Rewarding Learning

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 3 (Physics)

Foundation Tier

[GSS31]

MONDAY 19 MAY 2014, AFTERNOON

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.

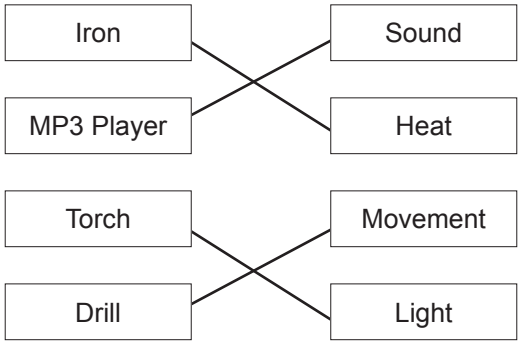
The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends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



All 4 correct = 3 marks
3/2 correct = 2 marks
1 correct = 1 mark [3]

(b) (i) 805/230 = 1 mark
3.5 = 2 marks [2]

(ii) 5 (Allow consequential on (i)) [1]

(iii) plastic (insulator) cover/cable grip/earth wire [1]

(iv) Amp [1] 8

2 (a) (i) Neptune [1] as it is furthest away from sun [1] [2]

(ii) Heliocentric [1]

(b) (i) As planet diameter increases so does number of moons [1]

(ii) Not correct as Uranus/Neptune doesn't fit the trend [1]

(c) Journey time [1] or implied
Difficult to carry enough food/oxygen/fuel [1] [2] 7

3 (a)

Factor	Thinking distance	Braking distance
Wet road surface	**no effect**	**increased**
Faster speed	**increased**	**increased**
Bald tyres		
New brakes	**no effect**	**decreased**

½ mark each – round down [3]

(b) 75 m [1]

(c) (i) Speed cameras reduced the % of vehicles speeding [1]

(ii) 50 mph [1]

(iii) Speed bumps/road narrowing [1] 7

					AVAILABLE MARKS
4	**(a)**	**(i)**	0.5 + 13.5 + 10 + 12 + 8 = 44 [1] 100 – 44 = 56 [2]	[2]	
		(ii)	Background	[1]	
	(b)	**(i)**	Kills microbes [1] which causes decay (or implied) [1]	[2]	
		(ii)	They have longer to sell the food/more profit/less wastage	[1]	
	(c)		As alpha would be stopped by air [1] beta would be stopped by skin/bone [1] gamma would not be stopped by skin/bone [1]	[3]	9
5	**(a)**	**(i)**	A to B = stopped [1] B to C = steady speed [1]	[2]	
		(ii)	50/50 [1] 1.0 [1]	[2]	
	(b)		B and D	[1]	5
6	**(a)**	**(i)**	3 points plotted correctly [1] Line of best fit [1]	[2]	
		(ii)	48 mpg (from script)	[1]	
	(b)	**(i)**	Streamlined/lighter/other appropriate response	[1]	
		(ii)	Fossil fuels/energy sources are running out/non-renewable [1] more efficient uses less fuel [1]	[2]	6
7	**(a)**	**(i)**	1000 – 880 [1] 120 [1]	[2]	
		(ii)	Any 3 from: • no power produced until speed reaches 3 m/s (at low wind speed) • (as wind speed increases), output power increases • up to a maximum of 880 W/14 m/s (unit not required) • then power decreases (after maximum/at high wind speed)	[3]	
	(b)	**(i)**	Will not run out	[1]	
		(ii)	Less air pollution/(**less**) carbon dioxide/(**less**) global warming [1] Unsightly/noisy [1]	[2]	8

AVAILABLE MARKS

8 **(a)** **(i)** 3 [1]

(ii) 10 [1]

(b) Indicative content
- echoes
- reflected sound
- hard surfaces
- hear the same sound at different times
- sound travels different distances
- use soft materials (named surface)
- to absorb sound

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe fully, in a logical sequence, why some people may not hear the sound clearly (using **6 or more** of the above points). 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, in a logical sequence, why some people may not hear the sound clearly (using **4** or **5** of the above points). They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3–4]
C	Candidates describe why some people may not hear the sound clearly (using **1**, **2**, or **3** of the above points). 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]

(c) Sounds with a frequency [1]
greater than 20kHz [1] [2] 10

Total **60**