Rewarding Learning

General Certificate of Secondary Education
2012

Science: Single Award (Modular)

Materials and their Management
Module 4
Foundation Tier

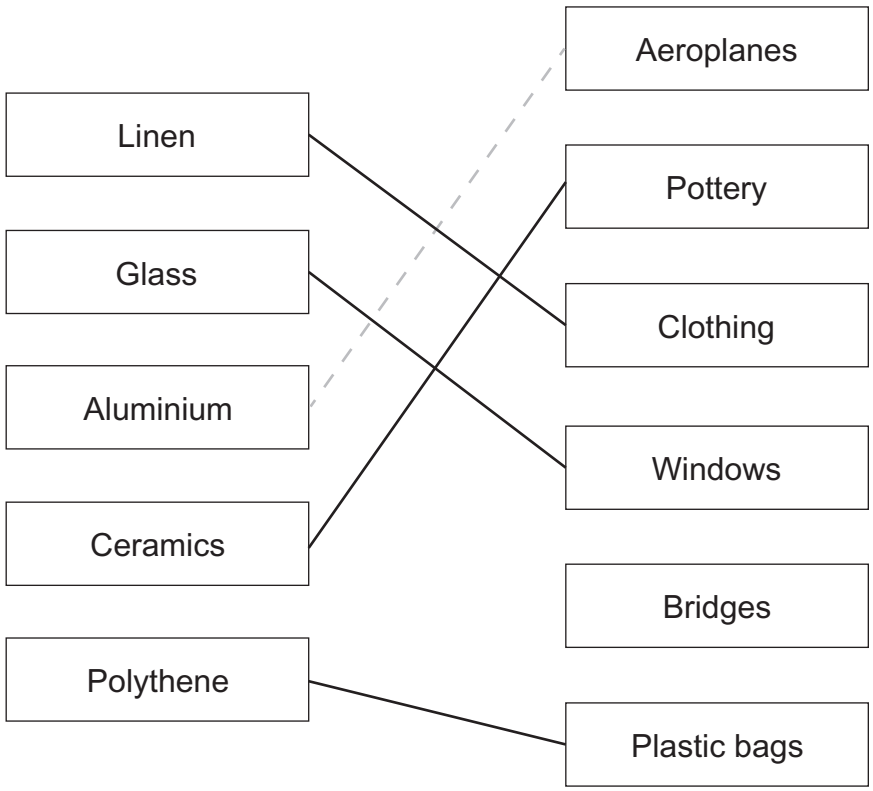
[GSC41]

TUESDAY 13 NOVEMBER 2012
10.15 am–11.00 am

MARK SCHEME

AVAILABLE MARKS

1 **(a)**



[4]

(b) *Any **two***:

- Lighter [1]
- Does not break/shatter [1]
- Cheaper [1]
- Any other suitable property [1]

[2] 6

2 **(a)** 100 − (35 + 10 + 29 + 6 + 5) [1]
15% [1] [2]

(b) £76 [1]

(c) Breaks down/decays [1]
By microbes/decomposers/micro organism/bacteria/fungus [1] [2] 5

	AVAILABLE MARKS

3 **(a)** All bars drawn correctly [2], 3 bars [1] [2]

(b) 5% [1]

(c) Difficult to lather [1]
With soap [1]
(Leaves scum [1]) [2]

(d)

Tastes good	✓	[1]
Gives kettle fur		
Wastes soap		
Good for strong teeth and bones	✓	[1]
Stains clothes during washing		

[2] 7

4

Use	Process
Detecting for alcohol and drugs	IR Spectroscopy [1]
Creating heat energy by burning a fuel	Combustion [1]
Softening hard water	Ion Exchange [1]
Producing long chain molecules such as polythene	Polymerisation [1]

[4] 4

5 **(a)** B D C A [2]
(*Any **two*** in correct position [1]) [2]

(b) Wear safety goggles (or other suitable) [1]

(c)

Metal chloride	Flame colour
Calcium	Brick red
Potassium	Lilac [1]
Sodium	Orange/Yellow [1]
Copper [1]	Blue/green
Lead [1]	Pale blue

[4]

(d) Calcium chloride [1] 8

				AVAILABLE MARKS
6	**(a)**	**(i)**	3 [1]	
		(ii)	Different number of dyes in each ink sample/dyes do not match [1]	
		(iii)	*Any **three*** • Dissolve a small sample of each ink from the cheque in water [1] • Place a sample of each ink on the pencil line [1] • Place the paper in a tank with the bottom dipping into the solvent [1] • Wait for the solvent to travel up the paper and compare results [1] [3]	
	(b)	**(i)**	Carbon (black) [1]	
		(ii)	Fingerprints are unique [1] Compare suspect's fingerprints to those found at the scene of a crime [1] [2]	8
7	**(a)**		Fluorine [1]	
	(b)	**(i)**	3 [1]	
		(ii)	Hydrocarbons contain carbon and hydrogen [1] only/Ethanol contains oxygen as well [1] [2]	
	(c)		*Any **three*** • Heat the mixture • Each hydrocarbon/fraction has a different boiling point [1] • Each fraction contains hydrocarbons with similar number of carbon atoms/similar sized hydrocarbons [1] • Each fraction separates at a different level [1] • Fractions are condensed and collected [1] [3]	7
			Total	**45**