

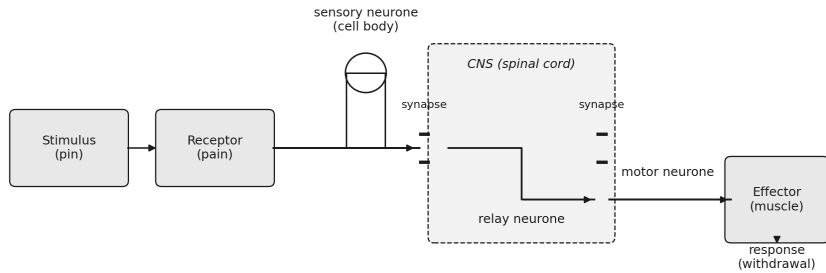
Exercise walk-through

5.2

The brain, eye and temperature – biology only (4.5.2.2–4.5.2.4)

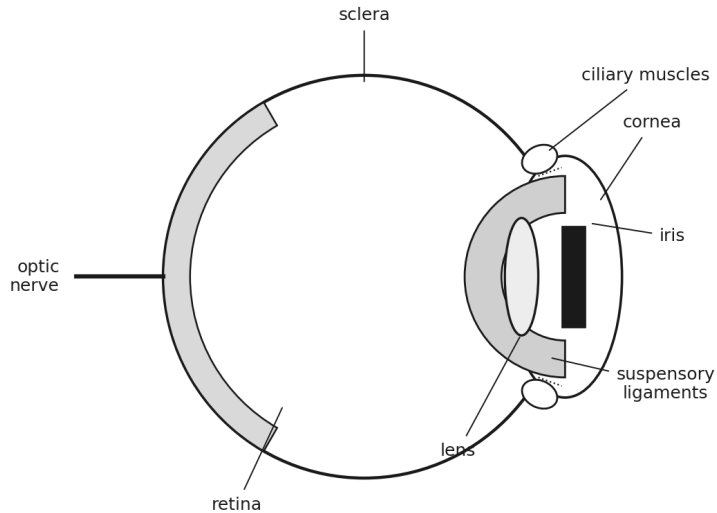
AQA · GCSE · Biology

The reflex arc



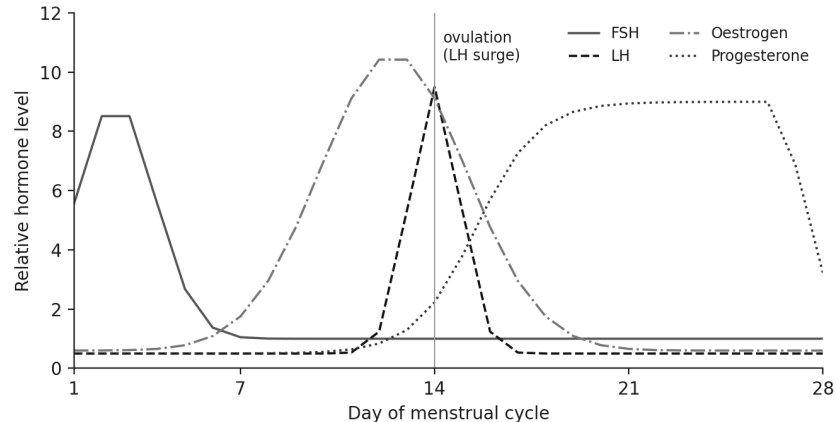
- Automatic and rapid — no conscious brain involved.
- Sensory neurone, synapse, relay neurone, motor neurone.
- At a synapse a chemical diffuses across the gap.

The eye and accommodation



- Named parts: retina, optic nerve, sclera, cornea, iris, ciliary muscles, suspensory ligaments.
- Near: ciliary muscles contract, ligaments loosen, lens thick.
- Distant: muscles relax, ligaments tight, lens thin.

The menstrual cycle



- FSH matures the egg; LH surge releases it — ovulation, about day 14.
- Oestrogen builds the lining; progesterone maintains it.
- (HT) read the four-hormone graph.

Exercises 2.1·2.3

2.1 Name the brain region controlling balance and the region controlling breathing. [2]

2.2 Copy and complete: to focus on a near object, the ciliary muscles _____, the suspensory ligaments _____, and the lens becomes _____. [3]

2.3 Name the defect in which light focuses in front of the retina, and one way it is treated. [2]

Exercises 2.1·2.3

2.1 Name the brain region controlling balance and the region controlling breathing. [2]

2.1 Cerebellum; medulla.

2.2 Copy and complete: to focus on a near object, the ciliary muscles _____, the suspensory ligaments _____, and the lens becomes _____. [3]

2.2 Contract; loosen/slacken; thicker.

2.3 Name the defect in which light focuses in front of the retina, and one way it is treated. [2]

2.3 Myopia/short sight; concave spectacle/contact lens (or laser surgery to reshape the cornea, replacement lens).

Exercises 3.1·3.2

3.1 Explain how the eye responds to dim light and why this is a reflex. [4]

3.2 (*HT*) A person moves from looking at a distant hill to reading a book. Explain the changes in the eye that focus the book, and compare them with a person with hyperopia reading the same book. [5]

Exercises 3.1·3.2

3.1 Explain how the eye responds to dim light and why this is a reflex. [4]

3.1 In dim light the radial muscles of the iris contract, so the pupil dilates/widens; more light enters the eye and reaches the retina's receptors; the response is automatic and rapid, not involving the conscious brain.

3.2 (*HT*) A person moves from looking at a distant hill to reading a book. Explain the changes in the eye that focus the book, and compare them with a person with hyperopia reading the same book. [5]

3.2 For near focus the ciliary muscles contract and the suspensory ligaments loosen; the lens becomes thicker and refracts light rays more strongly; this focuses the book's image exactly on the retina. In hyperopia, near objects focus behind the retina because the lens cannot refract enough/eyeball too short; a convex lens adds refraction so the image focuses on the retina.

Exercise 3.3

3.3 (*HT*) Explain two ways the body responds to a fall in body temperature and how each response helps restore normal temperature. [4]

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3.3 Any two, effect + mechanism: vasoconstriction – skin blood vessels narrow so less blood flows near the surface, reducing energy transfer to the environment; shivering – rapid involuntary muscle contractions, and respiration in the muscles transfers energy as heat, warming the blood. Also accept: sweating stops, so no energy is lost by evaporation.