

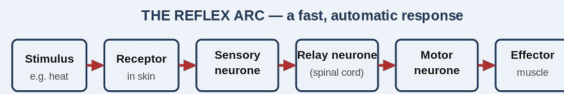
2.10 Co-ordination & Response

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1. KEY VOCABULARY

| TERM | MEANING |
|-------------|--------------------------------------------------|
| Stimulus | A change in the environment that is detected. |
| Receptor | A cell or organ that detects a stimulus. |
| Effector | A muscle or gland that carries out the response. |
| Synapse | A gap between two neurones. |
| Hormone | A chemical messenger carried in the blood. |
| Homeostasis | Keeping a constant internal environment. |

2. THE REFLEX ARC



... Response: the muscle contracts (e.g. you pull your hand away)

Reflexes are automatic and do not involve the conscious brain — that is why they are fast.
Neurones meet at gaps called synapses; the signal crosses as chemicals (neurotransmitters).

3. NERVES vs HORMONES

| | NERVOUS | HORMONAL |
|--------|--------------------|-------------------|
| Signal | Electrical impulse | Chemical in blood |
| Speed | Very fast | Slower |
| Lasts | Short time | Longer |

4. HOMEOSTASIS

Keeping internal conditions constant, e.g.:

Body temperature: sweating and vasodilation cool you down; shivering warms you up.

Blood glucose: insulin lowers it; glucagon raises it.

5. RESPONSE IN PLANTS — TROPISMS

Phototropism: shoots grow TOWARDS light (positive).

Gravitropism: roots grow TOWARDS gravity (positive), shoots grow away from it.

Plant responses are controlled by hormones such as auxin.

6. THE WHY

Why reflexes bypass the conscious brain: going straight through the spinal cord makes the response very fast — important for protecting the body from harm.

Why phototropism is useful: growing towards light lets the plant photosynthesise as much as possible.

7. COMMON EXAM MISTAKES

- X "Reflexes are controlled by the brain."
- ✓ Reflexes go through the spinal cord — not the conscious brain.
- X "Hormones travel along nerves."
- ✓ Hormones travel in the blood; nerve impulses travel along neurones.
- X "Insulin raises blood glucose."
- ✓ Insulin LOWERS blood glucose; glucagon raises it.

8. SELF-CHECK · cover & quiz

Can you...

1. Put the stages of a reflex arc in order?
2. Compare nervous and hormonal coordination?
3. Define homeostasis and give two examples?
4. Explain how body temperature and blood glucose are controlled?
5. Define phototropism and gravitropism?
6. Explain why reflexes do not involve the conscious brain?