Solar Shower Power

You need
★ 5 equal lengths of dark hose ★ a funnel ★ a bucket of water ★ a thermometer
★ a sunny day ★ corks, plugs, or duct tape ★ a timer or watch ★ classmates

> I'll want hot water to wash with on our camping trip!

> We could leave a container of water in the sun. That would soon heat up.

> Remember that experiment we did at school? The dark tins were better for heating the water.

Activity

1. In a group, carry out this experiment:

   i. Fill a bucket with water. Measure and record the temperature of the water.

   ii. Fill five equal lengths of dark hose with water from the bucket. (Block the ends!)

   iii. Put the hoses in full sunlight.

   iv. After 10 minutes, measure and record the temperature of the water in the first hose. Repeat at 10 minute intervals for the other hoses.
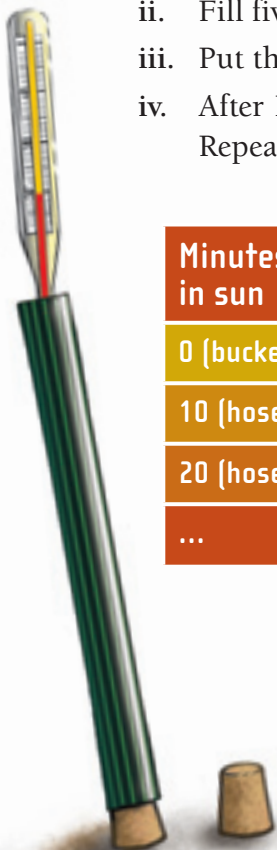
Minutes in sun	Temperature
0 (bucket)	
10 (hose 1)	
20 (hose 2)	
...	

Water Temperature
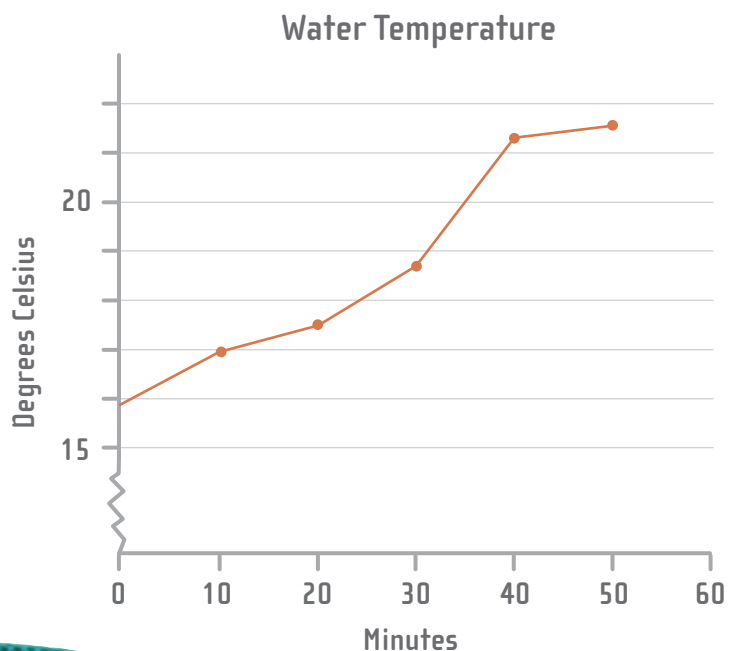
2. a. Make a graph of your data.
   b. Approximately how long does it take for the water to heat up by 5 degrees Celsius?
   c. How hot do you think the water will be after an hour in sunlight?
   d. Extend your graph to 3 hours and draw what you think would happen to the temperature of the water if you left a hose in sunlight for that long.

3.

How can we make the water heat up faster?

What if we coiled the hose?

What if we put the hose on concrete instead of grass?

Brainstorm ideas for heating the water faster. Then:
   a. Decide which idea your group will test. Repeat the experiment, using this idea. (You may need to ask your teacher for more materials.)
   b. What happened to the water? Did it get hotter? Did it heat faster?
   c. Compare your results with other groups. Discuss what makes the best solar shower.

4. a. Sketch a design for your own solar shower. Label and explain the ideas you include.
   b. Estimate how hot your shower would be after 30 minutes in the sun.
   c. Estimate the maximum temperature your shower would reach.
   d. Sketch a graph of the expected temperature over time for your shower.

5. Prepare a presentation for another group. In it, explain the ideas that have contributed to the shape of your graph.

Focus   Using time-series graphs and predicting trends