

B2 answers**Remember:**

Check which grade you are working at.

Page 31 Ecology in our school grounds

- 1 a** Artificial; community; habitat
- b i** Too cold/no food
ii Difficult to reach so difficult to explore
- 2 a** Pooter is a small container with tubes attached; suck up insects through tube
- b** Six legs; coloured wings
- 3** $\frac{20 \times 10}{5} = 40$ voles in the wood

Page 32 Grouping organisms

- 1 a i** Birds
ii Beak; feathers
- b i** Spider
ii No backbone

c

	food	shape	movement
animals	eat food	compact	move around

- 2 a** Organisms that inter-breed; produce fertile offspring

- b i** Bobcat; ocelot
ii First part of Latin name the same

*(Both = 1 mark)***Page 33 The food factory**

- 1 a** Carbon dioxide; water

b

product of photosynthesis	use in the plant
cellulose	cell wall
protein	growth/repair
oil	storage

- c** Starch is insoluble
- 2 a** Grows slower
- b** Carbon dioxide; temperature
- 3 a** Respiration
- b** Need the energy it provides to live

B2 answers

Page 34 Compete or die

- 1 a** Space; shelter; water (Any 2)
- b i** Grey squirrels out-compete red
ii Increase in numbers
- 2 a** Badger/shrew
- b i** Decrease
ii More caterpillars; so more get eaten
- c i** Organism that feeds off another living organism
ii Mutualism

Page 35 Adapt to fit

- 1 a**
-
- (3 correct = ; 1 or 2 correct = 1 mark)

b

adaptation	why it helps the camel survive
no fat on body, except in hump	whole body not insulated
hair-lined nostrils	stop sand getting into nose
higher body temperatures do not harm camel	higher body temperature reduces need to sweat

- c** Eyes at front of head
- d i** Layer of fat; for insulation; small ears; reduce heat loss; fur on soles; insulate feet
(Any 3 = 1 mark each)
- ii** Adapted to different habitats; cannot compete with brown bear in warmer habitat

Page 36 Survival of the fittest

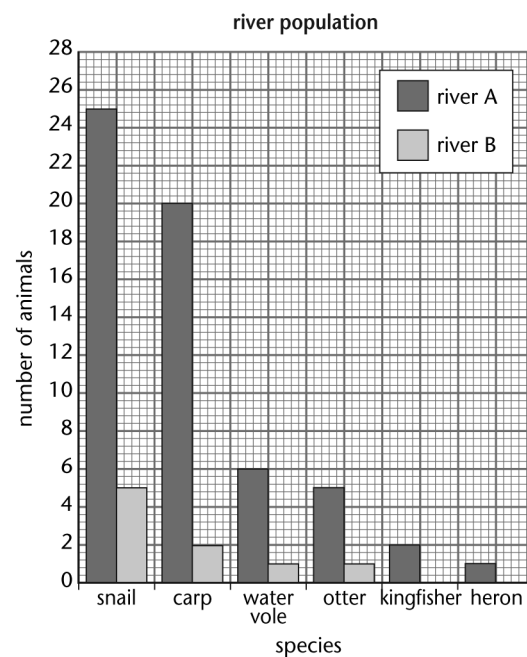
- 1 a** Evolution; rocks; deeper
- b** (B) C D A (C before D =1; D before A =1; A at end =1 mark)
- c** Not all organisms become fossilised or some may not have been found yet
- 2 a** When animals better adapted survive and pass on adaptation
- b** More resistant bacteria survive; pass on resistance

B2 answers

Page 37 Population out of control?

