YouthInsight
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2021 Youth in STEM Report

Prepared by YouthInsight for the
Department of Industry, Science,
Energy and Resources

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Contents

Notes on interpreting the report

Significant differences – Differences between demographic groups cited in the report refer to statistically significant differences based on a 95% confidence interval. Charts in this report show statistically significant differences between subgroups using black or white arrows alongside the percentage results. If a difference is described as indicative, the difference is not statistically significant.

Weighted data and rounding – To ensure the survey results are representative of the population, weighting was applied to correct for under or over representation of the sample. Where the weighted population or proportions do not add up to 100%, this is due to rounding of decimal places up or down to the nearest whole number.

Multiple choice questions (MC) – Multiple choice questions will not add to 100% as respondents could select more than one answer. All multiple-choice questions have been labelled within the question text as MC.

Non-binary respondents – Data was collected from respondents who did not identify with binary genders and also from parents who had children who did not identify with binary genders. While these respondents make up the overall sample size, due to low numbers, this report excludes any analysis based on these respondents.

CALD – People have been classified as CALD (Culturally and Linguistically Diverse) if they speak a language other than English at home.

Location / area – When we refer to location or metropolitan vs. regional areas, we are referring to the home location of the child, not the school or institution they attend.

Socioeconomic status – Low or high socioeconomic status (SES) has been determined by using the Australian Bureau of Statistics Socio-Economic Indexes for Areas (SEIFA) which ranks areas in Australia according to relative socioeconomic advantage and disadvantage into deciles. The indexes are based on information from the five-yearly census. This survey employs the Index of Education and Occupation (IEO). Postcodes supplied by respondents have been mapped to the corresponding IEO decile. This report has grouped deciles one to five and classified this group as lower SES and deciles six to ten as higher SES.

STEM classifications: Below is a list outlining how STEM has been classified in this research report.

- **STEM definition in the context of this report:** STEM stands for science, technology, engineering and mathematics. In this survey, science refers to topics such as biology, chemistry, physics, and earth and environmental sciences. It does not include medicine, nursing, psychology or health sciences.
- Technology refers to topics related to information technology and programming, mechanics, electronics, and all other types of technology. Some technology courses could also be called engineering. There are many types of engineering, like aerospace and environmental engineering, and many types of mathematics, such as geometry, logic and statistics.
- **STEM subjects at primary school:** mathematics, science, technologies.
- **STEM subjects at secondary school:**
    - **General STEM subjects:** mathematics, biology, chemistry, earth and environmental science, physics, geography, design and technologies and digital technologies.

    - **Year 9-10 elective STEM subjects:** geography elective, agricultural technology, design and technology, food technology, graphics technology, industrial technology, information and software technology.
    - **Year 11-12 elective STEM subjects:** agriculture, biology, chemical world science, chemistry, computing applications, design and technology, earth and environmental science, earth and space science, electrotechnology (VET), engineering studies, geography, human society and its environment, industrial technology, information and digital technology (VET), information processes and technology, investigating science, living world science, marine studies, mathematics, mathematics advanced, mathematics extension, metal and engineering (VET), physical world science life skills, physics, science extension, software design and development.
- **STEM subjects at higher education:** agriculture, computing and information technology, engineering and technology, environmental studies, mathematics, biology, chemistry, physics, earth and environmental sciences.
- **STEM qualifications:** computing or information technology (IT), data analyst, engineering, mathematics, science.
- **STEM jobs / careers:**
    - **Qualifying jobs / careers:** computing or information technology (IT), data analysis, engineer, mathematician, scientist.
    - **Potential qualifying jobs / careers, depending on specific role:** entrepreneur, machinery operator or driver, professor, lecturer or teacher, public servant (includes Army, Airforce, Navy), technician or trade worker (mechanic, electrician, carpenter).

Executive summary

The purpose of this study is to build understanding of the perceptions and attitudes of young people towards STEM to better assist families, educators and policy makers in supporting girls/women throughout their STEM education and towards the future consideration of STEM-related careers.

This report details the results of the third wave of research relating to Youth in STEM study undertaken by YouthInsight on behalf of the Department of Industry, Science, Energy and Resources (DISER). Waves 1 and 2 were conducted in 2018-19 and 2019-2020 respectively.

During July and August 2021, an online survey was conducted among a nationally representative sample of 3,154 young people aged 12-25 years old, sourced from a range of online panels. This report outlines the detailed findings from the 2021 Youth in STEM study and highlights some of the key comparative findings since Wave 2.

While maintaining a key focus on understanding gender differences, the current wave of research among young people builds on the emerging story concerning the central role played by parents in positioning STEM study and careers for the consideration of young people (previously noted in both the Youth in STEM 2019/20 study and the Parents, Teachers and Careers Advisors 2020/21 studies). The current survey found that young people whose parents have an education in STEM or work in a STEM-related field are more likely to demonstrate better understanding of STEM and participate in STEM study pathways than those whose parents do not. Further, the study demonstrates clear familial and cultural differences, with the propensity for young people who were born overseas as well as those from Culturally and Linguistically Diverse (CALD) backgrounds to demonstrate higher involvement in STEM-related study and careers than young people born in Australia or from non-CALD backgrounds. As such, the insights revealed in this report align closely to the findings uncovered in the Youth in STEM 2019/20 study and add a critical socio-cultural overlay to our understanding of the important contributing factors influencing the perceptions and attitudes of young people towards STEM.

Given the ongoing global Covid-19 pandemic, the current study explicitly sought to understand any potential impact of the pandemic on young people's perceptions of STEM as well as their future study and career intentions. Contextually, it was found that perceptions of scientists making 'a positive impact in the world' have increased since Wave 2. In addition, 38% of young people stated that they had 'reconsidered their study and career options' directly as a result of Covid-19. Young people also reported that they were 'slightly' or 'much more' likely to consider study or work in STEM in the future as a result of Covid-19 (particularly boys/men).

While the study is vastly detailed, this report focuses on a set of key metrics used to evaluate young people's understanding, attitudes, and perceptions of STEM as well as their current involvement with STEM and their future intentions regarding STEM. A summary of the findings for each of these key metrics, along with a summary table, can be found below.

Summary of results

The results presented in this section summarise key insights and differences between research Waves 2 and 3.

Table 1: Key metrics across Wave 2 and Wave 3.

Key metric	Wave 2	Wave 3
Understanding of the STEM acronym	58%	▲65%
Interest in STEM	84%	85%
Perceived importance of STEM	87%	▲92%
Confidence in studying STEM	80%	▲85%
Intention to pursue a career in STEM	33%	31%

Understanding of STEM and STEM-related jobs

- 65% of young people were able to correctly recall all four subjects involved in the STEM acronym (up from 58% in Wave 2). This increase is driven by a greater proportion of boys/men and those aged 18-25 who understand the term 'STEM' correctly this wave.
- It was found that young people with parents who are educated in STEM are significantly more likely to have a correct understanding of the subjects related to STEM (68% compared to 61%).
- Culturally and Linguistically Diverse (CALD) young people and those who were born overseas demonstrate a significantly stronger understanding of STEM than non-CALD students, and those born in Australia.
- It was found that those who identify as Aboriginal and/or Torres Strait Islander are significantly less likely to demonstrate correct understanding of STEM than non-Aboriginal young people.
- Young people's understanding of the types of jobs and careers related to STEM study is dominated by engineering and mathematics. However, there has been an increase in the ability of young people to correctly identify some STEM careers. These careers included 'scientist', 'medical/healthcare roles', and 'biologist', all roles that have had increased prominence in social discourse during the Covid-19 pandemic.
- Gender differences were evident with girls/women being significantly more likely to associate the jobs 'engineer' (64%) and 'scientist' (46%) with STEM study compared to boys/men (57% and 40% respectively).
- When asked about gender associations with a range of different jobs and careers, it was found that STEM jobs and careers including 'engineer', 'computing or information technology', 'data analyst' and 'scientist', are significantly more likely to be associated with males rather than females.

Attitudes (interest and perception) towards STEM

- There continues to be a high level of interest in STEM subjects among young people, with the proportion of those 'somewhat' or 'very' interested in STEM subjects overall remaining stable at 85%.
- Science and technology subjects consistently drive significantly more interest (63% and 64% respectively) than engineering and mathematics (43% and 48% respectively).
- Young people with parents educated in STEM and young people with parents employed in STEM-related fields are significantly more likely to express an interest in STEM at the overall level (88% and 92% respectively), as are boys/men (89%) when compared to girls/women (82%).
- When it comes to interest in specific subjects, boys/men demonstrate significantly higher levels of interest in all individual STEM subjects except for science. Boys/men are most likely to express interest in technology subjects (77%) whereas interest from girls/women is highest for science at 62%.
- The perceived importance of STEM skills and knowledge overall is significantly higher than seen in Wave 2 with increases evident across all individual subjects. It was found that skills in technology are still regarded as being the most important (84%) of all the STEM subjects for getting a good job in the future, followed by mathematics (78%), science (74%) and engineering (63%).
- Of interest, there has been a significant increase in perceptions of the importance of science in Wave 3 (74%) compared to Wave 2 (69%). Science is regarded as being important as it provides an understanding of how the world works (49%) and provides access to a wide range of career options (43%). These perceptions are significantly higher among girls/women (54% and 48% respectively) when compared to boys/men (44% and 37%).
- Perceptions of science and technology fields have remained stable for the most part, however, a significant increase has been observed in the proportion of young people who agree that scientists make a positive difference in the world. Despite acknowledgement of the social worth of scientists in the midst of a global pandemic, there is no corresponding uplift evident (as yet) in the desire to actually 'be' a scientist in future.
- Consistent with the theme of socio-cultural influence observed, parents and guardians play a strong role in positioning STEM study, jobs and careers to young people. Importantly, the perceptions of STEM fostered by discussions with parents are regarded as largely positive. Similarly, conversations with teachers and career advisors are seen to be positive regarding STEM study, jobs and careers.

Gender bias in STEM

- When asked about which gender is 'better' at STEM subjects, the majority of young people do not demonstrate gender bias in relation to STEM.
- Among those young people that do demonstrate gender beliefs, perceptions of boys/men being considered 'better' at STEM have remained consistently higher than for girls (being considered better). However, there has been a significant increase observed in perceptions of girls as being 'better' at all STEM subjects compared to Wave 2, suggesting some progress is evident in addressing this gender bias.
- In Wave 3, it was found that boys/men are significantly more likely to regard their own gender as being 'better' at all STEM subjects. Girls/women are more equitable than boys in their perceptions of who is better at STEM but still regard boys as being better at technology

and engineering subjects. Girls/women have more positive perceptions of their skills in relation to science and mathematics than do boys.

Current participation in STEM subjects

- Participation in STEM elective subjects has remained stable among Year 9 and 10 students (59%, compared to 61% in Wave 2).
    - Participation remains significantly higher among boys/men (75%) compared to girls/women (42%).
- Consistent with Wave 2, there is strong participation in STEM elective subjects overall among Year 11 and 12 students, led by participation in mathematics (44%), chemistry (37%) and biology (33%).
    - Girls/women are significantly more likely than boys/men to be currently studying mathematics (52% vs 37%), biology (42% vs 24%) or chemistry (41% vs 33%).
    - Boys/men are significantly more likely to be studying physics (29% vs 16%), information and digital technology (VET) (10% vs 4%), engineering studies (10% vs 3%), information processes and technology (10% vs 2%), and design and technology (8% vs 4%).
- Consistent with the previous wave, significantly more boys/men are studying STEM at a tertiary level compared to girls/women (43% vs 22% overall).
    - This wave we have seen a significant increase in the proportion of higher education students studying mathematics (5% vs 2% in Wave 2). This is driven by a greater proportion of boys/men studying mathematics in Wave 3 than Wave 2 (8% vs 3%).
- Socio-cultural influences on participation are evident across all three study levels.

Influences in relation to STEM study

- When it comes to factors that influence STEM study choices, young people report being led by personal interest (58%), their perceptions of their own skills and abilities (55%) and earning potential (31%).
- The role of personal interest and perceptions of own skills and abilities is of significantly greater influence among girls/women than it is for boys/men (65% vs 51% and 59% vs 51% respectively).
- Consistent with previous findings, parents remain a key influencer with regards to study choices (47%), along with friends (26%) and teachers/lecturers (25%).

Confidence in studying STEM

- Overall, confidence in studying STEM is higher than in Wave 2 (85% vs 80%), driven by increases in confidence in studying science (61% compared to 58%) and mathematics (60% compared to 57%).
- Boys/men are significantly more confident than girls/women in all STEM subjects, excluding science.
- Girls/women are least confident when it comes to studying engineering (30%), followed by technology (57%) and mathematics (58%).
- Students born overseas reported feeling more confident studying science than those students born in Australia (69% vs 59%).

- CALD students are also likely to feel more confident studying science and mathematics than non-CALD students (66% vs 58%).

