

B5: HEAT ENERGY BY RADIATION

Overview

Radiation is energy that originates in space. Our star, the **Sun**, is the **source** of this radiation energy on Earth. This energy is in the form of waves called **electromagnetic waves** such as **visible light, ultraviolet, X-rays, radio waves, gamma radiation, infrared radiation, or microwaves.** These activities concentrate on one form of radiant energy, namely infrared radiation in the form of **heat energy.** In **B5 ACTIVITY 1 (I): WHAT COLOUR SURFACES ABSORB HEAT?** students compare two different colours to see which absorbs the most heat. In **B5 ACTIVITY 2: WHAT TYPES OF SURFACES ABSORB HEAT?** two different surfaces are tested to see which absorbs the most heat. The heat source is an infrared (IR) bulb. Using the more sensitive digital thermometers or temperature sensors instead of the conventional liquid-in-glass thermometers allows for precise temperature readings.

In **B5 ACTIVITY 3: SOLAR HOUSE HEATING** students investigate the role played by glass in heat increase, and see how black card can transform visible light to heat (infrared radiation).

Suggested approaches:

- Start with a short brainstorm to ascertain what the students know about radiation as a form of heat transference.
 - ② *How do we receive heat energy from the Sun?*
 - ② *Does the nature or colour of the radiation surface play a part?*
- As the students carry out the two activities **B5 ACTIVITY 1 (I): WHAT COLOUR SURFACES ABSORB HEAT?** and **B5 ACTIVITY 2: WHAT TYPES OF SURFACES ABSORB HEAT?**, they could draw flow charts or posters to indicate the pathways involved. Using some cans with smooth exteriors alongside those with ridges, whilst keeping the same colour ranges, would demonstrate an interesting contrast.
- Another possible investigation would be to see if using different materials as covers (instead of paper) for the cans affected the outcome.
- As a follow-up exercise, students could research the role played by both surface texture and colour in buildings.