

# C1a answers

**Remember:**

Check which grade you are working at.

## Page 26 Elements and the periodic table

1 H; Na; Be

All three correct = (2) 2 correct = (1)

## Page 26 Atomic structure 1

2 C (1)

3 a i 16; 16; 16

All three correct = (2) 2 correct = (1)

ii Electrons have no / negligible mass (1)

b i Cl (1) *accept* Cl<sub>2</sub>

ii O (1) *accept* O<sub>2</sub>

## Page 27 Bonding

1

1	2	3	4
D	B	C	A

(4)

## Page 27 Extraction of limestone

2 a Calcium carbonate (1); marble (1)

3 a (Any 2:) Only allow traffic during the day; only operate quarry during the day; use rail to transport limestone; building banks around the quarry to act as 'noise shadows'

b Employment / jobs / income for local shops (1)

## Page 28 Thermal decomposition of limestone

1

Name of atom	Symbol	Number of atoms in formula
Calcium	Ca	1
Carbon	C	1
Oxygen	O	3

(3)

2 a Calcium carbonate → calcium oxide (1) + carbon dioxide (1)



b B (1)

## Page 28 Uses of limestone

3 Mortar (1); glass (1)

4 Stronger (1)

# C1a answers

## Page 29 The blast furnace

1

1	2	3	4
C	D	B	A

(4)

2 Carbon monoxide; oxygen; reduction

*All three correct = (2) 2 correct = (1)*

## Page 29 Using Iron

3 a 4% (1)

b It is softer (1); easier to shape (1)

## Page 30 Using steel

1 C (1)

2 a (Any 3:) Wrought iron contains the same type of atoms; atoms in wrought iron are in regular rows; atoms in steel are of different elements; sizes of atoms are different; rows are not regular in steel

b (Any 2:) Steel is harder; does not rust; steel is stronger; steel has a shinier finish

## Page 30 Transition metals

3 Copper (1); manganese (1)

4 a Positive ions (1); electrons (1)

b Electrons are involved in conduction (1); they move (1)

## Page 31 Aluminium

1

1	2	3	4
B	D	C	A

(4)

2 Reactive; negative; gain

*All three correct = (2) 2 correct = (1)*

## Page 31 Aluminium recycling

3 a (Any 2:) Spoiling of habitats / tree felling / ecosystem damage; burning trees leads to climate change; loss of living area for local people; health problems due to mining e.g. dust; use of old mines as dumps

b (Any 2:) Thrown away with other waste; difficulty of sorting / collecting; attitude of people to recycling

# C1a answers

## Page 32 Titanium

- 1 a Lower density; this means that the bikes will be lighter; corrosion resistant; this means that the frame will not rust or corrode (3)
- b i Aluminium oxide is an ionic compound and titanium oxide is a covalent compound (1); ionic compounds conduct electricity when they are molten, covalent compounds do not (1)
- ii Titanium has a melting point above 900 °C (1)

## Page 32 Copper

- 2 a Copper (1); sulfur (1)
- b Oxidation (1)

3

1	2	3	4
D	C	A	B

(4)

## Page 33 Smart alloys

1 a

1	2	3	4
B	D	C	A

(4)

- 2 a (Similar because:) Contain mainly metal atoms (1); contain mixture of elements (1); can be bent and stretched into different shapes (1); (different because:) have a shape memory (1)
- b Heating (1); then cooling (1)

## Page 33 Fuels for the future

- 3 a Petrol is made from crude oil. Crude oil will run out because it is **non-renewable**. When petrol burns it makes **carbon dioxide** and **water**. Carbon monoxide comes from car exhaust due to **incomplete** combustion. (4)
- b More cars in cities, less chance for gases to spread out and away (1)

## Page 34 Crude oil

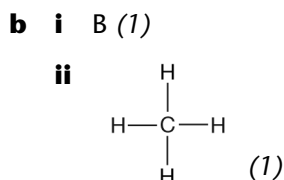
1

1	2	3	4
C	B	D	A

(4)

## Page 34 Alkanes

- 2 a i A (1)
- ii Does not have all single bonds / has a double bond (1); contains oxygen / does not contain just hydrogen and carbon (1)



# C1a answers

## Page 35 Pollution problems

1

1	2	3	4
D	B	A	C

(4)

## Page 35 Reducing sulfur problems

2 a 5 (1)

b Damage to trees / vegetation (1); test the pH of the lake (1); look for dead fish (1)

3 C only (2)

4 a Stops problems with acid rain (1)

b Limestone must be quarried which can cause environmental damage (1)

# C1b answers

**Remember:**

Check which grade you are working at.

