Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Road Safety, Radioactivity and Earth in Space Module 6

Foundation Tier

[GSC61]

GSC61

THURSDAY 24 MAY 2012, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all six** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
Total Marks	

Examiner Only	
Marks	Remark

1 **(a)** The table below shows some information about the planets in our Solar System.

Planet	Gravity/ N/kg	Distance from the Sun/ million km
Mercury	4	58
	9	108
Earth	10	150
Mars	4	228
Jupiter	26	778
	11	1427
Uranus	9	2870
Neptune	11	4497

(i) Complete the table above by adding the names of the missing planets. [2]

(ii) Name the planet on which your weight would be the greatest.

_____ [1]

(iii) From which planet would the Sun look dimmest? Explain your answer.

_____

_____

_____ [2]

(b) Suggest what would happen to all living creatures if the Earth was hit by a large asteroid.

_____

_____ [1]

(c) Complete the following sentences.

Choose from:

Earth : Orbit : Sun

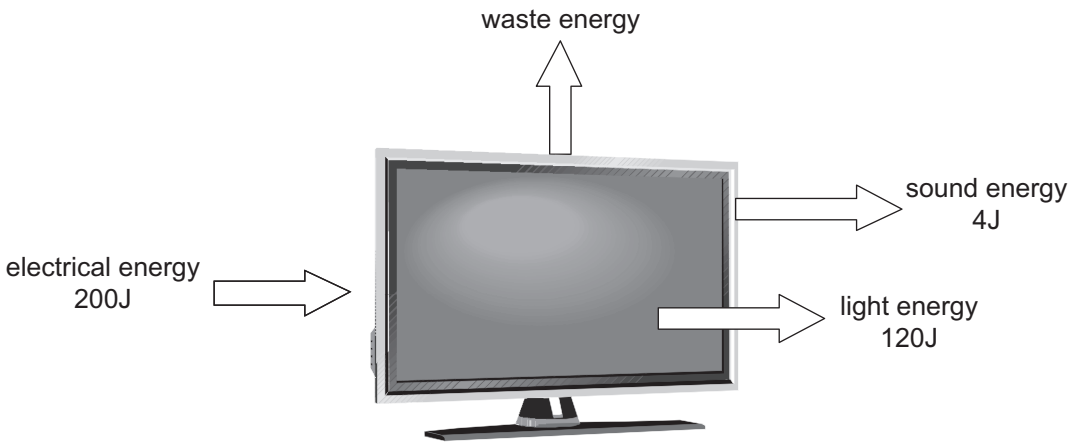
Moon : Gravity : Friction

Each planet moves in an _____ around the Sun. They do this because of the force of _____. People once believed that the _____ was at the centre of the Universe. [3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

2 **(a)** The diagram below shows the energy changes which take place in a television.



(i) Calculate how much useful energy is produced by the television.

_____ J [1]

(ii) Calculate how much energy is wasted by the television.

_____ J [1]

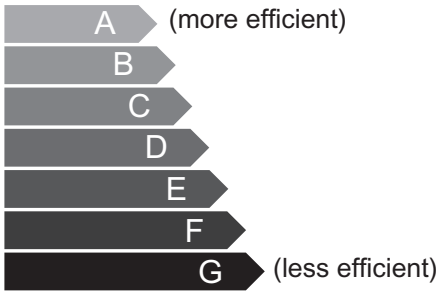
(iii) Name **one** type of energy wasted by the television.

Choose from:

electrical : stored : heat : movement

_____ [1]

The diagram below shows the energy efficiency label used on televisions.



(b) Which television (A–G) would waste the least energy?

_____ [1]

(c) What is meant by the term **efficient**?

Tick (✓) the correct answer.

How much energy a device uses. ☐

How good a device is at changing energy into useful energy. ☐

How much it costs to run a device. ☐ [1]

(d) Give one **economic** reason why someone would buy a more efficient television.

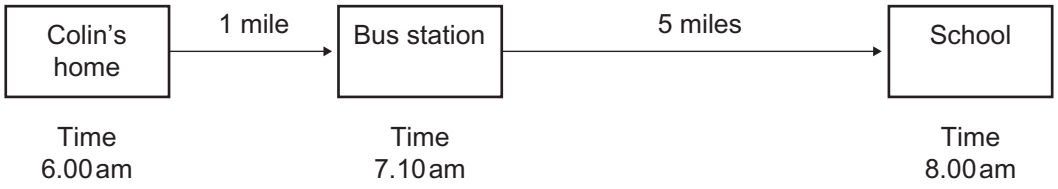
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

3 The diagram below shows Colin's journey to school including the time he left home and the time he arrived in school.



(a) (i) Calculate how far Colin's home is from the school.

