

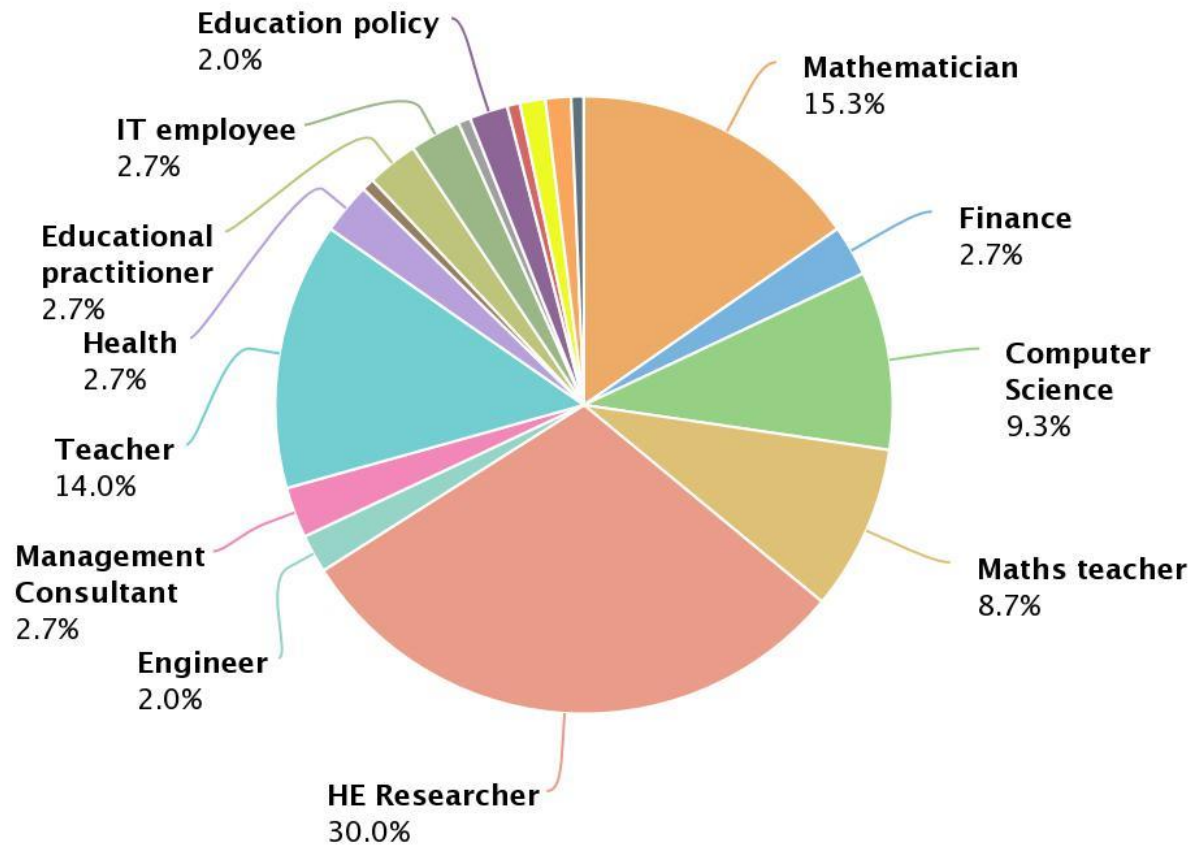
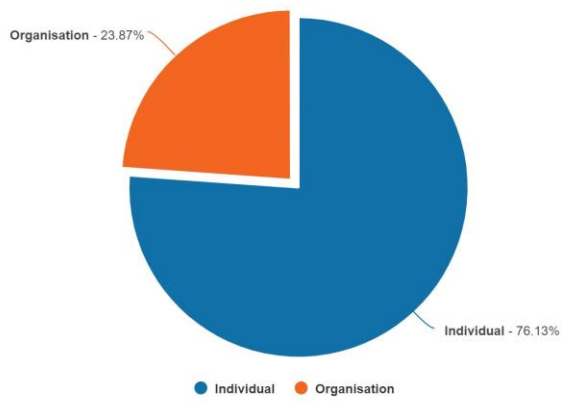
Call for Views on the future importance of mathematics in education

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Respondents



Partial: 309
 Completed: 156
 Analysed: 200



Organisations

- Arm Holdings Ltd
- British Society for the History of Mathematics
- Centre for Innovation in Mathematics Teaching, Institute for Education, University of Plymouth
- The Department for Education
- Education Endowment Foundation
- EMBL-European Bioinformatics Institute
- The Gatsby Foundation
- GlaxoSmithKline
- Institute and Faculty of Actuaries
- Institute of Mathematics and its Applications
- Mathematics Education Centre, Loughborough University
- Mathematics Education Group, UCL Institute of Education
- Mathematics in Education and Industry
- National Association for Numeracy and Mathematics in Colleges
- National Numeracy
- National Security Community
- NRICH
- Special Interest Group in Teaching Statistics at the Royal Statistical Society
- The Association for Science Education
- The British Academy
- The Early Childhood Maths Group
- The International Mathematical Union
- The Operational Research Society
- The Scottish Mathematical Council
- Wycombe Abbey

