

National Curriculum links

Working scientifically, pupils should:

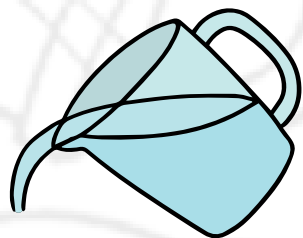
- Set up simple practical enquiries, comparative and fair tests
- Make systematic and careful observations
- Use straightforward scientific evidence to answer questions or to support their findings

Resources/equipment

- Large empty drinks bottle (2 litre)
- Water (you may want to colour it with food dye for clarity)
- Pair of sharp scissors
- Sharp object to poke a hole in the top of the bottle
- Marker pen/masking tape
- timer

Key Vocabulary

- clepsydra
- measure
- vessel
- pour



Video link



Teacher knowledge

- Water clocks are thought to be one of the oldest ways to measure time in the world - some have been found to date back to the 14th century BC. It is not known exactly who invented them but the oldest physical clock there is evidence of was found during the reign of Amenhotep III in Ancient Egypt. It may also have been an invention of the Chaldeans of Babylonia
- The water clock known as a clepsydra (water-thief) was developed by the Ancient Greeks who made many important contributions in the fields of maths, science and engineering. They were reliant on sundials to mark the passing of time but these obviously did not work in any situation where there was no sunlight
- As a solution to this problem, the Ancient Greeks designed their own version of a water clock using an earthenware vessel. The Romans also developed their own version of a clepsydra
- There are two different types of water clocks: inflow and outflow. In an outflow water clock, time is measured by how much water has been drained out of a container marked with lines indicating time. Alternatively, in an inflow water clock time is measured by how much water has filled up a marked container

Suggested practical tasks

- Discuss with the children different ways we can tell the time today. We can be extremely accurate with our measurements as we have the devices and technology to do so. How was time measured before clocks? What were the limitations of this? You could create a mind-map or time line of different ways to measure time and link to any history units the children have studied
- Introduce the concept of a water clock (or clepsydra) and discuss the history of this way to measure time. Why can't historians and archaeologists be sure who first created one?
- Take the children through the steps to make their own water clock. With the help of an adult, cut a plastic bottle in 2 parts about a third of the way down. Take off the lid from the bottle and ask an adult to make a hole in the lid with a sharp object such as a pin or pair of compasses (it may be useful to complete this step prior to the lesson). Turn the top piece of the bottle upside down and place inside the other piece. Take some water (with food dye added if you want) and pour this into the top of the bottle. Start timing and mark where the water has reached each minute on the side of the bottle. After this, pour the water back into the top of the bottle and using a timer, check the accuracy of your clepsydra!

Talk time

- How did people measure time before the invention of clocks and stopwatches? Can you think of any other ways to tell the time without a clock?
- What happens if you increase the quantity of the water?
- What happens if you make the hole in the bottle top bigger?
- What part does gravity play in making a water clock work? Could you use a water clock in space?
- What else could affect how accurately your water clock measured time?
- Do you use a sand timer in your classroom? What do you use it for? What are the disadvantages for measuring the time this way?