

GCSE Biology

Worksheet: Control of body temperature

TIME 35 min	TOTAL 31 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Control of body temperature

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

Body temperature is monitored and controlled by the thermoregulatory centre.

0 1 . 1

Where in the body is the thermoregulatory centre?

.....

.....

.....

.....

[1 mark]

0 1 . 2

When the body is too cold, what happens to the blood vessels supplying the skin capillaries?

Tick (✓) **one** box.

They dilate (widen)

☐

They constrict (narrow)

☐

They stay exactly the same width

☐

They disappear temporarily

☐

[1 mark]

0 1 . 3

Name the two places in the body that contain temperature receptors providing information to the thermoregulatory centre.

.....

.....

.....

.....

[2 marks]

0 2

Body temperature is monitored and controlled by the thermoregulatory centre.

0 2 . 1

Where is the thermoregulatory centre?

Tick (✓) **one** box.

Brain

☐

Heart

☐

Liver

☐

Skin

☐

[1 mark]

0 2 . 2

The thermoregulatory centre contains receptors.
What are these receptors sensitive to?

.....

.....

[1 mark]

0 2 . 3

Which organ also contains temperature receptors that send impulses to the thermoregulatory centre?

.....

.....

.....

.....
[1 mark]

0 2 . 4

Give **two** ways the body responds when body temperature is too low.

[2 marks]

0 3

A person falls into cold water and their body temperature starts to fall.

0 3 . 1

Explain how shivering helps to raise body temperature.

[2 marks]

0 3 . 2

Explain how vasoconstriction reduces the transfer of energy from the body.

[3 marks]

0 3 . 3

The person's skin looked pale.
Suggest why.

[1 mark]

0 4

Table 1 shows the volume of blood flowing through a person’s skin per minute at different environmental temperatures.

Table 1

Environmental temperature in °C	5	15	25	35
Blood flow through the skin in cm ³ per minute	150	280	420	900

0 4 . 1

Describe the trend shown in Table 1.

.....

.....

[1 mark]

0 4 . 2

Calculate how many times greater the blood flow through the skin was at 35 °C than at 5 °C.

.....

.....

.....

.....

Number of times =

[2 marks]

0 4 . 3

Explain why blood flow through the skin increases as the environmental temperature rises.

.....

.....

.....

.....

[2 marks]

.....

0 5

On a hot day, a person's body temperature starts to rise.

0 5 . 1

Explain how sweating helps to lower body temperature.

[2 marks]

0 5 . 2

Explain how vasodilation helps to lower body temperature.

[3 marks]

0 5 . 3

Suggest why sweating cools the body less well when the air is very humid.

[1 mark]

0 6

Newborn babies, especially those born prematurely, lose body heat much more quickly than adults. They have a large surface area compared with their body mass, and only a thin layer of fat under their skin. Premature babies are often cared for in an incubator, which keeps the surrounding air warm.

0 6 . 1

Explain why newborn babies lose body heat more quickly than adults.

.....

.....

.....

.....

[2 marks]

0 6 . 2

Explain why keeping a premature baby in a warm incubator helps to keep their body temperature within a safe range.

.....

.....

.....

.....

[2 marks]

0 6 . 3

Suggest why it would be dangerous for a premature baby's body temperature to fall too low.

.....

.....

[1 mark]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Biology · Worksheet: Control of body temperature · 31 marks

Question 1 (4 marks)

01.1 [1 mark]

Answer: In the brain

- (in the) brain (1)
-

01.2 [1 mark]

Correct: They constrict (narrow)

01.3 [2 marks]

- the thermoregulatory centre / the brain (its receptors are sensitive to the temperature of the blood) (1)
 - the skin (1)
-

Question 2 (5 marks)

02.1 [1 mark]

Correct: Brain

02.2 [1 mark]

- the temperature of the blood (1)
-

02.3 [1 mark]

Answer: Skin

- skin (1)
-

02.4 [2 marks]

- shivering / skeletal muscles contract (1)
- blood vessels supplying the skin capillaries constrict (vasoconstriction) (1)
- sweating stops (1)

Any 2 of the points above.

Question 3 (6 marks)

03.1 [2 marks]

- skeletal muscles contract (rapidly) (1)
- (so) more respiration takes place, transferring energy that warms the body (1)

03.2 [3 marks]

- blood vessels supplying the skin capillaries constrict / narrow (1)
- less blood flows near the surface of the skin (1)
- (so) less energy is transferred from the blood / skin to the environment (1)

Notes: Do not accept 'capillaries constrict' or 'capillaries move'.

03.3 [1 mark]

- less blood was flowing through the skin (because of vasoconstriction) (1)

Question 4 (5 marks)

04.1 [1 mark]

- as environmental temperature increases, blood flow through the skin increases (1)

04.2 [2 marks]

Answer: 6 times

- $900 \div 150$ (1)
- 6 (times) (1)

04.3 [2 marks]

- vasodilation: blood vessels supplying the skin capillaries widen (1)
 - more blood flows near the surface of the skin, transferring more energy to the environment to prevent the body overheating (1)
-

Question 5 (6 marks)

05.1 [2 marks]

- sweat (water) evaporates from the skin (1)
- (evaporation) transfers energy from the skin to the environment (1)

05.2 [3 marks]

- blood vessels supplying the skin capillaries dilate / widen (1)
- more blood flows near the surface of the skin (1)
- (so) more energy is transferred from the skin to the environment (1)

Notes: Do not accept 'capillaries dilate' or 'capillaries move closer to the surface'.

05.3 [1 mark]

- less sweat evaporates because the air already contains a lot of water vapour (1)

Question 6 (5 marks)

06.1 [2 marks]

- they have a large surface area relative to their body mass, so heat is lost more quickly relative to the amount of heat their body produces (1)
- a thin layer of fat provides less insulation, so less heat is retained (1)

06.2 [2 marks]

- a warm environment reduces the temperature difference between the baby's skin and the surroundings (1)
- less energy is transferred from the baby's body to the surroundings, reducing the baby's own need to generate heat, which a very young baby cannot do effectively by shivering (1)

06.3 [1 mark]

- enzymes and other metabolic reactions work more slowly at low temperatures, which could harm the baby's development or vital functions (1)
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