Intention to study STEM subjects in the future

- When asked about studying STEM subjects in the future, the intentions of Years 6 to 8 students to study STEM at Year 9 and 10 have remained stable (68% compared to 71% in Wave 2).
    - Consistent with the previous wave, boys/men in Years 6 to 8 remain significantly more likely to intend to study STEM subjects in future than do girls/women (79% compared to 59%).
- Among those in Year 9 and 10 there has been a small but statistically significant decline in the proportion of young people intending to enrol in STEM subjects for Years 11 and 12 (96% to 90%).
    - This shift is not driven by any one subject in particular; rather a generalised small decline is evident across many individual STEM subjects, such as chemistry, mathematics, mathematics extension and physics.
- The intention of Year 11 and 12 students to study STEM at the tertiary level has remained stable overall at 39%. While not statistically significant, the data shows a slight uplift in intention to study engineering and technology, and biology.
    - However, clear gender skews are evident in intention to study STEM at a tertiary level with intention to study STEM at a tertiary level overall is driven by boys/men rather than girls/women (49% compared to 26%).

Career intentions

- Intention to pursue a STEM career remained stable at 31%. Boys/men remain significantly more likely to intend to pursue a career in STEM overall than do girls/women (42% vs 21%). This is driven by significant gender skews in intention to pursue a career as an engineer; in the field of computing and information technology; a data analyst, inventor or mathematician.
- Those who wanted to become a scientist were asked what type of scientist they would like to become. The majority wanted to be biologists (34%), followed by earth or environmental scientists (22%). There was a slight gender skew, with boys/men being more likely to want to become a physicist (18% vs 7%).

In conclusion

The insights presented in this report provide information for policy makers to take a data-driven approach in addressing the gender imbalance existent in STEM education and related careers. This research extends our knowledge regarding the significant role played by socio-cultural factors upon young people's perceptions of STEM and their decisions made to pursue study and careers in STEM-related fields. Moving forward, DISER will continue tracking key measures around STEM from both young people and their key influencers. The second wave of the Parents/Teachers and Career Advisors research will be conducted in 2022, followed by the fourth wave of the Youth in STEM research in 2023.

Project background

Background

Building on from the Youth in STEM research, which was first commissioned in 2018 (referred to throughout as Wave 1), the Department of Industry, Science, Energy and Resources (DISER) has continued the collection and reporting of attitudes and perceptions of young Australians towards STEM. The objective of the research is to understand more about the perceptions of young Australians (12 to 25-year-olds) towards STEM skills and careers, particularly those of girls (women).

With the previous Youth in STEM research showing that girls' perceptions of, and engagement with, STEM are strongly influenced by parents, teachers and career advisors, DISER decided to expand the Youth in STEM research to provide insights into the attitudes and perceptions of these key influencer groups. DISER have since published the STEM Influencer (Parents) research and the STEM Influencer (Teachers & Career Advisors) research.

From 2020 onwards, the Youth in STEM research has been tracking both the 12 to 25 year-old group of young people and the influencer group of parents and educators. Each survey is conducted biennially as below, with results released early the following year:

- 2019: People aged 12-25 (completed) – referred to as 'Wave 2' throughout this report
- 2020: Parents (completed)
- 2020: Teachers & Career Advisors (completed)
- 2021: People aged 12-25 (current report) – referred to as 'Wave 3' throughout this report
- 2022: Parents
- 2022: Teachers & Career Advisors

The studies focus on any differences and similarities in data outcomes based on gender, as well as investigating the intersection of other demographics which may further influence STEM engagement and participation.

This research report is the third wave of the Youth in STEM research. Key differences between the insights from this report and the previous waves of the Youth in STEM research have been noted.

Objectives

The principal objective of the study is to track changes in awareness and perceptions of STEM subjects and STEM-related careers held by young Australians compared to the previous two waves. The underlying theme of the research is to uncover key gender differences.

More specifically, the study aims to:

- Understand student awareness of STEM and STEM-related careers
- Evaluate perceived importance of STEM subjects to students
- Determine student interest in STEM careers
- Assess young Australians' engagement with STEM outside of education
- Determine student interest in considering further STEM education
- Identify barriers and enablers to STEM careers
- Understand the factors that influence career choices.

Methodology

YouthInsight conducted a 20-minute online survey among a representative sample of young people in Australia. Young people completed the survey via computer, tablet or mobile phone.

Interviewing young people and children

YouthInsight adheres to The Research Society Code of Professional Behaviour Guideline on interviewing children and young people. The guideline states:

Researchers must take special care when researching children and young people. The consent of a parent or responsible adult must first be obtained before collecting information from:

a) *Children, defined as under 14 years; and*
b) *Young people, defined as 14-17 years, when sensitive information is being collected.*

YouthInsight approach

Due diligence was carried out to ensure the consent of the parent and/or guardian was obtained prior to surveying children under 14 years.

To achieve sample quotas YouthInsight blends online sample provider data with accredited external providers. For the 2021 survey, YouthInsight utilised three external online sample providers to help meet quotas for the 12-17 year old group as well as the 18-25 group. In the 2018/19 survey, external sample was only required for the 18-25 group.

To reach young people under the age of 18 who are not signed up to a panel, an external provider can contact the parent and/or guardian initially to then invite their child to complete the survey. Quality control measures were in place in this instance to ensure that it was a child taking part in the survey and not an adult, for example:

- Ensuring that age matched year of birth (if not, respondents were screened out)
- Thorough quality checking of responses upon completion, for example looking for straight liners, speeders, poor quality open-end responses and nonsensical response patterns.

Sampling

The total unweighted sample for the third wave of the Youth in STEM survey was 3,154. YouthInsight collaborated with three online panel partners to obtain a nationally representative sample of Australian young people.

Sample quotas were placed on state, gender and age group. To ensure survey results were representative of the population, weighting was applied based on age, gender, state, CALD status and lower SES to correct for under or over representation of the sample for these variables.

To determine socioeconomic status, the survey used Socio-Economic Indexes for Areas (SEIFA) developed by the Australian Bureau of Statistics (ABS). SEIFA ranks areas in Australia into ten equally sized groups according to relative socioeconomic advantage and disadvantage. These are known as socioeconomic deciles. The indexes are based on information from the five-yearly Census of Population and Housing. The data captured in the survey has been mapped to the Index of Education and Occupation (IEO).

Below are the summary tables of the unweighted sample and weighted population with applied weighting factors.

Table 2: Total unweighted sample and weighted population.

GENDER, AGE AND STUDIES	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
Total	**3,154**	**100%**	**3,154**	**100%**
Gender				
Boys/men	1,559	48%	1,545	49%
Girls/women	1,538	51%	1,426	49%
Other/non-binary	57	1%	63	2%
Age group				
12-13	180	6%	253	8%
14-17	938	30%	914	29%
18-21	921	29%	899	29%
22-25	1,115	35%	1,088	35%
Study status				
Enrolled in studies	2,505	79%	2,506	79%
Not enrolled in studies	649	21%	648	21%
Study level				
Primary school – Year 6 or below	29	1%	41	2%
High School – Year 7	93	4%	126	5%
High School – Year 8	99	4%	114	5%
High School – Year 9	135	5%	131	5%
High School – Year 10	185	7%	184	7%
High School – Year 11	259	10%	256	10%
High School – Year 12	421	17%	408	16%
University – Undergrad Year 1	295	12%	281	11%
University – Undergrad Year 2	210	8%	206	8%
University – Undergrad Year 3	260	10%	257	10%
University – Undergrad Year 4+	171	7%	162	6%
University – postgrad	170	7%	156	6%

GENDER, AGE AND STUDIES	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
TAFE/ Private College – Y1	101	4%	107	4%
TAFE/ Private College – Y2	26	1%	25	1%
TAFE/ Private College – Y3	17	1%	17	1%
TAFE/ Private College – Y4	10	0%	11	0%
Highest level of education among those no longer studying				
Year 10	63	10%	64	10%
Year 11	47	8%	47	8%
Year 12	181	29%	188	30%
VET Certificate	65	10%	66	11%
VET Diploma	23	4%	23	4%
Bachelor's degree	170	27%	160	26%
Graduate diploma or certificate	36	6%	34	6%
Postgraduate degree	29	5%	28	4%
Other	11	2%	9	2%
Type of school, among those in high school				
Public	676	55%	714	57%
Catholic	180	15%	189	15%
Private	221	18%	220	17%
Selective	123	10%	113	9%
Boarding	6	0%	7	1%
Other	15	1%	17	1%
Single sex or co-ed school				
Single sex	234	19%	218	17%
Co-ed	987	81%	1,042	83%
Student type				
International student	198	8%	212	8%
Domestic student	2,307	92%	2,295	92%

*Where weighted sample or proportions do not add up to 100%, this is due to rounding of decimal places up or down to the nearest whole number.

LOCATION, SES AND EMPLOYMENT STATUS	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION%
State				
NSW	1,074	34%	1,041	33%
VIC	845	27%	820	26%
QLD	541	17%	599	19%
WA	246	8%	347	11%
SA	306	10%	221	7%
ACT	74	2%	63	2%
TAS	35	1%	32	1%
NT	33	1%	32	1%
Location				
Capital city/major metropolitan area	2,504	80%	2,286	73%
Regional or remote/rural	631	20%	852	27%
Socioeconomic status (SES)*				
Lower SES (Decile 1 - 5)	2,184	70%	2,057	66%
Higher SES (Decile 6 - 10)	945	30%	1,072	34%
Employment status among those aged 15+				
Working full-time	448	16%	423	15%
Working part-time	564	20%	547	20%
Working casually	742	26%	730	26%
Working in holidays only	87	3%	88	3%
Stay at home parent	56	2%	57	2%
Not employed and looking for work	486	17%	479	17%
Not employed and not looking for work	400	14%	392	14%
Other	55	2%	54	2%

*Socioeconomic status (SES) - not all postcodes are available in the SEIFA index list.

BACKGROUND AND PARENT BACKGROUND	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
Country of birth				
Australia	2,663	83%	2,492	79%
Other	521	17%	662	21%
Aboriginal and / or Torres Strait Islander				
Aboriginal and / or Torres Strait Islander	152	5%	154	5%
Non-Aboriginal and / or Torres Strait Islander	2,947	93%	2,945	93%
Unspecified	55	2%	56	2%
CALD (Culturally and Linguistically Diverse - based on language spoken other than English at home)				
Non-CALD	2,128	67%	2,113	67%
CALD	1,026	33%	1,041	33%
Parent's highest level of education				
Primary School	36	1%	38	1%
High School (Year 10)	335	11%	343	11%
High School (Year 12)	628	20%	630	20%
VET Certificate	123	4%	122	4%
VET Diploma	73	2%	74	2%
Bachelor's degree	781	25%	774	25%
Graduate diploma or certificate	408	13%	416	13%
Masters	443	14%	432	14%
Doctorate	92	3%	88	3%
Other	13	0%	13	0%
Not sure/prefer not to say	222	7%	224	7%
Parent education				
STEM degree or certificate	1,621	51%	3,088	51%

BACKGROUND AND PARENT BACKGROUND	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
Non-STEM degree or certificate	1,533	49%	3,923	49%
Parent employment				
Do not work in STEM career	2,948	93%	2,951	94%
Work in STEM career	522	17%	511	16%

WAVE	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION%
Wave				
Wave 1 (2018)	2,092	100%	1,905	100%
Wave 2 (2019)	3,021	100%	2,929	100%
Wave 3 (2021)	3,154	100%	3,154	100%

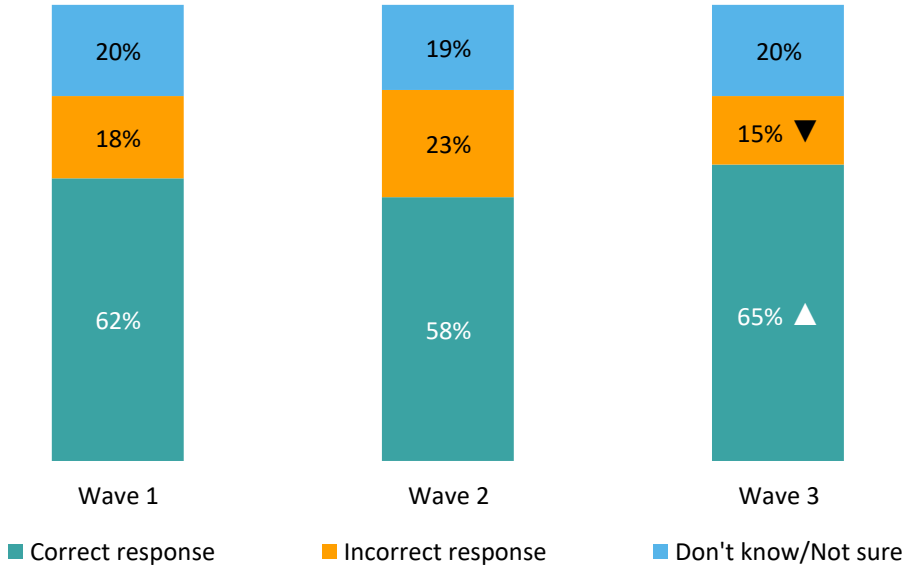
Current perspectives and behaviours

Understanding of STEM and STEM-related jobs

To get an indication of young people's understanding of STEM, respondents were asked what they believe the acronym 'STEM' stands for. Understanding of the term 'STEM' has increased significantly[1] for Wave 3 with 65% of young people overall able to correctly recall all four subjects involved, compared to 58% in Wave 2. While the proportion of those saying they are unsure remains consistent with the previous wave, there has been a significant decline in the proportion who gave an incorrect response (15% compared to 23%).

Figure 1: Understanding of the acronym 'STEM'.

