

B1 answers

Remember:

Check which grade you are working at.

Page 4 Fit for life

- 1 a** Oxygen; energy; respiration
- b i** Lactic acid
- ii** Body needs more energy; not enough oxygen to muscle; anaerobic respiration takes place
- 2 a** (B) A D C (A before D = 1 mark; D before C = 1 mark)
- b** Bacteria/viruses can still enter the body
- 3 a** Heart
- b** Take more exercise; eat a balanced diet; lose weight; drink less alcohol; relax more

(Any 2 = 1 mark each)

Page 5 What's for lunch?

- 1 a i** Growth/repair
- ii** $RDA = 40 \times 0.75$
= 30 g
- b i** Diabetes
- ii** More exercise
- 2 a** Chewing/squeezing stomach (Any 1 = 1 mark)

b

food type	enzyme	product
protein	protease	amino acids
fat	lipase	fatty acids and glycerol

(1 mark for each correct box)

Page 6 Keeping healthy

- 1 a** Athlete's foot
- b i** Vector
- ii** Feeds off living host
- 2 a**
- | | |
|----------------|-------------------------------|
| skin | seals wounds |
| stomach acid | stops pathogens entering body |
| mucus in lungs | traps dirt |
| blood clots | kills pathogens in food |
- (4 correct = 3; 2 or 3 correct = 2; 1 correct = 1 mark)
- b i** Number of cases went down
- ii** People stopped having MMR jab
- c** Antibiotics do not kill virus; they only treat bacterial/fungal infections
- d** Active: given pathogen; body makes antibodies; long lasting
Passive: given antibodies; body does not learn how to make antibodies;
short lived

(Any 3 = 1 mark each)

B1 answers

Page 7 Keeping in touch

1 Skin

2 a i iris ii retina iii optic nerve

b

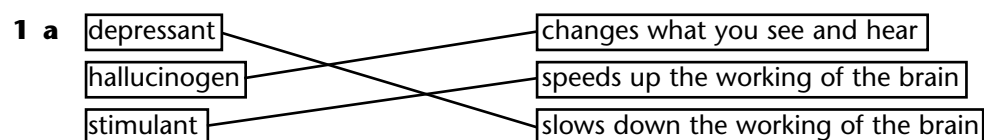
part of the eye	job
retina	contains light receptors
optic nerve	carries impulses to brain
cornea	refracts light

c i Binocular
ii Advantage: allows it to judge distance

3 a Reflex

b 3: sensory neurone; 4: relay neurone; 5: motor neurone

Page 8 Drugs and you



(3 correct = 2; 1 or 2 correct = 1 mark)

b

type of drug	example
hallucinogen	cannabis
depressant	alcohol

c Class C: less dangerous/they carry lighter penalties

2 a Nicotine; tars; particulates

(Any 2 = 1 mark each)

b Reduces oxygen in the blood/causes heart disease (Any 1)

c i Emphysema/bronchitis; (Any 1)
mouth/throat/oesophagus/lung (Any 1)

ii Stops cilia moving; dust collects; leads to smokers' cough; produce more mucus

(Any 2 = 1 mark each)

3 a Liver damage

b Matthew; because he drinks 5 units and Jo drinks only 4 units

B1 answers

Page 9 Staying in balance

- 1 a i** Sweating
ii 37 °C
- b** Get too hot, start to sweat and lose too much water
- c** Hypothermia
- d** Homeostasis
- 2 a i** Pancreas
ii Diabetes
iii Diet/insulin injections (Any 1)
- b i** Testosterone
ii Hair growth on face; hair growth on body; more muscular body; genitals develop; sperm production starts

(Any 2 = 1 mark each)

Page 10 Gene control

- 1 a** Nucleus; genes; DNA
- b** 4
- 2 a** 10
- b** 20
- c** Human sperm: 23 chromosomes; squirrel sperm: 10
- 3 a** Asexual
- b** Only one parent; offspring identical to parent

Page 11 Who am I?

