



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Materials and their Management

Module 4

Higher Tier

[GSC42]

MONDAY 21 MAY 2012

9.15 am–10.00 am

**MARK
SCHEME**

		AVAILABLE MARKS
1	<p>(a) Thermoplastic/Thermosoftening [1] Thermosetting [1] [2]</p> <p>(b) Non-Biodegradable materials will not decay [1] by the action of bacteria [1]</p> <p>(c) (i) Starch/Plant material or any named starchy plant, e.g. potato, maize [1]</p> <p>(ii) Any two of</p> <ul style="list-style-type: none"> ● Other named recycling bin, e.g. glass, paper ● Providing recycling centres ● Recycling available at supermarkets, etc. ● Charging businesses for putting waste in landfill sites ● Advertising/Education [2] 	7
2	<p>(a) Any three of:</p> <ul style="list-style-type: none"> ● Crude oil is heated/vaporized ● Each hydrocarbon/fraction has a different boiling point ● Each fraction contains hydrocarbons with similar number of carbon atoms/similar sized hydrocarbons ● Each fraction separates at a different level/section ● Fractions are condensed and collected [3] <p>(b) Fuel for gas ovens/LPG/Calor gas/heating homes [1]</p> <p>(c) (i) Oxygen [1], Water [1] (accept correct symbols)</p> <p>(ii) Global warming/Greenhouse effect [1]</p> <p>(d) Any one of:</p> <ul style="list-style-type: none"> ● Setting carbon dioxide emission limits ● Climate change program ● Clean Air act ● Air Quality strategy ● encouraging or giving grants for use of alternative fuels ● adverts encouraging less use of cars [1] 	8
3	<p>(a) It combines the properties of two or more materials [1] to form a better/more useful material [1]</p> <p>(b) Any one of</p> <ul style="list-style-type: none"> ● light ● long-lasting/durable ● unreactive ● non-rusting ● flexible [1] <p>(c) Cost: Expensive/not cheap [1]</p>	4

- 4 (a) Any **two** of: Blood, hair, skin, semen, saliva [2]
- (b) (i) unique [1] reference to cutting crime faster/solve crime faster [1]
- (ii) human rights/cost/big brother state/information may be lost [1]
- 5 (a) 5 points plotted correctly [2] or if 3–4 points plotted correctly [1] smooth curve [1]
- (b) The number/percentage of road accidents due to drink driving is **decreasing** over time [1]
- (c) Better education/more aware/more arrests/more likely to be caught/more advertising [1]
- 6 (a) A material whose properties change [1] when there is a change in surroundings/change in temp, pH or light [1]
- (b) (i) Many **small molecules/monomers** [1] **joined together/in long chains** [1]

(ii)

Monomer (alkene)	Polymer	Property	Common Use
Ethene	Polyethene [1] or Polythene	Light and flexible	Plastic bags, cling film (other suitable) [1]
Propene [1]	Polypropene	Light and Durable	Ropes

AVAILABLE MARKS

5

5

7

7 (a) (i) C [1]

(ii) A [1]

(iii) B [1]

(iv) D [1]

(b) Any **two** from:

- Measure a given volume of water and add **soap** solution
- Measure the amount of **lather** after shaking
- **boil** and redo experiment

[2]

Must have:

One named apparatus, e.g. measuring cylinder, test tube, ruler [1]

One fair test reference, e.g. same volume of water, same size test tube etc. [1]

Result expected: comparison/boiled sample would have more lather [1]

AVAILABLE
MARKS

9

Total

45