Pilot Assessment Schedule – 2023

Science RAS: Demonstrate understanding of science-related claims in communicated information (91923)

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of science-related claims in communicated information involves: • describing the source and intended purpose of the communicated information • describing science-related claims in communicated information • describing science language or conventions used in the communicated information.	*Explain science-related claims in communicated information* involves: • explaining how science language and conventions are used to support science-related claims in the communicated information.	*Examine science-related claims in communicated information* involves: • evaluating the use of science language or conventions used to support science-related claims in the communicated information.

Evidence

Sample Evidence – Organic meat benefits		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
• Dr Amber Sciligo and Dr Jessica Shade wanted to educate people about organic meat. Clark and Tilman wanted to share a summary of lots of research about organic farming. • Organic meat is better for the environment. Organic meat doesn't have harmful pesticides. Growing organic meat uses up a lot of land. • Pesticides have scientific names: organophosphates, neonicotinoids, pyrethroids. Organic meat does not have antibiotics, which are chemicals used to fight disease. The graph uses a key to compare meat's numbers under different headings.	• The graph has a labelled *x*- and *y*-axis. On the *y*-axis, the gaps are unequal making the graph confusing. This misrepresents the claim as the evidence is not clear. Under "what organic meat means", GMO is an acronym for genetically modified organism. Although this is not explained, it gives the impression that the claim is more valid, especially in the same sentence as growth hormones and pesticides, which sound like bad things.	• The two doctors name some hormones, steroids, and pesticides, but they do not explain how those chemicals are tested in the environment. They were also paid by two pro-organic companies to produce the report so there could be a conflict of interest here – the companies want data that supports what they do. In the graph from Clark and Tilman, the *y*-axis below 1 is not in proportion with the number divisions about 1. This makes the line for "organic methods" meat seem bigger for greenhouse emissions, and thus better than the shorter meat lines in the other columns. However, the graph suggests that organically grown meat is generally not good for the environment which counters the claim by the two doctors.

Sample Evidence – Astrology		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
• Aliza Kelly is the source of one claim, and she wants to help people understand their personality. • Aliza Kelly says that the position of planets in the sky when you are born tells us about your personality. Shawn Carlson's study claims that astrologers can't tell personality profiles apart from birth charts. • Planets and the sky are mentioned. The word 'natal' is used, which relates to birth and being born.	• Aliza's claim uses very little science language and no conventions at all. She says the position of planets in the sky is important but there is no information to help us understand this. There are no graphs or tables that would help us investigate what she is claiming. Carl's claim is followed by information about how the blind study was carried out, which helps us to consider how reliable it was.	• Aliza Kelly makes money from her birth charts. She is motivated by money to provide information about people's personalities. This could lead to her creating charts that satisfy her clients rather than provide reliable information. A study by Shawn Carlson showed that astrologers can't reliably tell the difference between a natal birth chart and reliable personality profiles. That study had a large sample size and was a double-blind investigation, so could be considered reliable. It is therefore unlikely that Aliza Kelly's claim that planet positions at birth determine our personalities is valid.

Sample Evidence – Climate change		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
• NIWA is a Crown research institute that is working to help New Zealand become more sustainable. • Dr Sam Dean claims that large storms like Cyclone Gabrielle have been influenced by climate change. NIWA claim that if rainfall and temperature change then there will be more extreme weather events. • Dr Dean has used careful language such as "influenced". NIWA has measured the amount of carbon dioxide in the atmosphere in ppm (parts per million). NIWA uses standard chemical symbols for carbon dioxide, which is CO_2.	• The data has been collected over 800 000 years, which is a large sample size. This clearly shows the 2017 value is much higher. The large amount of data means it's more likely to be accurate than if it had been measured for a shorter amount of time. • The data has been verified by many scientists through peer review. This makes it more trustworthy.	• Scientists have found a correlation between the temperature of the atmosphere and the amount of CO_2 in the atmosphere. They also understand mechanisms of greenhouse gases like CO_2 absorbing energy emitted by the surface of the Earth and heating the atmosphere. With both the correlation and causation, it is very difficult to argue that climate change is not caused by humans.

Sufficiency Statement

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response; no relevant evidence.	The response shows limited understanding of the science claim.	The response shows some attempt to understand the science claim.	The response shows **understanding and describes** the science claim, **although some descriptions may be partial or weak**.	The response **securely shows understanding and describes** the science claim.	The response **explains** the science claim, **although some parts of explanation may be partial or weak**.	The response **securely explains** the science claim.	The response **examines** the science claim, **although some parts of discussion may be partial or weak**.	The response **securely examines** the science claim.

Appendix: Marker determination of validity of evidence

Professional judgement
The marker will determine a grade using their professional judgement based on a holistic examination of the evidence provided.

Demonstration of understanding
A response must use information to **demonstrate understanding**. The marker must exercise professional judgement to decide if it does so. The following guidance is provided to assist in making this professional judgement.

- A response **demonstrates understanding** if it can be described wholly or substantially by one or more of the statements in the **left-hand column**.
- A response **does not demonstrate understanding** if it can be described wholly or substantially by one or more of the statements in the **right-hand column**.
- If a response is comprised of both used and reproduced information, the marker must decide if it meets the standard **when the reproduced information is ignored**.

Evidence of <u>use</u> of information	**Evidence of <u>reproduction</u> of information**
Prompts and / or questions have been provided and the candidate has responded to these.	Information is presented that does not relate to the prompts.
The response uses information relating to the standard, the prompts, or questions.	
Information from the candidate's practice, performance, research, the practice of others, and or teaching, is related to the candidate's experiences.	Information is presented in isolation from the candidate's experiences.
The response shows understanding that could be expected to come from a course of instruction derived from Level 6 of *The New Zealand Curriculum*.	Little or nothing is offered to suggest the information is related to a course of instruction at Level 6 of *The New Zealand Curriculum*.
Information is presented in the candidate's own voice.	Information is not in the candidate's voice. The word choice, sentence structure, sentence length, punctuation etc. are not what a candidate could be expected to produce.
Referenced complex research information unchanged by paraphrase is related to other information in a manner that constructs meaning.	**Unreferenced** complex information is presented as though it is the candidate's own work.

In general, the marker will exercise the following judgement:

N1	**N2**
The response does not include enough evidence to show understanding, and / or is substantially reproduced with little mediation by candidate.	The response is substantially produced by the candidate, but demonstrates little understanding. One part of the required response may be completely missing, or several parts may be weak.

Where doubt exists as to whether evidence has been produced, mediated, or used by the candidate, the doubt must be exercised to the benefit of the candidate.