

## **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.