizza) she/he is made up of 32 pounds of water, or 4 gallons of water! Try holding four gallons of water at one time. You'll find that four gallons of water weighs a lot!

3. Where is all the water in our bodies?
Where is the water located within you and me? If I get a cut I may bleed, but water doesn't come spilling out of me. [No, I am not going to cut myself to prove it] So, where is all this water? (Take a few answers from students.)
This potato contains a whole bunch of water, but when I cut the potato water doesn't come spilling out? Where is all the water? It is attached to the fibers of the potato. Water does not exist as a puddle inside the potato, nor does water exist as a puddle inside you and me. Most of the water inside us is tied up in our muscles, bones, skin, stomach, and heart. The water is in mostly in our guts! Water helps our body to function, to grow, to move nutrients through our bodies so they can get to the places they are needed. Water helps to remove the waste material that our bodies generate. We need water for all kinds of life functions. Water helps to keep our skin soft. Without water our skin would be a dry at this potato chip (Crush a chip in you fingers for effect)!

4. Where do we find water on Earth?
Rivers, lakes, underground groundwater, in the air, oceans, snow/ice caps/glaciers

5. Would you drink just any water?
Would you want to drink this water?" (Hold up a glass of dirty water.) "No, we need clean water. Would you drink salt water? Give a cup of salt water to a student to taste and report back to the class. Drinking salt water could also pull the good water out of you, and that's no good! It can take a lot of work to get clean water to drink. Would you dip a cup into a river or lake and drink it, or should something be done to that water before you drink it? Yes, it needs to be cleaned up somehow before we drink it.

6. How can we get enough water to keep our bodies healthy?
Take answers from students. You can get some of the water you need from the foods you eat, and liquids that you drink, such as juice, milk, and water. [Pop is not a healthy source of water,

because the chemicals and sugars in pop make your body lose water, eat holes in your teeth, and are empty calories with no nutritional value for your body.
How much water do you think you need to drink each day to stay healthy? Children need to drink **at least** 4 glasses of water each day to stay healthy." Show the kids four glasses of water. As you grow you will need to drink more water. Adults should drink 8 glasses of water each day. We need fresh, clean water to survive. Try to drink four glasses of water each day. Over a month you need at least 7 gallons of fresh, clean water to drink."

7. How much water is in YOU!
Have students work with partners to trace their body shape onto large pieces of newsprint paper. They can tape the paper to a wall and trace each other standing up or while lying on the floor. "Remember that your body is mostly water (3/4 or 75%) and this water is located all over inside your body----skin, eyes, ears, muscles, from the top of you head to the bottom of your toes. So once you get your shape traced, make blue dots all over to demonstrate that you have LOTS of water, everywhere throughout your body. You will need to put as many dots on your figure as I have on mine. Once students have colored themselves, have them write their name on the paper and write: "I need to drink 4 glasses of water every day to stay healthy." Tell students to take their figures home to show to their parents, so that they can teach their parents how important water is to people.

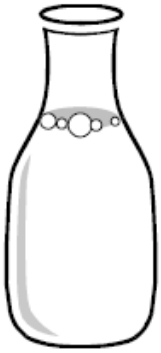
Summary
Check for understanding by asking:
1. Where is water found on Earth?
2. Why do we need water?
3. How is salt water different from freshwater?
4. Give examples of foods that contain water.
5. Explain why water is essential for the survival of plants, animals and humans.
6. Why is water important for human health?
7. How is salt water different from fresh water?

Take-Home Activity
Hand out the "four-cup" activity. Have students write their names on the paper and read the sentence at the top of the page. Tell student to take the sheet home and color one cup each time they drink a cup of water each day.

