Pages 20–21 Energy resources

1 a Because they were formed over millions of years from the remains of prehistoric plants and animals

b Non-renewable

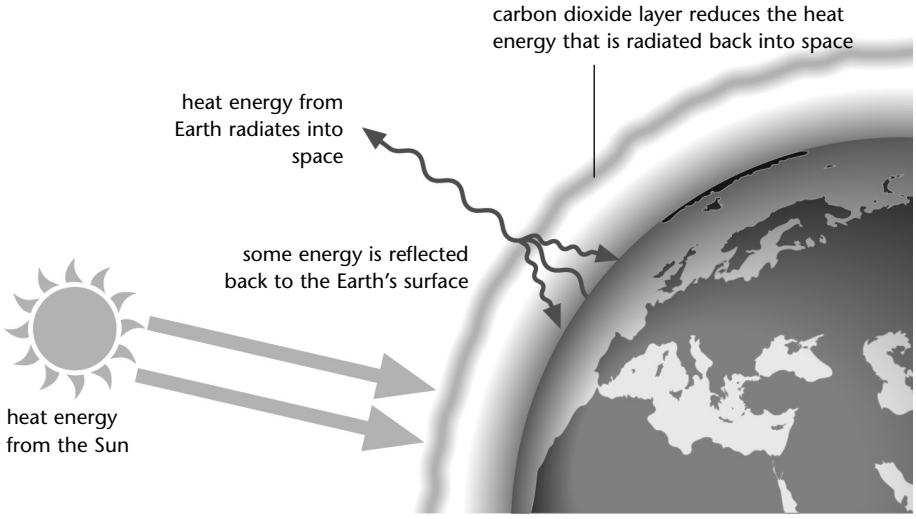
c It is not possible to make any more as they took millions of years to form

2 a Carbon dioxide

b The greenhouse effect

c Making the earth warmer

d



(Maximum 3 marks for all annotations correct)

e Acid rain

3 a Clean *or* will not run out

b Can only be used in right conditions *or* expensive for amount of electricity produced *or* high capital cost

c Can be used anywhere *or* high energy output

4 a The Sun

b Solar panels

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

(1) = 1 mark

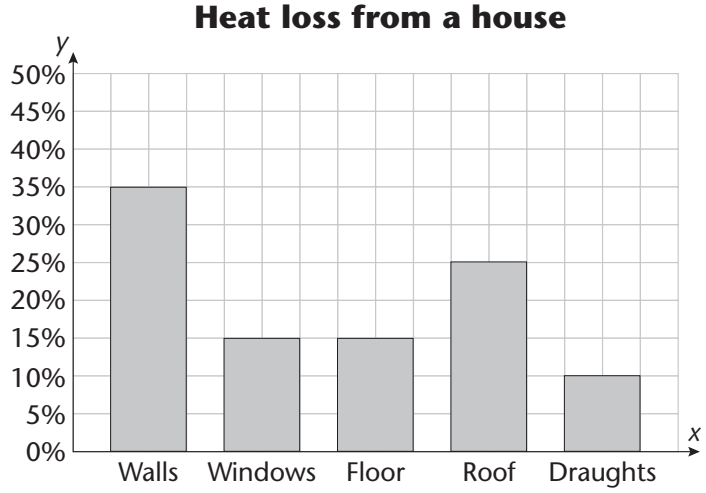
Pages 22–23 Generating and using electricity

1 a Turns the turbine

b A magnet is rotated inside a coil of wire *(1)* This induces an electric current in the wire *(1)*

c Combustion (*allow burning fuel*)

2 a



Suitable values on *y*-axis with even scale *(1)* Title *(1)* *x*-axis labelled *(1)*
Bars drawn correctly *(maximum 3 with 1 deducted for each incorrect bar to minimum of zero)*

b Cavity wall insulation

3 a FALSE

b TRUE

c TRUE

d FALSE

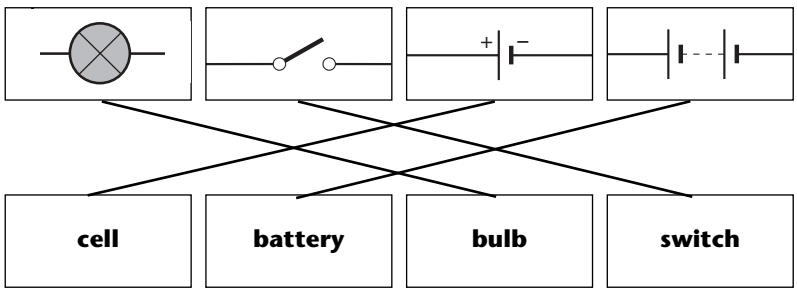
e FALSE

f TRUE

g B

Pages 24–25 Electrical circuits

1



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

2 **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

3 A, B and E

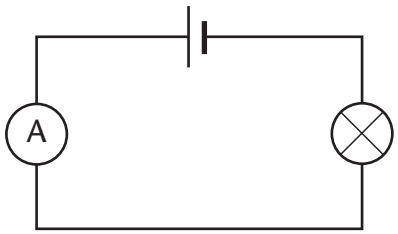
4 **a** A – there is only one lead from the cell (battery) to the bulb