- 1 a i** Gas/coal/oil (Any 1)
ii Sulphur dioxide
- b** Global warming/greenhouse effect; climate change; melting ice caps rise in sea level
 (Any 2 = 1 mark each)
- c i** CFCs
ii More ultra violet rays get through

2 a



(5 bars correct = 3 marks; 3 or 4 = 2 marks; 2 correct = 1 mark)

- b** Fewer numbers of each species; fewer different species
- c** Increase
- 3** Indicator species

Page 38 Sustainability

- 1 a** Extinct
- b** Loss of habitat; hunted; other animals out-competed it; disease; habitat polluted
 (Any 2 = 1 mark each)
- c** Osprey
- d i** Protect the panda
ii Captive breeding program/prevent hunting to extinction
- 2 a i** Too cold
ii Not enough food
- b** For: provide food/jobs; against: whales could become extinct
- 3 a i** Coal
ii Ensure enough fish left to reproduce and maintain population

C2 answers

Remember:

Check which grade you are working at.

Page 40 Paints and pigments

- 1 a** To decorate surfaces; to protect surfaces
- b i** Pigment; binding medium; solvent
- ii** The tiny particles of pigment powder are spread through the oil; a mixture of solid dispersed in a liquid is called a colloid
- c** Made of tiny droplets of one liquid in water which is called an emulsion; when emulsion paint has been painted onto a surface as a thin layer; the water evaporates leaving the binding medium and pigment behind; as it dries it joins together to make a continuous film (Any 2)
- 2 a i** It changes colour
- ii** It changes back to the original colour
- b** Phosphorescent
- c** Many people find that anything over 60 °C is too hot to hold so it can be used to paint cups; used to paint kettles; to act as a warning
- 3 a** The juice of coloured berries
- b** They give a brighter colour; it does not fade as much as a natural dye
- c** Over the last 150 years chemists have been making man-made (synthetic) dyes; these give brighter colour and do not fade as much as a natural dye; give a wider range of colours

Page 41 Construction materials

- 1 a** Granite; marble; limestone (Or any reasonable material from rock)
- b** Aluminium; iron (steel) (Or any reasonable metal)
- c** Limestone; marble; granite.

d

building material	brick	cement	glass	iron	aluminium
raw material	clay	limestone and clay	sand	iron ore	aluminium

- 2 a** Quarries and mines take up land-space; quarrying means an increase in noise, traffic and dust; landscapes are destroyed and have to be reconstructed
- 3 a** Limestone; marble (Accept chalk)
- b** Thermally decomposes
- c** Cement, sand, and gravel are mixed with water and left to set
- d** It is much stronger than normal concrete
- e** Steel rods are put inside it; the concrete is poured around steel rods and left to set; it is therefore made of two materials
- f** Calcium carbonate \longrightarrow calcium oxide + carbon dioxide

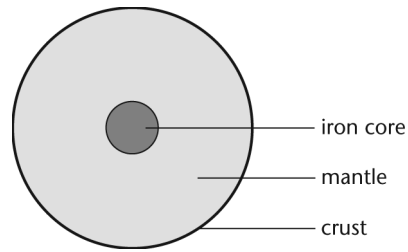
(Each compound = 1 mark)

C2 ROCKS AND METALS

C2 answers

Page 42 Does the Earth move?

1 a



- b** Molten rock
- c** Tectonic plates, earthquakes; volcanoes
- d** Less dense
- e** Continental; oceanic

2 a **i** Igneous
ii Lava

- iii** Runny lava is fairly safe, thick lava can be given out violently and catastrophically
- iv** Volcanic soil is very fertile

b If the magma is less dense than the crust

c

small crystals
cool rapidly
basalt

large crystals
cool slowly
granite

Page 43 Metals and alloys

1 a Compound; element; carbon

- b** It is cheaper to recycle copper than extract new copper from the ground; recycling also saves the energy needed to crush rock and to operate smelters and electrolysis cells
- c** It must first be analysed to find out how much of each element is present
- d** It has to be electrolysed again before it can be used

2 a Impure copper which dissolves into the electrolyte

b It is 'plated' with new copper

3 a It is a mixture of a metal element with another element

b

amalgam	used to join metals
solder	used to make taps and door handles
brass	used by dentists to fill cavities in teeth

c

amalgam	contains copper and zinc
solder	contains mercury
brass	contains lead and tin

