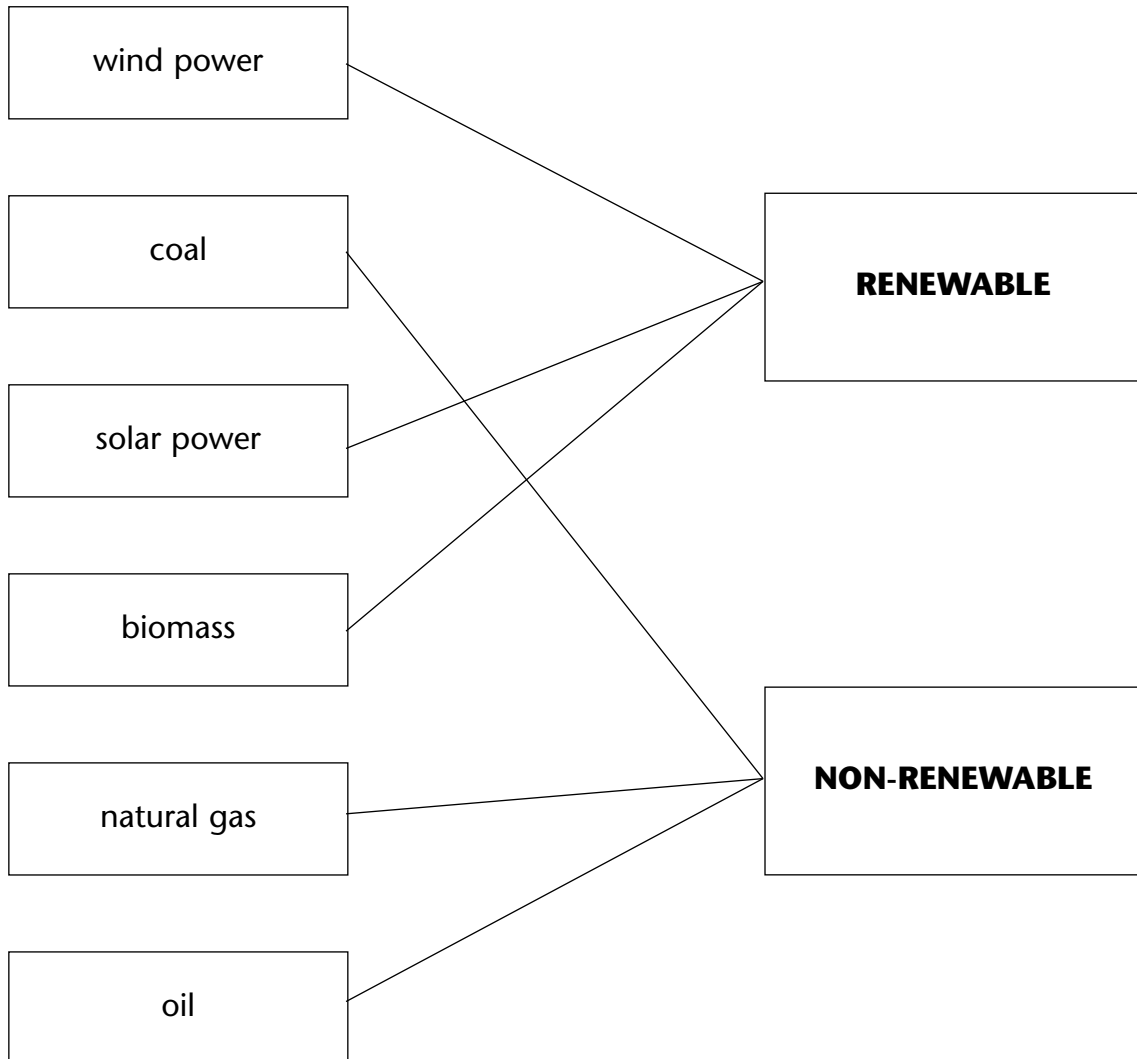


## Pages 92–93

1 a



*(Total 3 marks, deduct 1 mark for each incorrect line to a minimum of zero)*

**b** The Sun (1)

Max 4 marks

**2 a** Oak tree leaf → caterpillar → blue tit → sparrowhawk

Organisms in correct order (1) Arrows in correct direction (1)

**b** The first thing in a food chain is always a green plant (1)

**c** Cell wall (1) Vacuole (1) Chloroplasts (1) (any order)

**d** Chloroplasts (1)

Max 7 marks

**Maximum 11 marks**

*(1) = 1 mark*

## Pages 94–95

3 a Arrow on scale at left-hand side no higher than pH 4 (1)

| b Substance      | pH       |
|------------------|----------|
| Lemon juice      | 2 or 3   |
| Water            | 7        |
| Sodium hydroxide | 12 or 13 |

(1) each

4 a Tube D (sodium chloride solution) (1)

b Tube A (1) Tube B (1)

c Gold rings do not rust (1)

Max 4 marks

**Maximum 8 marks**

## Pages 96–97

5 a One arrow pointing downwards labelled gravity and one pointing up labelled upthrust (1) for each provided arrows are same size

b The forces acting on the boat are balanced (1)

Max 3 marks

6 a He should choose Bitch B and Dog C (1)

b Bitch B has the biggest litters so most puppies (1) but she is black and white, but as long as one parent is black, all the puppies will be black (1), so Dog C

Max 3 marks

**Maximum 6 marks**

## Pages 98–99

|  |                       |
|--|-----------------------|
| 7 To get sand from a mixture of sand and water   | <b>Filtration</b>     |
| To get water from black ink                      | <b>Distillation</b>   |
| To get salt crystals from sea water              | <b>Evaporation</b>    |
| To find how many food dyes are in a blue Smartie | <b>Chromatography</b> |

Max 4 marks

(1) each

- 8 a**
- i** Sodium chloride (1)
  - ii** (Common) salt (1)
- b** Sodium (1) and Chlorine (1)
- c** Because a completely new substance has been formed (1)
- Max 5 marks

**9 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 18 marks**

## Pages 100–101

- 10 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

**11 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 102–103

**12 a** Streamlined body position/Streamlined clothing (1) 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)

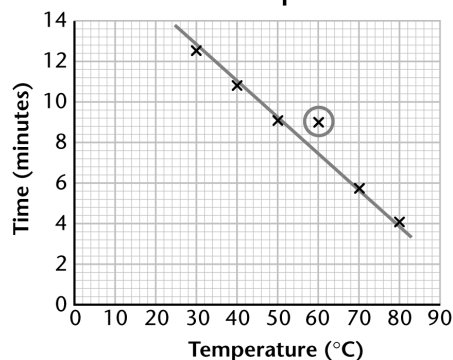
Max 10 marks

**Maximum 10 marks**

## Pages 104–105

- 13 a** Volume of water/mass of jelly/size of jelly cube/amount of stirring (1) 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)

Graph to show the time for jelly to dissolve in water at different temperatures



- 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 106–107

- 14 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) for reactants (1) for products including energy
- d** The lungs (1)

Max 9 marks

**Maximum 9 marks**

## Pages 108–109

- 15 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**