GCSE English Language Unit 3

Reading and Writing: Argumentation, Persuasion and Instructional

Space

Text A:

**Solar System**

The **Solar System**[[a]](https://en.wikipedia.org/wiki/Solar_System#cite_note-6) is the [gravitationally](https://en.wikipedia.org/wiki/Gravity)-bound system comprising the [Sun](https://en.wikipedia.org/wiki/Sun) and the objects that orbit it, either directly or indirectly.[[b]](https://en.wikipedia.org/wiki/Solar_System#cite_note-7) Of those objects that orbit the Sun directly, the largest eight are the [planets](https://en.wikipedia.org/wiki/Planet),[[c]](https://en.wikipedia.org/wiki/Solar_System#cite_note-8) with the remainder being significantly smaller objects, such as [dwarf planets](https://en.wikipedia.org/wiki/Dwarf_planet) and [small Solar System bodies](https://en.wikipedia.org/wiki/Small_Solar_System_body). Of the objects that orbit the Sun indirectly, the [moons](https://en.wikipedia.org/wiki/Natural_satellite), two are larger than the smallest planet, [Mercury](https://en.wikipedia.org/wiki/Mercury_%28planet%29).[[d]](https://en.wikipedia.org/wiki/Solar_System#cite_note-9)

The Solar System [formed 4.6 billion years ago](https://en.wikipedia.org/wiki/Formation_and_evolution_of_the_Solar_System) from the [gravitational collapse](https://en.wikipedia.org/wiki/Gravitational_collapse) of a giant interstellar [molecular cloud](https://en.wikipedia.org/wiki/Molecular_cloud). The vast majority of the system's [mass](https://en.wikipedia.org/wiki/Mass) is in the Sun, with the majority of the remaining mass contained in [Jupiter](https://en.wikipedia.org/wiki/Jupiter). The four smaller inner planets, [Mercury](https://en.wikipedia.org/wiki/Mercury_%28planet%29), [Venus](https://en.wikipedia.org/wiki/Venus), [Earth](https://en.wikipedia.org/wiki/Earth) and [Mars](https://en.wikipedia.org/wiki/Mars), are [terrestrial planets](https://en.wikipedia.org/wiki/Terrestrial_planet), being primarily composed of rock and metal. The four outer planets are [giant planets](https://en.wikipedia.org/wiki/Giant_planet), being substantially more massive than the terrestrials. The two largest, Jupiter and [Saturn](https://en.wikipedia.org/wiki/Saturn), are [gas giants](https://en.wikipedia.org/wiki/Gas_giant), being composed mainly of [hydrogen](https://en.wikipedia.org/wiki/Hydrogen) and [helium](https://en.wikipedia.org/wiki/Helium); the two outermost planets, [Uranus](https://en.wikipedia.org/wiki/Uranus) and [Neptune](https://en.wikipedia.org/wiki/Neptune), are [ice giants](https://en.wikipedia.org/wiki/Ice_giant), being composed mostly of substances with relatively high melting points compared with hydrogen and helium, called [volatiles](https://en.wikipedia.org/wiki/Volatiles), such as water, [ammonia](https://en.wikipedia.org/wiki/Ammonia) and [methane](https://en.wikipedia.org/wiki/Methane). All eight planets have almost circular orbits that lie within a nearly flat disc called the [ecliptic](https://en.wikipedia.org/wiki/Ecliptic).

The Solar System also contains smaller objects.[[e]](https://en.wikipedia.org/wiki/Solar_System#cite_note-footnoteB-14) The [asteroid belt](https://en.wikipedia.org/wiki/Asteroid_belt), which lies between the orbits of Mars and Jupiter, mostly contains objects composed, like the terrestrial planets, of rock and metal. Beyond Neptune's orbit lie the [Kuiper belt](https://en.wikipedia.org/wiki/Kuiper_belt) and [scattered disc](https://en.wikipedia.org/wiki/Scattered_disc), which are populations of [trans-Neptunian objects](https://en.wikipedia.org/wiki/Trans-Neptunian_object) composed mostly of ices, and beyond them a newly discovered population of [sednoids](https://en.wikipedia.org/wiki/Sednoid). Within these populations are several dozen to possibly tens of thousands of objects large enough that they have been rounded by their own gravity.[[10]](https://en.wikipedia.org/wiki/Solar_System#cite_note-Stern2012-15) Such objects are categorized as [dwarf planets](https://en.wikipedia.org/wiki/Dwarf_planet). Identified dwarf planets include the asteroid [Ceres](https://en.wikipedia.org/wiki/Ceres_%28dwarf_planet%29) and the trans-Neptunian objects [Pluto](https://en.wikipedia.org/wiki/Pluto) and [Eris](https://en.wikipedia.org/wiki/Eris_%28dwarf_planet%29).[[e]](https://en.wikipedia.org/wiki/Solar_System#cite_note-footnoteB-14) In addition to these two regions, various other small-body populations, including [comets](https://en.wikipedia.org/wiki/Comet), [centaurs](https://en.wikipedia.org/wiki/Centaur_%28minor_planet%29) and [interplanetary dust clouds](https://en.wikipedia.org/wiki/Interplanetary_dust_cloud), freely travel between regions. Six of the planets, at least four of the dwarf planets, and many of the smaller bodies are orbited by [natural satellites](https://en.wikipedia.org/wiki/Natural_satellite),[[f]](https://en.wikipedia.org/wiki/Solar_System#cite_note-16) usually termed "moons" after the [Moon](https://en.wikipedia.org/wiki/Moon). Each of the outer planets is encircled by [planetary rings](https://en.wikipedia.org/wiki/Planetary_ring) of dust and other small objects.