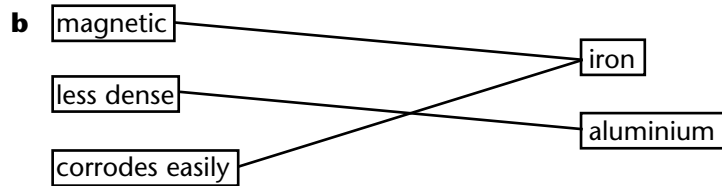
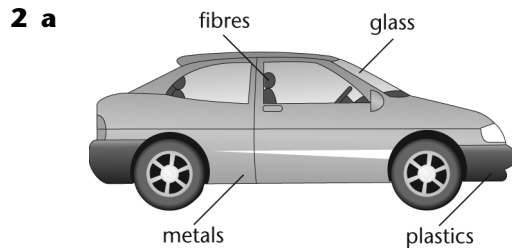
d Pure copper conducts electricity so well

C2 ROCKS AND METALS

C2 answers

Page 44 Cars for scrap

- 1 a** Oxygen; water
b Salt accelerates rusting which means that car bodies rust quicker
c It has a protective layer of aluminium oxide which does not flake off the surface
d It flakes off



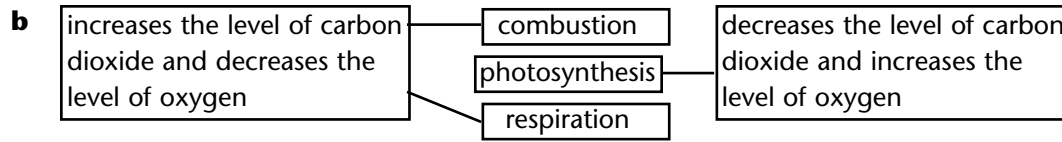
- c** Iron; carbon
i Stronger; harder; does not rust as easily as pure iron (Any 2)
ii Advantages: the mass of a car body made of aluminium will be less than the same car body made from steel; the car body made of aluminium will corrode less;
 disadvantage: the car body of the same car will be more expensive made from aluminium
d The car body is cut into smaller pieces and an electromagnet is used to attract iron or steel
- 3 a** More recycling of metals means that less metal ore needs to be mined; recycling of iron and aluminium saves money and energy compared to making iron from their ores; less crude oil is used to make plastics; less non-biodegradable waste from plastics is dumped; recycling batteries reduces the dumping of toxic materials into the environment

(Any 3)

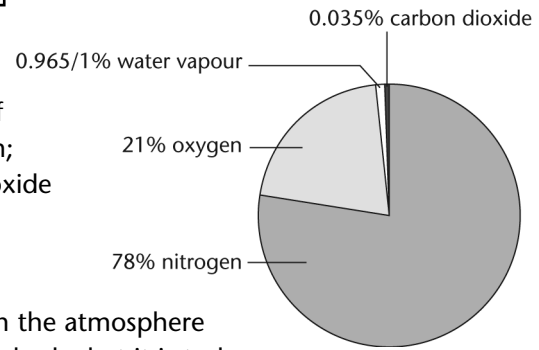
C2 answers

Page 45 Clean air

1 a Oxygen; nitrogen; carbon dioxide (Any order)



- c i (See diagram)
 ii (See diagram)
 iii Combustion and respiration increase the level of carbon dioxide and decrease the level of oxygen; photosynthesis decreases the level of carbon dioxide and increases the level of oxygen



- 2 a In volcanoes
 b These organisms could remove carbon dioxide from the atmosphere and add oxygen; eventually the level of oxygen reached what it is today

3 a

pollutant	carbon monoxide	oxides of nitrogen	sulphur dioxide
environmental problem	<i>a poisonous gas</i>	photochemical smog and acid rain	acid rain that kills plants and aquatic life, erodes stonework and corrodes metals
origin of pollutant	incomplete combustion of petrol or diesel in car engine	<i>formed in the internal combustion engine</i>	<i>formed when sulphur impurities in fossil fuels burn</i>