Q. Please write below what you believe the term 'STEM' stands for.



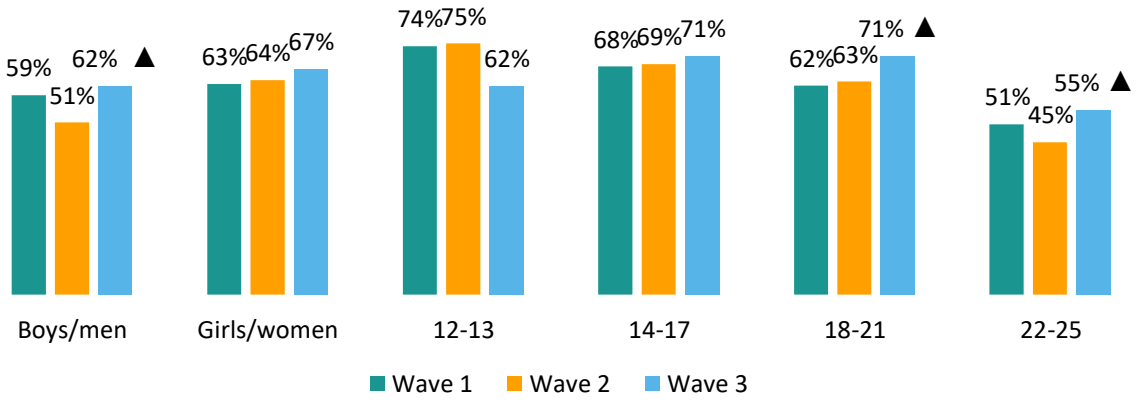
Base: Total – Wave 1 – 1,434, Wave 2 – 3,021, Wave 3 – 3,154.

[1] **Significant differences** – Differences between demographic groups cited in the report refer to statistically significant differences based on a 95% confidence interval. Charts in this report show statistically significant differences between subgroups using black or white arrows alongside the percentage results. If a difference is described as indicative, the difference is not statistically significant.

This overall increase in understanding is driven by a significant increase in the proportion of boys/men (from 51% to 62%) and those aged 18-25 (from 45% to 55%) who understand the term 'STEM' correctly compared to Wave 2. While understanding has increased among girls/women by an additional three percentage points, from 64% to 67%, this change is not significant.

Figure 2: Understanding of the acronym 'STEM' by gender and age (% Correct response).

Q. Please write below what you believe the term 'STEM' stands for.



Base: Wave 1 – 2,092, boys/men – 978, girls/women – 1,069, 12-13 – 77, 14-17 – 650, 18-21 – 771, 22-25 – 594. Wave 2 – 2,537, boys/men – 1,088, girls/women – 1,432, 12-13 – 44, 14-17 – 783, 18-21 – 875, 22-25 – 835. Wave 3 – boys/men – 1,559, girls/women – 1,538. 12-13 – 180, 14-17 – 938, 18-21 – 921, 22-25 – 1,115. Non-binary/other not shown due to low base size.

Consistent with previous waves, errors in understanding commonly relate to attributing incorrect subjects to the 'e' and the 'm' in STEM. Below are some of common responses mistakenly offered in the place of 'engineering' or 'mathematics':

- Science, Technology, **English**, Mathematics
- Science, Technology, **Economics**, Mathematics
- Science, Technology, **Education**, Mathematics
- Science, Technology, **Enterprise**, Mathematics
- Science, Technology, **Environment**, Mathematics
- Science, Technology, **Electronics**, Mathematics
- Science, Technology, Engineering, **Medicine**
- Science, Technology, Engineering, **Marketing**
- Science, Technology, Engineering, **Management**
- Science, Technology, Engineering, **Mechanics**
- Science, Technology, Engineering, **Management**

Below are other significant differences in the ability of key demographic groups to correctly identify the subjects included in STEM.

Table 3: Proportion correctly identifying all four STEM subjects: significant differences by audience.

Audience	WEIGHTED %
Location	
Metropolitan	69%
Regional / remote	52%
Socioeconomic status	
Lower SES (Decile 1 - 5)	62%
Higher SES (Decile 6 - 10)	67%
CALD	
Non-CALD	60%
CALD	72%
Aboriginal and/or Torres Strait Islander	
Non-Aboriginal or Torres Strait Islander	66%
Aboriginal and/or Torres Strait Islander	44%
Country of birth	
Born in Australia	63%
Born overseas	71%

As noted in the above table, young people who identify as Culturally and Linguistically Diverse (CALD) and those who were born overseas demonstrate a significantly stronger understanding of STEM than non-CALD students, and those born in Australia. Of note, it was found that those who identify as Aboriginal and/or Torres Strait Islander are significantly less likely to demonstrate a correct understanding of STEM than non-Aboriginal students.

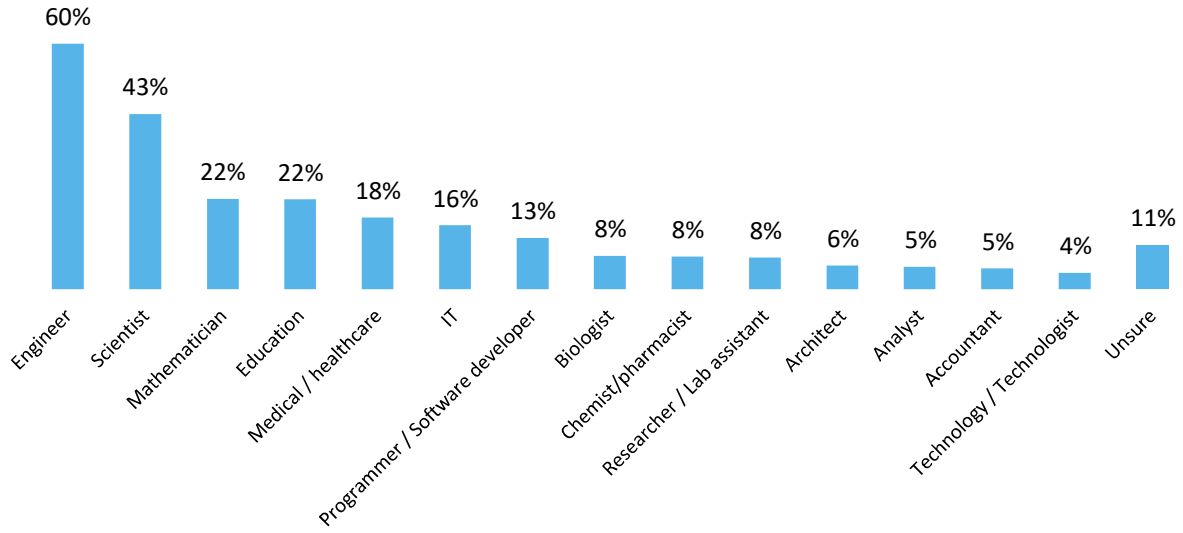
The role of parents continues to have a strong influence on young people's understanding of STEM. Young people with parents who are educated in STEM are significantly more likely to have a correct understanding of the subjects related to STEM (68% compared to 61%), as are young people whose parents are employed in a STEM-related field (75% compared to 64%).

Understanding of Jobs in STEM

In Wave 3, young people were again asked about the types of jobs they associate with studying STEM subjects. Despite the evident misunderstanding of the 'e' and 'm' within the STEM acronym, engineering and mathematics remain the top-of-mind careers commonly related to STEM study.

Figure 3: Top 15 jobs associated with STEM study pathways.

Q. What type of jobs do you think you would be able to get if you have a STEM degree or certificate?



Base: Total – Wave 3 – 3,154.

Compared to Wave 2, young people were more likely to identify some STEM careers such as engineer, scientist, medical/healthcare roles, biologist, chemist and architect. There was a significant decline in the proportion who said they were unsure of any STEM jobs.

It was found that girls/women are significantly more likely to associate the jobs 'engineer' (64%) and 'scientist' (46%) with STEM study compared to boys/men (57% and 40% respectively).

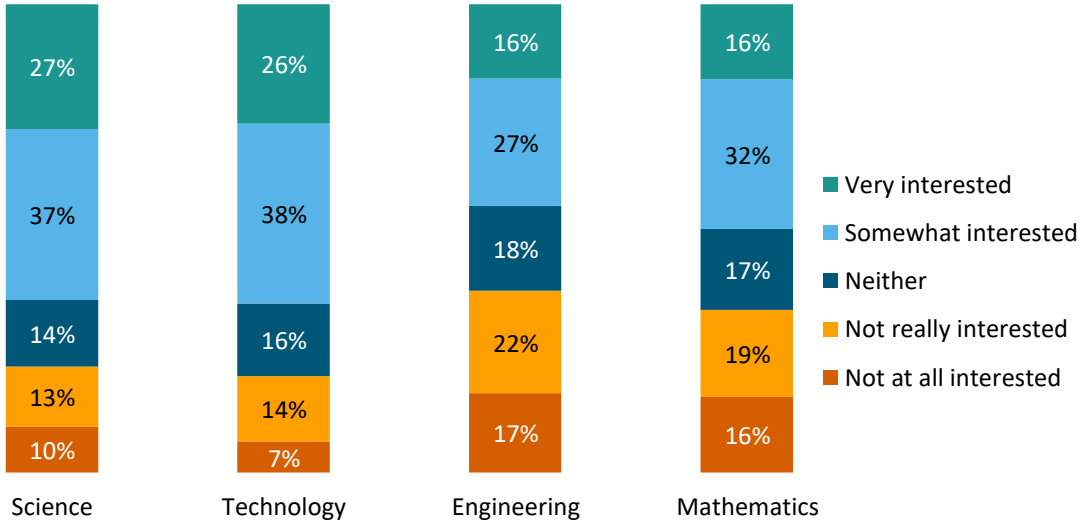
Attitudes towards STEM

Interest

The data shows that there continues to be a high level of interest in STEM subjects, with the proportion of those 'somewhat' or 'very' interested in STEM subjects overall remaining stable at 85% (compared to 84%) in Wave 2. Science and technology subjects continue to drive significantly more interest among young people (63% and 64% respectively) than engineering and mathematics (43% and 48% respectively).

Figure 4: Level of interest in STEM subjects.

Q. How interested are you in each of the below subjects?



Base: Wave 3 only. Total – 3,154. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Table 4: Level of interest in STEM subjects (Net: somewhat/very interested), by wave.

Q. How interested are you in each of the below subjects?

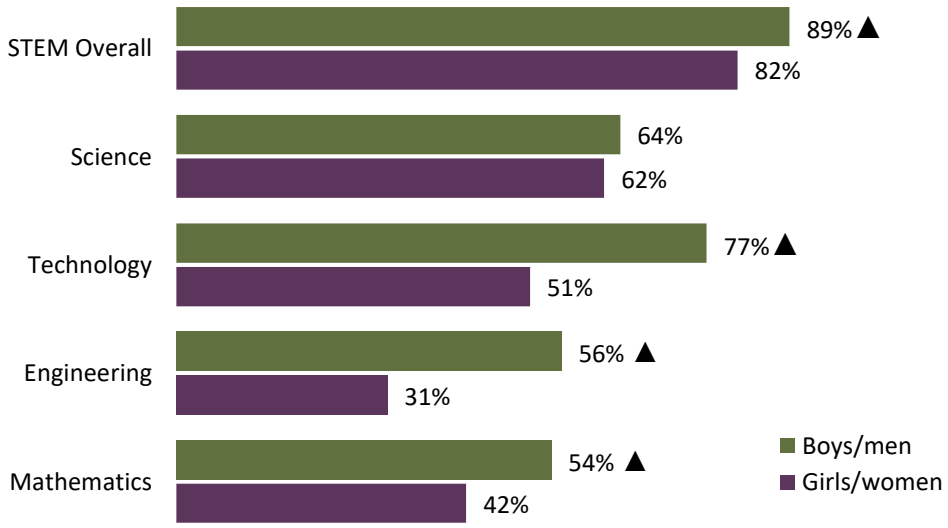
Subject	Net: somewhat/very interested		
	Wave 1	Wave 2	Wave 3
STEM overall	86%	84%	85%
Science	64%	62%	63%
Technology	65%	65%	64%
Engineering	42%	44%	43%
Mathematics	50%	46%	48%

Base: Total – Wave 1 – 1,434, Wave 2 – 3,021, Wave 3 – 3,154.

It was found that boys/men are significantly more interested in STEM subjects overall than girls/women (89% vs 82% overall). Boys/men also demonstrate significantly higher levels of interest in all individual STEM subjects except for science where interest from girls/women is on par with that of boys/men (62% and 64% respectively). Boys/men are most likely to express interest in technology subjects (77%) whereas interest from girls/women is highest for science at 62%. These findings have been consistent over time.

Figure 5: Level of interest in STEM subjects by gender (Net: somewhat/very interested).

Q. How interested are you in each of the below subjects?



Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

Below are other significant differences among key demographic groups in relation to interest in STEM overall.

Table 5: Proportion interested in STEM overall.

Audience	WEIGHTED %
Location	
Metropolitan	87%
Regional / remote	81%
CALD	
Non-CALD	84%
CALD	87%
Country of birth	
Born in Australia	84%
Born overseas	89%

The research found that young people in metropolitan areas are more likely to be interested in science than those in regional or remote areas (66% vs 57%) as are those born overseas (72% vs 61%) and CALD students (67% vs 61%). CALD students are also more likely to be interested in maths compared to their non-CALD counterparts (52% vs 45%).

