



ST PAUL'S
GIRLS' SCHOOL

Candidate number: _____ Group: _____

Comprehension Paper – The Moon

50 minutes (5 minutes reading time + 45 minutes answering time)



There are three sections, all of which must be attempted. You should answer the questions in this booklet. You should spend about 15 minutes on each section.

- You will be told when to move on by the invigilator and you must do so.
- If you finish a section early you may move on to later sections.
- It does not matter if you do not finish every section; it matters more that you have had a go at each one.
- You may go back to other questions at the end.

Write all your answers, including any working out or rough work, in the booklet. If you want to highlight any details please do so.

You will need a pencil, a pen, a ruler and a rubber. You can write in either pencil or pen.

Section A - History

Man’s attempt to land on the Moon – real and imagined

It was Neil Armstrong, an American, who was the first man to land on the Moon. He did this on 20 July 1969 to huge public attention. For centuries before, however, the idea of such a landing had been a popular subject for story writers. The Moon’s proximity to the earth, its beguiling shape and apparent impact on Earth meant that the idea of a landing exerted a powerful influence on people’s imagination.

Question 1 – refer to the resource booklet for more information

Use the passage and images in Section A of the resource booklet to fill in the table below. Some has been done for you. If there is no relevant evidence, write NOT KNOWN.

[8]

Title of Book	Author	Date of Publication	Image	Main Character	Means of getting to the Moon	Type of life on the Moon?
A True Story		c.2AD	A	Lucian		
		1638	C	Gonsales		
	Jules Verne				Cannon	
The First Men in the Moon	HG Wells					Moon Calves

Question 2

There have also been attempts to pretend that there was life on the Moon. The Great Moon Hoax was a series of six articles that were published in *The Sun*, a New York newspaper, beginning in 1835, about the supposed discovery of life on the Moon. The articles described fantastic animals on the Moon, including bison, goats, unicorns, bipedal tail-less beavers and bat-like winged humanoids who built temples. There were trees, oceans and beaches. These discoveries were supposedly made with ‘an immense telescope of an entirely new principle’.

This is an image from one of the articles.



a. Why do you think *The Sun* decided to publish these stories? [2]

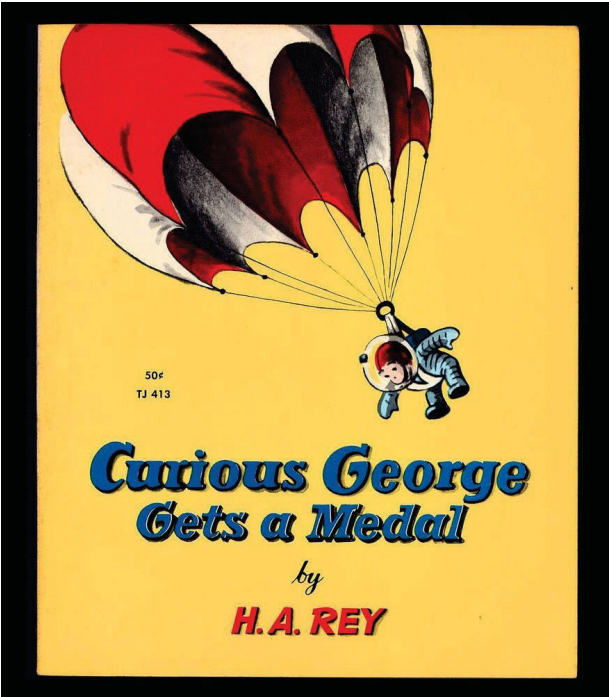
b. In what ways were these stories similar and different to the earlier imagined accounts in Question 1? [5]

Question 3

After the Second World War the USA and Russia competed with each other about who would get the first man in space. In 1957, the Russians sent a dog, Laika, into space. This is a stamp to commemorate the event.



In 1957, an American book featuring the well-known character, Curious George, was published called *Curious George Gets a Medal*. Look at the cover of the book below.



a. What do you think it was about? [2]

b. How useful do you think this book is to the historian studying the race to space? [4]

Question 4

Why do you think that the Moon holds such fascination for humans? Use your own ideas, ones which have not been outlined in this paper, to answer the question. [4]

THIS IS A BLANK PAGE

Section B - Languages

Lunar language

Imagine that people did manage to find other, alien life on the Moon. They would be very keen to communicate with these other life forms. They might start off by showing them a number of common objects which we see or use on a daily basis. They would show them what these objects are used for and teach them the words for the objects. Let’s suppose for the sake of argument that the language they would be using is English!

Our space explorers selected the following objects. The aliens listened carefully to the names that they were given and then reproduced the sounds of the words using their alien voices. The words became slightly altered when they said them.

Here are the objects that they were shown:

A

B

C

D

E

F

G

H

I

J

K

L

Question 1

- a. Here are the sounds that the aliens made to describe the objects. Which object matches which sound? One has been done for you. [5]

Alien pronunciation	Object	Alien pronunciation	Object
crok	clock	tā	.....
mat	.....	terewhono	.....
mūn	Moon	whauk	.....
paipa	.....	whūt	.....
penser	.....	wot	.....
pūn	.....	wūru	.....

