

## Pages 18–19 Energy resources

**1 a** Coal (1) Oil (1) Natural gas (1) *(If more than 3 boxes ticked, deduct 1 from total score)*

**b** Non-renewable

**c** Because they took millions of years to make (1) and so it is not possible to make any more (1)

**2 a** Carbon dioxide (1) Sulphur dioxide (1)

**b** Carbon dioxide causes the green house effect / global warming (1) Sulphur dioxide causes acid rain (1)

*(Must be specific answers not just pollution)*

**c** Carbon dioxide

**4 a**

Energy source	Advantage	Disadvantage
Coal	<b>C</b> Can be used anywhere and when burned gives off a large amount of heat.	<b>A</b> Will one day run out and it is not possible to make more.
Wind power	<b>F</b> Is clean to use and renewable.	<b>E</b> Can only be used where the conditions are right.
Biomass	<b>B</b> Supplies can be fairly easily replaced.	<b>D</b> Although not a fossil fuel, still gives off greenhouse gases.

*(1 mark for each correct box)*

**5 a** The Sun

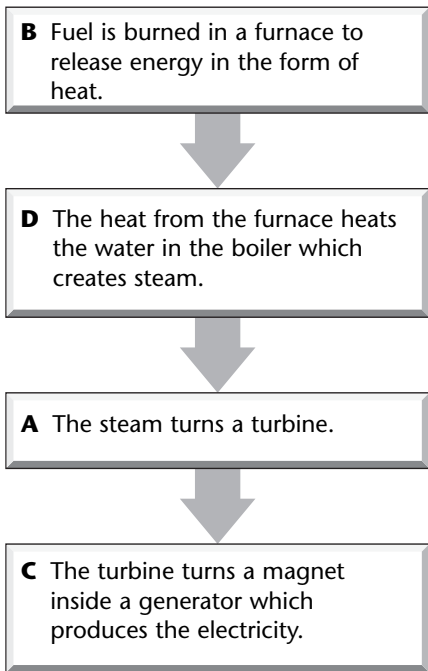
**b** Solar panels

**c** It can only be used in daylight/when the Sun is shining

*(1) = 1 mark*

## Pages 20–21 Generating and using electricity

1 a

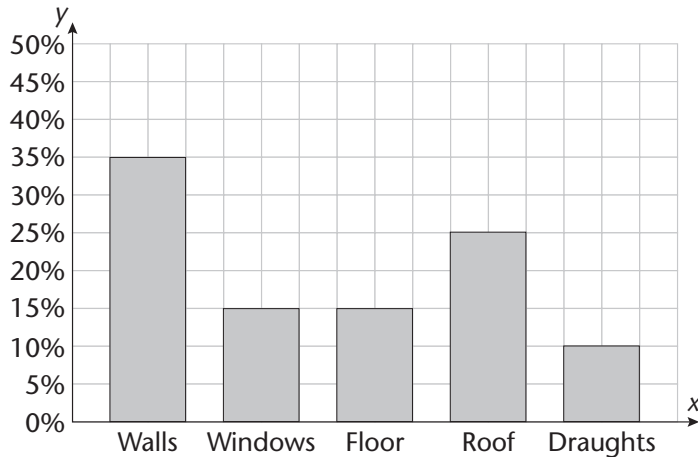


(1 mark for each one correct)

b Burning the fuel to give off heat to make steam

2 a

**Heat loss from a house**

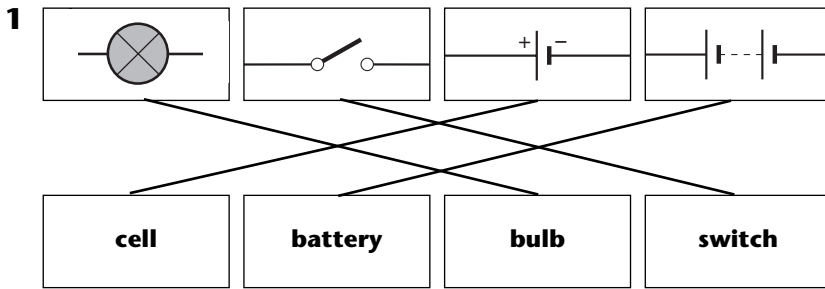


(maximum 3 with 1 deducted for each incorrect bar to minimum of zero)

- b i FALSE
- ii TRUE
- iii TRUE
- iv FALSE
- v FALSE
- vi TRUE

c B

## Pages 22–23 Electrical circuits



(1 mark for each correct match of symbol to component)

2 a In series circuit, current is always the same

b If one bulb breaks, the other will as well

3 a A2 and A3

b A1 will be the sum of A2 and A3

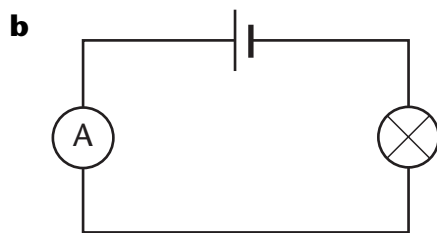
c If bulb X went out, bulb Y would stay lit OR nothing would happen

4 a A – there is only one lead from the cell (battery) to the bulb

B – both leads are going into the same terminal of the cell

C – the bulb is broken

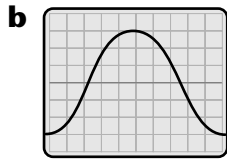
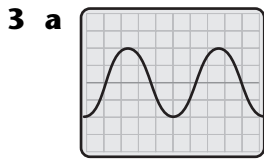
(In each case the circuit is not complete, but for the mark it is necessary to say why)



