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## Level 1 Science RAS 2023

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

# EXEMPLAR

**Merit**

**TOTAL 06**


# Page 1 – Pilot Assessment

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: Rongoā in the treatment of type 2 diabetes 

Read the information in the Resource Booklet for your chosen science idea and use it to answer ALL parts of the task.

## TASK

For part (a), focus on the following features of science:

- the development of science ideas in response to new evidence or varied perspectives, such as Māori and Pacific knowledge systems
- responding to needs and opportunities.

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

(i) How has new evidence contributed to the science idea?



New evidence has contributed to the science idea that rongoa in the treatment of type 2 diabetes is possible as over time traditional medical procedures have been slowly removed from choices for treatment. New evidence has shown that it is possible Maori genetics process natural rakau rongoa more effectively than synthetic drugs. This new evidence shows that natural rakau rongoa (taonga plants) also hold active chemicals that are useful for treatment for diabetes. Dr Jonni Koias idea has been developed from the research in chemicals that are used for diabetes treatment, she has developed it as those synthetic drug chemicals are proving to be difficult for Maori genetics to process. Her new evidence shows that previous idea could have multiple sources as taonga plants hold the same chemicals but iust in a way that is more beneficial for maori peoples health.

(ii) What are the varied perspectives considered in the science idea?



There are 2 varied perspectives for rongoa in the treatment of type 2 diabetes. Dr Jonni Koia (Waikato-Tainui) believes that Maori are more vulnerable to type 2 diabetes as they cannot process synthetic drugs as well as they could process rakau rongoa (plants with medicinal properties) , she believes this could reduce the side effects that her Maori paitents experince. She also believes that diet has a role to play in the increasing type 2 diabetes cases in Maori children under the age of 15. Dr Jonni Koia states "Adaption to a Western style diet and lifestyle is thought to have contributed towards high rates of diabetes among Maori." Another Perspective is from Professor Peter Shepard (expert in biotechnology). Professor Peter Shepard is working with Dr Koia. Together they are trying to find new prevention strategies and treatments for type 2 diabetes. However it is clear that the two are focusing on different aspects of the science idea. Professor Peter Shepard is mainly looking at a gene found in Maori and Pacific people that helped prevent diabetes. Professor Peter Shepard is looking at the cause. and Dr Jonni at the treatment.

(iii) How has a need OR opportunity led to the development of the science idea?



A need arose when Dr Jonni Koia noted that the number of people with type 2 diabetes is increasing, especially in Maori children under the age of 15. The need led to the development of the science idea as i believe Dr Jonni was thinking about the future generaions of Maori people, which made her put more research into the idea. She discovered that diet and lifestyle is thought to have contributed towards the high rates amongst maori. Her and Professor Peter Shepard had also done research into a gene found in Maori Males which helped prevent diabetes. All this led to the final development of the science idea that plants/taonga were a treatment course.

(iv) Give reasons why the new evidence OR varied perspectives responded to the need or opportunity in the development of the science idea.

B I U

New evidence responded to the need as showed that future generations would be effected by type 2 diabetes. The new evidence showed that Rongoa holds the same chemicals as the synthetic drugs but the Maori people would benefit more from the Rongoa as they can effectively process it. It has led to the development as she has done more research around the cause of diabetes in the first place. such a diet, lifestyles, and genes.

For part (b), focus on the following features of science:

- replicable, verifiable data collection
- the attributes of the people who carry out the science such as collaboration, creativity, critical thinking, and curiosity.

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

(i) How has the data information shown in the resource helped in the development of the science idea?

B I U

The data shown in the resource helps the development that Rongoa can be used in the treatment of type 2 diabetes as it shows from ages 65-80 People who are Indian, Pacific, and Maori have a higher rate of type 2 diabetes than Europeans. It helps confirm Dr Jonni's theory that Maori cannot process synthetic drugs effectively. It also develops her idea as maybe Pacific people also have the same gene is Maori people which would explain why the graph shows similar high rates.

(ii) Choose one of the following attributes that people who carry out science use:

- collaboration     creativity     critical thinking     curiosity

State with a reason how this attribute has played a significant part in the development of the science idea.

