

Name Class Date

The demands of a control system

Specification references

- B5.1 Importance of homeostasis

Aims

Many organisms are very complex and have to react in sophisticated ways to their environment in order to survive. This exercise will ensure that you understand the basics of control systems in organisms.

Learning outcomes

After completing this worksheet, you should be able to:

- define the terms control system, receptor, and stimulus co-ordination centre
- give examples of a control system, receptor, and stimulus co-ordination centre
- link these together in a logical manner.

Task

First ensure that you have read Topic B10.1 *Principles of homeostasis* in your student book.

Read the following passage about a football match.

We were drawn against our big rivals in the cup so everyone was trying hard to play their best. It was a freezing cold day so before the match I was shivering and had goose bumps but I soon warmed up. I was marking a particularly fast player so I had a lot of running to do and by ten minutes in I was sweating!

We held them for the first half but it was tough and by half time we were really thirsty. Luckily we had loads of drinks handy. In the second half I heard by mate shout "Man on!" and turned around just in time to see one of their players coming to do a dangerous tackle on me. I managed to get out of the way but it made my heart thump!

We scored in the last minute! As we were celebrating and heading back into the changing rooms I could smell the pies they were cooking in the canteen. It made my mouth water as I hadn't eaten before the game. After we had changed we got stuck into them – they were delicious!

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Questions

1 a i Looking through the passage, identify which senses the player was using to detect changes in the external environment.

- 1
- 2
- 3
- 4
- 5

(5 marks)

ii For each sense identified in part i, give an example from the passage of when it was used to detect something about the external environment of the player.

- 1
- 2
- 3
- 4
- 5

(5 marks)

b i What changes in the internal environment (inside the body) were detected?

- 1
- 2
- 3

(3 marks)

ii How did the player's body react to these internal changes?

- 1
- 2
- 3

(3 marks)

AQA Biology

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Use the following words to answer Questions 2 to 6.

gland	hormone	receptors	spine	muscles
nervous	homeostasis	stimuli	brain	

- 2 a Which word refers to cells which detect changes in the environment?
..... (1 mark)
- b Which word refers to the actual changes in the environment?
..... (1 mark)
- 3 a When the player was nearly tackled badly, he reacted really fast. Which co-ordination centre allows us to react fast to danger without thinking about it?
..... (1 mark)
- b When he was in danger, his body put out adrenalin which made his heart go faster. What sort of substance is adrenaline?
..... (1 mark)
- c What type of effector produces adrenaline?
..... (1 mark)
- d What type of effector made him able to get out of the way?
..... (1 mark)
- 4 Which system connects the receptors, the co-ordination centres and the effectors?
..... (1 mark)
- 5 Which word means keeping the body environment at optimum (best) levels?
..... (1 mark)
- 6 Which co-ordination centre does the thinking?
..... (1 mark)