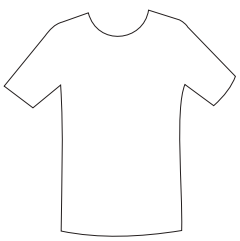
NAME: ..... DATE: .....

CLASS: ..... MARKS 10

Heat and Temperature

1. A group of boy scouts were planning an overnight hiking trip in a tropical rainforest. The scout leader wanted to order T-shirts for the group so that all of them would be dressed uniformly during the hike. He had to decide which of the two T-shirts to order for his group.



white cotton T-shirt

black cotton T-shirt

(a) Which T-shirt would be a better choice for use during the day? Explain why. [2m]

(b) Which T-shirt would be a better choice for use during the night under the moonlight? Explain why. [2m]

(c) Why is cotton a good choice of material for a T-shirt? [1m]

(d) The day for the hike finally arrived. It was a cloudy day without any sunshine. However, the scouts still perspired during their hike. What caused them to perspire? [2m]

That night, the scouts decided to build a campfire.

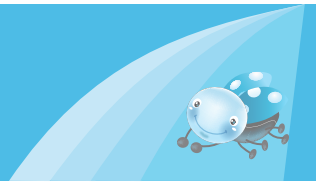
(e) What natural fuel source did they use to build the campfire? [1m]

(f) What forms of energy did the campfire provide? [1m]

(g) Although the scouts were sitting a distance away from the campfire, they could still feel the warmth of the fire. How did the heat from the fire reach the scouts? [1m]

Answers to

Heat and Temperature



1. (a) The white cotton T-shirt would be a better choice for use during the day. White materials reflect heat away, so the wearer will not feel so hot while walking under the hot sun.
   (b) The white cotton T-shirt would be a better choice for use during the night. At night, the white T-shirt will be able to reflect the light shone by the moon, making it easier to spot the wearer.
   (c) Cotton is light and airy, so the wearer will feel cool in it. It is also able to absorb perspiration well.
   (d) Although there was no sunlight to provide more heat, the scouts still perspired because their bodies absorbed the heat that was already present in the atmosphere. Perspiring is nature's way of helping their bodies to cool down. (*Note: They would perspire more profusely if it was sunny.*)
   (e) They used wood.
   (f) The campfire provided heat and light energy.
   (g) The heat from the campfire heated up the surrounding air. The heat energy passed through the air until it reached the scouts. (*Note: Details of convection currents are not needed in this answer.*)