

Cool Colours

You need

- ★ 3 small tins (same size and colour) and 3 small and 3 large tins in pairs of different colours (black, lighter-coloured, white), all with foil for the lids
- ★ a sunny location
- ★ tap water
- ★ 3 thermometers
- ★ a computer spreadsheet/graphing program
- ★ a classmate

Our solar hot-water unit is black. I wonder if that helps heat the water?

Does a black car get hotter than a white car?

Activity One

1. Fill 3 tins (same size and colour) with the same amount of water, cover the tops with foil, and put them in 3 different locations (full sunlight, some sunlight, shaded).

Record the temperature of the water in each tin towards the end of the day. Discuss the effect of sunlight on water temperature.

2. Investigate whether some colours absorb heat better than others:

- i. Fill 3 small different-coloured tins with cold water. (Run the tap first so that the temperature is the same in each tin.) Cover the tins with foil.
- ii. Place the tins so that they get as much uninterrupted sunlight as possible, for example, in a sheltered courtyard or a north-facing room. Record the temperature of the water and replace the covers.
- iii. Every hour, take the temperature of the water in each tin and record it in a table.

Time of day	Colour 1	Colour 2	Colour 3
9 a.m.			
10 a.m.			
11 a.m.			
12 p.m.			
1 p.m.			
2 p.m.			
3 p.m.			

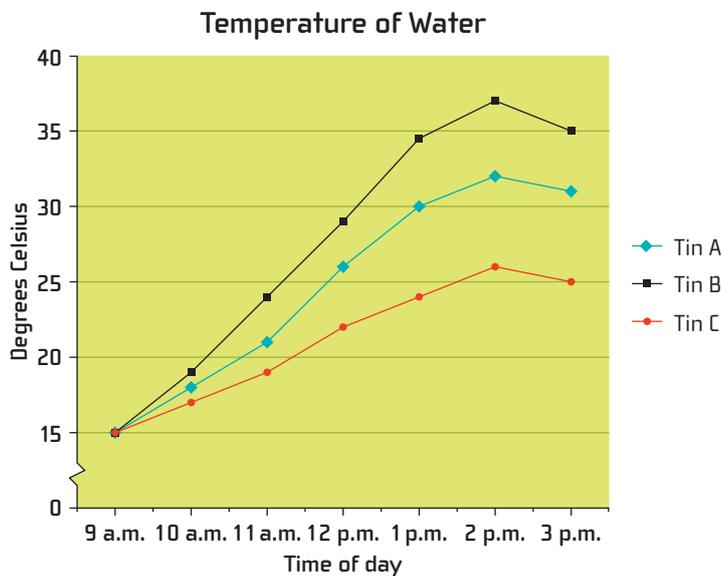


- iv. Use a line graph to display the temperature data for each tin. (You will need to use this information at the end of Activity Two.)
- v. Discuss what your graph shows.

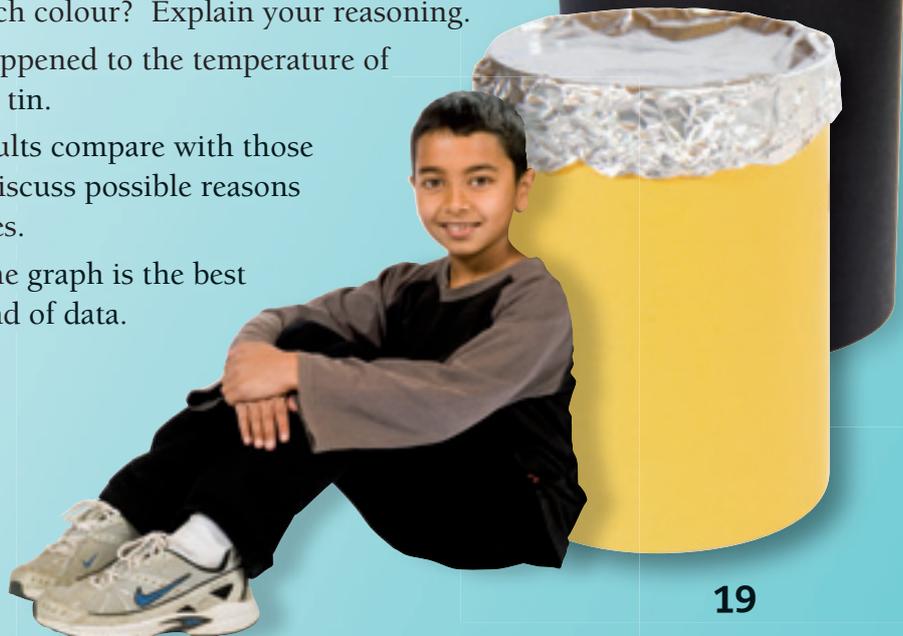
Activity Two

1. Discuss:
 - a. What would happen to the temperature of the water if the day clouded over?
 - b. How would air temperature affect the temperature of the water?
2. Here are one group's results:

Time of day	Degrees Celsius		
	Tin A	Tin B	Tin C
9 a.m.	15	15	15
10 a.m.	18	19	17
11 a.m.	21	24	19
12 p.m.	26	29	22
1 p.m.	30	34.5	24
2 p.m.	32	37	26
3 p.m.	31	35	25



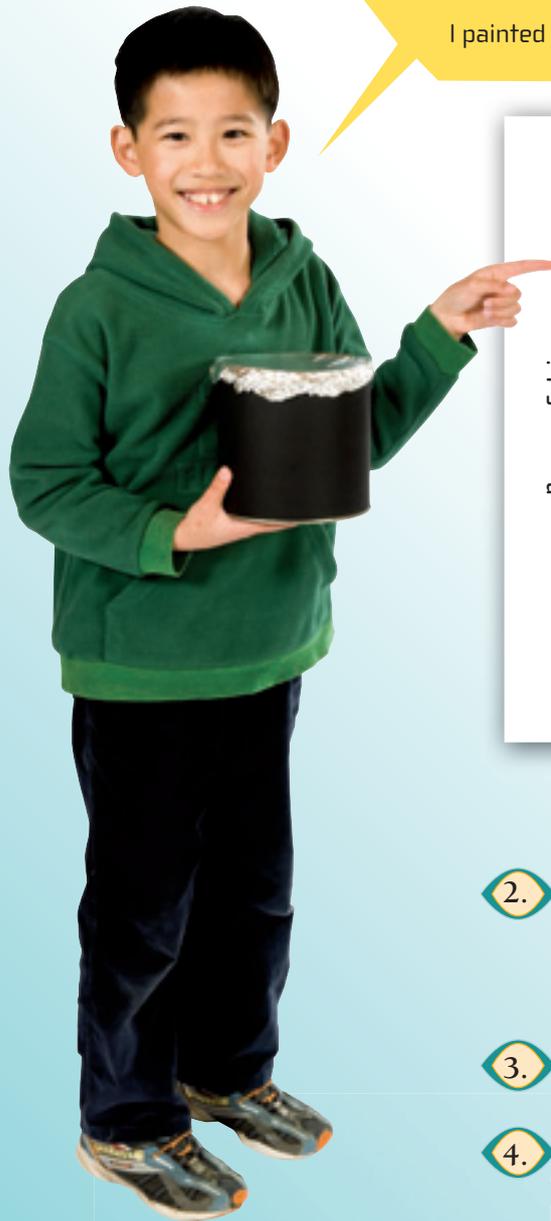
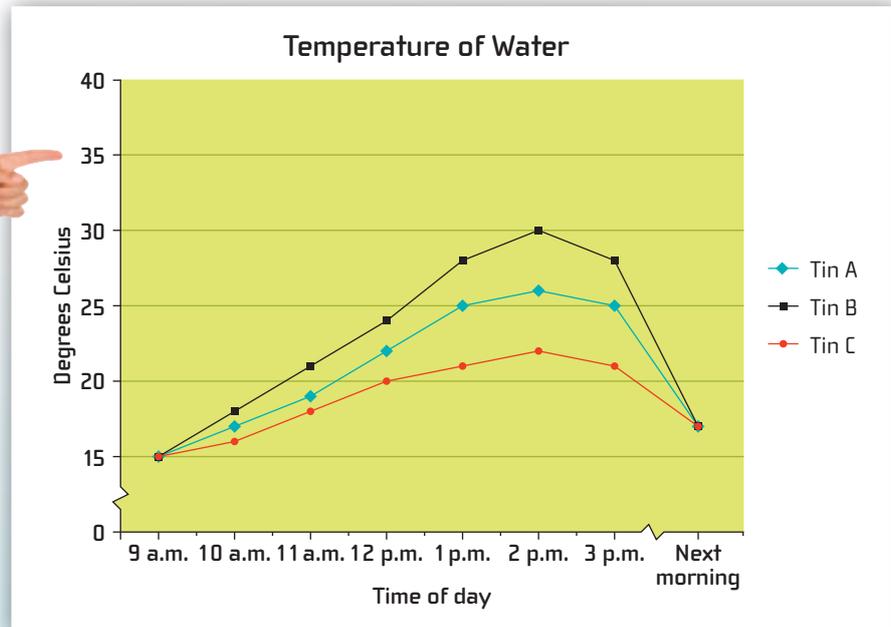
- a. Which tin is which colour? Explain your reasoning.
- b. Describe what happened to the temperature of the water in each tin.
- c. How do your results compare with those shown above? Discuss possible reasons for any differences.
- d. Explain why a line graph is the best graph for this kind of data.