_____ miles [1]

(ii) Calculate the time taken for this journey.

_____ hours [1]

(iii) Use the equation:

$$\textbf{average speed} = \frac{\textbf{total distance}}{\textbf{time taken}}$$

to calculate Colin's average speed travelling to school.
(Show your working out.)

_____ miles/hour [1]

(b) The next day Colin's journey to school took less time. What, if anything, will happen to his average speed?

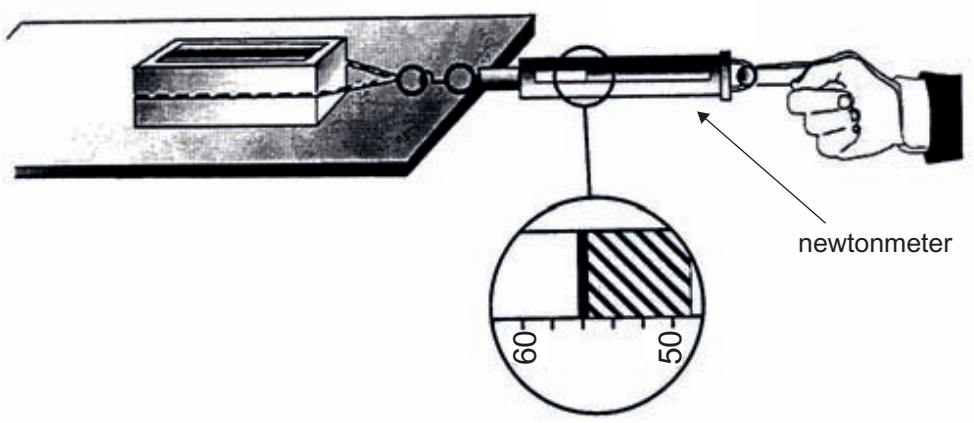
Choose from:

increase : stay the same : decrease

_____ [1]

Examiner Only	
Marks	Remark

(c) The diagram below shows a brick being pulled across a bench by a newtonmeter.



(i) What is the reading on the newtonmeter?

_____ N [1]

(ii) Name the force which opposes the movement of the brick.

_____ [1]

(iii) If the surface of the bench was rougher, state the effect, if any, this would have on the size of force needed to move the brick.

_____ [1]

Examiner Only	
Marks	Remark

4 **(a)** What word is used to describe the small amount of radiation that is always around us?

Circle the correct answer.

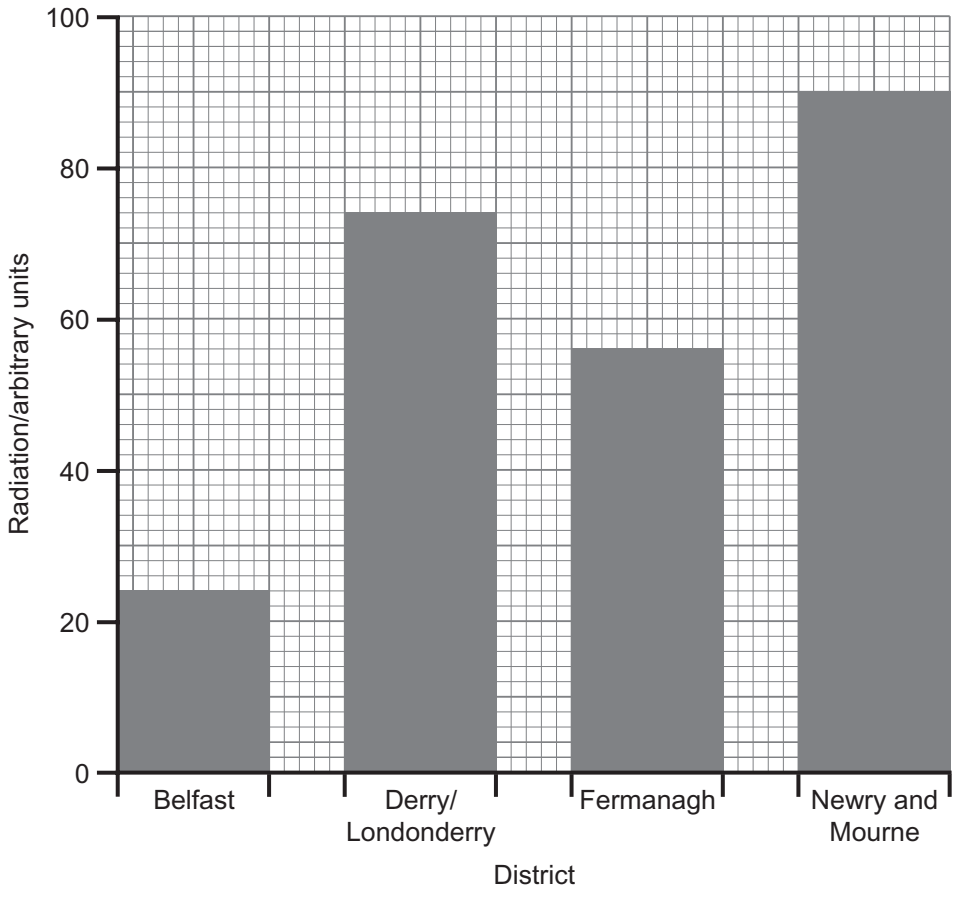
background : surround : foreground : underground [1]

