



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Road Safety, Radioactivity
and Earth in Space

Module 6

Higher Tier

[GSC62]

WEDNESDAY 29 FEBRUARY 2012

11.00 am–11.45 am

**MARK
SCHEME**

		AVAILABLE MARKS
1	(a) Heat/thermal/sound	[1]
	(b) (i) 600/2400; 0.25/25%/1/4	[2]
	(ii) Engines use less fossil fuels; less carbon dioxide produced/less greenhouse gases	[2]
		5
2	(a) Hydrogen gas; Pulled together by gravity: Fusion begins	[3]
	(b) Radio telescopes/light telescopes/satellites/probes <i>any 1</i>	[1]
	(c) The distance: travelled by light in 1 year	[2]
	(d) Minimum 24 year round trip; large supply of food/water would be difficult to carry; large supply of oxygen required; difficult to cope with major illnesses over such a distance; larger spacecraft so more fuel technical failure/astronauts stranded (any three)	[3]
		9
3	(a) There are more children in residential areas; slower speed means less chance of serious injury if a child is hit	[2]
	(b) less friction; increased braking distance/stopping distance	[2]
	(c) (i) 4 units	[1]
	(ii) 60 mg	[1]
	(iii) Increased reaction time; increase in thinking distance/stopping distance	[2]
	(iv) At 75 mg you are 3.5 times as likely to have a crash/or other appropriate comparison from table	[1]
	(d) (i) The forces are balanced; moving at a steady speed	[2]
	(ii) The car would decelerate if it was moving at a steady speed	[1]
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			AVAILABLE MARKS	
4	(a)	(i) 5 points correct – 2 marks 4 points correct – 1 mark smooth curve – 1 mark	[3]	7
		(ii) The time it takes; the radioactivity/radiation count to fall by half	[2]	
		(iii) 5700–5900 years	[1]	
		(iv) 2000–2200 years	[1]	
5	(a)	(i) Universe started as a single point/singularity; Universe was created from a large explosion After millions of years gravity pulled this matter together to eventually form stars and galaxies universe still expanding today (any three)	[3]	8
		(ii) Steady State theory	[1]	
	(b)	(i) Heliocentric	[1]	
		(ii) Earth is at the centre of the Solar System	[1]	
	(c) Homborg 11; furthest from our galaxy	[2]		
	6	(a) mass = $1 + 0.01 = 1.01$ momentum = 3.0×1.01 $3 \times 1 = 1$ mark 3.03 kgm/s	[3]	
(b) Increase the velocity of bullet		[1]		
Total			45	