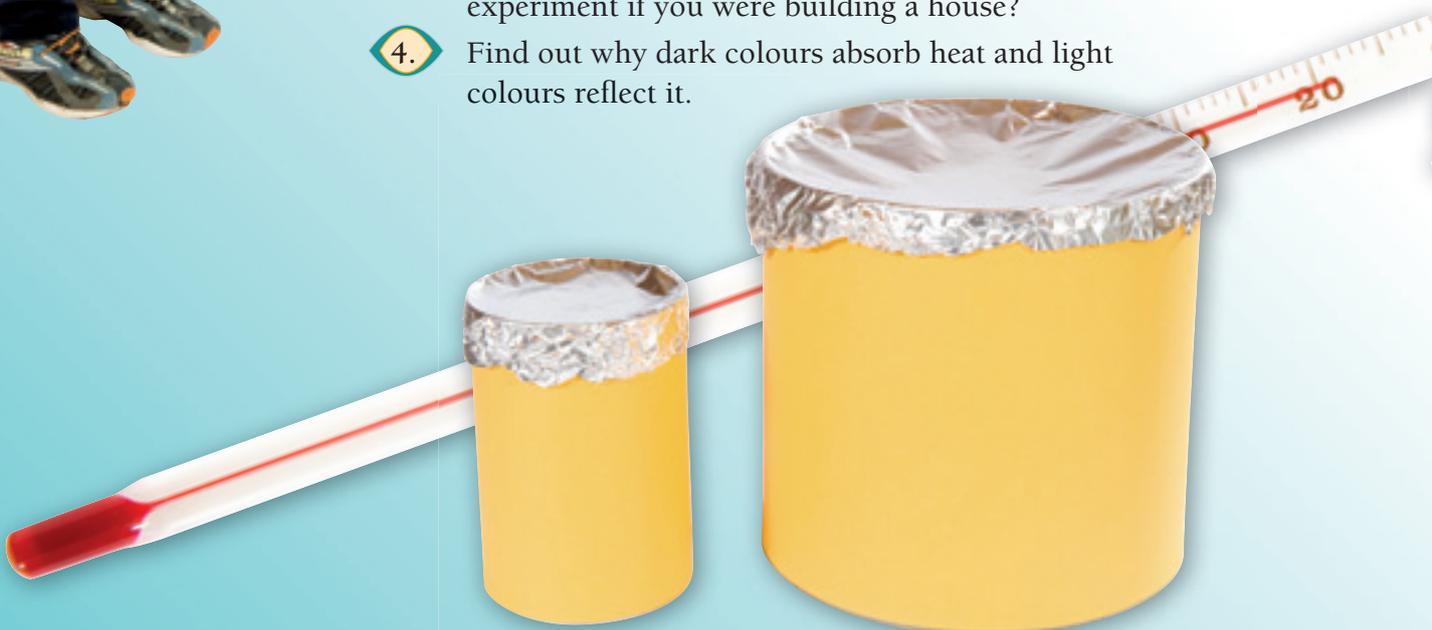
Activity Three

1. Chichang repeated the experiment at home, but this time he used catering tins. He also recorded the temperature of the water the next morning.

I painted the tins to match the colours we used at school. Here's my graph!



- a. What happened to the temperature overnight?
 - b. What else does Chichang's graph tell you?
2. a. Repeat Chichang's experiment with 3 large tins. Graph your results.
b. Compare your results with those in Chichang's graph. What similarities and differences do you see?
 3. How could you make use of the findings from this experiment if you were building a house?
 4. Find out why dark colours absorb heat and light colours reflect it.



Focus

Collecting and comparing data and interpreting graphs