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91922



Draw a cross through the box (☒) if you have NOT written in this booklet

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Mana Tohu Mātauranga o Aotearoa  
New Zealand Qualifications Authority

## Level 1 Science 2025

**91922 Describe features of science that have contributed to the development of a science idea in a local context**

Credits: Five

Achievement	Achievement with Merit	Achievement with Excellence
Describe features of science that have contributed to the development of a science idea in a local context.	Explain features of science that have contributed to the development of a science idea in a local context.	Examine features of science that have contributed to the development of a science idea in a local context.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

**Choose ONE science idea from the Resource Booklet to answer ALL parts of the task in this booklet.**

Pull out Resource Booklet 91922R from the centre of this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–11 in the correct order and that none of these pages is blank.

Do not write in the margins (//////). This area will be cut off when the booklet is marked.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

Merit

**TOTAL 06**

Make sure you have the paper Resource Booklet 91922R.

**INSTRUCTIONS**

This task is made up of three parts. You must answer ALL three parts.

Choose ONE science idea from the resource booklet to complete this assessment.

Science Idea One: Designing spacesuits for the lunar and Martian environments

Use information in the resource booklet for your chosen science idea to answer ALL parts of the task.

**PART ONE**

For part one, focus on **these two** features of science:

- the influence of social and cultural factors on science
- responding to needs and opportunities.

Using the information from your chosen science idea, discuss the following:

(a) How does the influence of social and cultural factors on science contribute to the development of the science idea?

**B I U** [bullets] [numbered] [undo] [redo] [help]

The influence of social and cultural factors contribute to the development of spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. According to the information, the next artemis mission will carry four astronauts around the moon which contains the first women, the first person of colour and the first international partner. In earlier artemis missions only americans were selected for space/lunar missions and including a range of people around the world supports the development of this science idea. By having a range of astronauts around the world, NASA can receive support from other space agencies as well which shows collaboration. This collaboration helps these space agencies to work together to send these people around the world into space missions as the people are not only americans but selected astronauts around the world. This is important as working together further accelerates the process of developing spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. This shows that social and cultural factors positively contributed to the science idea through social and cultural factors by collaborating.

(b) How does responding to needs and opportunities contribute to the development of the science idea?

**B I U** [bullets] [numbered] [undo] [redo] [help]

Responding to need and opportunities heavily contribute to the development of spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. Previously developed space suits were only able to fit the specific astronaut as the suits were custom made and these suits did not provide much reinforced protection for long-term stay in other planets. This created a need to develop much better spacesuits that provide better abrasion-resistant protection while also being able to fit any astronaut. The scientists used this opportunity to research different ways to improve their suits and improve on communication caps, audio and a 'quick swap' feature to provide flexibility in case the helmet is damaged which is currently under development. If the existing suit already meets the requirements for long-term stay on space scientists won't have the need and opportunity to develop better space suits. The need and opportunity acted as a main catalyst for further development on this matter to build spacesuits that can be worn by any astronaut while providing improved communication and damage resistance. The need and opportunity further developed the idea as it acted as a starting point for scientists to build a better spacesuit.

(c) Why are these features of science important to the development of the science idea?

B I U ☰ ▼ ☰ ▼ ↶ ↷ ?

The influence of social, cultural factors on science and responding to needs and opportunities are important towards the development of spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. Social and cultural factors allowed scientists to use a range of astronomers around the world which creates more support as the mission not only represents the specific country but an accomplishment for all countries around the world. This creates more collaboration between space agencies to work together to build the best suitable spacesuit by sharing each other technology and knowledge. NASA could just use their existing knowledge to build a better spacesuit than the previous version but using the help of other organisations NASA can borrow their knowledge and work together to make a spacesuit as versatile and suitable as possible. This is important because by using collaboration NASA and other organisations together can build a better version much faster accelerating the scientific idea. On the other hand responding to needs and opportunities started the development of spacesuits in the first place. As discussed in (b) if the previous version of spacesuits didn't need improvements there would be no need to continue developing a better spacesuit. If there is no need to create one and the Mercury spacesuit in 1962 is just as suitable there wouldn't be any collaboration caused by agencies around the world. Responding to needs and opportunities is important as this scientific feature created the need to upgrade spacesuits and an opportunity to develop one in the first place. This shows that both features are very important towards the development of the science idea.