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)

b

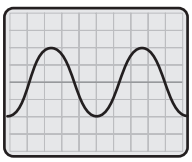


Pages 26–27 Energy transformation

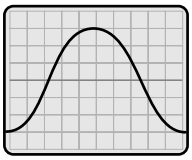
1 Thermal energy (*allow heat*)

2 There is no atmosphere on the moon and therefore no air particles *(1)* If there are no particles, sound waves cannot travel as they rely on the vibration of particles *(1)*

3 **a**



b



4 **a** Gravitational potential

b Kinetic

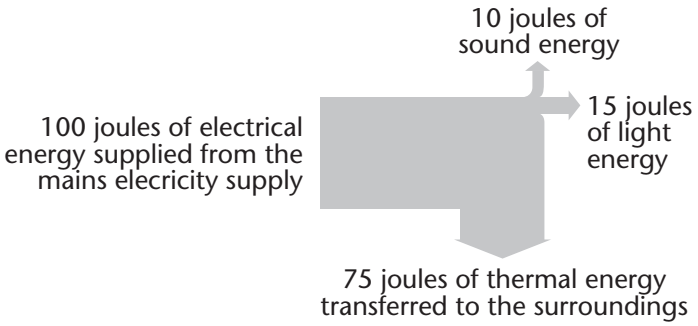
c Sound and heat *(1 mark for both correct)*

5 **a** C

b Chemical potential energy

Pages 28–29 Energy transfer

1



2 **a** Metals

b Because they conduct heat and so allow the food to cook

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 30–31 Energy from food

1 Because only green plants can produce their own food

2 **a** Glucose + oxygen → carbon dioxide + water + ENERGY is released
(1 mark for reactants, 1 for products, 1 for energy; each given only if written in correct format)

b Respiration

3 **a** B

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

5 **a** 2000 kcal

b 4000 kcal

c 3000 kcal

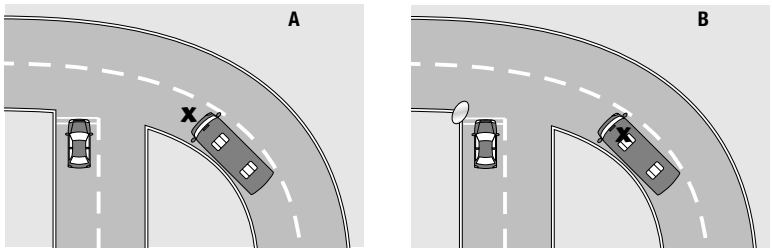
d 1500 kcal

Pages 32–33 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 We see most objects because light is reflected off them into our eyes

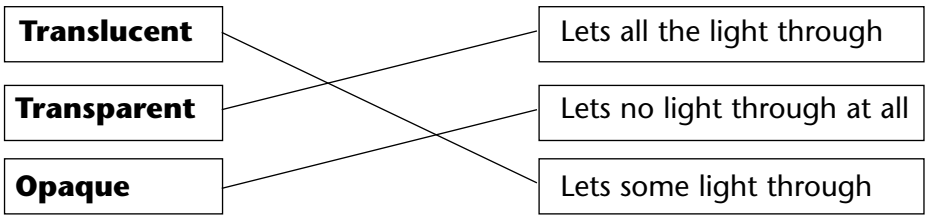
3 **a**



4 **a** B

b B

5



(1 mark each for each correct link)

6 **a** FALSE

b TRUE

c TRUE

d FALSE

e FALSE

f TRUE

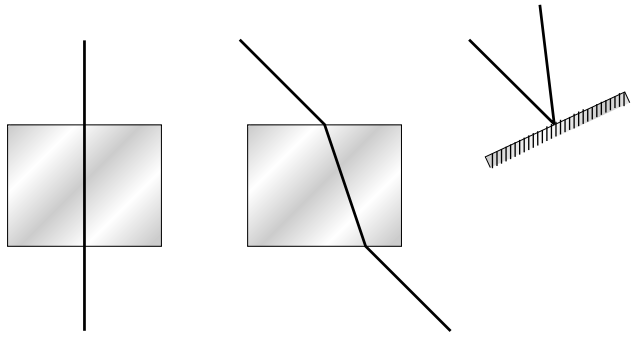
Pages 34–35 Reflection, refraction and seeing colour

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 mark per diagram)

3 **a** Red *(1)* Green *(1)* Blue *(1)* (*any order*)

b Red *(1)* Green *(1)*

4

Colour in white light	**Colour in green light**
White	**Green**
Red	**Black**
Yellow	**Green**
Green	**Green**
Black	**Black**

5 Because all the colours of light are absorbed *(1)* and none are reflected *(1)*

6 **a** All the colours in the spectrum

b Not reflecting any colours but absorbing all of them

c Red light