6 Themes



**Mathematical
curricula**



**Teaching
mathematics**



Assessment



**Teaching
Workforce**



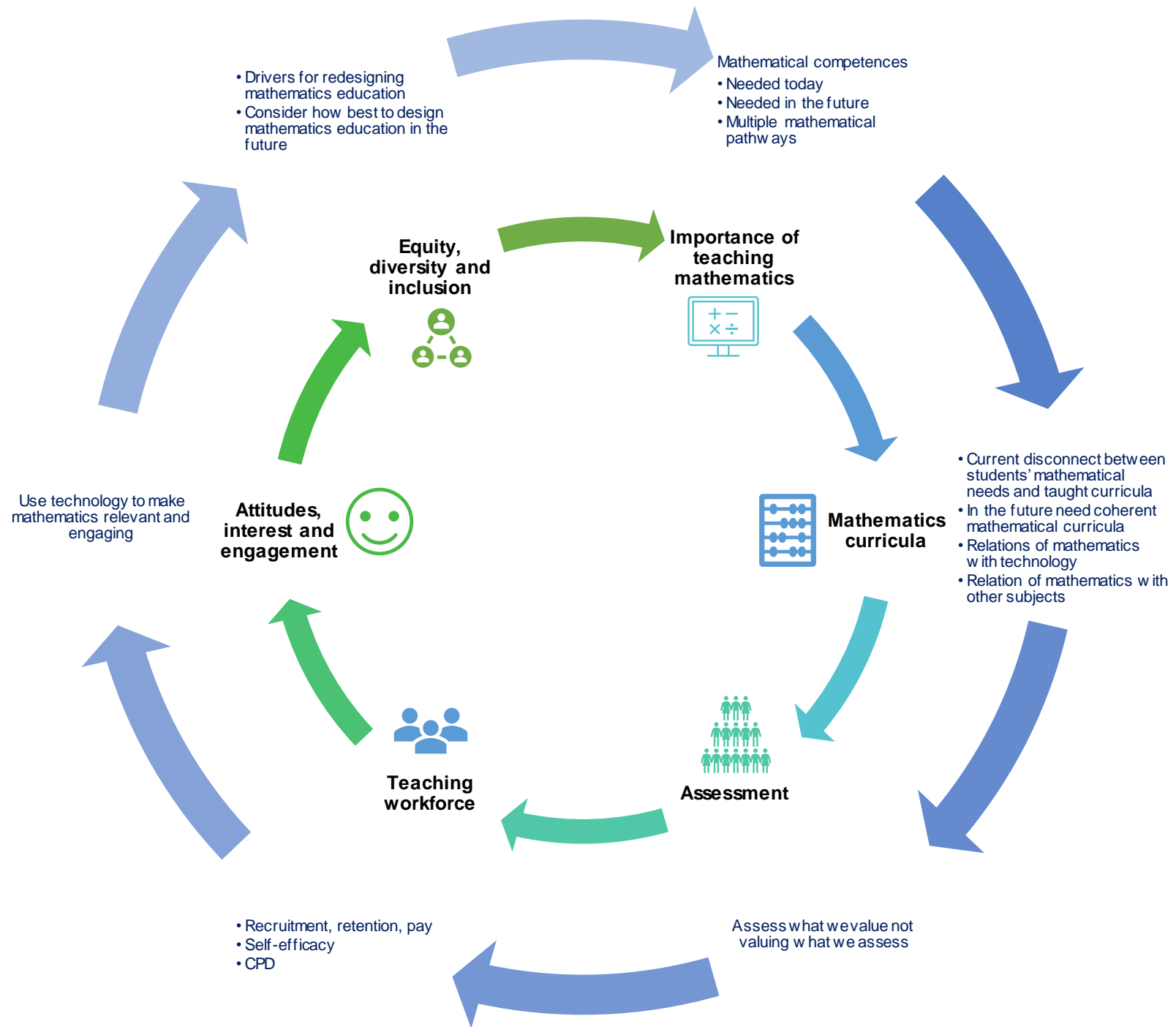
**Attitudes, interest
and engagement**

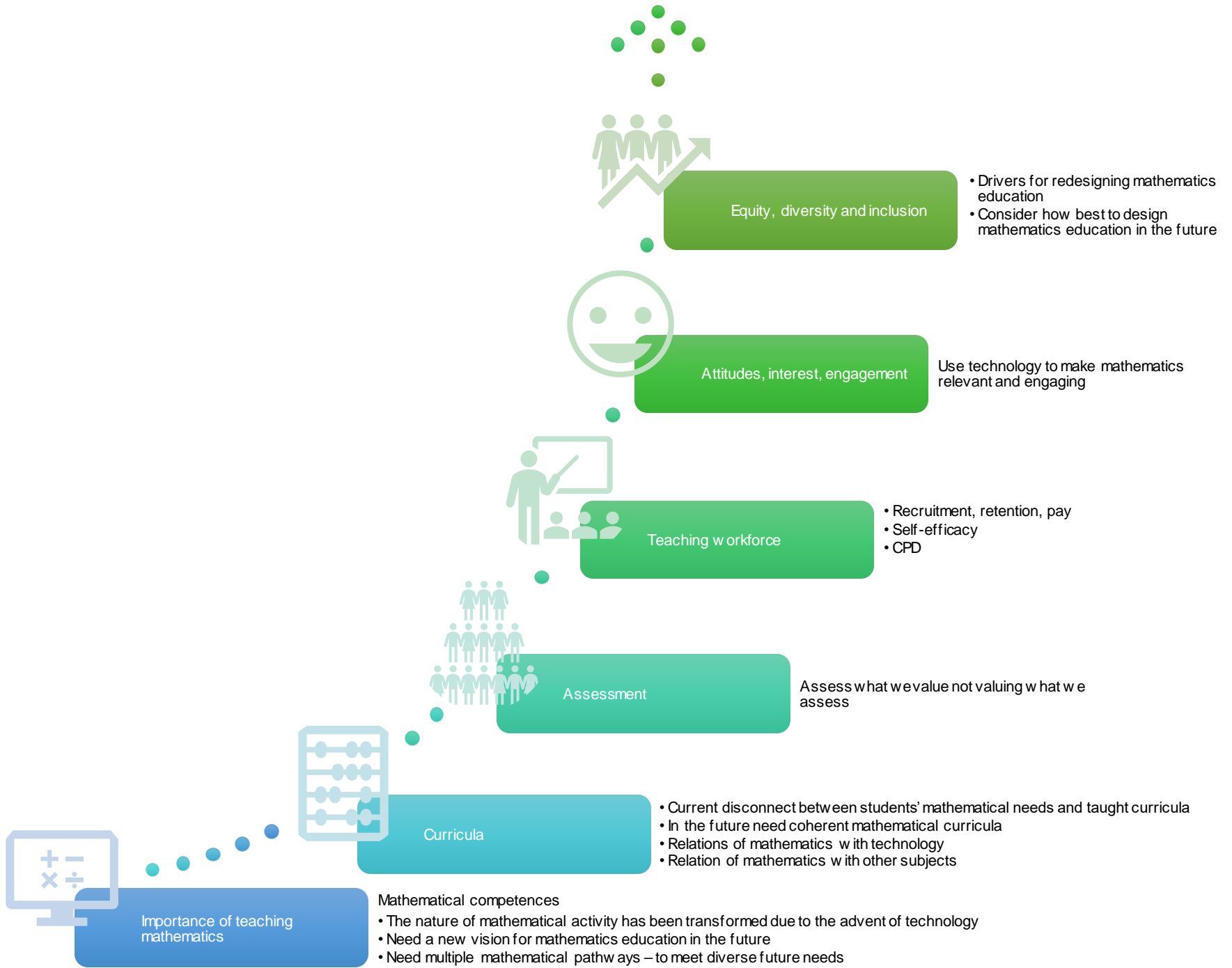


**Equity, diversity
and inclusion**

2 key messages

- Mathematics has been transformed by the ever increasing ubiquity and power of technology
- Need a new vision for mathematics education in the future that recognises the relation of mathematics to technology and to other disciplines and communities outside mathematics education (STEM, STEAM, families, workplaces and leisure)





Importance of teaching mathematics

Mathematical competences

- The nature of mathematical activity has been transformed due to the advent of technology
- Need a new vision for mathematics education in the future
- Need multiple mathematical pathways – to meet diverse future needs



Curricula

- Current disconnect between students' mathematical needs and taught curricula
- In the future need coherent mathematical curricula
- Relations of mathematics with technology
- Relation of mathematics with other subjects



Assessment

Assess what we value not valuing what we assess



Teaching workforce

- Recruitment, retention, pay
- Self-efficacy
- CPD



Attitudes, interest, engagement

Use technology to make mathematics relevant and engaging



Equity, diversity and inclusion

- Drivers for redesigning mathematics education
- Consider how best to design mathematics education in the future

