



Water Clock

Tick Tock! Tick Tock! Ancient civilizations didn't have electricity or batteries to power clocks. Discover how they used the tools available to them to track time with the movement of water with your own water clock!

TEKS:

SCI 3/4/5.3 C: The student is expected to connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

MATH 4/5.1 A: The student is expected to apply mathematics to problems arising in everyday life, society, and the workplace.

MATH 4.8 C: The student is expected to solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.

Materials:

- Craft stick
- Glass jar
- Scissors
- Small bead (optional)
- Small bell or large bead
- Small plastic lid (Ex: a water bottle cap or milk lid)
- String or yarn
- Styrofoam or plastic cup
- Thumbtack
- Timer
- Water

How To:

1. Use the thumbtack to poke a hole in the middle of the plastic lid and the bottom of the cup. **Safety: an adult should assist when using a thumbtack.**
2. Cut your string to match the depth of the cup.

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3. Thread one end of the string through the hole you made in the middle of the plastic lid and tie a knot. (Optional: Tie a small bead at the end of the string to keep it from pulling through the hole in the lid.)
4. Tie the bell (or large bead) to the opposite end of the string.
5. Pause to check the length of the string. With the bell at the top of the cup and the string taut, the plastic lid should *just* touch the bottom of the cup. If needed, adjust the length of the string before moving on to the next step.
6. Next, set your cup in the top of the jar so it sits just inside, but does not touch the bottom of the jar.
7. Place your craft stick across the top of the cup and balance the bell so it rests on top of the stick.
8. Hold the bell in place while you add water to the cup. You'll notice the plastic lid begins to float as you add water and the bell remains balanced on the stick.
9. After adding water, watch as it starts dripping through the hole in the cup into the jar.
10. Once all of the water has dripped into the jar and the plastic lid reaches the bottom of the cup, it should pull the bell off of the stick, sounding an alarm that the time is up.
11. Use the timer to challenge yourself and find out how much water to add in the cup for your water clock to measure 30 seconds, one minute, and other intervals.



STEM Explanation:

Ancient civilizations didn't have electricity for battery-powered clocks and the first mechanical clock wasn't invented until the early fourteenth century. However, people still needed a way to keep track of time. Sundials were a useful tool to tell time; however, they couldn't be used at night without sunlight and shadows.

Water clocks are one of the oldest solutions for measuring time. The earliest known example was made by an Egyptian civilization over 3,500 years ago! Water clocks can have two methods of timekeeping: inflow or outflow. An outflow water clock consists of just one container, in which water leaks out at a steady pace. Measurements on the side of this container tell the observer how much time has passed based on the changing water level. The water clock that you made in this activity was an inflow water clock. Inflow water clocks use two containers, and time is measured based on how much water drips from one container into the other.

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Career Connection:

Mathematicians do research to develop and understand mathematical principles. They are concerned with numbers, data, quantity, structure, space, models, and change. They analyze all kinds of measurements and types of data and use mathematical techniques to help solve problems in the world. They often work with teams of scientists and engineers.

Resources:

<https://deceptivelyeducational.blogspot.com/2014/04/how-to-make-water-clock.html>

<https://www.steampoweredfamily.com/activities/water-clock-stem-activity/>

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