- 1 a i** Red hair; straight hair; blue eyes; freckles; large front teeth; rounded chin; ear without lobe (Any 2 = 1 mark each)
- ii** Scar; broken nose; decayed tooth (Any 2 = 1 mark each)
- b** Y
- c** Purple; because F1 are all purple
- d** Radiation/chemicals (e.g. tobacco smoke) (Any 1)
- 2** Cystic fibrosis

C1 answers

Remember:

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Page 13 Cooking

- 1 a** Barbeque; in a grill; on an electric/gas ring (frying, boiling or steaming); in a microwave; in an oven *(Any 3 = 1 mark each)*
- b** The food needs high temperature to kill harmful microbes in food; the texture of food is improved; the taste of food is improved; the flavour of food is enhanced; food is easier to digest *(Any 2 = 1 mark each)*
- 2 a** Irreversible; energy; substance
- b** They change shape
- 3 a** Baking powder; carbon dioxide; heated
- b i** Sodium hydrogencarbonate $\xrightarrow{\text{(heat)}}$ sodium carbonate + carbon dioxide + water
- ii** Sodium hydrogencarbonate
- iii** Sodium carbonate/carbon dioxide/water *(Any 1)*
- 4** Colourless; milky (cloudy)

Page 14 Food additives

- 1 a** Chemicals
- b** Antioxidants; food colours; emulsifiers; flavour enhancers
- c** Stop food from reacting with oxygen and turning bad
- d** It was found to be harmful to some children
- e** Tinned fruit and wine
- f** Preserve food from reacting with oxygen and preventing bacteria or mould; to give a different sensory experience such as enhancing the colour/flavour of food *(Any 1 = 1 mark)*

2 a

ingredient	typical value per 100g
wheat	14.0 g
sugar	6.0 g
salt	0.2 g

(Wheat before sugar = 1 mark; sugar before salt = 1 mark)

- b** To stop food spoiling
- c** Packaging that changes the condition of the food to extend its shelf life
- d** Packaging that uses sensors to monitor the quality of the food and lets the customer know when the food is no longer fresh
- 3 a** Detergent
- b** A detergent in washing-up liquid provides 'hooks' between oil and water; the oil is 'hooked' on to the water and pulled off a dirty plate; the detergent in washing-up liquid acts as an emulsifier; the tail is a 'fat-loving' part and the head is a 'water-loving' part; the fat-loving part of the molecule goes into the oil and attracts it towards this end; the water-loving part will not go in; the water-loving part stays out of the oil but is attracted to the water molecules; the oil is 'hooked-up' to the water
- c** Some paints; milk; mayonnaise *(Any 1 = 1 mark each)*

C1 answers

Page 15 Smells

1 a Rose; lavender

b Distilled

- c i Animals have no control over what is happening to them
 ii They feel safer if the cosmetics have been tested

2 a

evaporate easily	it can be put directly on the skin
non-toxic	its particles can reach the nose
insoluble in water	it does not poison people
does not irritate the skin	it cannot be washed off easily

b Sense cells in the nose

3 a i Acid + alcohol $\longrightarrow$ ester + water
 (reactants = 1 mark, products = 1 mark)

ii (Alcohol and acid label = 1 mark)

iii (Label to upward condenser tube = 1 mark)

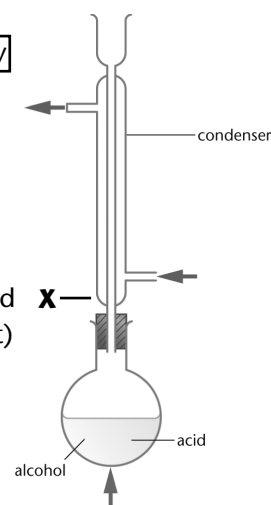
iv At X the vapour is cooling down again and condensing back to a liquid

v So that the mixture can be boiled/react for longer (without drying out)

b Butyl ethanoate

4 a Insoluble; soluble

b Solution



Page 16 Making crude oil useful

1 a Coal; gas; crude oil

b Formed from dead animals and/or plants; trapped in the Earth and compressed over millions of years

c When these fossil fuels are used up there will be no more

d Because they are no longer being made

2 a Boiling point

b A molecule containing carbon and hydrogen only

c i (A: at the bottom, left-hand side, of the tower = 1 mark)

ii (B: it 'exits' through the bottom of the tower = 1 mark)

iii (C: at the top of the tower = 1 mark)

iv Fractions with lower boiling points such as petrol/LPG

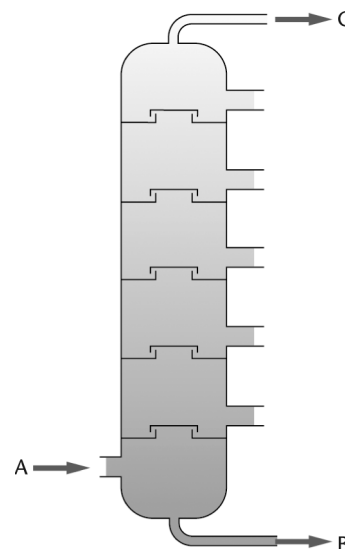
3 a i It is pumped using oil rigs and goes through pipelines

ii The oil spills and forms an oil slick

b Increase in wealth in population and therefore an increase in number of cars on roads