(b) Some of this radiation is caused by humans. Place a tick (✓) by each source caused by humans.

Source	Caused by humans
Nuclear weapons	
Cosmic rays	
Granite rocks	
X-rays from hospitals	

[2]

The bar chart below shows radiation levels in different districts of Northern Ireland.



(c) Name the district where a person receives the largest dose of radiation.

_____ [1]

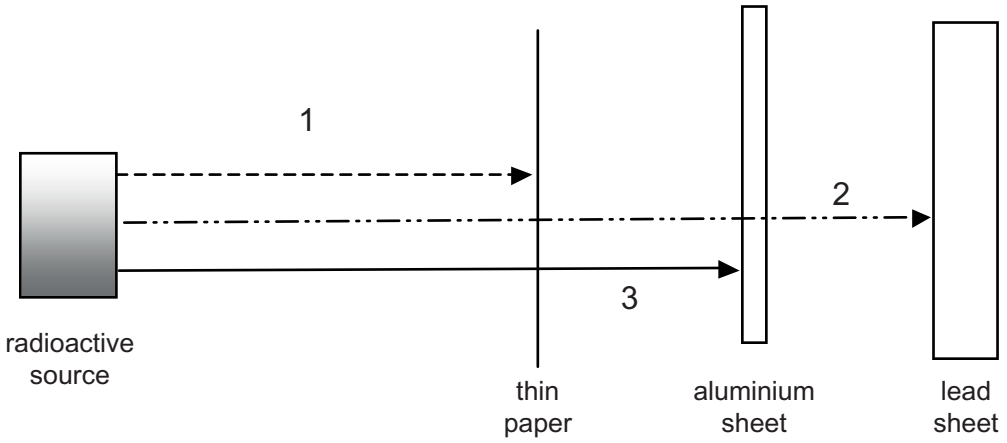
(d) Explain fully how too much radiation affects living tissue.

_____

_____

_____ [2]

(e) A radioactive source emits alpha, beta and gamma radiation. Each type is stopped by a different material as shown below.



Use the diagram to name each type of radiation (1, 2 and 3).

1. _____

2. _____

3. _____ [2]

