

- M1.(a) (i) central block 1
- (ii) conducts electricity 1
- (b) any **two** from:
- visual pollution
  - noise pollution
  - dust pollution
  - habitat destruction.
- 2
- (c) (i) to concentrate the ore / copper carbonate  
**or**  
to remove / separate the rock 1
- (ii) 12 (tonnes)  
*If answer is incorrect allow one mark for  $(127 + 132) - 247$  or  $259 - 247$*  2
- (iii) any **one** from:
- so no reactant is wasted / left unreacted
  - so they know how much product they will make
  - need to record / compensate for the carbon dioxide produced
- allow so they can work out their carbon footprint.* 1
- [8]**

<b>M2.</b>	(a)	atoms	1
	(b)	mixture	1
		metal	1
		structure	1
		smart	1
(c)	(i)	any <b>two</b> from:	
		<ul style="list-style-type: none"> <li>• saves raw materials / iron ore</li> <li>• saves energy / fuels <i>accept cheaper / saves money</i></li> <li>• make new / useful items</li> <li>• make money / it is economic</li> <li>• <u>reduces</u> pollution <i>allow less harmful for the environment</i></li> <li>• decreases cost of steel cans</li> <li>• reduces carbon dioxide emissions</li> <li>• decreases waste materials / use of landfill</li> </ul>	2

(ii) any **one** from:

- provide information / education of the need to recycle
- legislate against / charge for waste
- reward / pay people to recycle  
*accept fine people for not recycling*
- put labels on the cans
- provide recycling bags / bins / areas

1

[8]

- M3.** (a) (i)  $C_2H_4$  1
- (ii) poly(ethene) 1
- (b) (i) is not biodegradable 1
- (ii) not enough landfill sites / space  
*accept landfill sites are filling up or plastics remain for years or  
plastics not broken down  
ignore cost / waste of resources / not biodegradable / wildlife* 1
- (iii) less (crude) oil / fuels / energy used  
*accept (crude) oil is a non-renewable resource* 1

[5]

- M4.** (a) (i) monomers 1
- (ii) crude oil 1
- (b) any **three** from:
- metal may not corrode away / remains
  - plastic remains / does not break down (decay) / not affected by microorganisms  
*accept non-biodegradable*
  - should recycle / conserve resources / mend the kettle / burn (plastic) as a fuel  
*accept it is a waste of materials / resources*
  - landfill sites are limited / filling up
  - water pollution  
*ignore harms wildlife / habitats or problems caused by burning the kettle*
- 3

[5]

- M5.** (a) (i) hydrogen  
*must be name* 1
- (ii) a line of four or more ethene molecules joined to the original two with single bonds  
*at least two other ethene molecules joined to the original two in a chain gains 1 mark* 2
- (b) (i) any **two** from:
- non-biodegradable  
*accept remains a long time*
  - landfill sites are filling up / limited  
*accept land / space used up*
  - waste of a resource / could be recycled / reused  
*ignore references to tablets / animals* 2
- (ii) any **one** from:
- (two) different polymers / plastics / materials
  - need to be separated
  - limited collection points / many need to be collected
  - tablets may still be present 1
- [6]**

- M6.** (a) (i) poly(ethene)  
*accept polythene* 1
- (ii) cracking 1
- (iii) hydrogen 1
- (b) (i) bar labelled 9 1
- bar drawn to correct height 1
- (ii) (boiling point) increases 1
- (iii) heat / evaporate (the crude oil)  
*accept separate by boiling point* 1
- cool / condense (hydrocarbons at different temperatures)  
*accept smaller molecules go to top / larger molecules stay at bottom*  
*accept fractional distillation for two marks or distillation / fractionation for one mark* 1
- (c) **yes**
- any **two** from:
- because plastic does not biodegrade **or** running out of space for landfills **or** land cannot be used for a long time
  - it provides heat energy
  - which can be used to generate electricity / heat homes or greenhouses
  - any other advantage of burning
  - any other disadvantage of landfill
- or**

**no**

- burning plastic produces carbon dioxide / carbon emissions / toxic gases  
*accept landfill does not produce  
carbon dioxide / carbon emissions*
- causes global warming / climate change / increase greenhouse effect / global dimming / acid rain
- any other disadvantage of burning
- any other advantage of landfill

2

[10]