MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Briefing Note: Royal Society Te Apārangi Expert Advisory Panel Independent paper on Pāngarau Mathematics and Tauanga Statistics in Aotearoa

To:	Hon Jan Tinetti, Associate Minister of Education		
Date:	20 September 2021	**Priority:**	Low
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Purpose of Briefing

The purpose of this paper is for you to:

- **Note** that the Ministry received the final report from the Royal Society Te Apārangi Mathematics and Statistics Expert Advisory Panel on 15 September 2021 in advance of the public release date of 30 September 2021.
- **Agree** that this briefing will be proactively released once the report has been made public.

Agree / Disagree

Ellen MacGregor-Reid
Deputy Secretary
Early Learning and Student Achievement

19/09/2021

Hon Jan Tinetti
Associate Minister of Education

26 /09/ 2021

Summary

1. The Royal Society Mathematics Expert Advisory Panel was convened in January 2021 and asked to develop a paper for public release to provide independent advice on the development of mathematics knowledge and skills in relation to *The New Zealand Curriculum (NZC).*

2. The Ministry received the final report from the Royal Society Te Apārangi Mathematics and Statistics Expert Advisory Panel on 15 September 2021 in advance of the public release date of 30 September 2021.

3. The Royal Society Te Apārangi will be publishing the report independently of the Ministry.

4. The final report recommendations do not differ from those in the draft report received on 21 June 2021 apart from minor language edits.

5. The 14 recommendations provided in the report will be considered as part of the development of the strategy to strengthen mathematics and the refresh of the mathematics and statistics learning area of the curriculum.

6. The Ministry has done supplementary work and explored some areas in greater depth after receiving the draft report.

Background

7. The Royal Society Mathematics Expert Advisory Panel was convened in January 2021 and asked to provide independent advice on the development of mathematics knowledge and skills in relation to the NZC.

8. The Panel's advice was sought as part of a wider programme of work on refreshing the Mathematics and Statistics learning area of the NZC and helping inform the direction of travel of the Mathematics and Statistics strategy.

9. The Royal Society Te Apārangi Mathematics Expert Panel was asked to provide independent advice on the development of mathematics knowledge and skills in relation to *The New Zealand Curriculum*, specifically:
    i. the mathematical skills and knowledge needed for being a critically engaged citizen
    ii. the mathematics skills and knowledge learners need to know and by when, and the important cross-disciplinary links, taking into consideration the rapid changes and growth in computer science/ ICT
    iii. the important 'big ideas' in mathematics and statistics that all learners need to develop through schooling
    iv. the relationship between numeracy and mathematics
    v. progress, assessment and where the checkpoints in the mathematics education pathway should be.

10. The Panel provided a final draft of the paper to the Ministry on 21 June 2021, (METIS 1266696 refers) and we have already been able to use this to inform other mathematics working groups.

11. The Royal Society Mathematics Expert Advisory Panel provided the final report to the Ministry on 15 September 2021 (Annex 1) to share with internal stakeholders prior to the public release date of 30 September 2021.

12. As agreed in the Terms of Reference, the Royal Society Te Apārangi will publish the paper independently of the Ministry with a media release statement. The media statement is in progress and will be provided to you once it is finalised.

13. A reactive Question-and-Answer sheet is attached (Annex 2).

The Panel's Final Report

14. The final report is comprehensive and offers insights into recent evidence about effective mathematics teaching and curriculum design. These insights align with what we have heard through engagement with stakeholders for the Mathematics and Statistics Strategy.

15. The report makes 14 recommendations for the Ministry to consider and presents them in four broad themes:
    i. **Slippage:** this describes how year-on-year many ākonga fall away from the trajectory described in the Mathematics and Statistics learning area of the NZC.
    ii. **Teacher discipline and pedagogical knowledge:** this refers to teacher knowledge of mathematics and statistics and how to teach this effectively.
    iii. **Leadership:** this theme recognises the need for a more centralised approach to support coherence and clarity around teaching and learning in mathematics and statistics.
    iv. **Inequity:** The evidence is that many groups of learners in our education system continue to experience inequitable outcomes. Achievement data in mathematics and statistics reflects this.

16. The final and draft reports have very minor language differences between them but nothing that substantially changes the ideas, direction, or recommendations.

17. The advice provided by the Royal Society Te Apārangi Mathematics Expert Panel along with information from a wide range of sector, community and expert representatives will be considered in the refresh of the NZC Mathematics and Statistics learning area and the Mathematics Strategy.

Supplementary work to inform the refresh of the NZC

18. While the Royal Society paper has provided useful information there were some critical aspects that were not covered in sufficient depth to inform the next steps of the curriculum refresh.

19. The Ministry engaged a small group of maths experts to provide supplementary information on the following aspects:

    i. the specific mathematics skills and knowledge learners need to know and by when, and the important cross-disciplinary links, particularly when taking into consideration the rapid changes and growth in computer science/ ICT

    ii. the relationship between numeracy and mathematics

    iii. progress, assessment and where the checkpoints in the mathematics education pathway should be.

20. We received this advice at the end of August, and it clearly provides indicators for key learning ākonga need for continued progress. It also highlights key factors that

the curriculum refresh writers will need to consider, for example granularity in describing skills and knowledge.

Risks and mitigations

21. The panel were asked to provide independent advice on the development of mathematics knowledge and skills in relation to the NZC. While the report does comment on curriculum, it also goes beyond this and makes broad recommendations about system change in mathematics and statistics across New Zealand.

22. The issues highlighted in the report are very similar to those being considered in the development of the Pāngarau strategy and the Mathematics and Statistics strategy. The Ministry has engaged Pāngarau and Mathematics and Statistics experts along with sector practitioners, industry, and community groups in this significant programme of work.

23. We have prepared reactive Q&A (Annex 2).

Annexes

Annex 1: Royal Society Te Apārangi Expert Advisory Panel Pāngarau Mathematics and Tauanga Statistics in Aotearoa New Zealand report

Annex 2: Reactive Q&A