

Solutions

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

2.1

- the retina contains **light receptors** that detect light

2.2

- in bright light the pupil **gets smaller** (narrows)

2.3

- most focusing is done by the **cornea**

2.4

- **radial** muscles contract and **circular** muscles relax
- the pupil becomes **wider**, so more light enters

2.5

- the lens becomes **fatter** / more curved
- so it **refracts the light more**

3.1 C

- the **lens** focuses light onto the retina
- A controls pupil size; B is most of the focusing but not the named part here; D carries impulses

3.2

(a)

- **circular** muscles of the iris contract
- **radial** muscles relax, so the pupil **narrows**

(b)

- **rods**: dim light, no colour
- **cones**: colour vision, work best in bright light

3.3

(a)

- **retina; iris; optic nerve; lens**

(b)

- circular muscles **contract**; radial muscles **relax**
- the pupil becomes **smaller**, so less light enters

(c)

- it **protects the retina** from very bright light

(d)

- the **ciliary muscle relaxes**
- suspensory ligaments are pulled **tight**
- the lens is pulled **thinner**, so it refracts less

(e)

- the lens becomes **fatter** / more curved
- a near object needs the light **refracted more** to focus on the retina