

Assessment Schedule – 2025

Science: Describe features of science that have contributed to the development of a science idea in a local context (91922)

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<p><i>Describing features of science that have contributed to the development of a science idea in a local context involves:</i></p> <ul style="list-style-type: none"> identifying the characteristics of the features of science for an identified science idea outlining how the FOS contributed to the development of the science idea. 	<p><i>Explaining features of science that have contributed to the development of a science idea in a local context involves:</i></p> <ul style="list-style-type: none"> explaining why each identified FOS was significant to the development of a science idea, which means: <ul style="list-style-type: none"> giving a reason explaining why each FOS plays an important part in the development of a science idea giving examples from the selected local context. 	<p><i>Examining features of science that have contributed to the development of a science idea in a local context involves:</i></p> <ul style="list-style-type: none"> discussing how the FOS have interacted in the development of the science idea, which means: <ul style="list-style-type: none"> discussing with detail the relationship between the different FOS and how they interact with each other in the development of the science idea giving examples from the selected local context.

The features of science (FOS) included in the assessment are:

- linking new evidence to existing models, theories, and ideas
- the influence of social and cultural factors on science
- the influence of the development and use of technology on science
- responding to needs and opportunities.

N1	N2	A3	A4	M5	M6	E7	E8
Some partial FOS identified.	One FOS identified and some outlining. OR Two FOS identified and not outlined.	Two FOS identified and outlined (one outline limited).	Two FOS identified and outlined.	Significance of two FOS explained with examples (one explanation limited).	Significance of two FOS explained with examples.	One relationship / interaction between FOS discussed with examples.	Two relationships / interactions between FOS discussed with examples.

N0 = No response; no relevant evidence.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0–2	3–4	5–6	7–8

Sample Evidence

What follows is not a complete list of all acceptable responses, nor is it an indication of the exact wording required. Assessment judgments are based on the level of understanding shown. The overall grade for a question must be judged holistically.

Science Idea One: Designing spacesuits for the lunar and Martian environments			
Part	Achievement	Achievement with Merit	Achievement with Excellence
ONE	<p><i>The influence of social and cultural factors on science</i> may include:</p> <ul style="list-style-type: none"> • In the past, only (white) men have been involved in lunar missions. A more diverse group of people may provide more perspectives and information on the best design for a spacesuit. 	<p><i>The influence of social and cultural factors on science</i> may include:</p> <ul style="list-style-type: none"> • It is important to study a more diverse group of people to see how they function in space, as women or people of other cultures may react differently to living in space, both physically and mentally, or may provide different insights to situations. This will provide a greater amount of data to analyse, allowing for a more complete understanding of humans in space and what is needed in a spacesuit. 	<p><i>The influence of social and cultural factors on science AND responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> • Having a diverse group of people going to space has created a need to develop spacesuits that fit most people, rather than having to custom-fit every spacesuit. This will eventually make the process of making spacesuits more efficient as they can make many at the same time, rather than having to measure everyone. This has given the designers an opportunity to think of ways to ensure that the suits are suitable for everyone in a variety of situations, helping to create a larger body of information on spacesuit design.
	<p><i>Responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> • People cannot survive in space without specialised equipment such as spacesuits. This need has meant that specific equipment was developed so people could live in space. 	<p><i>Responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> • As people are exploring new places in space, the older spacesuits may not function as well. Therefore, there is a need to update spacesuits to ensure that people could survive in different conditions. This meant more research had to go into creating the new spacesuits, further progressing spacesuit design. 	

TWO	<p><i>Linking new evidence to existing models, theories, and ideas</i> may include:</p> <ul style="list-style-type: none"> As previous missions have found evidence that lunar dust is sharp, they have had to change spacesuit design so that the suits don't get damaged and endanger the people wearing them. 	<p><i>Linking new evidence to existing models, theories, and ideas</i> may include:</p> <ul style="list-style-type: none"> New evidence from previous missions around lunar dust being harmful has meant that the old models of spacesuits had to be updated to stop them from being damaged and endangering the people wearing them. This has further progressed the idea as, if they did not know this about lunar dust, they would not have improved the spacesuits. 	<p><i>Linking new evidence to existing models, theories, and ideas AND the influence of the development and use of technology on science</i> may include:</p> <ul style="list-style-type: none"> NASA is now planning on working with more partners. This will mean that each group can provide each other with new evidence and theories about spacesuit design and the best way for humans to function in space. This will allow the groups to combine ideas and apply this to developing new technology to help provide even better spacesuit design. Without these features working together, it would take much longer for the spacesuit design to improve – they would all have to come up with the ideas and associated technology on their own.
	<p><i>The influence of the development and use of technology on science</i> may include:</p> <ul style="list-style-type: none"> With new technology being made around audio systems, the space suits can now have an improved communications system, which will allow the astronauts to communicate with others better and help them further develop the design of the spacesuit. 	<p><i>The influence of the development and use of technology on science</i> may include:</p> <ul style="list-style-type: none"> They have changed the shape of the helmet. This new technology means that they can now see the ground better. The development of this technology has improved the design of the spacesuit. If they did not have this then the astronauts would not be able to function in space as well. 	
THREE			<p><i>The influence of the development and use of technology on science AND responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> Humans have had an opportunity to travel into space, for which they need to have a suitable spacesuit, otherwise they would not survive. Without the development of technology to test the spacesuits, create the materials, and make changes to the spacesuits when they have better technology and ideas etc., designers would not have been able to make the spacesuits. Therefore, both these features are important in designing a spacesuit, because if you don't need one, then you won't make one, and if you don't have the need, then people won't develop the technology to create them.