From an article on Wikipedia

Text B : **NASA: How to become an Astronaut**

**A Very Brief History of Astronaut Selection**

The military selected the first astronauts in 1959. They had to have flight experience in jet aircraft and a background in engineering. And they had to be shorter than 5 feet 11 inches – to fit in the Mercury spacecraft.

But, in addition to flight and engineering expertise, space exploration requires scientific knowledge and the ability to apply it. So, in 1964, NASA began searching for scientists to be astronauts. Back then, one qualification for scientist-astronauts was a doctorate in medicine, engineering, or a natural science such as physics, chemistry or biology.

**So, What Does It Take to Be an Astronaut?**

Astronaut requirements have changed with NASA's goals and missions. A pilot's license and engineering experience is still one route a person could take to becoming an astronaut, but it’s no longer the only one. Today, to be considered for an astronaut position, U.S. citizens must meet the following qualifications:

1. A bachelor's degree in engineering, biological science, physical science, computer science or mathematics.
2. At least three years of related professional experience obtained after degree completion OR at least 1,000 hours pilot-in-command time on jet aircraft.
3. The ability to pass the NASA long-duration astronaut physical. Distant and near visual acuity must be correctable to 20/20 for each eye. The use of glasses is acceptable.

Astronaut candidates must also have skills in leadership, teamwork and communications.

NASA's Astronaut Selection Board reviews the applications (a record-breaking 18,300 in 2016) and assesses each candidate's qualifications. The board then invites about 120 of the most highly qualified candidates to NASA's Johnson Space Center in Houston, Texas, for interviews. Of those interviewed, about half are invited back for a second round. Once the final astronauts are selected, they must complete a two-year training period.

NASA official website

<https://www.nasa.gov/audience/forstudents/9-12/features/F_How_to_Become_an_Astronaut.html>

**Text C:**



Taken from a science textbook.

**Text D: BBC Newspaper Article**

**Space junk at tipping point, says report** By Jonathan AmosScience correspondent, BBC News : 2 September 2011

**A in the US have warned Nasa that the amount of so-called space junk orbiting Earth is at tipping point.**

[**A report**](http://www.nap.edu/catalog.php?record_id=13244) by the National Research Council says the debris could cause fatal leaks in spaceships or destroy valuable satellites.

It calls for international regulations to limit the junk and more research into the possible use of launching large magnetic nets or giant umbrellas.

The debris includes clouds of minuscule fragments, old boosters and satellites.

Some computer models show the amount of orbital rubbish "has reached a tipping point, with enough currently in orbit to continually collide and create even more debris, raising the risk of spacecraft failures," the research council said in a statement on Thursday.

**Situation 'critical'**

Hopes of limiting the amount of space junk in orbit suffered two major setbacks in recent years.

In 2007, China conducted an anti-satellite weapon test which destroyed a decommissioned weather satellite, smashing the object into 150,000 pieces larger than 1cm.

Two years later, two satellites - one defunct and one active - crashed in orbit, creating even more debris.

"Those two single events doubled the amount of fragments in Earth orbit and completely wiped out what we had done in the last 25 years," said Donald Kessler, who led the research.

There are 22,000 pieces of debris large enough to track from the ground, but smaller objects could still cause serious damage.

The International Space Station must occasionally dodge some of the junk, which flies around the Earth at speeds of up to 17,500 mph (28,164 km/h).

**Dr Robert Massey, Royal Astronomical Society: "It is a serious issue"**

In June, some debris narrowly missed the space station, forcing its six crew to go to their escape capsules and prepare for an emergency evacuation back to Earth.

The situation is critical, said Mr Kessler, a retired Nasa scientist, because colliding debris creates even more of the junk.

"We've lost control of the environment," he said.

The report makes no recommendations about how to clean up the field of debris.

