



*Rewarding Learning*

General Certificate of Secondary Education  
2011–2012

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**Science: Single Award (Modular)**

Materials and their Management

Module 4

Higher Tier

[GSC42]

**TUESDAY 28 FEBRUARY 2012**

**9.30 am–10.15 am**

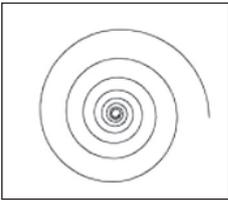
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**MARK  
SCHEME**

- 1 (a) any **one** of: lighter/doesn't break easily/cheaper/easier to shape  
**not** safer/flexible [1]
- (b) any **two** of: bottle banks/household bins for recycling/advertising/  
fines/rewards [2]
- (c) any **two** of: saves money/energy/saves raw materials/reduces use of  
landfill [2]
- (d) (i) Breaks down/decays/rots [1]  
by microbes/decomposers/microorganism/bacteria/fungus [1] [2]
- (ii) any named suitable material e.g. cotton, wool, paper, food,  
wood [1]

AVAILABLE  
MARKS

8

- 2 (a)  Any spiral shape [1]

- (b) Gently press finger on tile/surface [1]  
Sprinkle some carbon black powder on the paper [1]  
Use a (paint) brush to remove excess powder/gently tap [1]  
Place a piece of (sticky) tape on the fingerprint and remove [1] [4]

- (c) **Any 2** from

Hair [1]  
Blood [1]  
DNA/saliva/skin/sperm [1]  
Footprint [1]  
Clothes/fibres [1]  
Paint/bits of metal [1]

Or other suitable [2]

7

- 3 (a) (i) 7 [1]
- (ii) 140 [CM allowed (i) × 20] [1]

- (b) Any **two** of:

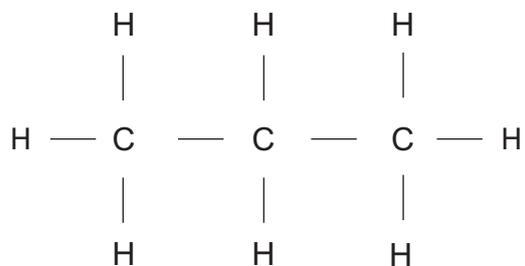
Affects nervous system/slows down reactions/affects concentration/  
judgement or similar [1]  
Can cause accident/death [1] [2]

- (c) Any **one** of: LSD/Marijuana/ecstasy or other suitable  
Scientific names only. [1]

5

		AVAILABLE MARKS
4	<p>(a) (i) 1 000 000 000 [1]</p> <p>(ii) Any <b>one</b> of: Sterilising sprays/wound dressings/cleaning operating theatres [1]</p> <p>(b) (i) They change (properties) depending on their surroundings [1] Heat [1] causes the paint to change colour [1] (Changes colour as temperature changes = [2]) [3]</p> <p>(ii) When the metal frame is damaged it can easily return to its original shape/easily reshaped <b>not:</b> easily fixed/repaired [1]</p> <p>(c) Lilac [1] Lead [1] [2]</p>	8
5	<p>(a) (i) Sample C [1]</p> <p>(ii) Take each sample, shake with soap solution and (measure the height of the lather) [1] Test tube/Measuring Cylinder or Ruler [1] Same volume of water/same volume of soap or other suitable [1] Do not accept repeat experiment</p> <p>(b) <math>\text{CaCO}_3</math> [1] <math>\text{Ca}(\text{HCO}_3)_2</math> [1]</p> <p>(c) Calcium chloride + Carbon Dioxide (either order) accept symbols [2]</p>	8

6 (a)



[1]

(b) (i)  $\text{C}_2\text{H}_4 + \text{C}_8\text{H}_{18}$  either order [2]

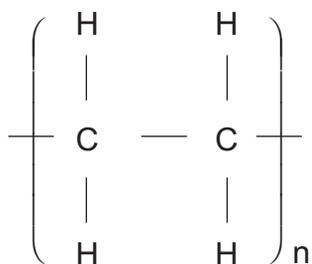
(ii) using a catalyst [1]

(iii) Higher demand for smaller hydrocarbons/petrol/smaller hydrocarbons more useful [1]

(c) (i) Many small molecules/monomers [1]  
joined together/in long chains [1]

Total [2]

(ii)



No double bond [1]

n [1]

Total [2]

9

**Total****45**