



Cool colours

Sometimes we choose colours for buildings without considering how they might affect the temperature of rooms inside. It can be useful to understand which colours absorb more heat from the sun and which colours absorb less.

Try this scientific investigation.

You will need:

- three identical 1.5 or 2 litre clear, plastic bottles with screw-on lids
- black, white and red paint
- 3 thermometers
- plasticine or play dough.

Method

1. Paint the outside of each plastic bottle. Paint one using black paint, one using white paint and one using red paint. Leave the neck of each bottle unpainted. Alternatively, you might swirl a thin layer of coloured paint around the inside of the bottles leaving enough time for the paint to dry thoroughly.
2. Make a hole in each of the lids large enough to insert the thermometer. (Ask your teacher to help with this!)
3. Put the lids on the bottles. Insert a thermometer in each bottle so that it is suspended about halfway down.
4. Use the plasticine to secure the thermometer and seal any gaps.
5. Place the 3 bottles directly in the sun.
6. Summarise your data using in a table. (see below for example)

Observe the temperature in each bottle every two minutes for twenty minutes.

Predict

What do you think will happen to the temperature in each bottle? Of the three colours, which bottle will be hottest inside? Which bottle will be coolest inside?



Results

When working scientifically it is important to record your results carefully. Use the table below to do this.

Record the temperature readings in the table below.

Time (minutes)	Temperature inside the white bottle (°C)	Temperature inside the red bottle (°C)	Temperature inside the black bottle (°C)
After 2 min			
After 4 min			
After 6 min			
After 8 min			
After 10 min			
After 12 min			
After 14 min			
After 16 min			
After 18 min			
After 20 min			

Now you have results, a graph will help you to show how the temperature changed in each box. Use the axes below to draw a graph. Label the axes to show the units you are using.

Horizontal axis – time (in minutes)

Vertical axis – temperature (in degrees Celsius)

Discussion

Were there any differences in the data collected for the temperature inside each bottle?

Conclusion

How did colour influence the temperature inside each bottle?

Reflect

Think about the process you used. Was the test fair? Why?