(d) How do the two features of science **work together** to support the development of the science idea?

B I U ☰ ▼ ☰ ▼ ↶ ↷ ?

The influence of social and cultural factors worked together with responding to needs and opportunity to develop spacesuits that aim to fit a broader range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. If there is no need to create a spacesuit and the existing version is good enough there wouldn't be any need to research, develop and invent new technology to upgrade the spacesuit. The need and opportunity encouraged scientists to build a better spacesuit suitable for the Artemis III and future missions. The positive consequences of social factors wouldn't have happened if there is no need/opportunity and if there is no positive social factors the development of the idea would still continue but with fewer knowledge and technology and only using existing ideas. This means that both social and cultural factors (by creating collaborating with other countries with including astronomers around the world) and responding to needs and opportunities (need to upgrade spacesuits and opportunity to develop one) worked together to help scientists develop the best possible spacesuit. The social and cultural factors of collaboration borrows knowledge as other space organisations could have better ways to tackle various issues in the development process and this worked with the need and opportunity to create a better spacesuit which cause collaboration caused by social and cultural factors in the first place. This shows that social and cultural factors worked together with responding to needs and opportunities to develop the scientific idea.

## PART TWO

For part two, focus on **these two** features of science:

- linking new evidence to existing models, theories, and ideas
- the influence of the development and use of technology on science.

Using the information from your chosen science idea, discuss the following:

(a) How does linking new evidence to existing models, theories, and ideas add to the science idea?

B I U ☰ ▼ ☰ ▼ ↶ ↷ ?

Linking new evidence to existing models, theories and ideas added to the development of spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. The main existing knowledge in this case was the previous space suit (shown in figure 1 worn by John H. in 1962). The problems caused by the previous suits and weaknesses caused scientists to strengthen specific aspects of the newer version. The older version has a problem such as being custom built meaning that it can only be worn by a specific person and not enough protection for long term stay in the lunar surface. This caused scientists to build upon the existing idea and develop/modify specific aspect to better fit the idea of building spacesuits that provide better protection and used by a broader range of crew members. If there is no existing spacesuit meaning no existing knowledge scientists will have to build a spacesuit from scratch without knowing the requirements needed for lunar travel and if it will be good enough to survive the harsh conditions in the moon. The previous suit proved that it served well for the survival of lunar travel but caused issues such as problems in communication, lack of visibility and a time limit. In conclusion, the existing knowledge of the previous spacesuit and the problems caused by it is under development to be fixed which adds to the science idea of developing spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. This shows that linking new evidence to existing models, theories and ideas add to the science idea.

(b) How does the influence of the development and use of technology add to the science idea?

B I U     

The influence of the development and use of technology heavily contributed to the development of the science idea of developing spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. The use of the development of the technology was a main feature that havily contributed towards upgrading the spacesuit in every aspect. When building new spacesuits (which itself is technology) used decades of development in modern technology to fix the weaker spots of the previous suits and better fit the needs of the mission. According to the the comparison of figure 1 and 2 there seem to be a considerable difference between the materials used and this is due to the development of technology in materials that can withstand temperatures from -156 to 121 C. The upgraded spacesuit is expected to have an upgraded audio system for better communication and 'quick-swap' visors this development is mainly due to technology advancements and discoveries overtime. If technology never developed scientists and stuck with using the same materials and technology for existing spacesuits meaning that it really isn't an 'upgrade' more like using the same materials and technology differently. This shows that the influence and the developmet and the use of technology positively contributed to the development of the science idea.

(c) Why are these two features of science significant to the development of the science idea?

