Pages 92–93

1 a

Source of information	Evidence
An experiment you carried out at school.	✓
What your Granny thinks.	
What your teacher thinks.	
The results of a survey published in a scientific journal.	✓
A TV interview with a famous scientist about an experiment she has been doing.	
Something written in your science textbook.	✓

(1) each

b i Independent variable – the amount of light given to a plant *(1)*

Dependent variable – a measurement of the height of the plant/thickness of stem/number of leaves *(1)*

ii Independent variable – the material the cups are made of *(1)*

Dependent variable – how long it takes for the liquid to reach room temperature/the temperature of the liquid at 1-minute intervals for 10 minutes *(1)*

iii Independent variable – volume of water *(1)*

Dependent variable – height of bean plant *(1)*

Max 9 marks **Maximum 9 marks**

Pages 94–95

2 a So it is possible to compare accurately the energy content of different foods without making allowance for different quantities *(2)*

b Food A *(1)*

c Weigh out the same mass of each food *(1)*

Burn the food under a test tube of water *(1)*

Measure how much the temperature of the water rises as each food is burned *(1)*

Max 6 marks

(1) = 1 mark

3 a Sulphur dioxide *(1)*

b The gas combines with the water vapour in the air *(1)* which then falls as rain that is a weak solution of sulphuric acid *(1)*

c The acid rain falling onto lakes and rivers can change the pH of the water from neutral to acid *(1)* The animals and plants that live in that habitat may not be able to survive in such changed conditions *(1)*

d Alkalis can be added to the water to restore the pH to neutral *(1)*

e Neutralisation *(1)*

Max 7 marks **Maximum 13 marks**

Pages 96–97

4 a Streamlined body position/streamlined clothing *(1 mark each or for anything else sensible)*

b Terminal velocity *(1)*

c Two arrows one representing accelerating force in the direction the car is travelling and one representing the retarding forces of friction and air resistance *(1)* Forward force arrow bigger than retarding force arrow as car is accelerating *(1)*

d **i** 100 miles in 4 hours = 25 *(1)* miles per hour *(1)*

ii No *(1)*

iii The car will have gone faster at some times than at others *(1)* 25 mph is its average speed for the journey *(1)*

Max 10 marks **Maximum 10 marks**

Pages 98–99

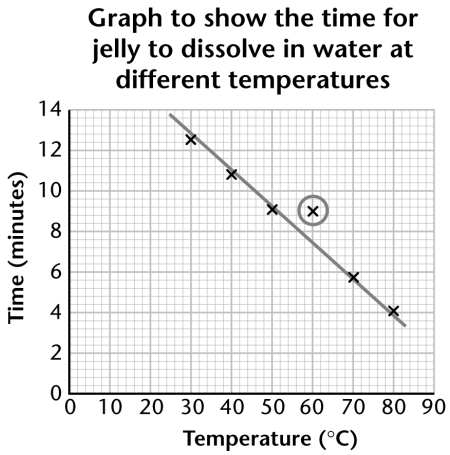
5 a Volume of water/Mass of jelly/Size of jelly cube/Amount of stirring *(1 mark each for 2 correct)*

b i Graph axes correctly labelled and with suitable scales *(2)*

Points plotted correctly *(2)*

Smooth line of best fit ignoring anomalous result *(1)*

ii Circle around the point at 60 °C and 3.3 g *(1)*



c i Because she did not refer to the evidence of her results *(1)*

ii The hotter the water, the more quickly the jelly dissolved *or* The jelly dissolved more quickly if the temperature of the water was higher *(1)*

Max 10 marks **Maximum 10 marks**

Pages 100–101

6 a i The circulatory system *(1)*

ii Oxygen *(1)*

iii Oxygenated blood *(1)*

b No nucleus *(1)* Biconcave shape *(1)*

c i Respiration *(1)*

ii Glucose + oxygen → carbon dioxide + water + ENERGY is released *(1 mark for reactants, 1 for products including energy)*

d The lungs *(1)*

Max 9 marks **Maximum 9 marks**

Pages 102–103

7 a i No *(1)*

ii They did not measure pulse rates before drinking the cola *(1)*

b i No *(1)*

ii Because although in this experiment the girls did have very slightly higher pulse rates, the sample was far too small to make such a general conclusion *(1)*

c Because there are so many variables that it is hard to control *(1)*

Max 5 marks **Maximum 5 marks**

Pages 104–105

8 a A longer handled spanner means the force is being applied at a greater distance from the pivot and so the turning force is increased *(1)*

b Pressure is caused by gas particles colliding with the walls of the tyre, more gas will mean more particles and so more collisions *(1)*

c i Pressure = force ÷ area = 130 ÷ 10 = 13 N/cm^2 *(1)*

ii No *(1)*

iii Because it is lower than the pressure of the gas already in the tyre *(1)*

Max 5 marks **Maximum 5 marks**

Pages 106–107

9 a i The object will become coated with a thin layer of silver and change colour *(1)*

ii The object will not look any different *(1)*

iii Copper is more reactive than silver and so displaces the silver from the silver nitrate solution. Gold is less reactive than silver so there is no displacement reaction *(1)*

Max 3 marks

10 a Hydrogen *(1)*

b Zinc + sulphuric acid → zinc sulphate + hydrogen *(1)*

c Sulphur and oxygen *(1)*

Max 3 marks

11 **a** Because the falcons will have eaten small birds who had themselves eaten mosquitoes *(1)*

b Each small bird would eat a large number of mosquitoes so the poison would build up in their bodies even if it was not enough to kill them *(1)* When the falcons then ate a large number of small birds, all the doses together would be enough to kill the falcons *(1)*

Max 3 marks **Maximum 9 marks**

Pages 108–109

12 **a** Collect a range of objects and weigh them to make sure some are heavier than others *(1)*

Drop each object in turn from the same height and time how long it takes to reach the ground *(1)*

b **i** The golf ball and the table tennis ball *(1)*

ii They are the same shape and size *(1)*

c Scientist work by testing their own ideas and by retesting other people's ideas from the past to see if new ways of working give new information *(1)*

Max 5 marks **Maximum 5 marks**