

[Materials (Polymers, ceramics, composites (properties/uses))]

Q1.a).(2018)

	Material A		Material B	
	Energy used in MJ	Greenhouse gases made in g of CO ₂	Energy used in MJ	Greenhouse gases made in g of CO ₂
Extracting the raw materials	5.0	2.2	3.8	1.4
Manufacturing of the glass from the raw materials	0.4	0.3	0.4	0.1
Transporting the glass to the shops	1.5	1.0	3.1	2.2
Process W	2.0	0.6	5.0	1.7
Total	8.9	4.1	12.3	5.4

2

2 x 2.2

All correct = 2 marks
2 or 3 correct = 1 mark
1 correct = 0 marks

IGNORE units

Q1.b).(2018)

disposal (of the product) / end of life management / **AW**✓

1

1.1

ALLOW recycling / reuse / melting

IGNORE use of/selling product

Q1.c).(2018)

idea that they could be heavier or more dense/ more energy or fuel used✓

1

2.1

ALLOW travels further

IGNORE packaging/fragile

IGNORE greenhouse gases

Q1.d).(2018)

<p>material A (no mark) because Any two from: uses less (total) energy /8.9 less than 12.3 (MJ) or 3.4 (MJ) less✓ makes less (total) greenhouse gases/CO₂ or 4.1 less than 5.4 or 1.4 less✓ cheaper to transport ✓ Process W/disposal is cheaper ✓ (total) energy cost is less ✓</p>	2	2 x 3.2a	<p>ALLOW data from table throughout ALLOW less global warming/climate change MAX 1 mark if B chosen and any one of: Less energy used for extracting Less greenhouse gases produced for extracting Less greenhouse gases produced for manufacturing ECF for B from part a for MAX 2 marks Any two from: uses less (total) energy makes less (total) greenhouse gases/CO₂ Less energy used for extracting Less greenhouse gases produced for extracting Less greenhouse gases for manufacturing</p>
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Q2.a).(2024)

<p>Any one from: Idea about the use of (raw) materials or energy ✓ Idea about environmental impact (of waste products or using product or pollution) ✓ Idea about lifespan of the product ✓ Idea about disposal / recycling of the product ✓ Ideas about sustainability ✓</p>	1	1.1	<p>ALLOW any valid reason for carrying out a life-cycle assessment ALLOW idea reducing impact of raw material and energy on environment e.g., use of mining to extract the ore / energy use of extracting ore / energy use purifying ore / using up finite resources / damaging habitats / felling trees ALLOW ideas about assessing efficiency ALLOW idea reducing impact of waste products on environment e.g. visual/noise pollution caused by mining /dust/ CO₂ from burning fossil fuels for energy / CO₂ causing enhanced greenhouse effect/global warming/climate change ALLOW ensures that as little waste as possible is created ALLOW idea about recycling being better than using raw materials / recycling reduces landfill ALLOW leaving resources for future generations ALLOW Idea of product being viable IGNORE cost</p>
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Q2.b).(2024)

Any two from:

Idea that recycling conserves (raw) materials / (natural) resources ✓

Idea that recycling reduces environmental impact of mining ✓

Idea that recycling uses less energy ✓

Idea that recycling releases less named polluting substances into the environment ✓

Idea that less / no waste (products) /less (goes into) landfill ✓

2

2 x 1.2

IGNORE cost / saves the planet / helps environment / littering

ALLOW reduce the need to extract finite resources/ conserve finite resources

ALLOW less fossil fuels used

ALLOW less impact from mining on habitats / less removal trees / less visual/noise pollution

e.g., carbon dioxide/greenhouse gases

ALLOW reduces climate change / reduces global warming / less toxic waste