B I U     

Linking new evidence to existing models, ideas and theories and the decelopment and use of technology is significant towards the development of spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. The use of existing models, theories and ideas from the previous spacecraft allowed scientists to develop on the idea and add on rather than starting all over again. This allowed scientists to focus on weak spots of the previous spacesuit (eg.communication) and replace it with a better audio interface. This is important as the use of existing knowledge helped scientists to focus on a specific matter and keep developing for a longer space travel. The development of technology on the other hand was the reason why the technology was upgraded. The technology allowed scientists to use the development of technology over the years to dactually upgrade the spacesuit. This is important as development technology allowed scientists in NASA to use it in the upgraded version as previosuly the lack of technology caused problems such as only short term stay in the lunar surface but advances in technology has come up with new solutions to stay in the lunar surface for longer to conduct important experiments and 'explore the moon for scientific discovery and technological advancements'. This shows that both the use of existing models, theories and ideas and developmet of technology allowed scientists to develop better spacesuits.

(d) How do these two features of science **work together** to develop the science idea?

B I U     

Linking new evidence to existing models, theories and ideas worked with the use and development of technology to further develop the science idea. The use of exsiting knowledge from the previous spacecraft helped scientists to research new ways on how to tackle various issues on the moon. The use of technology helped scientists to use that existing knowledge and develop the spacecraft further using the devleopmet of better audio communication, better materials. If there is not existing information scientists wouldn't have known which aspect of the spacesuit should be improved to use the technology on it. For example if a previous spacesuit wouldn't have been developed scientists will have no idea on what went wrong or have any existing knowledge on the matter regarding the spacesuit. The previous spacesuit really helped as it has allowed scientists to see which parts need imporveemnts such as fitting a broader range of astronauts, better damage protection, better communication and even swappable helmets. Using these list of improvements using existing knowledge scientists used the development of technology to adress and upgrade this issue in the next version of the spacesuit. For example the scientists identifies that the previosu spacesuit only allowed astronomers to say on lunar land for a limited amount of time and building a better suit allows them using technology allows scientists to make allow astronomers to stay on lunar land for an extended period of time. This shows that the use of existing knowledge worked with the development of technology to develop spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface.

## PART THREE

For part three, focus on **these two** features of science:

- the influence of the development and use of technology on science
- responding to needs and opportunities.

How do these two features of science **support each other** in the development of the science idea?

B I U     

The influence of the development and the use of technology on science and responding to needs and opportunities supported each other as features of science to develop spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. Responding to needs and opportunities allowed scientists to start developing new spacesuits in the first place, scientists had a need to develop a better spacesuit and an opportunity to do so which created this science idea. The use and development of technology supported to fulfill this science idea. As even in the first version the existing technology was used to build a successful spacesuit even though it had its weaknesses. Using those weaknesses scientists had another need and opportunity to continue developing and upgrading the next gen of spacesuits. To upgrade the spacesuits the scientists use of development on technology heavily contributed to the science idea positively as upgrading in specific aspects require upgrading in technology as well. Overtime after every different version of spacesuits the need and opportunity changes meaning that the development of technology is used in a different aspect. This shows that development of technology overtime is crucial for new opportunities to upgrade the spacesuit and respond to the need and opportunity. This shows that the influence of the development and use to technology on science and responding to needs and opportunities supported each other in the development of spacesuits that aim to fit a broad range of crew members and provide more abrasion-resistance from potential damage on the lunar surface. From this evidence we can conclude that the influence of the development and the use of technology on science supported each other with responding to needs and opportunities.

## Merit

**Subject:** Science

**Standard:** 91922

**Total score:** 06

Part	Grade score	Marker commentary
One	M6	The response explains how social and cultural factors contribute to the science idea by explaining how collaboration allows knowledge sharing, which accelerates the development of the idea.
Two		The response links new evidence to existing models and ideas by explaining how scientists have modified the design of the previous custom spacesuits to accommodate a broader range of crew members in response to information gathered on previous missions. There are also some elements of explaining the benefits of technology.
Three		The response attempts to show how the two features support each other. The response could benefit from making a clear distinction between needs and opportunities.