4 a High temperature; a catalyst

b C_7H_{16}



C1 answers

Page 17 Making polymers

1 a Polymers; chains; monomers; polymerisation

b C

c High pressure; catalyst

2 a Carbon; hydrogen

(Both = 1 mark)

b D

c i An alkane has a single bond, C–C

ii Propene

d i Contains an oxygen atom

ii It contains a double bond

iii A polymer (made from the monomer butene)

Page 18 Designer polymers

1 a Fabrics for clothes; paint for cars; cases for computers; packaging; insulating or any other reasonable use

(Any 2 = 2 marks)

b Poly(ethene); nylon; polyester; polystyrene; poly(propene)

(Any 2 = 2 marks)

c Flexible – to allow insulating/non-conducting or able to be coloured

d Keeps people dry not only from the rain but also from sweat

e It keeps water vapour from body sweat in, the water vapour from the sweat condenses and makes the wearer wet and cold inside their raincoat

f

polymer	property 1	property 2	use
PVC	waterproof	flexible	raincoat
poly(ethene)	waterproof	flexible	plastic bags
poly(styrene)	rigid	absorbs shock	packaging
poly(propene)	strong	flexible	ropes

2 a They do not decay and are not decomposed by bacteria

b Landfill sites: waste valuable land; burning: toxic gases; recycling: difficulty in sorting different polymers

(1 mark each = 3 marks)

c i So that they do not have to be disposed of in landfill sites; burned but can decay by bacterial action

ii To make laundry bags for hospitals so that they degrade when washed leaving the laundry in the machine

(Or any other suitable use)

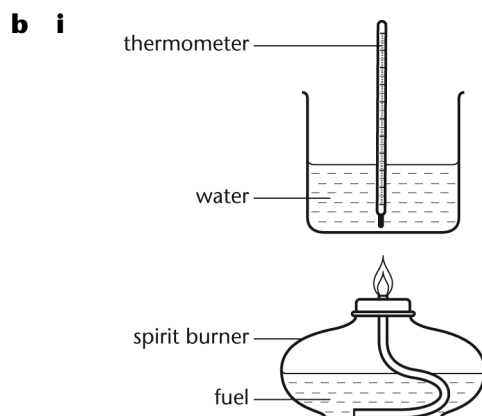
C1 answers

Page 19 Using carbon fuels

- 1 a** Petrol; it flows around an engine
- b i** Coal
ii High energy value; good availability
- 2 a** Oxygen
- b** Oxygen; carbon dioxide; water.
- c** Monoxide; toxic; blue; yellow; monoxide; soot; water vapour; less
- d i** Hydrocarbon fuel + oxygen $\longrightarrow$ carbon dioxide + water
ii Carbon dioxide; water
iii Carbon dioxide turns limewater milky/white copper sulphate turns blue with water
 (Any 1 = 2 marks)

Page 20 Energy

- 1 a** Heat; light; sound; electrical (Any order)
- b** Exothermic; endothermic; exothermic; exothermic
- 2 a i** Oxygen
ii Ethanol + oxygen $\longrightarrow$ carbon dioxide + water
iii Ethanol and oxygen



- ii** The mass of fuel; increase in temperature; mass of water
iii The same mass of fuel; same increase in temperature; same mass of water

(Any 1)

P1 answers

Remember:

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Page 22 Heating houses

- 1 a** Degrees Celsius; energy; joules
b Energy flows from warm to cooler body; temperature of warmer body falls
- 2 a** 8 minutes
b Iron is a different material
c Specific heat capacity
- 3 a** It changes state from solid to liquid
b It changes state from liquid to gas
c Melting ice; boiling water (Any 1)
d Specific latent heat

Page 23 Keeping homes warm

- 1 a** Air is a good insulator/a poor conductor
b Cavity wall insulation; drawing curtains; sealing gaps; shiny foil behind radiators; carpets/underlay (Any 3)
c $120 \div 40 = 3$ years
d Shorter payback time
e Only 32% of energy input is useful; as energy output
f Energy is lost up the chimney