Again, young people with parents educated in STEM and young people with parents employed in STEM-related fields are significantly more likely to express an interest in STEM at the overall level. This is driven by significantly higher interest levels across all STEM subjects (when compared to those without parents educated or employed in STEM).

Table 6: Level of interest in STEM subjects (Net: somewhat/very interested), by parent education/employment in STEM.

Q. How interested are you in each of the below subjects?

Subject	Parents Educated in STEM		Parents Employed in STEM	
	Yes	No	Yes	No
STEM overall	▲88%	82%	▲92%	85%
Science	▲70%	56%	▲74%	62%
Technology	▲67%	61%	▲71%	63%
Engineering	▲48%	39%	▲56%	42%
Mathematics	▲55%	41%	▲61%	47%

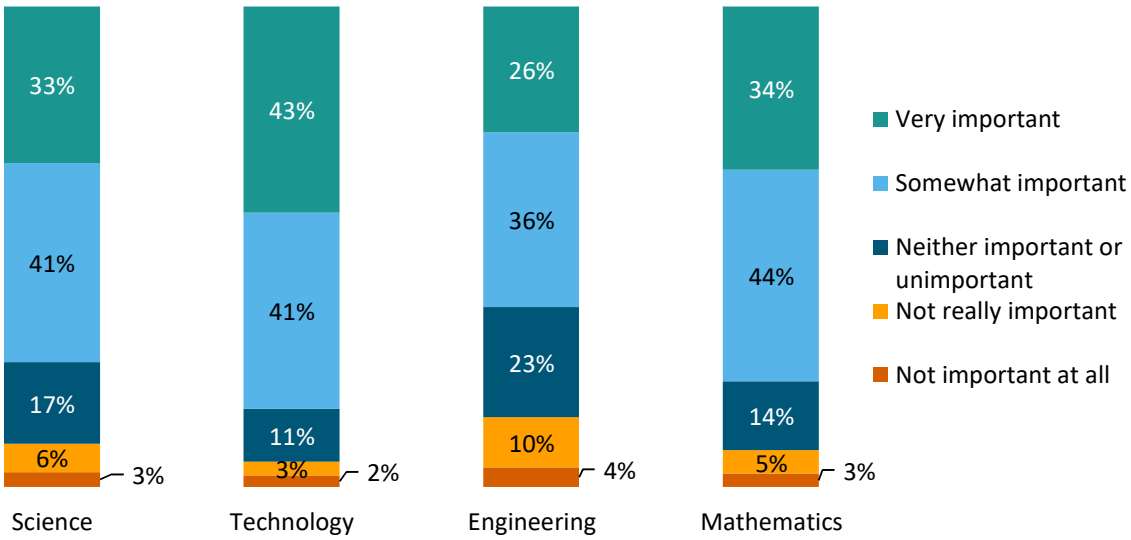
Base: Wave 3 – Parents educated in STEM - 1,621, Parents not educated in STEM - 1,533; Parents employed in STEM – 522, Parents not employed in STEM-related work – 2,948

Perceived importance

These findings are consistent with young people's perceptions of the importance of STEM knowledge and skills for getting a job in the future. The perceived importance of STEM skills and knowledge overall is significantly higher than seen in Wave 2 (92% compared to 87%). Similar increases are evident across all individual subjects. It was found that skills in technology are still regarded as being the most important (84%) of all the STEM subjects for getting a good job in the future, followed by mathematics (78%), science (74%) and engineering (63%).

Figure 6: Perceived importance of STEM skills.

Q. How important do you believe it is to have knowledge and skills related to each of the subjects that make up STEM?



Base: Total. Wave 3 – 3,154. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Table 7: Perceived importance of STEM skills (Net: somewhat/very important), by wave.

Q. How important do you believe it is to have knowledge and skills related to each of the subjects that make up STEM?

Subject	Net: somewhat/very important		
	Wave 1	Wave 2	Wave 3
STEM overall	92%	87%	▲92%
Science	73%	69%	▲74%
Technology	85%	79%	▲84%
Engineering	60%	58%	▲63%
Mathematics	79%	72%	▲78%

Base: Total. Wave 1 – 2,092, Wave 2 – 3,021, Wave 3 – 3,154. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The respondents were asked why they thought STEM skills in these areas were important. Three in five (62%) young people said that technology is shaping the future, while 55% said that technology skills are in high demand. Technology skills (along with skills in mathematics) are also significantly more likely to be regarded as 'essential life skills' (44% and 58% respectively), 'usable in the workplace' (47% and 42%) and 'transferable to other areas' (46% and 47% respectively). The majority of these perceptions are significantly higher for girls/women than boys/men.

Table 8: Reasons given for why it is important for knowledge and skills in technology and mathematics to get a good job, by gender.

Q. Why is it important to have knowledge and skills in (subject) to get a good job?

Statements	Technology		Mathematics	
	Girls/Women	Boys/Men	Girls/Women	Boys/Men
Technology is shaping the future/constantly evolving	▲68%	55%	-	-
These skills are in high demand	▲59%	51%	31%	28%
It is an essential life skill	▲47%	40%	▲63%	51%
Skills are transferable to other areas	▲52%	40%	▲54%	41%
You have to use these skills in the workplace	▲51%	42%	▲45%	38%

Base: Wave 3 only, those who think it is important. Maths, Girls/women – 1,201, Boys/men – 1,217; Maths, Girls/women – 1,276, Boys/men – 1,324

Skills in engineering are the least likely to be considered overall as essential life skills (19%). Despite this, those that regard engineering as important believe that engineering skills are in high demand (41%); and that studying the subject equips you with good problem-solving skills (41%) and logical thinking skills (40%).

There has been a significant increase in perceptions of the importance of science in Wave 3 (74%) compared to Wave 2 (69%). Science is regarded as being important as it provides an understanding of how the world works (49%) and provides access to a wide range of career options (43%). These perceptions are significantly higher among girls/women (54% and 48% respectively) when compared to boys/men (44% and 37%).

Table 9: Reasons given for why it is important for knowledge and skills in STEM subjects to get a good job.

Q. Why is it important to have knowledge and skills in (subject) to get a good job?

Statements	Subject			
	Science	Technology	Engineering	Mathematics
It is an essential life skill	25%	▲44%	19%	▲58%
Gives you a wide range of careers options	▲43%	▲45%	36%	34%
These skills are in high demand	37%	▲55%	41%	30%
This subject teaches problem solving skills	37%	33%	▲41%	▲55%
This subject teaches you logical thinking	41%	31%	40%	▲51%
Skills are transferable to other areas	38%	▲46%	36%	▲47%

Base: Wave 3 only, those who think it is important. Science – 2,323, Technology – 2,643, Engineering – 1,979, Mathematics – 2,462.

Engineering is a key point of difference between boys/men and girls/women. Boys/men are significantly more likely than girls/women to regard skills in engineering as being important for getting a good job in the future (69% compared to 56%).

Drivers of perceptions of low importance of STEM subjects in getting a good job

Among those who regard skills in science as being unimportant for getting a good job in the future, key reasons provided include:

Lack of understanding about the breadth of 'science'

- *"Science is its own discipline and other jobs won't cross into the knowledge and skills of science."*
- *"Science is only important if you want to become a scientist."*
- *"I do not know many roles outside of traditional jobs such as doctors who would need a background in science."*
- *"Science is a very niche area and can only get you a certain number of jobs whilst there are plenty of other jobs out there where skills outside of science are transferable."*

Lack of perceived need

- *"You don't need a science degree to end up working in a job relating to science."*
- *"How many scientists are there; do you really need a certificate of paper to get a good job?"*
- *"There are so many jobs that don't require knowledge in science."*

Lack of awareness of complementary skills and overlap in disciplines

- *"I want to be a lawyer and we don't need any knowledge in science."*
- *"Because there are plenty of jobs such as teaching which don't inherently require scientific skills."*
- *"Information technology-related jobs don't rely on science that much."*

Perceptions of poor job prospects

- *"Not many jobs need science, it is only really required for a few jobs plus you can still get really good jobs without scientific skills."*
- *"Good jobs exist outside of science."*
- *"In comparison to technology and math, science isn't in as many industries."*
- *"How many people did science at uni and now are working in a bar or retail, it is just a massive waste of time."*

For those who regard skills in engineering as being unimportant for getting a good job in the future, key reasons provided include:

Engineering regarded as niche and a specific skill set

- *"Engineering is its own discipline and other jobs won't cross into the knowledge and skills of engineering."*

- *“Engineering is a very specific subject. Whereas the other ones are way more diverse and broad.”*
- *“Because again it’s very specialised.”*
- *“I mean if you want a job that involves engineering it's important, but it's not like maths where you will require solid knowledge of it within the vast majority of jobs.”*
- *“Engineering is very separate from a lot of jobs. Engineering skills and knowledge is more direct and mostly applies to engineering only.”*

Lack of understanding of what engineering actually is

- *“I don't know what engineering is... I don't think anyone actually knows what engineering is...”*
- *“I literally don't really know what engineering is but if you’re a lawyer, you probably don't need to build stuff.”*
- *“I'm unsure of engineering and how it could be used, or is used, in everyday life.”*

Many other jobs that do not require skill set

- *“Many job opportunities in fields unrelated to engineering (e.g. law).”*
- *“It is all dependant on the job that you want to get. If I wanted to be a sport teacher, I would not need to know anything about engineering.”*
- *“I don't believe engineering skills are needed for most jobs.”*
- *“Because there are many well-paying jobs which are not relating to engineering skills.”*

Perceptions of poor prospects

- *“Not much demand?”*
- *“There are only a few jobs that specifically require engineering skills.”*

For those who regard skills in technology as being unimportant for getting a good job in the future, key reasons provided include:

Ability to learn on the job

- *“Technology skills can be learnt on the job.”*
- *"If technology is needed for a specific job, it can easily be picked up.”*
- *“Because most jobs provide training with technology when you start.”*

Many jobs available that don’t require use of technology

- *“Because you don't have to use technology necessarily.”*
- *“Only some jobs need you to know much about technology.”*
- *“Depending on what job, most jobs just need basic knowledge and skills or technology. Not all companies have up to date technology.”*
- *“Because again you don't need an understanding for technology for every job.”*

Not relevant to chosen/preferred career

- *"Not very important in the jobs I want."*
- *"I want to be a lawyer and we don't need any knowledge in technology."*
- *"Not relevant to my chosen career."*

For those who regard skills in maths as being unimportant for getting a good job in the future, key reasons provided include:

Not relevant to chosen/preferred career

- *"Not really relevant for me because the jobs I want don't need maths."*
- *"You don't need maths to translate languages."*
- *"Because it does not relate to my aspired career."*
- *"My current role in health does not require any complicated maths."*

Many jobs available that don't require deep knowledge of maths

- *"Most jobs just need you to know basic maths."*
- *"Basic maths is required in any job, but when it comes to advanced mathematics, unless you are in a highly technical field, it doesn't really matter."*
- *"Because not all jobs require maths. There are jobs that do require you to do complex calculations regarding maths, but not every single job needs you to do that."*
- *"It's not required for every job, you can get by just knowing simple addition, subtraction, multiplication and division."*

Maths regarded as niche and a specific skill set/not relevant for everyday life

- *"Because maths is defined towards a select few fields and it's not really that useful in daily life."*
- *"Mathematics has very little real-world application unless you are in a particularly specific field of work."*
- *"A lot of maths is pointless to me and not used in everyday lives and jobs."*
- *"A lot of maths that we learn is not very practical."*
- *"Mathematics has very little real-world application unless you are in a particularly specific field of work."*
- *"I'm never going to use Pythagoras theorem on-the-job."*

Ability to leverage technology to support math skills if needed

- *"You can always use a calculator. Most people are not going to need half of the formulas they learn in school. Most use a calculator."*
- *"Most jobs don't require strenuous mathematics knowledge, plus calculator apps exist as well as Google."*

- *“Calculators, Excel etc technology supersedes math calculations, hence can get away without knowing too much in the industry.”*
- *“We have calculators in our phones.”*

Dislike of maths in general/not good at it

- *“I hate maths.”*
- *“Most maths is useless.”*
- *“Not good at it.”*
- *“I'm horrible at it.”*
- *“Maths is not intriguing to me, not very interesting and I'm not very good.”*

Perceptions about STEM fields

Perceptions of science and technology fields have remained stable in Wave 3 for the most part, however a significant increase has been observed in the proportion of young people who agree that scientists make a positive difference in the world (77% compared to 73% in Wave 2). Yet, despite this acknowledgement of the social worth of scientists in the midst of a global pandemic, there is no corresponding uplift evident (as yet) in the desire to actually 'be' a scientist in future.

Table 10: Proportion who agree with these statements about science and technology (Net: agree/strongly agree), by wave.

Q. Below is a list of statements people have made about science and technology. Please indicate, how much you agree with each of these statements.

