

## Roofing – colour and reflectivity

Colours and reflection can change conditions inside a space. When making choices about the roof of a building it can be useful to understand which surfaces reflect heat and which surfaces absorb heat.

Try this scientific investigation.

You will need:

- two identical boxes with lids/roof (copy paper boxes are ideal)
- a length of cooking foil – enough to cover the outside of the lid/roof of one of the boxes
- black paint for the outside of the lid/roof of the other box
- plasticine or play dough
- two thermometers.

The boxes are a model of a room and the lids are the roof. You will test to see whether a shiny (reflective) roof or a black roof changes the temperature inside a box.

Remember your test must be fair!

### Method

1. Make a small hole in each box big enough to insert a thermometer.
2. Suspend a thermometer in each box and cover the hole with plasticine
3. Seal any gaps.
4. Place both boxes in the sun.
5. Record the temperature every 2 minutes for the next 20 minutes.
6. Record your findings in a table. (see below for example).

### Predict

Do you think the temperature in each box will remain the same? In which box will the temperature become higher?

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## Results

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

Time (minutes)	Temperature inside the box with the foil covered lid (°C)	Temperature inside the box with the black lid (°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 each box/room?

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## Conclusion

How did a reflective surface on the roof/lid change room temperature when the box/room was heated by the sun?

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What do you think happened to the energy provided by the sun?

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## Reflect

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

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