Page 24 How insulation works

- 1** Trapped; insulator
- 2** (**F** in bottom left-hand corner of room = 1 mark)
- 3 a** Particles in solid close together; gap between glass filled with gas/vacuum; particles in gas far apart/no particles in vacuum; more difficult to transfer energy than in solid (Any 3)
- b i** Air in foam is good insulator; reduces energy transfer by conduction; air is trapped; unable to move; reduces energy transfer by convection (Any 4)
ii Energy from room reflected back into room in winter; energy from Sun reflected back outside in summer



Page 25 Cooking with waves

- 1 a** Infrared; absorb; spectrum; water
b Microwave radiation is more penetrating than infrared; microwave ovens cook by conduction and convection (Any 1)
- 2 a** Some evidence of heat energy being transferred to the body; young people more likely to be affected
b Microwaves need line of sight; no obstructions in space
c Amplified; retransmitted back to Earth

P1 answers

Page 26 Infrared signals

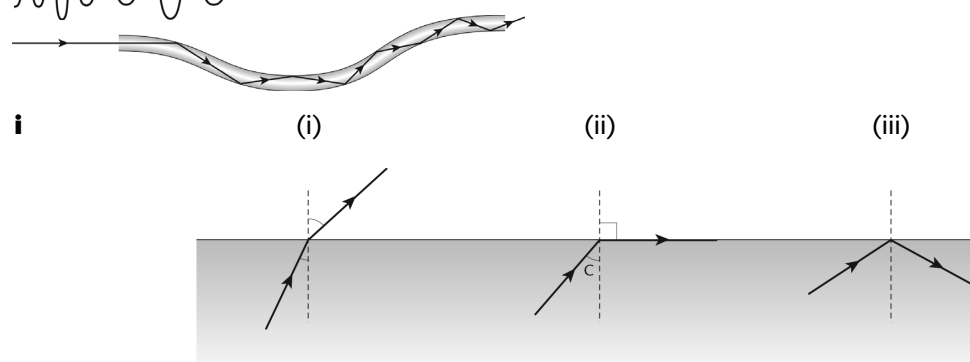
1 a True; false; true

b Digital

c 

2 a

b i



ii (See diagram)

Page 27 Wireless signals

1 a Can be used anywhere/portable

b Reflected

c The radio station is broadcasting on the same frequency;
the radio waves travel further because of weather conditions

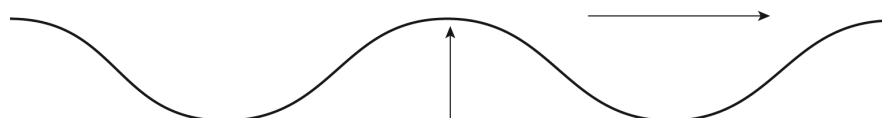
d Atmosphere; frequency

Page 28 Light

1 a Radio; microwave; infrared; ultraviolet; X-rays; gamma ray

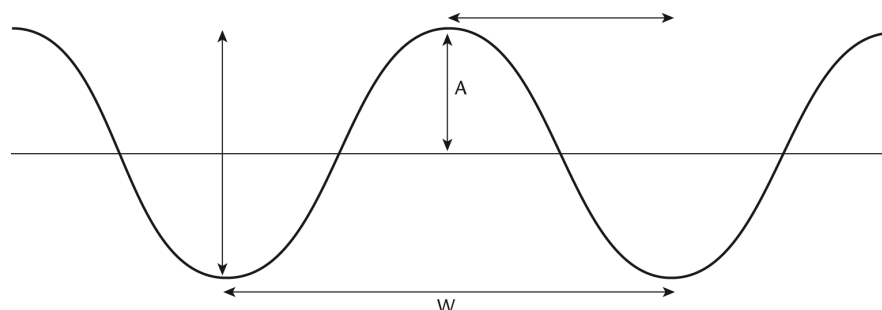
(Any 3)

b (See diagram)



2 a (See diagram)

b (See diagram)



c Number of complete waves passing a point each second

3 a Semaphore; smoke signals; runner

(Any 1)

b Need to represent letters as electric signal

P1 answers

Page 29 Stable Earth

1 a Seismometer

b Fault; shock

c

description	P wave	S wave
pressure wave	✓	
transverse wave		✓
longitudinal wave	✓	
travels through solid	✓	✓
travels through liquid	✓	

2 a i Global warming

ii Carbon dioxide

iii Reflects radiation back down to Earth

b i Sunburn; skin cancer

ii Can stay in sun 30 times longer without burning

(Any 1)