## Page 37 Cracking

- 1 a Carbon (1); hydrogen (1)
- b i Used for fuels (1); fuels are needed in much larger quantities than road building materials or other chemicals (1)
- ii Makes shorter chain molecules (1); which have more uses / needed for fuels / used in larger amounts (1)
- 2 C (1)

## Page 37 Alkenes

3 a  $C_5H_{10}$  (1)

True for alkanes	True for alkenes
B	A
C	
D	

All four correct = (3) 3 correct = (2) 1 or 2 correct = (1)

## Page 38 Making ethanol

- 1 Ethene has a double bond (1); ethanol has OH / contains an oxygen atom (1)
- 2 a Fermentation (1); using yeast (1)
- b Renewable means that the supply will not run out (1); more sugar beet can be grown to produce more fuel (1); it is called a biofuel because it is made from living things (1)

## Page 38 Plastics from alkenes

3 a

1	2	3	4
B	A	C	D

(4)

- b i Structure B (1)
- ii Contains a double bond (1)

# C1b answers

## Page 39 Polymers are useful

- 1 a B (1)  
 b D (1)  
 c (Any 2:) A has shorter chains; and so is more runny; molecules can move over each other more easily
- 2 a Does not soften at high temperatures (1); very slippery so gives pans a non-stick coating (1)  
 b Melts at 100 °C (1); which is fine for hot drinks, but would melt on a cooker (1)  
 c Waterproof (1); flexible whereas polyethene would crack (1)

## Page 39 Disposing of polymers

3

1	2	3	4
D	B	C	A

(4)

## Page 40 Oil from plants

- 1 a Nuts (1); seeds (1)  
 b A (1)
- 2 Dissolves; distilled; boiling points All 3 correct = (2) 2 correct = (1)

## Page 40 Green energy

- 3 a Mixed with other oils / fuels (fuels that are mixed in are usually petrol) / fuels from crude oil (1)  
 b (Any 2:) Saves fossil fuels; idea that fossil fuels are not renewable / will run out; biofuels are renewable; they are 'greenhouse neutral'  
 c Petrol is non-renewable / will run out (1); when it becomes scarce it will be more expensive (1)

# C1b answers

## Page 41 Emulsions

1

1	2	3	4
D	C	A	B

(4)

2 a

Type of emulsion	Dispersed phase	Continuous phase
Shaving foam	Air/gas	Liquid
After shave cream	Water/liquid	Oil/liquid

(2)

b Do not mix together (1)

## Page 41 Polysaturates

3 a Contains all single bonds / contains no double bonds (1)

b Contains lots of / many double bonds (1)

c

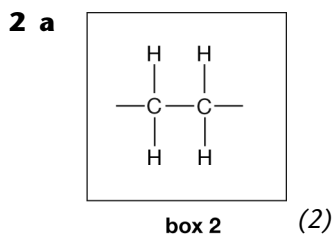
Type	Olive oil	Saturated fat	Polyunsaturated oil
Observations	Orange to colourless	No change	Orange to colourless

(2)

## Page 42 Making margarine

1 a It is a runny liquid (1)

b Hydrogenation (1)



b Oil is heated (to 60 °C) (1); a nickel catalyst is used (1)

## Page 42 Food additives

3 a

1	2	3	4
C	B	A	D

(4)

b B (1)

# C1b answers

## Page 43 Analysing chemicals

- 1 a** Solvent should be pure / should not use a mixture of ink and water (1); ink spot should not be below level of solvent (1); need to stop before the solvent reaches the top of the paper (1)
- b i** B (1)
- ii** B (1); C (1)
- iii** Chromatography (1)

## Page 43 The Earth

- 2 a**
- |   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| B | D | A | C |
- (4)

## Page 44 Earth's surface

- 1** D (1)
- 2**
- |   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| A | C | B | D |
- (4)

## Page 44 Earthquakes and volcanoes

- 3 a**
- |   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| D | C | A | B |
- (4)
- b** The continental plate is less dense because it rises on top of the oceanic plate (1)

## Page 45 The air

- 1**
- |   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| A | D | C | B |
- (4)

- 2** B (1)

## Page 45 Evolution of the air

- 3 a i** The volcano is at over 1000 °C / at a very high temperature (1)
- ii** The Earth cooled (1); water vapour condensed (1); to form the seas (1)
- b i** Carbon dioxide (1)
- ii** Dissolving in sea water (1); photosynthesis (1)
- c** (Any 2:) Does not contain oxygen; does not contain carbon dioxide; contains large amounts of sulphur dioxide / hydrogen / carbon monoxide



# C1b answers

## Page 46 Atmospheric change

1 a Increased; melt; rise; extreme

All four correct = (3) 3 correct = (2) 2 correct = (1)

2 a

Activity	Decreases amount of carbon dioxide in air	Increases amount of carbon dioxide in air	Does not affect amount of carbon dioxide in air
Using CFCs			✓
Planting more trees	✓		
Burning biofuels			✓
Burning fossil fuels		✓	

(4)

3 a Crude oil (1); limestone (1)

b Short lived plants decay and return carbon dioxide to the air (1); trees live a long time and the carbon dioxide is 'locked up' in the wood for a long time while it rots away slowly (1)

c If the seas warm up, not as much carbon dioxide will dissolve in them (1); therefore, more carbon dioxide would be released into the air (1)