

# Answers to Workbook exercises

## Chapter 13

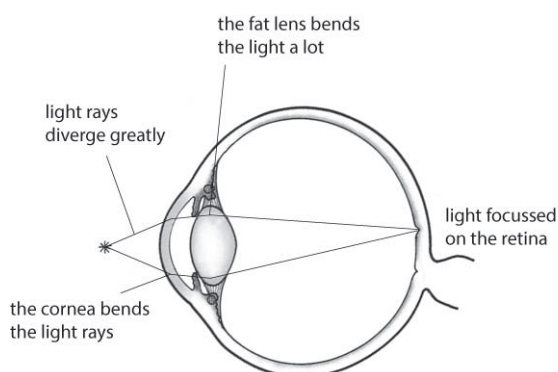
### Exercise 13.1 Caffeine and reaction time

Look for these points being made somewhere in the plan:

- ◆ caffeine intake varied (for example, drinking coffee or cola and drinking water); some students may wish to use a range of caffeine concentrations
- ◆ important variables controlled: volume and concentration of caffeine in the liquid drunk; time between drinking and doing the reaction time test; time of day; age and sex of person; what the person has done just before the test is carried out; how many times the person has done a reaction time test before (in practice, it is impossible to control all of these variables)
- ◆ reaction time measured, using a stated method (for example, using a test on the Internet, or catching a dropped ruler)
- ◆ repeats done (probably using different people, as any one person will improve as they do more tests, up to a limit)
- ◆ outline results chart drawn, and sketch graph showing predicted results if the hypothesis is correct.

### Exercise 13.2 Accommodation in the eye

a



- b The ciliary muscles contract, which narrows the diameter of the circle of muscles. This loosens the tension on the **suspensory ligaments**, which allows the **lens** to revert to its natural, rounded shape. The **lens** now refracts light rays more strongly, bringing the diverging rays from the nearby object to a focus on the retina.
- c
  - i A fast, automatic response to a stimulus.
  - ii A blurred image on the retina.
- d They are less able to focus on objects at different distances. They may be able to see clearly at a particular distance, but vision will be blurred at other distances.

### Exercise 13.3 Auxin and tropism

- a A response in which part of a plant grows away from the direction in which it is pulled by gravity.
- b
  - i Look for:
    - ◆ 'time / minutes' on the  $x$ -axis
    - ◆ 'percentage increase in length' on the  $y$ -axis
    - ◆ suitable scales on both axes
    - ◆ accurately plotted points using small crosses or encircled dots
    - ◆ neat best-fit lines
    - ◆ a key or labels to identify the two lines.
  - ii There was more auxin on the lower surface than on the upper surface. This made the cells on the lower surface get longer than those on the upper surface, so the shoot curved upwards.