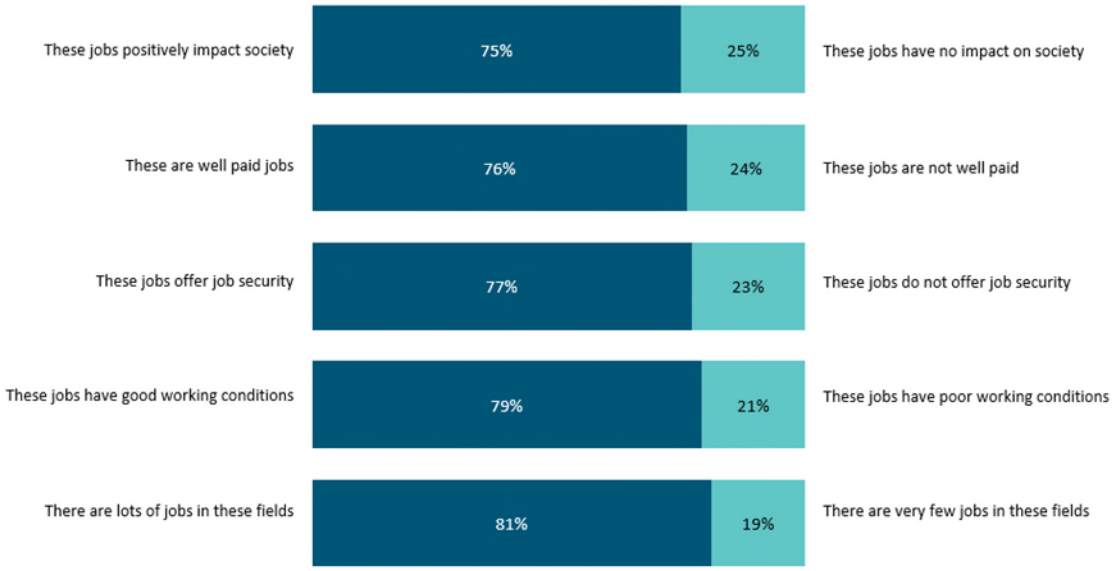
Statements	Net: agree/strongly agree		
	Wave 1	Wave 2	Wave 3
My parents think it's important to learn about science and technology	55%	54%	56%
I talk about science and technology at home with my family	43%	42%	43%
My friends are interested in science and technology	56%	52%	53%
I like to watch shows about science and technology	53%	53%	51%
Scientists make a positive difference in the world	79%	73%	▲77%
I would like to be a scientist one day	26%	30%	30%
Learning about science and technology is exciting	64%	60%	60%
I will need to know about science and technology to get a good job in the future	55%	53%	53%
STEM skills are important when considering employment opportunities	Not asked	Not asked	66%

Base: Total. Wave 1 – 2,092, Wave 2 – 3,021, Wave 3 – 3,154.

As seen consistently throughout this report, parents and guardians play a strong role in positioning STEM study, jobs and careers to young people. The perceptions of STEM fostered by discussions with parents are largely positive.

Figure 7: Perceptions of STEM jobs as a result of conversations with parents/guardians.

Q. Thinking about conversations you have with your parents or guardians, which of the following opinions/views have you heard from them about careers that need science, technology, engineering and maths skills?

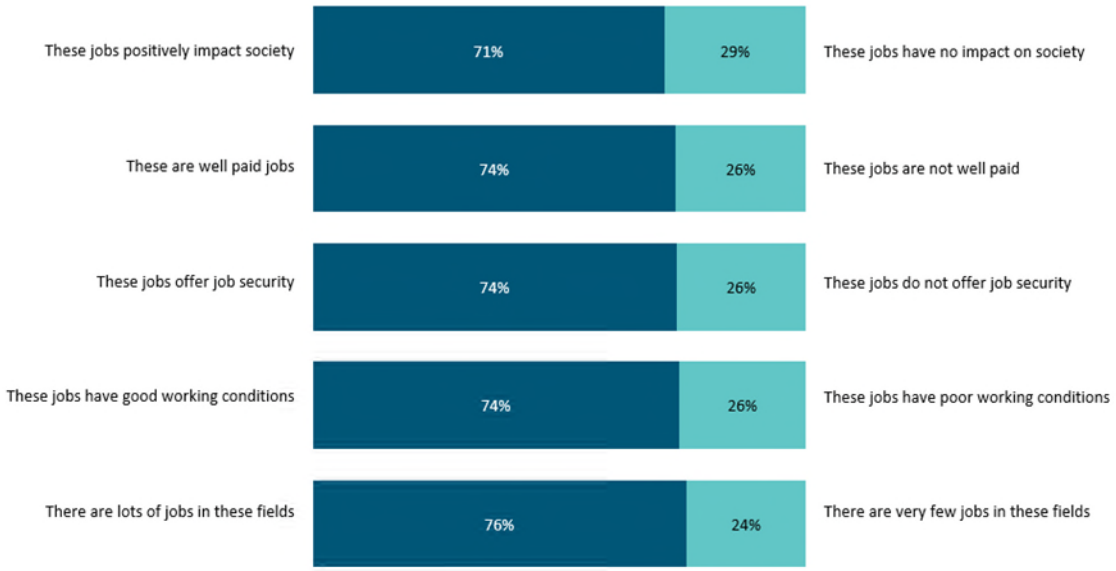


Base: Wave 3 only, those who have talked to their parents / guardians about STEM careers – 1,016. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Similarly, conversations with teachers and career advisors are positive regarding STEM study, jobs and careers.

Figure 8: Perceptions of STEM jobs as a result of conversations with teachers/career advisors.

Q. Thinking about your teachers or career advisors, which of the following opinions/views have you heard about careers that need science, technology, engineering and maths skills?



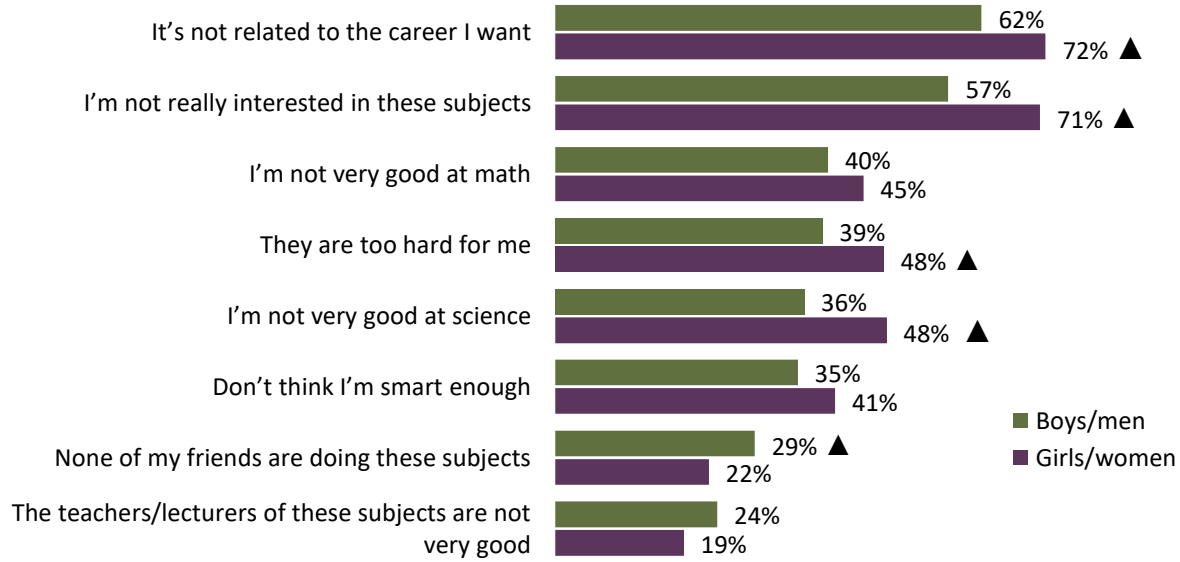
Base: Wave 3 only, those who have talked to their teachers or career advisors about STEM careers – 543. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Boys/men in general demonstrate significantly higher engagement with science and technology, being more likely than girls/women to agree that learning about science and technology is exciting (63% vs 58%), to watch shows about science and technology (56% vs 46%), have friends who are also interested in science and technology (55% vs 49%), or discuss science and technology with their family (46% vs 40%).

While girls/women are significantly more likely to acknowledge the contribution of scientists to the world than boys/men (79% vs 74%), boys/men are significantly more likely to agree that they would like to be a scientist one day in the future (35% vs 25% of girls/women).

Figure 9: Proportion who agree with these statements about science and technology (Net: agree/strongly agree), by gender.

Q. Below is a list of statements people have made about science and technology. Please indicate, how much you agree with each of these statements.



Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

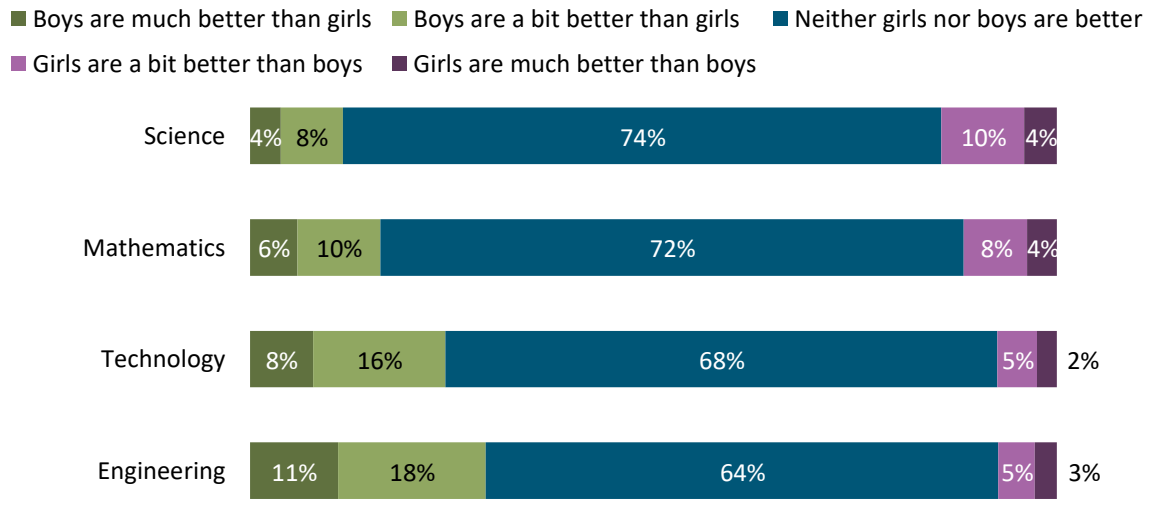
Gender bias in STEM

When asked about which gender is 'better' at STEM subjects, the vast majority of young people do not hold a gender bias. Results per subject are consistent across age groups.

Three quarters (74%) of young people said neither girls nor boys are better at science, and 72% said the same for mathematics. However, the data shows a slightly greater gender bias when it comes to technology, with only 68% saying neither girls nor boys are better at this subject, 24% saying boys are better and only 7% saying girls are better. The same is true for engineering, with 64% saying neither girls nor boys are better, 30% saying boys are better and only 7% saying girls are better at this subject.

Figure 10: Perceptions of gender differences in skills in STEM subjects.

Q. Who is better at the following subjects?



Base: Total. Wave 3 – 3,154. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

However, there is evidence of some progress in addressing bias with a significant increase in Wave 3 in perceptions of girls as being 'better' at all STEM subjects, whilst the perceptions of boys being 'better' has remained stable.

Table 11: Proportion who selected that either girls or boys are better at STEM subjects, by wave.

Q. Who is better at the following subjects?

Statements	% Selected	
	Wave 2	Wave 3
Girls are better at science	12%	▲14%
Girls are better at mathematics	9%	▲12%

Statements	% Selected	
	Wave 2	Wave 3
Girls are better at technology	6%	▲7%
Girls are better at engineering	4%	▲7%
Boys are better at science	13%	12%
Boys are better at mathematics	17%	16%
Boys are better at technology	24%	24%
Boys are better at engineering	30%	29%

Base: Total. Wave 2 – 3,021, Wave 3 – 3,154.

In Wave 3, it was found that boys/men are significantly more likely to regard their own gender as being 'better' at all STEM subjects. Girls/women are more equitable than boys in their perceptions of who is better at STEM but still regard boys as being better at technology and engineering subjects. Girls/women have more positive perceptions of their skills in relation to science and mathematics than do boys.

Table 12: Proportion who selected that either girls or boys are better at STEM subjects, by gender.

