

Biology only - KS4

Homeostasis and Response

Regulating Body Temperature

Downloadable Resource

Miss Ray

Exam style question

Humans maintain a stable body temperature of 37°C.

Describe the role of arterioles in this. [4]

If the temperature of the body decreases, the arterioles supplying blood to the _____ will _____. This reduces the blood flow to the skin and _____ heat loss via _____.

If the temperature of the body increases, the arterioles supplying blood to the skin will _____. This _____ blood flow to the skin and increases _____ via radiation.



Exam style question

Humans maintain a stable body temperature of 37°C.

Describe the role of arterioles in this. [4]

If the temperature of the body decreases, the arterioles supplying blood to the skin will constrict. This reduces the blood flow to the skin and reduces heat loss via radiation.

If the temperature of the body increases, the arterioles supplying blood to the skin will dilate. This increases blood flow to the skin and increases heat loss via radiation.



Complete the table, selecting the correct answer

Temperature	Arterioles	Sweat glands	Skin hairs
Too hot	dilate/constrict	releasing sweat/stop sweating	flat/erect
Too cold	dilate/constrict	releasing sweat/stop sweating	flat/erect



Complete the table, selecting the correct answer

Temperature	Arterioles	Sweat glands	Skin hairs
Too hot	dilate	release sweat	flat
Too cold	constrict	stop sweating	erect





1. Why is it important that our body temperature does not rise too far above 37°C?
2. Which part of the brain controls temperature regulation?
3. Describe two ways the body can cool itself down and two ways it can keep itself warm.





1. Why is it important that our body temperature does not rise too far above 37°C?

To prevent enzymes becoming denatured

2. Which part of the brain controls temperature regulation?

Thermoregulatory centre

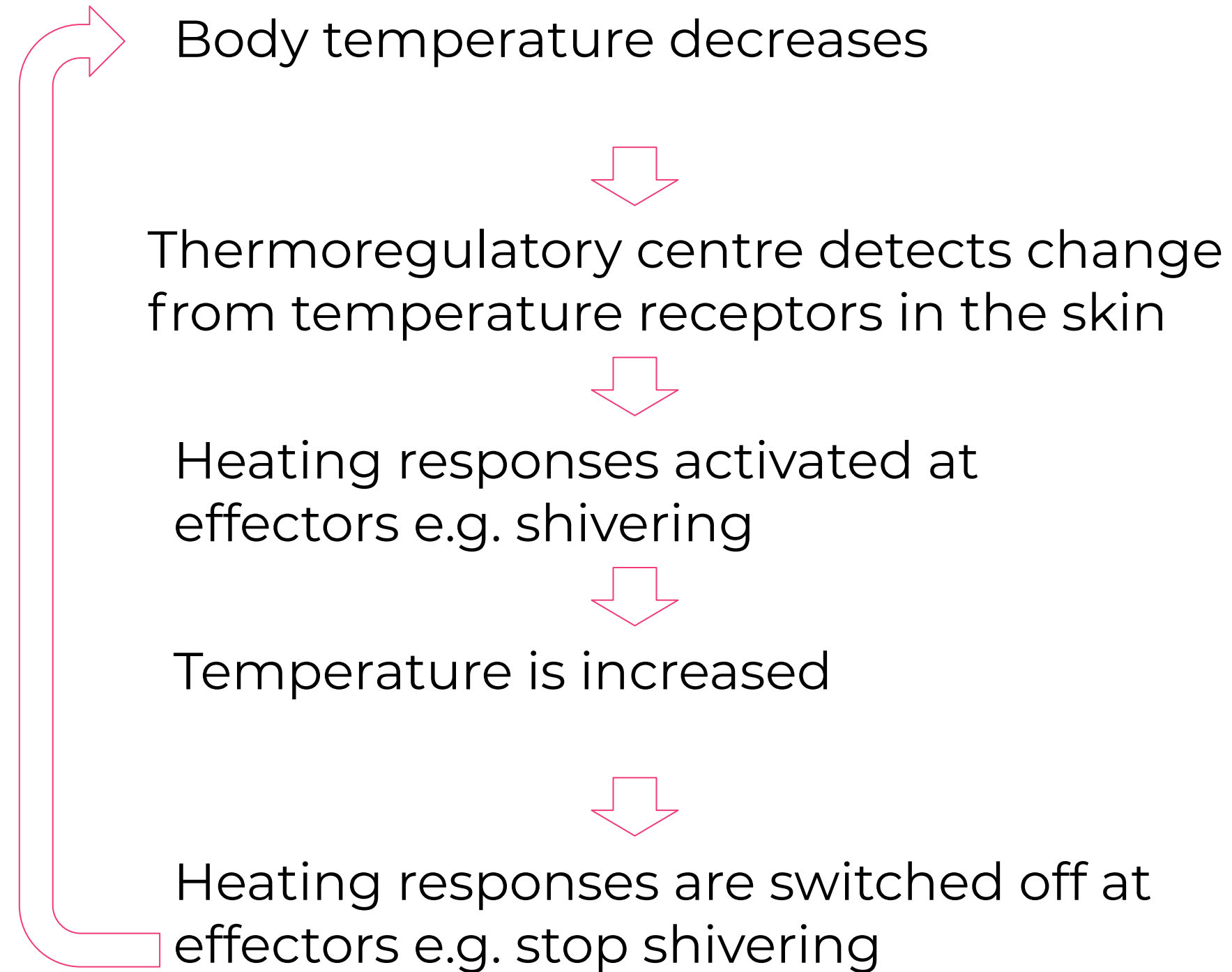
3. Describe two ways the body can cool itself down and two ways it can keep itself warm.

Cool - vasodilation, flat hairs, sweating

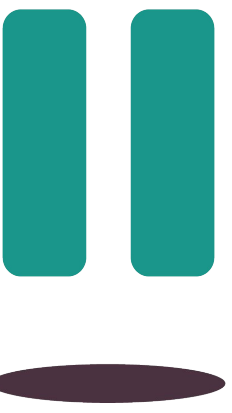
Warm - vasoconstriction, erect hairs, stop sweating, shivering



Describe the mechanisms the body puts in place to return internal body temperatures to 37°C if the temperature receptors in the skin detect a decrease in temperature. [4]



Describe the mechanisms the body puts in place to return internal body temperatures to 37°C if the temperature receptors in the skin detect a decrease in temperature. [4]



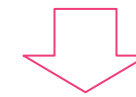
The **thermoregulatory centre** receives an **electrical impulse** from the temperature receptors in the skin.

The **thermoregulatory centre** activates the heating **effectors**.

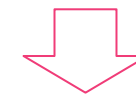
List any of the following:

- The **sweat glands stop** producing **sweat**;
- the **muscles contract rapidly** to release heat from **respiration**;
- **erector muscles** in the skin **contract** to raise the hairs on the skin to trap an **insulating layer of air**;
- **Vasoconstriction** of the **arterioles** to reduce heat loss by **radiation**.

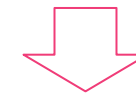
Body temperature decreases



Thermoregulatory centre detects change from temperature receptors in the skin



Heating responses activated at effectors e.g. shivering



Temperature is increased



Heating responses are switched off at effectors e.g. stop shivering