B I U

Collaboration has played a significant part in the development of the idea that Rongoa can help treat type 2 diabetes. This is as Dr Jonni has collaborated with Professor Peter Shepard. He has the same goal as Dr Jonni, to find new prevention strategies and treatments for type 2 diabetes. Putting the research together has played a significant part as he has a different perspective to Dr Jonni. He is focused on the gene that helps prevent diabetes and insulin in the blood in relation to that, compared to Dr Jonni who is focused on Natural treatment of type 2 diabetes and why Maori people cannot effectively process the synthetic drugs. Putting both of their research and ideas together significantly extends their research and could potentially prevent bias.

(iii) Choose ANOTHER attribute that people who carry out science use:

- collaboration     creativity     critical thinking     curiosity

How has this attribute and the data collection shown in the resource interacted in the development of the science idea?

B I U

Dr Jonni displayed creativity as she had a need and was creative to think about possible treatment causes. Her treatment cause (rongoa) interacts with the data as it explains her idea that Maori people cannot process the synthetic drug as effectively as rongoa which explains their high rate in figure 1 & 2. The data collection helped her develop her idea as you can clearly compare the rate for European to Maori and see a large difference in the rates, which yet again proves her science idea.

For part (c), focus on the following features of science:

- using specific language, symbols, and conventions
- the development of science ideas in response to new evidence or varied perspectives, such as Māori and Pacific knowledge systems.

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

(i) What are the specific language, symbols, and conventions that have been used in the development of the science idea?

B I U    

Specific language, symbols, and conventions that have been used in the development of the science idea. Some examples of specific language used in the science idea are when Dr Jonni talks about Maori peoples genes enable them to process natural rongoa better than synthetic drugs. She has used symbols in figure 3 to show chemical elements that are found in plants that are useful in treating diabetes.

(ii) Why are specific language, symbols, and conventions important in the development of the science idea?

B I U    

Specific language, symbols, and conventions are important in the development of the science idea. Symbols are important as the periodic table of elements has been used for years and years and has had little to no alterations. They are important as they show the scientist has understanding over what they are studying, and show that the research information provided is reliable. Specific Language is important as it shows that Dr Jonni shows she has carried out statistical research to reliably back up her science idea, Some examples of specific language used in the science idea are when Dr Jossi talks about Maori peoples genes enable them to process natural rongoa better than synthetic drugs.

(iii) In what ways has new evidence OR varied perspectives interacted with specific language, symbols, and conventions in the development of the science idea?

B I U    

Varied perspectives interacted with specific language and symbols in the development of the science idea as Dr Jonni and Professor Peter Shepard had different perspectives when carrying out their research about type 2 diabetes. It interacts with specific language as what Dr Jonni says, she has carried out statistical research to reliably back up her science idea, Some examples of specific language used in the science idea are when Dr Jossi talks about Maori peoples genes enable them to process natural rongoa better than synthetic drugs. Professor Peter Shepard could disagree with her research as her result is different to hers. It also interacts with symbols as Dr Jonni has used chemical symbols/elements and Professor Peter Shepard is an expert in biotechnology which I'm sure he would agree with her use of chemical elements as it is a reliable way to show understanding. It has helped develop the science idea as varied perspectives have to come to an agreement so the original idea from Dr Jonni would be developed until both perspectives are in agreement.

## Merit

**Subject:** Science

**Standard:** 91922

**Total score:** 06

| Q | Grade score | Marker commentary   |
|---|-------------|---|
| 1 | M6          | <p>The candidate has chosen Science Idea One: Rongoā in the treatment of type 2 diabetes. A Merit grade has been awarded for the candidates awareness of the science features around responding to needs, new evidence, and attributes of people who carry out science.</p> <p>The candidate has examined the new evidence around genes found in Māori and Pacific peoples, and active chemicals being found in plants traditionally used for Rongoā. They have also explained the need that the researchers responded to and how collaboration was an important feature in this research. The candidate has given reasons why each of these features were significant to the development of this science idea.</p> <p>To gain an excellence, the candidate needed to discuss how these features of science interact to develop the science idea.</p> |