- b. Why do you think the aliens pronounce words differently? [3]

- c. How do you think the aliens would say the words for: [5]

- I. Torch

II. Stone

III. Flute
- IV. Plate

V. Pool

Question 2

The aliens did of course have their own language and began to teach this to the astronauts in their turn. Here are some examples:

mera dondi	three women	penser donka	three pencils	tero senior	five rocks
woni sendi	five men	mat panka	four matches	paip panka	four flutes
mat donka	three matches	mat senka	five matches	talo senior	five stars
penser panka	four pencils	tero donor	three rocks	poro donor	three lakes
woi sendi	five aliens	poro panor	four lakes	paip senka	five flutes
paip donka	three flutes	poro senior	five lakes	woi dondi	three aliens
woi pandi	four aliens	woni pandi	four men	woni dondi	three men
penser senka	five pencils	tero panor	four rocks	talo panor	four stars
talo donor	three stars	mera sendi	five women	mera pandi	four women

a. Which word parts in the alien language mean: [3]

- I. three
- II. four
- III. five

b. The aliens seem to name things in a certain way according to particular characteristics that they have. What are the three ways of classifying objects and which part of the word tells us this? [4]

c. If you were the astronauts and aliens trying to learn each other’s languages, what other things would you need to learn about the language in order to understand and speak it? How would you go about doing this? [5]

Section C - Science

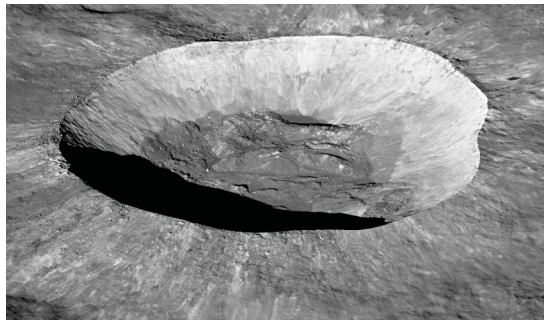
The Moon and meteorite craters

The Moon is not like Earth. It does not have oceans, lakes, rivers, or streams. It does not have wind-blown ice fields at its poles. Flowers do not sprout from its charcoal grey surface. The wind never blows. People never lived there but, as you have seen, they have wondered about it for centuries and a few lucky ones have even visited it. Twelve astronauts in six Apollo missions landed on and explored the Moon between 1969 and 1972. The Apollo astronauts' footprints remain undisturbed on the surface of the Moon to this day.

The major features of the Moon's surface can be seen just by looking up at it. It has lighter and darker areas. The bright areas are the lunar highlands and the darker parts are called the lunar maria, Latin for 'seas', which they resembled to Thomas Hariot and Galileo Galilei, the first scientists to examine the Moon with telescopes. The arrangement of these areas on the Moon famously resembles a human face, commonly known as 'the Man in the Moon'.



'The Man in the Moon'



A crater on the Moon

Closer inspection shows that the highlands are made up of numerous overlapping craters, ranging in diameter from one metre to over one thousand kilometres. All of these craters formed when meteorites crashed into the Moon. Shock waves were sent back into the meteorite from the Moon and the meteorite was so overwhelmed that it vaporised, never to be seen again. The only evidence of its impact is the crater hole where it landed and piled up material around the rim, which forms mountains. The diameter of a crater is ten times larger than the diameter of the meteorite that landed there and its depth on impact is one tenth of the crater's diameter.

The dark maria cover 16% of the Moon's surface and are composed of lava flows filling low-lying areas, including craters. Samples of rock from the Moon show that the maria filling the craters formed up to a billion years after the craters were formed. The man on the Moon's right eye is known as the Mare Imbrium. The impact that formed the Mare Imbrium crater caused material to be thrown outwards and onto the mountains that were formed with the Serenitis crater (the left eye), changing the mountains' appearance.

Question 1

- a. The Mare Imbrium crater has a diameter of 1146km. Calculate the diameter of the meteorite that formed it. Show your working. [1]

- b. Immediately after the Mare Imbrium crater was formed, its floor bounced back up to become 100km shallower than it was on formation. How deep is the Mare Imbrium now? Show your working. [2]

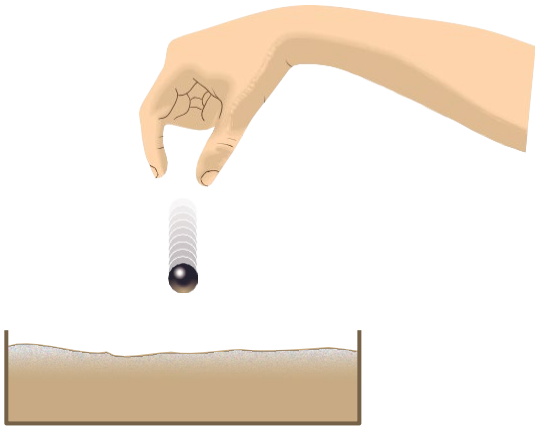
- c. Which crater is older, the right or left eye of the man on the Moon? Explain how you know. [3]

Question 2

Why are the rocks that the Apollo astronauts collected from the Moon more useful than the rocks on Earth for studying the history of our Solar System? [3]

Question 3 – refer to the resource booklet for more information

Scientists can investigate the formation of Moon craters by simulating a meteorite impact in the laboratory. One group of scientists investigated the effects of different sized meteorites by dropping balls of different sizes onto sand. The balls represent meteorites and the sand represents the surface of the Moon.



The balls the scientists used are shown in the table below.

Ball	Diameter (cm)
Football	22
Tennis ball	6.5
Golf ball	4.3
Marble	0.6

Use the results of the scientists’ experiments shown in Section C of the resource booklet. to answer the following questions.

- a. Use a ruler to measure the diameters of the craters as accurately as possible. Record your measurements in the table below. Don’t forget to label the columns clearly and include units of measurement. [4]

- b. What is the relationship between size of ball and crater diameter? [1]

- c. List up to three factors that the scientists should have kept the same to make this a fair test. [3]

1.
2.
3.

- d. Evaluate how effective this experiment is at simulating meteorite impact on the Moon. You should try to identify strengths and weaknesses of the experiment. [8]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

THIS IS A BLANK PAGE