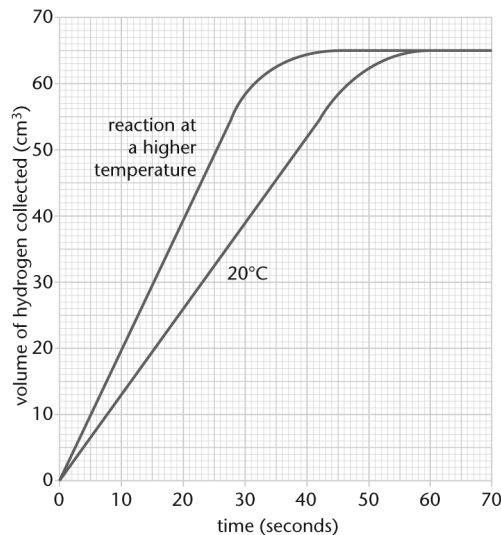
b It changes carbon monoxide into carbon dioxide and oxides of nitrogen into nitrogen.

Page 46 Faster or slower (1)

- 1 a i 33 seconds
 ii No more gas is made or the reactants have run out
 iii 33 cm³

2 If the concentration/temperature/pressure/surface area is increased then the rate of reaction increases

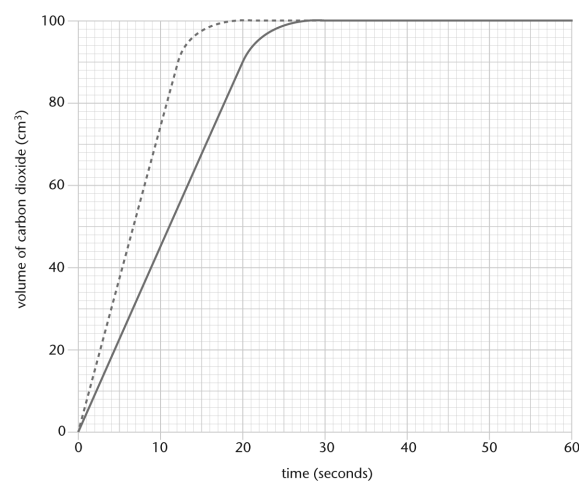
- 3 a i (See graph)
 ii (If gradient A is the reaction at 20 °C; gradient B is the reaction at a higher temperature) Gradient B, the higher temperature, has the steeper gradient
 iii As the temperature increases the particles move faster; the reacting particles have more kinetic energy and so the number of collisions increases and the number of successful collisions increases



C2 answers

Page 47 Faster or slower (2)

- 1 a** A reaction that takes place very quickly
- b** Burning hydrogen; custard powder; TNT/dynamite explosion (Any 2)
- c** Carbon dioxide; water vapour
- 2 a** Powdered reactant will react faster as the surface area increases there are more collisions between reacting particles
- b** Carbon dioxide is given off
- c i** 25–27 seconds
- ii** (See graph)



- iii** As there is less reactant there are fewer frequent collisions between particles
- 3 a** A chemical that speeds up (changes the rate of) a reaction but remains unchanged at the end of the reaction
- b** Only small amounts of it are needed; it remains unchanged at the end of the reaction

P2 answers

Remember: Check which grade you are working at.

Page 49 Collecting energy from the Sun

- 1 a** Light for photosynthesis; heat for warmth
- 2 a** Light
- b** Robust/not much maintenance; no fuel/no power cables; no pollution/no contribution to global warming; renewable energy source
- (Any 4)*
- c** Less electricity produced
- 3 a i** Black absorbs more energy
- ii** Convection
- b** Walls and floors radiate energy back into room

Page 50 Generating electricity

- 1 a** Ammeter needle moves to left
- b** Stronger magnet; more turns on coil; turn coil faster
- (Any 2)*
- 2** Magnetic field turns inside coil of wire
- 3 a** Turbine turns generator
- b** Wires become warm and lose energy to surroundings
- 4 a** Change size of ac voltage
- b** More energy would be lost as heat from transmission wires