But it refers to an earlier study for the Pentagon's science think-tank, the Defence Advanced Research Projects Agency (Darpa).

[**The Darpa report**](http://www.rand.org/pubs/monographs/2010/RAND_MG1042.pdf), dubbed "Catcher's Mitt", suggested a range of technologies, including harpoons, nets and an umbrella-shaped device that would sweep up the debris.

The aim would be to push the debris further towards the earth where it would burn up, or into a higher but safer orbit.

**Text E**

This text was taken from the newspaper The Guardian, conveying the unique experience Tim Peake had of The London Marathon

**Runner's high: Tim Peake finishes London Marathon in space**

British astronaut becomes first man to complete a marathon in space, finishing in three hours, 35 minutes and 21 seconds.



Tim Peake provided the countdown for the 36th London Marathon Sunday before running his own virtual version of the race, on a treadmill, hundreds of miles above the Earth.

A recorded message in which Peake wished the competitors good luck was played on big screens, before the runners set off in London and the 44-year-old astronaut began his own run on board the International Space Station.

The treadmill turned and the timer began. It was 10am on Sunday morning in London and as tens of thousands of runners set out on the marathon below, the British astronaut Tim Peake broke into his stride on board the International Space Station. He was somewhere over the Pacific Ocean.

Dressed in a red vest and black shorts, with the union flag hoisted behind him, Peake’s run took him into the world record books as the first man to complete a marathon in space. He finished in three hours, 35 minutes and 21 seconds. In the time he had taken to pound out 26.2 miles, he had travelled more than twice around the planet, on board the International Space Station.

“This morning was fantastic, what a unique experience” he said on the phone to his medical support crew at the European Space Agency’s astronaut centre in Cologne. “Although I did not have the crowd with me and to push me, I did feel the support. I was aware of thousands of people watching on the internet, from all over the world which is truly inspiring”. Moments earlier, he had completed the distance, thrown his hands in the air in triumph and taken a long, hard drink from a water pouch he had attached to the wall above his head. Then came the double thumbs up to the camera.

Text A:

1. Which 4 planets are known as terrestrial planets? [1]

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1. What are the main components of the planet Neptune? [1]
2. Hydrogen and helium
3. Ammonia, water and methane
4. Rock and metal
5. According to the text, where could you find the asteroid belt? [1]

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Text B

1. Explain how the astronaut selection process has changed. [5]

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1. According to the text, what approximate percentage of those who are invited to the first round of interviews make it through to the second round of interviews?

 [2]

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1. In your own words summarise the requirements for becoming a NASA astronaut.

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Text C:

1. What is the purpose of this text? [1]
2. Educational
3. Occupational
4. Personal
5. Public
6. What is meant by the phrase ‘orbital debris’? [1]

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Text D

1. What is the Darpa Report’s solution to the problem of orbital debris? [2]

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1. How does the writer make ‘space junk’ sound dangerous? [10]

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1. Both texts C and D are about ‘space junk’. Compare how the texts present the issue.

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Text E

1. What are your thoughts and feelings about Tim Peak after reading this article? [5]

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1. What makes Tim Peak’s run so important? [1]

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Section B: (Writing) 40 Marks

In this section you will be assessed on your writing skills.

Answer both B1 and B2

**B1**. You are concerned about the amount of environmental waste. Write a letter to the editor of your local newspaper explaining your concerns and making suggestions about how the situation could be improved.

**Write your letter**. [20]

*10 marks are awarded for communication and organisation; 10 marks are awarded for writing accurately.*

*You should aim to write between 200-300 words.*

The space below can be used to plan your work before starting on the next page. You may continue on an extra sheet of paper should you need it.

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B2:

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Text B talks about the astronaut selection process. NASA are looking for applicants to their Astronaut Summer Camp for teenagers. Applicants must give a speech persuading the selection team to choose them for the camp/

Write a speech for your NASA explaining why you would be a good candidate for the summer camp position. [20]

You should aim to write between 250 – 300 words.

In your speech you could include:

* Your interest in the mission – your passion for space and travel
* Personal qualities you feel are important
* Any experience you have that would be useful
* Your ability to lead and motivate others/work as part of a team

The space below can be used to plan your work before starting on the next page.

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**Unit 3 SAMS Mark Scheme: Space**

Text A:

1. Which 4 planets are known as terrestrial planets? [1]

***Award 1 mark to pupils who list the following 4 planets: mercury, venus, earth, marks***

1. What are the main components of the planet Neptune? [1]
2. Hydrogen and helium
3. **Ammonia, water and methane**
4. Rock and metal
5. According to the text, where could you find the asteroid belt? [1]

***Between Mars and Jupiter***

Text B

1. Explain how the astronaut selection process has changed. [5]

*This question tests the ability to demonstrate verbal reasoning skills in context.*

***Award one mark for an explanation that suggests the following: More qualifications are needed and applicants must have a degree, 3 years of experience (or 1000 hours experience), pass a NASA physical exam and be a US Citizen.***

1. According to the text, what approximate percentage of those who are invited to the first round of interviews make it through to the second round of interviews?