Examiner Only

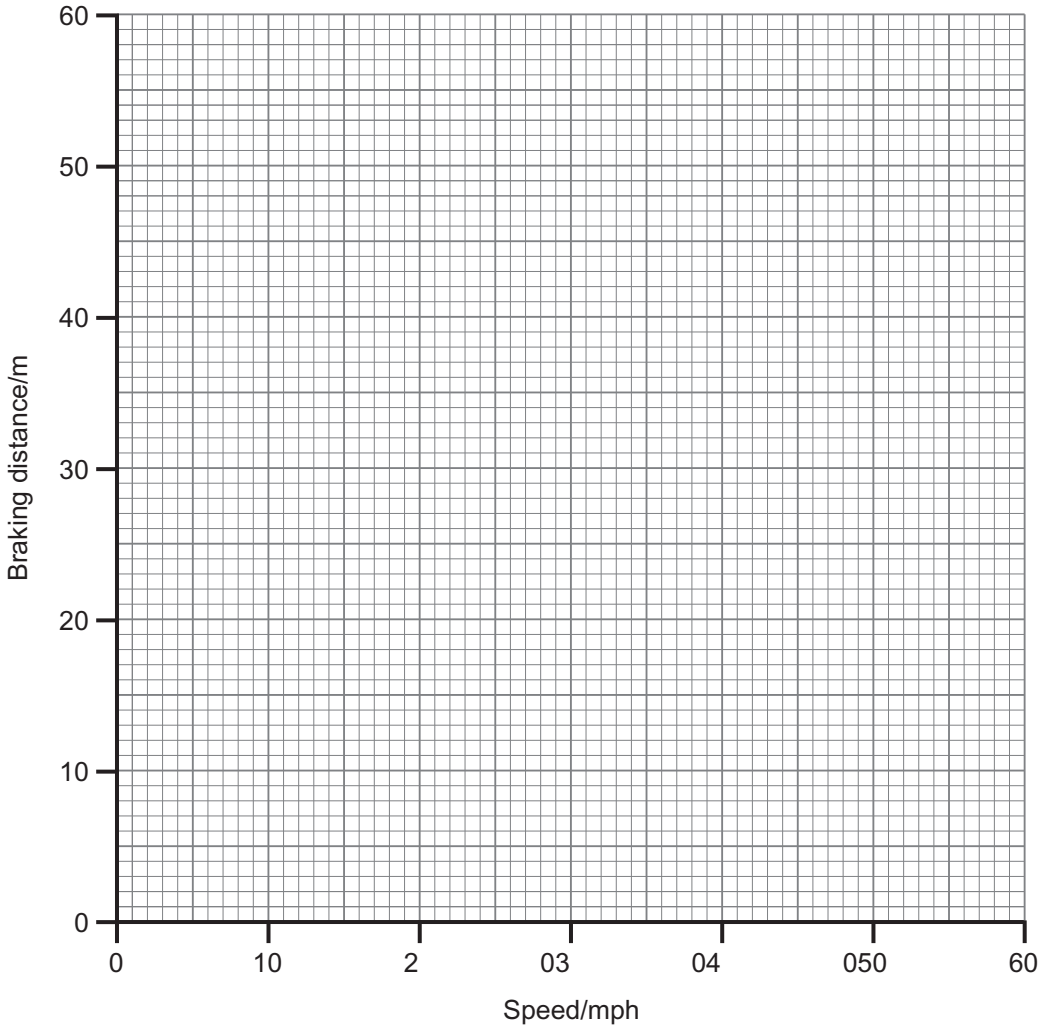
Marks	Remark

Examiner Only	
Marks	Remark

5 **(a)** The table below gives information about the braking distance at different speeds.

Speed/mph	Braking distance/m
20	6
30	14
40	24
50	38
60	54

(i) Use the information in the table to plot and draw a line graph on the grid below.



[3]

(ii) Describe a trend shown by these results.

_____

_____ [1]

Examiner Only	
Marks	Remark

(b) Apart from speed give **one** other factor that will increase the braking distance. Explain your answer in terms of forces.

_____

_____

_____ [2]

(c) The photograph below shows a car which was involved in a collision. The front has collapsed to help reduce injuries.

© TRL Ltd / Science Photo Library

What name is given to the front part of a car which collapses in this way? Suggest how this helps reduce injuries to the driver.

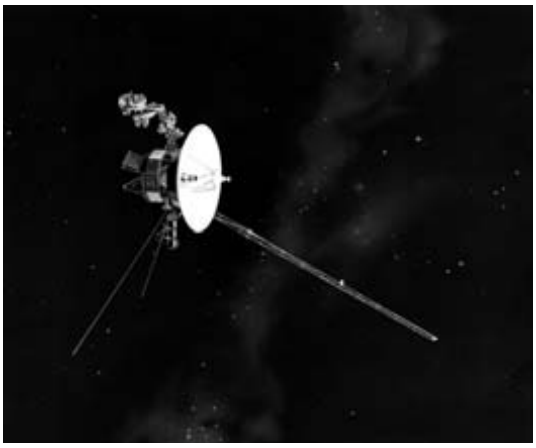
_____

_____

_____ [2]

Examiner Only	
Marks	Remark

6 The picture below shows the spacecraft Voyager 1 on its journey to the edge of the Solar System and beyond.



© NASA / JPL / Science Photo Library

(a) Explain fully why it is unlikely that this spacecraft will reach any planet outside our Solar System.

_____

_____

_____ [2]

(b) Space exploration is very expensive. Suggest **two** reasons why scientists continue to explore space.

_____

_____

_____ [2]

(c) Explain fully the formation of the Sun.

_____

_____

_____

_____

_____ [3]

THIS IS THE END OF THE QUESTION PAPER

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