Page 51 Fuels for power

- 1 a** Straw; wood
- b i** Substance that burns; releases energy as heat
- ii** Atoms of uranium split
- 2 a** Radioactive nuclear waste produced
- b** Nuclear; DNA; mutate; cancer
- 3 a** Power = voltage x current
= 12×2
= 24 W
- b** Cost = power x time x cost per kWh
= $2.5 \times 0.5 \times 12$
= 15p

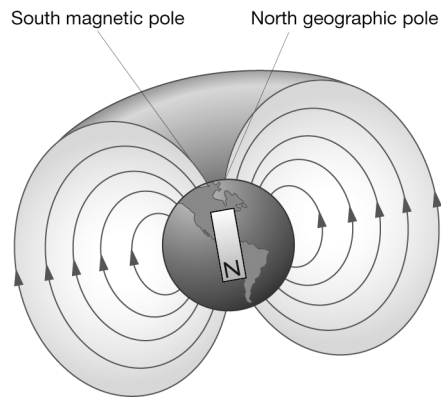
P2 answers

Page 52 Nuclear radiations

- 1 a Geiger counter
- b Radon gas; rocks and soil; cosmic rays; food and drink (Any 2)
- 2 False; true; true; false
- 3 Safe distance; do not handle directly; shield; use for minimum time; do not point at his body (Any 3)
- 4 a Kills living cells/bacteria
- b i Tracer
- ii Penetrating
- c Wall is thinner

Page 53 Our magnetic field

- 1 a (N at bottom of magnet = 1 mark)
- b Magnetic field is similar to a bar magnet
- 2 Navigation/GPS; spying; communication; mapping; weaponry (Any 2)
- 3 a Communication signals disrupted
- b Charged particles
- 4 The presence of the Moon

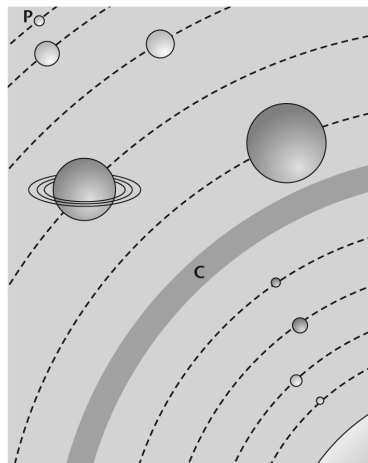


Page 54 Exploring our Solar System

1 a

object	how object may be seen
artificial satellite	object cannot be seen at all
black hole	object seen because it produces its own light
comet	object seen because it reflects light
meteor	object seen because it reflects light
moon	object seen because it reflects light
star	object seen because it produces its own light

- b i (See diagram)
- ii (See diagram)
- 2 a Sending radio signals
- b Always gravitational forces acting however small
- c Avoid being blinded by Sun

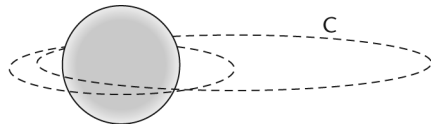


P2 answers

Page 55 Threats to Earth

- 1 a** It got colder; there were lots of fires; tsunamis flooded large areas
b Mars; Jupiter
c Rocks left over when the Solar System formed

2 a



- b** When it is near the Sun
c Solar winds blow dust
3 a Near-Earth-objects/comets or asteroids whose orbits pass close to the orbit of Earth
b Increased accuracy of predicting if a collision may occur

Page 56 The Big Bang

- 1 a** A single point
b Helium; hydrogen; protons
c Those furthest away
2 a Cloud of gas and dust
b i Red giant; core contracts; outer changes colour from yellow to red expands; planetary nebula thrown out; core becomes white dwarf; cools to become black dwarf
(Any 4)
ii Red supergiant; core contracts; outer expands; core becomes neutron star; explosion/supernova; neutron star becomes black hole; supernova remnants become new stars

(Any 4)