Q. Who is better at the following subjects? Gender differences.

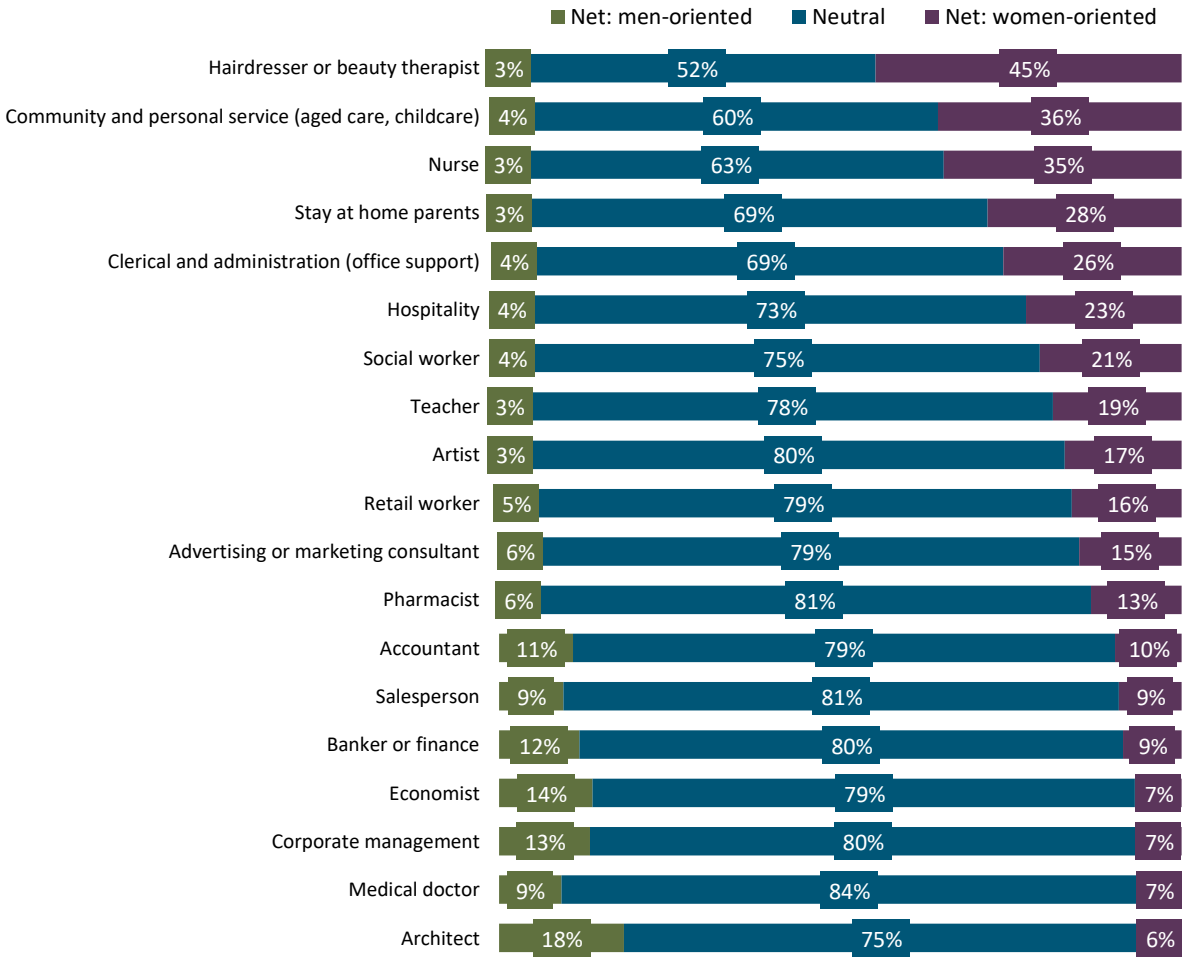
Statements	% Selected	
	Boys/men	Girls/women
Girls are better at science	15%	14%
Girls are better at mathematics	13%	11%
Girls are better at technology	8%	7%
Girls are better at engineering	8%	7%
Boys are better at science	▲16%	7%
Boys are better at mathematics	▲20%	13%
Boys are better at technology	▲30%	20%
Boys are better at engineering	▲35%	25%

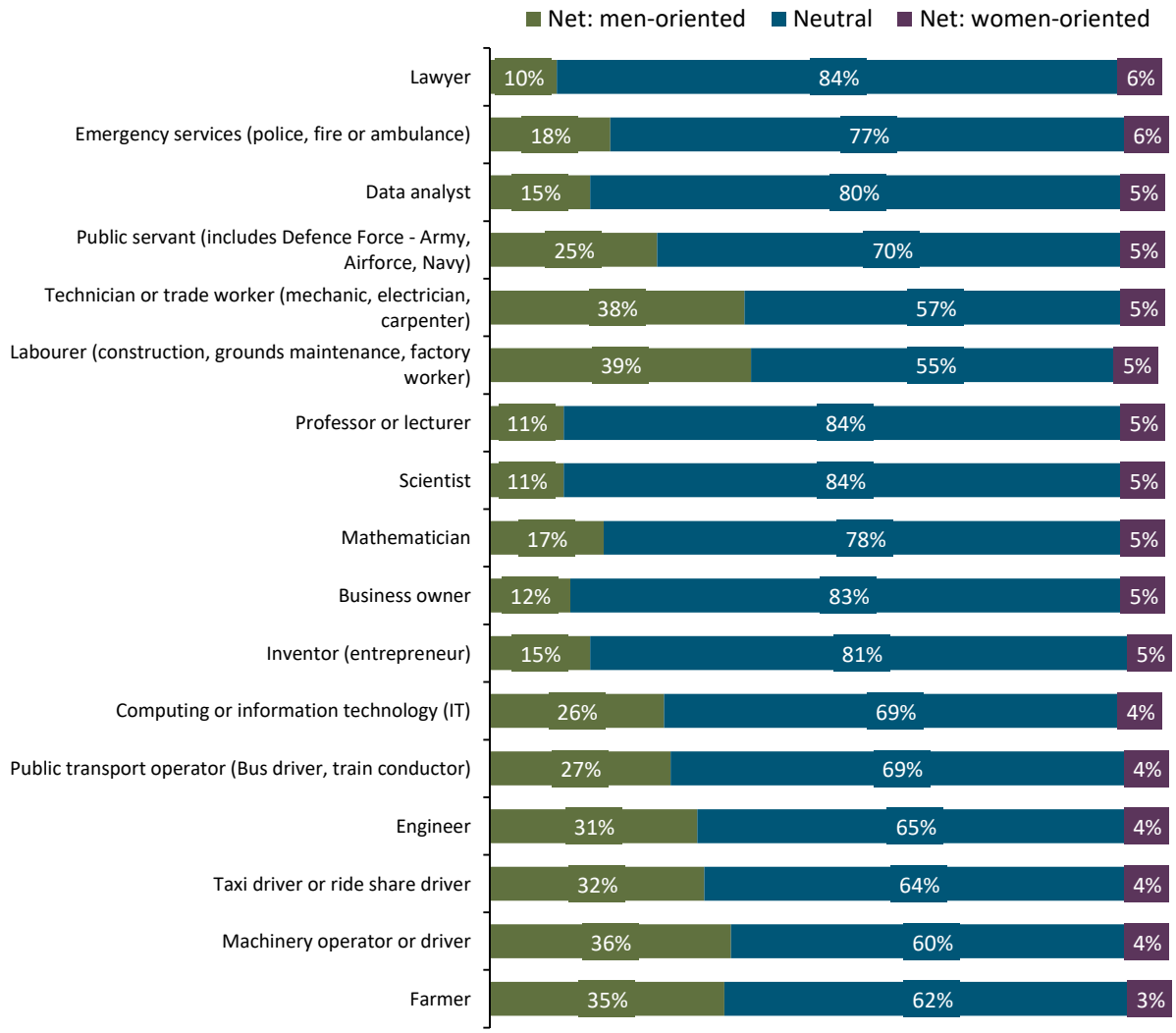
Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

Consistent with this bias, when asked about gender associations with a range of different jobs and careers, STEM jobs and careers including ‘engineer’, ‘computing or information technology’, ‘data analyst’ and ‘scientist’, are significantly more likely to be associated with males rather than females.

Figure 11: Perceptions of gender orientation of certain job roles.

Q. Thinking about what you know do you think these jobs are more for boys, more for girls or for both?





Base: Wave 3 only, total – 3,154. Don't know excluded. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

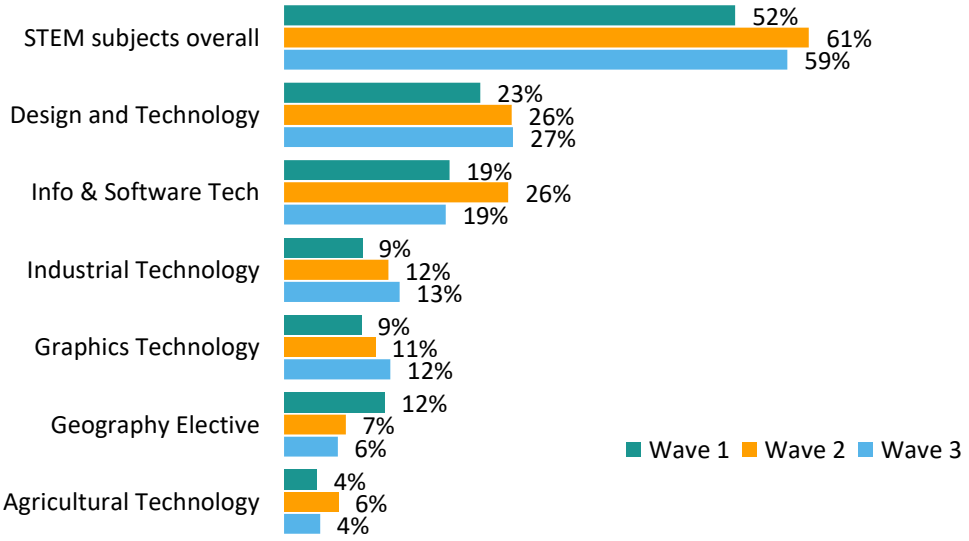
Current participation in STEM subjects

Year 9 and 10

The survey collected data on the proportion of young people currently studying STEM subjects. Participation in STEM elective subjects has remained stable overall for Wave 3 among Year 9 and 10 students (59%, compared to 61% in Wave 2).

Figure 12: Elective subjects undertaken by Year 9 and 10 students. Showing STEM subjects only.

Q. Which of the following elective subjects best describes the subjects you have chosen to do in years 9 and 10?



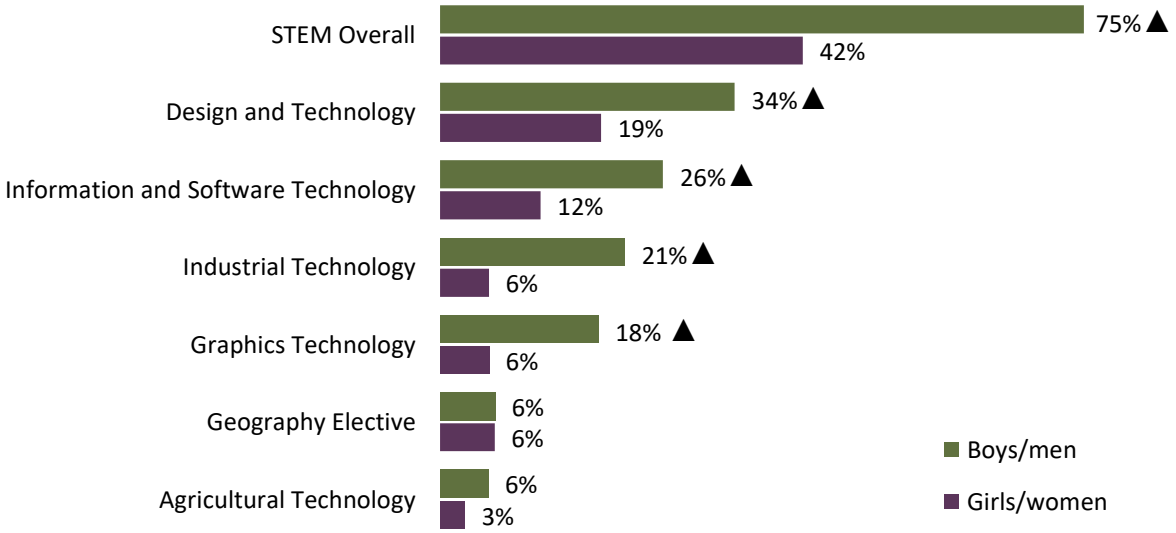
Base: Year 9 and 10s – Wave 1 – 209, Wave 2 – 358, Wave 3 – 320. (MC).

Current participation in STEM elective subjects in Year 9 and 10 overall remains significantly higher among boys/men (75%) compared to girls/women (42%). Among girls/women this overall participation in STEM subjects has decreased over time from 51% to 42% (in current wave). This decrease is not driven by any one subject in particular, rather by small decreases across the subjects. Results among boys/men are consistent over time.

This significant gender divide is evident across several key elective subjects including design and technology (34% vs 19%), information and software technology (26% vs 12%), industrial technology (21% vs 6%), and graphics technology (18% vs 6%).

Figure 13: Elective subjects undertaken by Year 9 and 10 students by gender. Showing STEM subjects only.

Q. Which of the following elective subjects best describes the subjects you have chosen to do in years 9 and 10?



Base: Wave 3 only. Year 9 and 10s, boys/men – 166, girls/women – 148. Non-binary/other not shown due to low base size. (MC).

The only significant differences in relation to participation in overall STEM at the Year 9 and 10 level (excluding differences by gender as noted above) relates to socio-economic status with those in the deciles 6-10 (higher SES) being more likely to study STEM electives overall than their 1-5 decile counterparts (64% vs 52%). The same pattern is seen among those students with a parent employed in a STEM-related field (68%) compared to those with parents who are not employed in STEM (56%).

Further differences are evident at an individual subject level. Information and software technology is significantly more likely to be studied by students in metro areas (23% compared to 9% for regional/remote students), CALD students (26% vs 14% for non-CALD), and students whose parents are employed in a STEM-related area (23% vs 17% for students whose parents are not employed in STEM).

Agricultural Technology is more likely to be studied by students located in regional/remote areas (9% vs 2% for metro students), non-CALD students (6% vs 1% for CALD students) and students that identify as Aboriginal and/or Torres Strait Islander (16% vs 4% for non-Aboriginal students).