NAME _____

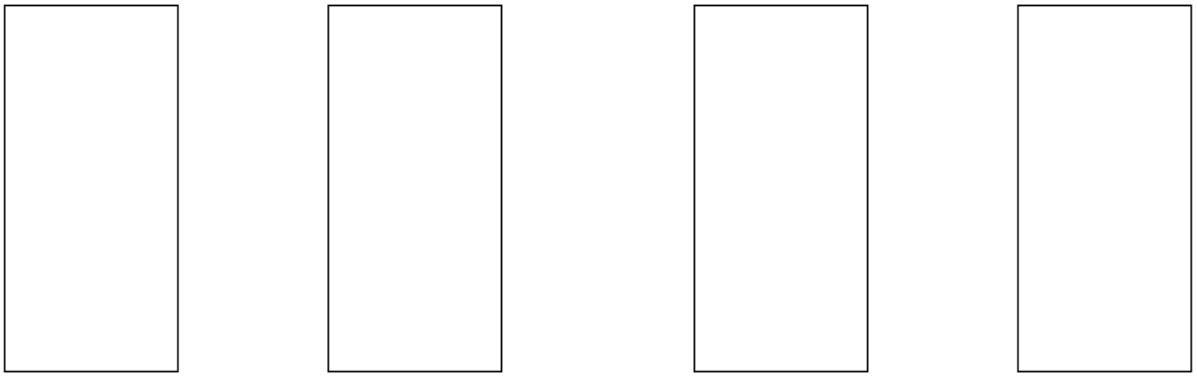
I need to drink FOUR glasses of water EVERYDAY to stay healthy.




Color one cup each time you drink a glass of water.

1 2 3 4



Michigan GLCS:

Kindergarten

Science GLCS:

S.IP.00.11 Make purposeful observation of the natural world using the appropriate senses.

S.IP.00.12 Generate questions based on observations.

S.IP.00.13 Plan and conduct simple investigations.

S.IP.00.14 Manipulate simple tools (for example: hand lens, pencils, balances, non-standard objects for measurement) that aid observation and data collection.

S.IP.00.15 Make accurate measurements with appropriate (non-standard) units for the measurement tool.

L.OL.00.11 Identify that living things have basic needs.

E.SE.00.11 Identify Earth materials (air, water, soil) that are used to grow plants.

Social Studies GLCS:

K – G5.0.1 Describe ways people use the environment to meet human needs and wants (e.g., food, shelter, clothing).

English Language Arts:

S S.DS.00.01 engage in substantive conversations, remaining focused on subject matter, with interchanges beginning to build on prior responses in literature discussions, paired conversations, or other interactions.

L.CN.00.01 understand and follow one- and two-step directions.

L.CN.00.02 ask appropriate questions during a presentation or report.

L.CN.00.03 listen to or view knowledgeably while demonstrating appropriate social skills of audience behaviors (e.g., eye contact, attentive, supportive) in small and large group settings; listen to each other, interact, and respond appropriately.

L.CN.00.04 begin to evaluate messages they experience, learning to differentiate between sender and receiver.

Mathematics:

N.ME.00.01 *Count objects in sets up to 30.**

N.ME.00.02 Use one-to-one correspondence to compare and order sets of objects to 30 using phrases such as “same number”, “more than”, or “less than”; use counting and matching.

M.UN.00.04 Compare two or more objects by length, weight and capacity, e.g., which is shorter, longer, taller?

M.PS.00.05 Compare length and weight of objects by comparing to reference objects, and use terms such as shorter, longer, taller, lighter, heavier.

First Grade

Science GLCS:

S.IP.01.11 Make purposeful observation of the natural world using the appropriate senses.

S.IP.01.12 Generate questions based on observations.

S.IP.01.13 Plan and conduct simple investigations.

S.IP.01.14 Manipulate simple tools (for example: hand lens, pencils, balances, non-standard objects for measurement) that aid observation and data collection.

S.IP.01.15 Make accurate measurements with appropriate (non-standard) units for the measurement tool.

L.OL.01.13 Identify the needs of animals.

E.SE.01.12 Describe how Earth materials contribute to the growth of plant and animal life.

Social Studies GLCS:

1 – G1.0.4 Distinguish between landmasses and bodies of water using maps and globes.

English Language Arts:

S S.DS.01.01 engage in substantive conversations, remaining focused on subject matter, with interchanges beginning to build on prior responses in literature discussions, paired conversations, or other interactions.

L.CN.01.01 understand, restate and follow two-step directions.

L.CN.01.02 ask appropriate questions during a presentation or report.

L.CN.01.03 listen to or view knowledgeably while demonstrating appropriate social skills of audience behaviors (e.g., eye contact, attentive, supportive) in small and large group settings; listen to the comments of a peer and respond on topic adding a connected idea.

L.CN.01.05 begin to evaluate messages they experience from a variety of media and differentiate between sender, receiver, and message.

Mathematics:

N.ME.01.03 Order numbers to 110; compare using phrases such as “same as”, “more than”, “greater than”, “fewer than”; use = symbol. Arrange small sets of numbers in increasing or decreasing order, e.g., write the following from smallest to largest: 21, 16, 35, 8.