## Pages 24–25 Energy transformation

1 Heat or thermal energy

2 Sound travels by vibrations of particles, in a vacuum there are no particles so the energy cannot be transferred



**4 a** Gravitational potential

**b** Kinetic

**c** Sound and heat

*(1 mark for both correct)*

**5 a** C

**b** Chemical potential energy

## Pages 26–27 Energy transfer

**1 a** Heat (1) Light (1) Sound (1)

**b** Heat

**2 a** Aluminium (1) Copper (1)

**b** Because they are metals (1) and metals conduct heat (1)

**c** Because wood does not conduct heat/is an insulator (1) and so a wooden spoon will not get hot in the way a metal one would (1)

**3 a** Because when the water nearest to the element is heated, it rises by convection (1) and the cold water from the top falls and is heated in its turn (1)

**b** Radiation

**c** The air above the hot liquid is heated by convection (1), the heat is conducted through the side of the cup (1) and is then radiated out into the surroundings (1)

**4 a** TRUE

**b** FALSE

**c** TRUE

**d** FALSE

**e** TRUE

## Pages 28–29 Energy from food

1 A green plant

2 a Respiration

b Glucose + oxygen → carbon dioxide + water + energy

*(1 mark for reactants, 1 for products, 1 for energy – all only given if in correct format)*

c Movement (1) Growth (1) Warmth (1)

3 a A

b A

c A

d B

e B

f Meal B contains protein, some carbohydrate, some fat and plenty of vitamins and minerals, so all the food groups are there (1) Meal A does contain some protein but too much carbohydrate, sugar and fat and hardly any vitamins and minerals (1)

4 a 2000 kcal

b 4000 kcal

c 3000 kcal

d 1500 kcal

5 So it is possible to directly compare the energy values of different foods

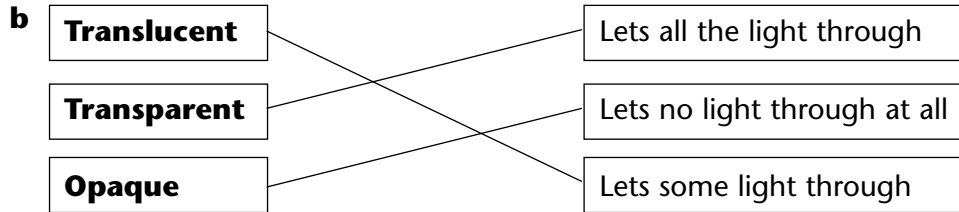
## Pages 30–31 Sound and light

1 It is possible to tell what a sound will be like by looking at the wave. If the wave has a high **frequency** (1) then the sound will have a **high** (1) pitch. The **amplitude** (1) of the wave tells us whether it will be loud or quiet.

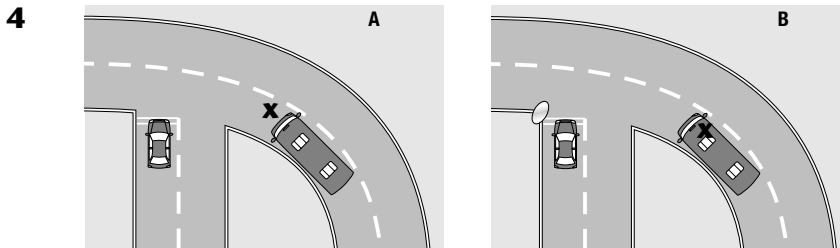
2 a Sound B

b Sound B

3 a Luminous



(1 mark each for each correct link)



5 a FALSE

b TRUE

c TRUE

d FALSE

e FALSE

f TRUE

6 As there is no atmosphere, there are no particles, so sound waves cannot travel (1)  
Radio waves, like light, can travel through a vacuum (1)

## Pages 32–33 Reflection, refraction and seeing colour

1 We are able to see objects because light is **reflected** into our eyes. The angle at which light strikes a surface is called the **angle of incidence**. The angle at which light is reflected from a surface is called the **angle of reflection**. The angle of reflection is always **the same** as the angle of incidence.

White light is a mixture of **seven** colours and objects that look white reflect **all** of these colours. Objects that look black reflect **none** of the colours of the spectrum and objects that look coloured reflect **some** of the colours. Although light always travels in straight lines, it will change direction at the boundary between two substances. This is called **refraction**. This can make water look **shallower** than it really is.

(1 mark for each correct choice)

2 (1 RED)

2 ORANGE

3 YELLOW

4 GREEN

5 BLUE

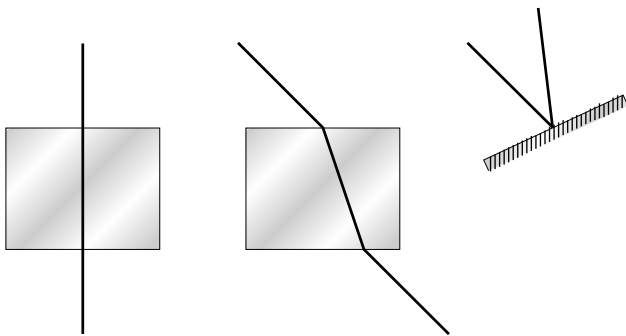
6 INDIGO

7 VIOLET

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

3 Because there is a red filter in front of the white light bulb (1) The red filter absorbs all the other colours and only allows red light to pass through (1)

4



*(1 mark per diagram)*

5 a All the colours in the spectrum

b Not reflecting any colours but absorbing all of them

c Red light