Key messages

Coherent mathematical curricula will need to respond to new and diverse needs

- **Relation of mathematics to technology** is critical in supporting the learning of mathematics
- **Relation of mathematics to other subjects** is critical for ensuring relevant curricula
- **Emphasis on statistics and probability, data science and also numeracy, mathematical literacy, critical and creative thinking** – often with reference to the changing world and the planet at risk

Mathematical curricula

Change is needed to reflect 21st century curricula and student achievement

A key challenge is to **assess what we value** rather than valuing what we assess

Assessment

To **inspire more people to excel in mathematics**, a key challenge is to improve young people's attitudes, interest and engagement with mathematics

Attitudes, interest, engagement

Teaching mathematics

Mathematical competences for the future will become increasingly **more demanding** and require best in class teaching across subjects

- Teaching mathematics will continue to be important to address diverse needs and interests through **multiple pathways**

Teaching workforce

To improve mathematics education in the future, teaching workforce issues (**recruitment, retention, pay and self-efficacy**) need to be a priority

The teaching workforce needs access to **professional development** and resources to keep up to date with disciplinary and societal changes in the future

Equity, diversity and inclusion

EDI are drivers for **redesigning mathematics education** in the future to address **big societal issues**

Action plan

	Theme	Key messages	Future priorities	Future activity
1	Importance of teaching mathematics	<p>Mathematical competences</p> <ul style="list-style-type: none"> • Needed today – insufficient • Needed in the future – even more demanding • Need multiple mathematical pathways • The nature of mathematics has been changing due to the advent of technology and data 	<ul style="list-style-type: none"> • The teaching of mathematics should contribute to broader educational goals of developing young people's identity, contribute to their empowerment, and help them see the value of mathematics in their everyday life and work. 	<ul style="list-style-type: none"> • Make the case for and elevate the status of mathematics in the future (as it should not be taken for granted) • What mathematics content should be taught today to prepare students for jobs of the future, especially given growth of the digital world and its impact on a global economy?
2	Curricula	<p>Disconnect between students' mathematical needs and curricula requires action</p> <ul style="list-style-type: none"> • Coherent mathematical curricula for both specialist technical and everyday practical competences • Relation of mathematics to technology • Relation of mathematics to other subjects • Responses split between the need for mental arithmetic and use of technology • But there was consensus that future curricula should adapt to account for new tools 	<ul style="list-style-type: none"> • Mathematical curricula across stages and phases of education needs to be fully-resourced, coherent, research-informed and respond to 21st century problems 	<ul style="list-style-type: none"> • Explore the relation of mathematics with data science, statistics and computing • Reimagine mathematical pathways • Reimagine technology in mathematics education: If computers can do some tasks much better than people, what is it that students need to learn?
3	Assessment	<ul style="list-style-type: none"> • Assess what we value not valuing what we assess • Change needed to reflect 21st century curricula and student achievement 	<ul style="list-style-type: none"> • Consider the place of assessment in the education system so that it does not drive the curriculum or classroom practice, yet still achieves its purpose 	<ul style="list-style-type: none"> • Alternative possible future scenarios in education
4	Teaching workforce	<ul style="list-style-type: none"> • Recruitment, retention, pay will continue to be challenging • Self-efficacy and autonomy should be a priority • CPD needs to be well-resourced 	<ul style="list-style-type: none"> • High quality CPD to ensure mathematics is taught in interesting and creative ways 	<p>Explore the implications of the new mathematical competencies for the teaching workforce</p> <ul style="list-style-type: none"> • Required upskilling • Professional development
5	Attitudes, interest and engagement	<ul style="list-style-type: none"> • Negative attitudes can start at an early age • Improving attitudes towards mathematics should be a priority throughout stages of education 	<ul style="list-style-type: none"> • Promote mathematics as a relevant, enjoyable and achievable subject • Understand how technology can improve interest in mathematics 	<ul style="list-style-type: none"> • Horizon scan of future developments in improving attitudes towards mathematics, eg the use of technology to enhance interest in mathematics
6	Equity, diversity and inclusion	<ul style="list-style-type: none"> • Drivers for redesigning mathematics education to address big societal issues • Consider how best to design mathematics education in the future to ensure everyone has access to high quality mathematics education, close the attainment gap and strive for social justice 	<ul style="list-style-type: none"> • Consider how mathematics education in the future should address phenomena related to social markers (e.g., race, class, gender) • Closing the attainment gap will continue to remain the most significant issue faced by education as a whole 	<p>Gender and socioeconomic inequities in mathematics education: how can these be reduced?</p> <ul style="list-style-type: none"> • Think pieces across stages of education • Developments internationally