

15 The skin, and temperature control - answers

- 1 (a) Our skin protects us against bacteria (A) and ultraviolet light (B).
(b) Our skin helps to control body temperature (C) and evaporation of water (D).
- 2 The two main layers of the skin are the epidermis and dermis.
- 3 (a) The basal (Malpighian) layer produces new skin cells and the pigment, melanin, which protects against ultraviolet light.
(b) The cornified layer reduces evaporation from the skin and resists entry of bacteria.
- 4 In the dermis you would expect to find sensory nerve endings, nerve fibres, capillaries, arterioles and venules, sweat glands and ducts, sebaceous glands and hair follicles.
- 5 The extremities of the body (hands and fingers, feet and toes, ears and nose) are likely to be the coldest parts. The internal organs (particularly the brain and active muscles) are likely to be the warmest parts.
- 6 The approximate range of normal body temperature is 36-38 °C.
- 7 The body loses heat by conduction, convection, radiation and evaporation (from skin and lungs).
- 8 (a) Respiration in the tissues, particularly in the brain and active muscles, is the main internal source of body heat.
(b) Direct sunlight, a hot environment and hot food and drink are external sources of body heat.
- 9 (a) Vaso-constriction is the reduction in diameter of small arterioles and capillaries.
(b) Vaso-constriction in the skin makes the skin look paler and reduces heat loss.
- 10 Respiration in the spasmodically contracting muscles produces heat.
- 11 (a) Vaso-dilation is an increase in diameter of small arterioles and capillaries.
(b) Vaso-dilation makes the skin go more pink and increases heat loss.
- 12 For sweat to have a cooling effect, it must evaporate. In doing this it takes heat from the body.
- 13 Hypothermia is a lowering of the 'core' temperature of the body to below 35°C.
- 14 Eating well before going out and wearing warm, wind-proof clothing can reduce the chances of hypothermia.

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1 From the list below, select the most appropriate words or phrases to complete the following sentences.

(a) Our skin protects us against(A)and(B).....

(b) Our skin helps to control (C) and(D)

touch and pressure, ultraviolet light, bacteria, evaporation of water, heat from the sun, body temperature.

2 Name the two main layers of the skin.

3 What are the main functions of (a) the basal (Malpighian) layer, (b) the cornified layer of the skin?

4 Make a list of the structures you would expect to find in the dermis.

5 What are likely to be (a) the coldest, (b) the warmest parts of the body?

6 What, approximately, is the normal range of body temperature?

7 List the ways in which the body might lose heat.

8 What (a) internal, (b) external events contribute to gain of heat in the body?

9 (a) What is 'vaso-constriction'?

(b) What are the effects of vaso-constriction in the skin?

10 Why should shivering contribute to heat gain in the body?

11 (a) What is meant by 'vaso-dilation'?

(b) What are the effects of vaso-dilation in the skin?

12 Sweating, by itself, will not cool the body. What has to happen to sweat if it is to have a cooling effect?

13 What do you understand by the term hypothermia?

14 Name two ways in which the chances of hypothermia can be reduced during outdoor activities.