



Rewarding Learning

**General Certificate of Secondary Education
2015–2016**

Science: Single Award

Unit 3 (Physics)

Foundation Tier

[GSS31]

FRIDAY 13 NOVEMBER 2015, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

			AVAILABLE MARKS		
1	(a) (i)	Kettle [1] toaster [1]	[2]	7	
		(ii) Sound	[1]		
	(b)	Neutral = blue live = brown earth = green/yellow all 3 correct = 2 marks 1 or 2 correct = 1 mark	[2]		
		(c) (i)	Fuse		[1]
			(ii) Plastic cover		[1]
2	(a)	Asteroid – moon – planet – star any 2 in correct order [1] all correct [2]	[2]	9	
		(b) (i)	Saturn is further away than Jupiter but has less gravity (or converse)		[1]
	(ii) As size increases, gravity increases		[1]		
	(c)	Decreases	[1]		
	(d) (i)	8800	[1]		
		(ii) The number of asteroids discovered has increased in time	[1]		
	(iii)	Any two from:			
		• craters/tsunamis			
		• cloud of dust			
		• extinctions/millions killed	[2]		
3	(a) (i)	30 [1] 330 [1]	[2]	6	
		(ii) A	[1]		
	(iii)	Speed = wavelength \times frequency	[1]		
	(b)	Ultrasound	[1]		
	(c)	Energy	[1]		
4	(a) (i)	X releases metre stick and Y catches (as quickly as possible) [1] pupils changing position [1] less distance dropped, faster reactions [1]	[3]	7	
		(ii)	Repeat/average		[1]
		(b) (i)	Braking distance		[1]
	(ii) 96 m		[1]		
	(iii)	Increased	[1]		

			AVAILABLE MARKS
5	<p>(a) Bends/refracts light [1] converges/inwards/focus on retina [1]</p> <p>(b) Close : far [1] concave [1]</p> <p>(c) (i) As thickness increases, focal length decreases (allow converse) [1]</p> <p>(ii) 64–68 mm [1]</p>	<p>[2]</p> <p>[2]</p> <p>[1]</p> <p>[1]</p>	6
6	<p>(a) Neutrons [1] protons [1]</p> <p>(b) (i) 300 cpm [1]</p> <p>(ii) 80 cpm [1]</p> <p>(c) (i) Gamma [1]</p> <p>(ii) Stop radiation escaping [1] prevent cancer/tumour [1] [2]</p> <p>(iii) Kills bacteria [1] keeps food fresh longer/prevents fruit rotting/longer sell-by date [1] more profit/less waste [1] [3]</p>	<p>[2]</p> <p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[2]</p> <p>[3]</p>	10
7	<p>(a) (i) Any two from:</p> <ul style="list-style-type: none"> • same driver • same speed • same road (conditions) • same car • same fuel type <p>(ii) More mpg = more efficiency [1]</p> <p>(iii) Lighter cars [1]</p> <p>(b) Remains of plants/animals [1] compressed/pressure [1] millions of years [1]</p>	<p>[2]</p> <p>[1]</p> <p>[1]</p> <p>[3]</p>	7

8 (a) Indicative content

- Bulbs connected in branches in parallel
- Bulbs connected side by side in series
- If one bulb goes out, the rest stay lit in parallel/all go out in series/
easier to find broken bulb in parallel
- Bulbs are brighter in a parallel circuit
- More bulbs connected, same brightness in parallel/dimmer in series
- Current is split among the branches in parallel/every bulb gets a
constant voltage in a series circuit
- Same current all around a series circuit/voltage is shared in a parallel
circuit
- More wiring/more expensive

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe fully the differences between parallel and series circuits (using 6 or more of the above points) to explain why a parallel circuit should be chosen in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to partially describe the differences between parallel and series circuits (using 3 to 5 of the above points) to explain why a parallel circuit should be chosen in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe the differences between parallel and series circuits (using 1 or 2 of the above points) to explain why a parallel circuit should be chosen. However these are not in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

(b) 722 units [1]

10830/£108.30 [1]

Correct answer gets full marks

[2]

Total

8

60AVAILABLE
MARKS