

## Additional Activities: Making a Sand Clock and a Water Clock

### The Sand Clock

Materials: Two small, plastic bottles (e.g. 16-32 oz. soda bottles); sand; masking or duct tape, 1"X 1" square of thick aluminum foil; sharp pencil; wristwatch or classroom clock for calibration.

1. Fill one bottle with sand. Cover the top of the bottle with the small piece of aluminum foil, shape it to fit the bottle, and tape it in place.
2. Poke a hole through the aluminum foil at the center of the bottle's neck with a sharp pencil. Verify that it is large enough for sand to flow uniformly.
3. Place the second and empty bottle on top of the first, neck-to-neck, and secure by wrapping some tape around the necks. Flip over!
4. Time how long it takes to empty the top bottle.

How could we lengthen the amount of time it takes to empty one of the bottles? How could we shorten the time? Would this be a good clock to try to keep the time of day? What about timing specific events, like hard-boiling an egg?



### The Water Clock

Materials: Coffee can; glass or clear plastic container to collect water; small nail; hammer; masking tape; marker; water; wristwatch or classroom clock for calibration.

1. Poke a small hole in the center of the bottom of the coffee can with the nail and hammer.
2. Over a sink, put some water in the coffee can. Hold your finger over the hole.
3. Place the coffee can on top of the clear container. The clear container must be narrow enough so that the coffee can does not fall through its opening and strong enough to support the coffee can with water.
4. Place a strip of masking tape along the height of the clear container, on which will be recorded the time required for the water to reach a given level.
5. Release your finger from the hole and see how much of the clear container is filled in one minute. Mark the height of the water at convenient intervals (e.g. minutes) on the masking tape.

How could you make this clock faster or slower? What advantages does the water clock have over the sand clock? Will a water clock work everywhere? Why or why not?