Science Idea Two: Reducing methane production by adding seaweed to cattle feed			
Part	Achievement	Achievement with Merit	Achievement with Excellence
ONE	<p><i>The influence of social and cultural factors on science</i> may include:</p> <ul style="list-style-type: none"> • Cattle are important to New Zealand’s economy and support rural communities, therefore, we need to find ways to keep cattle but lower their methane emissions. 	<p><i>The influence of social and cultural factors on science</i> may include:</p> <ul style="list-style-type: none"> • There are a lot of New Zealanders who are employed by the dairy or beef industry. This is how they get their money, so if we reduced the number of cattle, some of these people would lose their jobs. To make sure this doesn’t happen, researchers are looking into ways to reduce the methane emissions of cattle. If this social factor was not there, they would not be looking at ways to reduce methane emissions, so the idea would not have progressed. 	<p><i>The influence of social and cultural factors on science AND responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> • As climate change is becoming a bigger and bigger issue, there is a need to find a way to reduce New Zealand’s methane emissions. One way to do this would be to get rid of all our cattle. However, the social feature – that cattle are a big part of New Zealand’s economy and many New Zealanders work in this industry – means we can’t do this, as our country would have less money and a lot of people would not have jobs. This has meant researchers need to find ways to reduce the methane emissions from cattle without negatively impacting the economy or people’s employment. If they didn’t have to do either of these things, then the ideas about using seaweed in cattle feed would never have been hypothesised and would not have been researched. This would have meant there was no development of this idea.
	<p><i>Responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> • As climate change is a big issue, we need to reduce methane emissions from cattle. This creates opportunities for researchers to explore new ways to solve this problem. They found they could add seaweed to cattle feed to address this. 	<p><i>Responding to needs and opportunities</i> may include:</p> <ul style="list-style-type: none"> • There is a need to reduce the methane emissions of cattle to reduce their direct impact on climate change. Researchers have investigated different methods to see if they helped. It was found that feeding cattle the seaweed <i>Asparagopsis</i> was the best at reducing emissions. If this need was not there, the researchers would not be looking into ways to do this and there would be no new learning on this topic. 	

<p>TWO</p>	<p><i>Linking new evidence to existing models, theories, and ideas</i> may include:</p> <ul style="list-style-type: none"> • When researchers investigated adding things to cattle feed, they found that bromoform helped reduce emissions. This idea allowed them to investigate and build on the knowledge in this area, discovering that it was better to use whole seaweed and not just bromoform in the cattle feed. 	<p><i>Linking new evidence to existing models, theories, and ideas</i> may include:</p> <ul style="list-style-type: none"> • New evidence is important to improving ideas. Researchers have found out how much methane a cow produces each year. If this was not known, then researchers would not know how much of an impact they had on climate change and may work in the wrong areas. Knowing that cattle are a big source of methane means more research is put into reducing methane emissions from them. If researchers did not know this, they would not be able to make this discovery and may not have such a big impact on methane emissions. 	<p><i>Linking new evidence to existing models, theories, and ideas AND the influence of the development and use of technology on science</i> may include:</p> <ul style="list-style-type: none"> • Technology is important to develop ideas. Without the use of technology, some ideas would not be able to be investigated. Researchers used huge, aerated vessels to grow the seaweed in – if they did not have this technology, they would not be able to grow the seaweed effectively. Having a more reliable source for the seaweed means they can do more research on it to see how it can be best used to reduce methane emissions from cattle. This research means that they can find new evidence to support or disprove their ideas around using seaweed in cattle feed. These features interact with each other to help researchers carry out their experiments so they can find out more about this science idea.
	<p><i>The influence of the development and use of technology on science</i> may include:</p> <ul style="list-style-type: none"> • Growing the seaweed inside instead of outside can be done with the use of technology. Researchers use huge, aerated vessels to do this. Having a consistent source of seaweed means that they can keep working on this idea. 	<p><i>The influence of the development and use of technology on science</i> may include:</p> <ul style="list-style-type: none"> • Technology such as aerated vessels is needed to grow seaweed in an environment that is controlled and consistent. If technology was not used, then the seaweed might not grow very well, and this would mean that they could not harvest as much of it and then they could not do as much research on it to see which way of harvesting it and preparing it works best to reduce methane emissions from cattle. Therefore, using technology is important to further develop this science idea. 	

THREE			<p><i>The influence of the development and use of technology on science AND responding to needs and opportunities may include:</i></p> <ul style="list-style-type: none"> • Climate change is an issue that is impacting New Zealand and the world. There is a need to reduce our greenhouse gas emissions to slow this problem down. This creates opportunities for researchers to investigate new ways to slow the problem. Researchers can use technology to investigate this issue. In this situation, they have used aerated vessels to help the seaweed grow well and then be used for research. Without the need and opportunities that this problem created, researchers may never have developed knowledge in this area, and the use of technology has allowed them to improve their methods and work in a more efficient way.
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