

Solutions

Each answer shows the steps, then the **result**.

2.1

- a chemical made by a **gland**
- carried in the blood, changing the activity of a **target organ**

2.2

- adrenaline is released by the **adrenal gland**

3.1 B

- hormonal control is **slower and longer-lasting**
- A and D are nervous; C is how nerves travel

3.2

(a)

- any **two** of: increases heart rate / increases breathing rate / raises blood glucose / widens pupils

(b)

- a hormone travels **in the blood**

3.3

(a)

- a hormone is a chemical messenger carried in the **blood** to target organs
- it is made by an **endocrine** (ductless) gland

(b)

- the **adrenal glands**, just above the kidneys
- any **three** of: heart and breathing rate increase / pupils widen / blood diverted to muscles / glycogen → glucose

(c)

- faster heart and breathing deliver more **oxygen and glucose** to muscles
- wider pupils let in **more light**
- more blood and glucose mean more **energy** for running or fighting

(d)

- nervous: **electrical impulses along neurones**; hormonal: **chemicals in the blood**
- nervous is **very fast**; hormonal is **slower**
- nervous effects are **short-lived**; hormonal last **much longer**