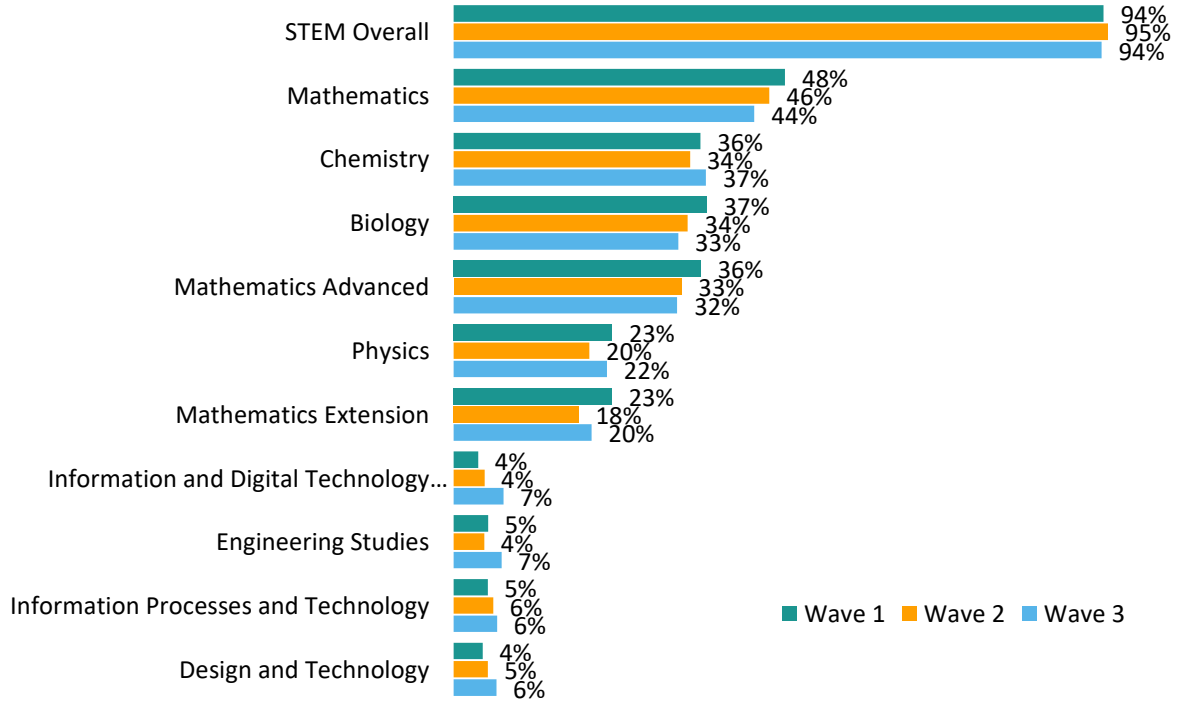
Non-CALD students and students whose parents work in a STEM-related field are also more likely to be studying Graphics Technology (16% non-CALD vs 8% for CALD; and 16% for those with parents in STEM-related work vs 11%).

Year 11 and 12

Consistent with Wave 2, there is strong participation in STEM elective subjects overall among Year 11 and 12 students, led by participation in mathematics (44%), chemistry (37%) and biology (33%). Participation among Year 11 and 12 students has not changed since last wave.

Figure 14: Elective subjects undertaken by Year 11 and 12 students. Showing top 10 STEM subjects only.

Q. Which of the following elective subjects best describes the subjects you have chosen to do in years 11 and 12?



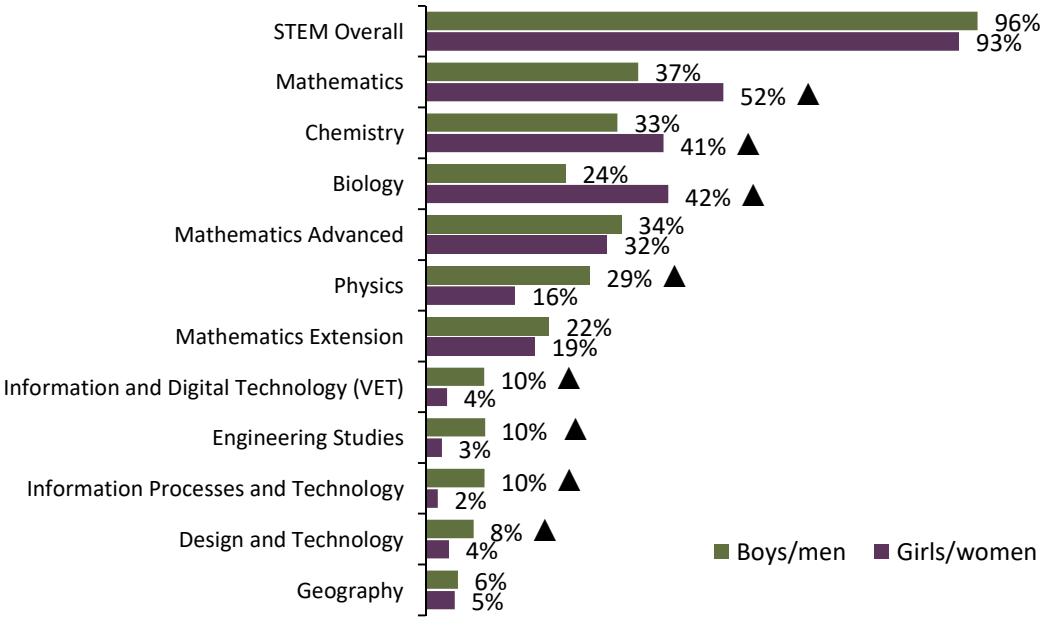
Base: Year 11 and 12s – Wave 1 – 380, Wave 2 – 653, Wave 3 – 680. (MC).

While participation is consistent at an overall STEM level across gender, significant skews are evident by individual subjects. Girls/women are significantly more likely than boys/men to be currently studying mathematics (52% vs 37%), biology (42% vs 24%) or chemistry (41% vs 33%).

In comparison, it was found that boys/men in Year 11 and 12 are significantly more likely to be studying physics (29% vs 16%), information and digital technology (VET) (10% vs 4%), engineering studies (10% vs 3%), information processes and technology (10% vs 2%) and design and technology (8% vs 4%).

Figure 15: Elective subjects undertaken by Year 11 and 12 students, by gender. Showing top 10 STEM subjects only.

Q. Which of the following elective subjects best describes the subjects you have chosen to do in years 11 and 12?



Base: Wave 3 only. Year 11 and 12s, boys/men – 374, girls/women - 297. Non-binary/other not shown due to low base size. (MC).

While no significant demographic differences beyond gender are noted in STEM electives currently being undertaken by Year 11 and 12 students at the overall STEM level, some key differences are evident for individual subjects.

Students born overseas are more likely to be studying chemistry than those born in Australia (51% vs 33%), as are CALD students (49% vs 27% for non-CALD) and those living in metro areas (40% vs 27% for regional/remote areas). CALD students are also more likely to be studying mathematics advanced (43% vs 24%), biology (37% vs 29%), physics (30% vs 16%), and mathematics extension (27% vs 14%).

Once again, the influence of parents' education in STEM is evident. Students *without* a parent who has studied STEM are more likely to be studying mathematics (general) (52% vs 37%) and design and technology (10% vs 3%), while those *with* parents who have studied STEM are more likely to be studying chemistry (41% vs 31%) and mathematics advanced (37% vs 26%). Those with parents employed in a STEM-related field are more likely to be studying physics (28% vs 21%) and mathematics extension (29% vs 19%).

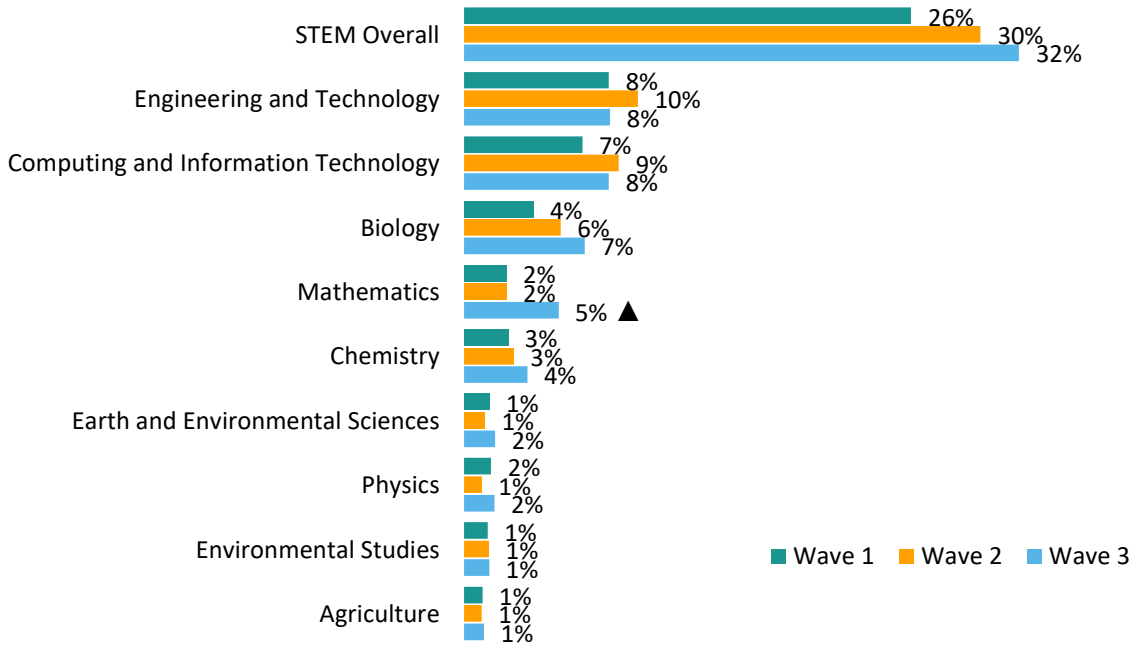
Higher education

Overall, the proportion of young people studying STEM-related courses at a tertiary level has remained stable for Wave 3, at 32% compared to 30% in Wave 2. Tertiary courses in engineering and technology, computing and information technology, and biology remain the most popular STEM areas of study at a tertiary level overall.

This wave we have seen a significant increase in the proportion of higher education students studying mathematics (5% vs 2% in Wave 2). This is driven by a greater proportion of boys/men studying mathematics in Wave 3 than Wave 2 (8% vs 3%).

Figure 16: Subject(s) studying at higher education. Showing STEM subjects only.

Q. Which of the below courses best describes the course you are currently studying in your higher education course?



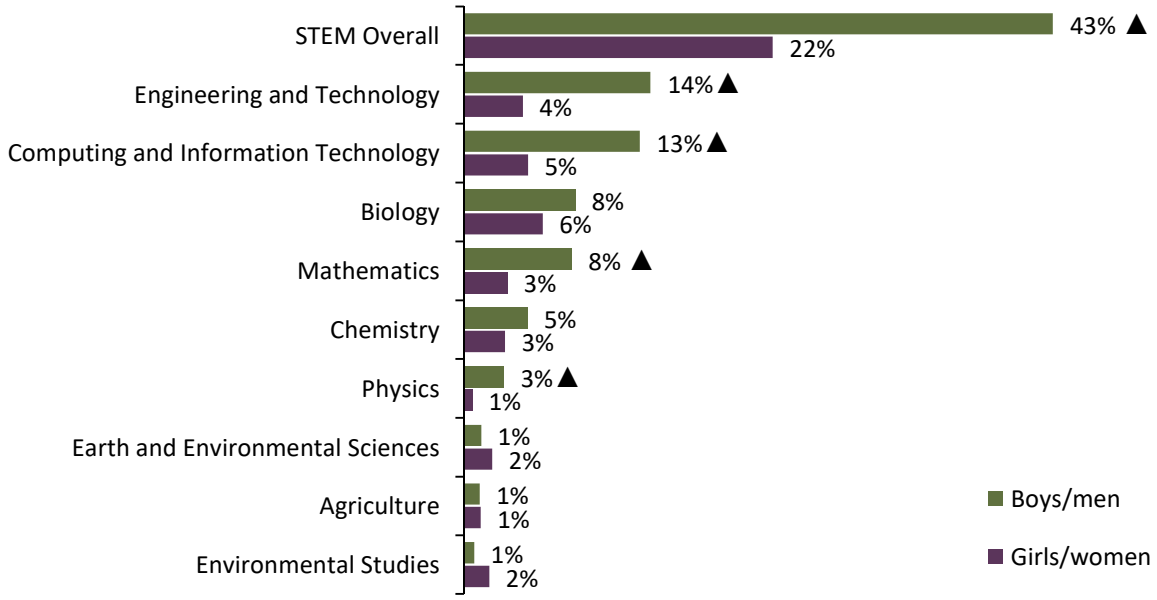
Base: Those in higher education – Wave 1 – 933, Wave 2 – 1,140, Wave 3 – 1,260. (MC).

Consistent with the previous wave, significantly more boys/men are studying STEM at a tertiary level compared to girls/women (43% vs 22% overall).

It was found that at an individual subject level, boys/men are significantly more likely than girls/women to be studying engineering and technology (14% vs 4%), computing and information technology (13% vs 5%), mathematics (8% vs 3%) and physics (3% vs 1%) at a tertiary level.

Figure 17: Subject(s) studying at higher education, by gender. Showing STEM subjects only.