 [2]

***Approx 50% of the 120 called to first interview. (Around 60 candidates)***

1. In your own words summarise the requirements for becoming a NASA astronaut.

 [5]

*This question tests the ability to synthesise and summarise information.*

Award **one** mark for each of the following summarised in the own candidate’s words, to **a maximum of**

**five.**

* ***Applicants must be US Citizens***
* ***A bachelor's degree in engineering, biological science, physical science, computer science or mathematics.***
* ***At least three years of related professional experience obtained after degree completion OR at least 1,000 hours pilot-in-command time on jet aircraft.***
* ***The ability to pass the NASA long-duration astronaut physical. Distant and near visual acuity must be correctable to 20/20 for each eye. The use of glasses is acceptable.***
* ***Astronaut candidates must also have skills in leadership, teamwork and communications.***

Text C:

1. What is the purpose of this text? [1]
2. **Educational**
3. Occupational
4. Personal
5. Public
6. What is meant by the phrase ‘orbital debris’? [1]

***Rubbish or unnecessary items left behind in space by previous space travel***.

Text D

1. What is the Darpa Report’s solution to the problem of orbital debris? [2]

***Introducing a device which would push out debris further to prevent further collisions.***

1. How does the writer make ‘space junk’ sound dangerous? [10]

*This question tests the ability to use inference and deduction skills to retrieve and analyse information from written texts and reflect on the ways in which texts may be interpreted.*

***Give 0 marks for responses where there is nothing worthy of credit.***

***Give 1-2 marks to those who identify and begin to comment on some examples of content that are persuasive, but struggle to engage with the text and/or the question.***

***Give 3-4 marks to those who identify and give straightforward comments on some examples of persuasive content. These responses will simply identify some facts and/or evidence.***

***Give 5-6 marks to those who explain how a number of different examples from the text persuade, and begin to analyse how language and techniques are used to achieve effects and influence the reader. Carefully selected examples are used to support comments effectively.***

***Give 7-8 marks to those who make accurate comments about how a range of different examples from the text persuade, and begin to analyse how language and techniques are used achieve effects and influence the reader. Carefully selected examples are used accurately to support comments effectively.***

***Give 9-10 marks to those who make accurate and perceptive comments about how a wide range of different examples from the text persuade, and provide detailed analysis of how language and techniques are used to achieve effects and influence the reader, and begin to analyse how language and techniques are used achieve effects and influence the reader. Subtleties of the writer’s technique are explored in relation to how the reader is influenced. Well-considered, accurate use of linguistic terminology supports comments effectively.***

1. Both texts C and D are about ‘space junk’. Compare how the texts present the issue.

 [5]

***This question tests the ability to interpret themes, meaning, ideas and information in a range of texts and comparing and evaluating the usefulness, relevance and presentation of content.***

***Give 0 marks for responses where there is nothing worthy of credit.***

***Give 1 marks to those who identify basic similarities and differences in terms of the new dog owners’ experiences between the two texts.***

***Give 2 marks to those who identify and give a straightforward description of the similarities and differences between the two texts and the writers’ experiences***

***Give 3 marks to those who identify the similarities and differences between the two texts, and make some comparisons and / or contrasts about the experiences that the two writers have had.***

***Give 4 marks to those who make detailed comparisons and contrasts about the two owners and the experiences they have had with their dogs, with valid comments on the similarities and differences between the two texts and the writers’ reactions to what they have experienced.***

***Give 5 marks to those who make comparisons and contrasts that are sustained and detailed, showing clear understanding of the similarities and differences between the two texts including the writers’ experiences, attitudes and feelings.***

Text E

1. What are your thoughts and feelings about Tim Peak after reading this article? [5]

***Give 0 marks for responses where there is nothing worthy of credit.***

***Give 1 mark to those who identify and begin to comment on one or two superficial details with linked basic textual reference.***

***Give 2 marks to those who identify and give straightforward comments on some general impressions of Tristram supported by straightforward textual references.***

***Give 3 marks to those who begin to show some understanding of Tim and support comments with appropriate textual references.***

***Give 4 marks to those who make accurate comments about a range of impressions about Tim supported by well-selected textual references.***

***Give 5 marks to those who make accurate and perceptive comments about a wide range of impressions about Tim supported by convincing, well selected examples and purposeful textual references.***

1. What makes Tim Peak’s run so important? [1]

***He is the first man to complete the marathon in space.*** …………………………………………………………………………………………………………………………

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