Q. Which of the below courses best describes the course you are currently studying in your higher education course?



Base: Wave 3 only, those in higher education, boys/men – 570, girls/women - 672. Non-binary/other not shown due to low base size. (MC).

Aside from gender, a key factor in determining study of STEM at a tertiary level is parental engagement in STEM. Tertiary students with parents who are educated in STEM are significantly more likely to be studying STEM overall (36% vs 27%), as are tertiary students with parents who are employed in a STEM-related field (46% vs 30%).

Below are other significant differences among key demographic groups.

Table 13: Significant differences between subgroups in studying STEM overall at a tertiary level.

Audience	WEIGHTED %
Location	
Metropolitan	34%
Regional / remote	23%
CALD	
Non-CALD	30%
CALD	35%
Country of birth	
Born in Australia	30%
Born overseas	38%

Some key differences are also evident for individual subjects. Students living in metro areas are more likely than those in regional/remote areas to be studying engineering and technology (9% vs 5%) and computing and information technology (9% vs 4%).

Students born overseas are more likely to be studying computing and information technology than those born in Australia (13% vs 7%), as are CALD students (10% vs 7% for non-CALD), those with parents educated in STEM (11% vs 5% with parents not educated in STEM) and those with parents employed in a STEM-related field (19% vs 7% for those with parents who do not work in a STEM field).

Influences in relation to STEM study

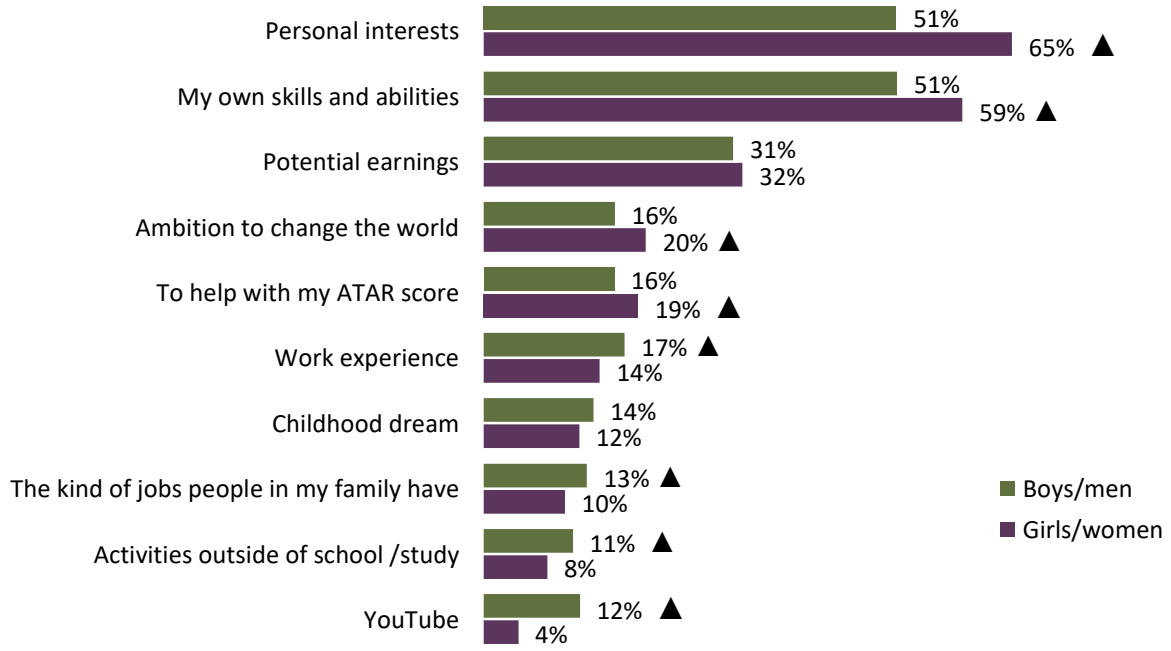
Key factors influencing the consideration of STEM study continue to be led by personal interest (58%), young people's perceptions of their own skills and abilities (55%) and earning potential (31%).

Of interest, the role of personal interest and perceptions of own skills and abilities is of significantly greater influence among girls/women than it is for boys/men (65% vs 51% and 59% vs 51% respectively). This is of key importance in the context of women's/girls' relatively weaker perceptions of their own skills in engineering and technology subjects discussed above. Girls/women are also significantly more likely to be influenced by an ambition to change the world (20% vs 16% of boys/men) and the drive to improve their ATAR score (19% vs 16%).

Conversely, boys/men are more likely than girls/women to be influenced by work experience (17% vs 14%), the chosen careers of family members (13% vs 10%), activities outside school/study (11% vs 8%) and YouTube (12% vs 4%).

Figure 18: Top ten factors most influencing decision of which subject to study, by gender.

Q. Which factors most influence your decision of the subjects you choose to study? (MC).

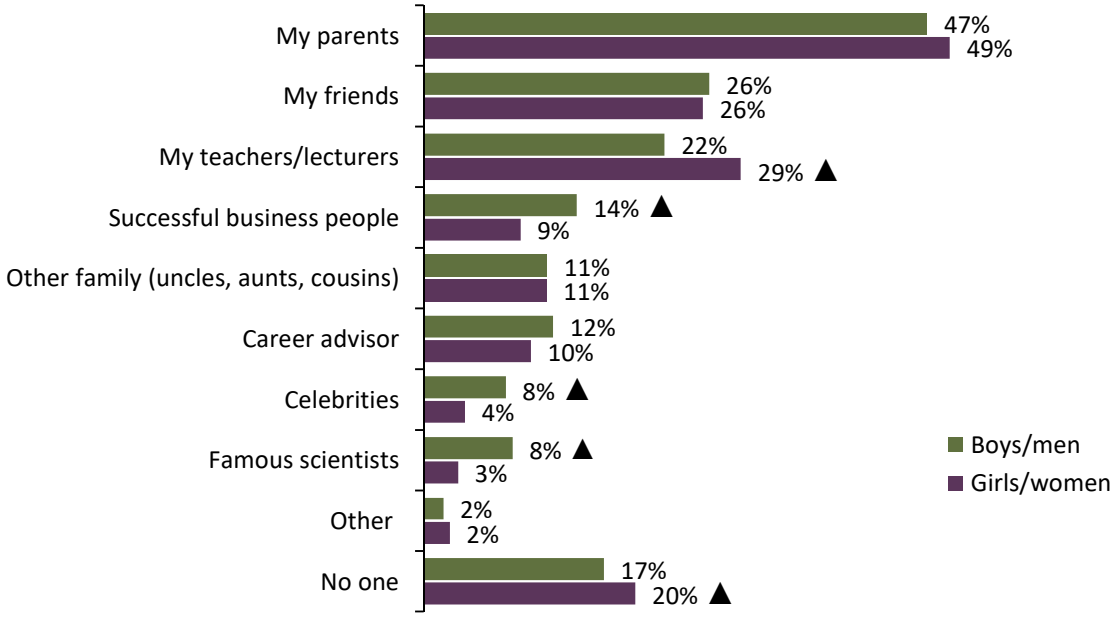


Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

Overall, parents remain a key 'person' of influence with regards to study choices (47%) along with friends (26%) and teachers/lecturers (25%). It was found that girls/women are more likely than boys/men to be influenced by teachers/lecturers (29% vs 22%). Girls/women are also significantly more likely to say that no one influences their decision of which subjects to study than boys/men (20% vs 17%). On the other hand, boys/men are more likely than girls/women to be influenced by successful business people (14% vs 9%), celebrities (8% vs 4%) and famous scientists (8% vs 3%).

Figure 19: People most influencing the decision of which subject to study, by gender.

Q. And which of the below people most influence your decision of the subjects you choose to study? (MC).



Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

Television programs as a source of influence include programs such as sitcoms and drama programs including The Big Bang Theory, House M.D., The Good Doctor, Grey's Anatomy, Suits and Bones. Programs for younger students include The Dengineers and Operation Ouch as well as scientifically based programs such as documentaries by Sir David Attenborough, MythBusters and Bill Nye The Science Guy which appeal to a broad audience. These programs introduce STEM topics and concepts (usually science or medicine based) and *"make it appear cool to work in a science-related field".*

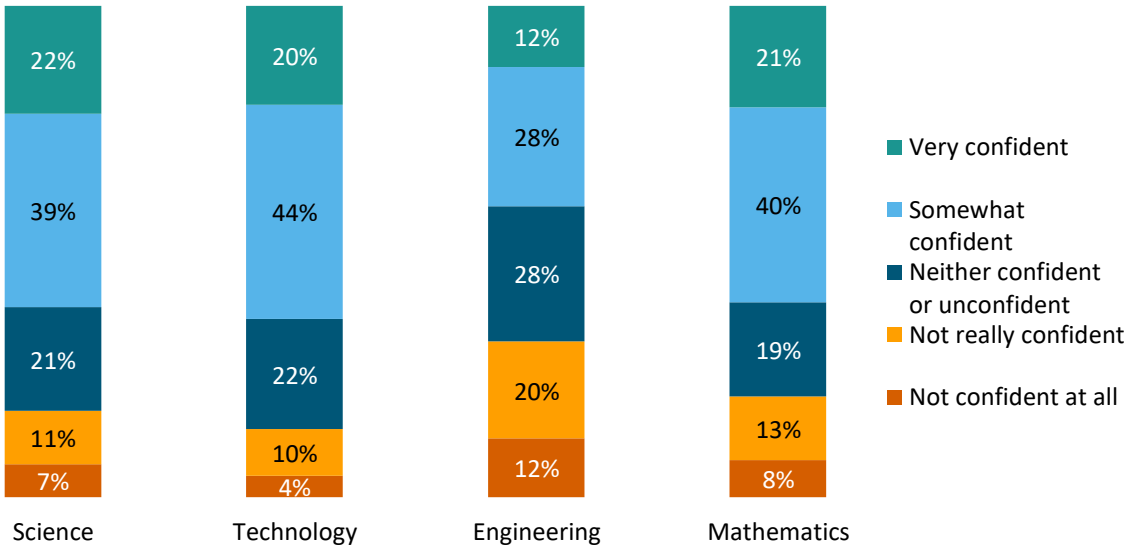
Key figures inspiring subject choice include famous historical scientists (e.g. Marie Curie, Albert Einstein, Thomas Edison, Charles Darwin, Stephen Hawking), modern day tech entrepreneurs (e.g. Jeff Bezos, Steve Jobs, Elon Musk, Bill Gates), celebrity scientists/environmentalists (e.g. David Attenborough, Jane Goodall), social celebrities (e.g. YouTubers and TikTok influencers), and personal contacts (e.g. known professionals including doctors, business owners, lawyers etc.). These people demonstrate through action what is possible with STEM: *"Seeing what these people have done to the world and how they have influenced so many people makes me want to do the same."*

Confidence in studying STEM

Young people were asked about their level of confidence in studying a range of STEM subjects. Overall, confidence in studying STEM is high (85%), driven by increases compared to Wave 2 in confidence in studying science (61% compared to 58%) and mathematics (60% compared to 57%).

Figure 20: Confidence levels in studying STEM, by STEM subject.

Q. How confident do you feel about studying each of the subjects that make up STEM?



Base: Wave 3 only, total – 3,154. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Table 14: Confidence in studying STEM (Net: somewhat/very confident) by wave.

Q. How confident do you feel about studying each of the subjects that make up STEM?

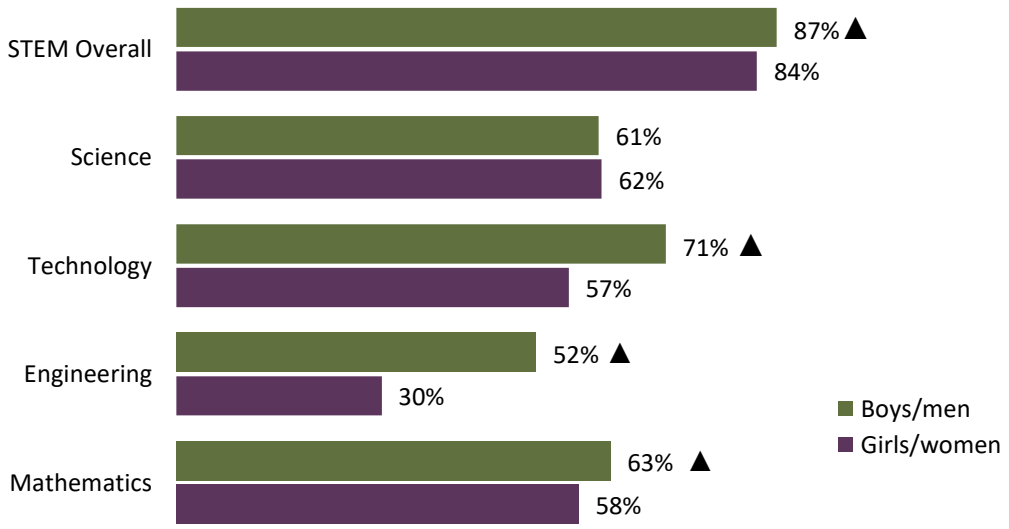
Subject	Net: somewhat/very confident		
	Wave 1	Wave 2	Wave 3
STEM Overall	85%	80%	▲85%
Science	62%	58%	▲61%
Technology	64%	61%	64%
Engineering	37%	38%	41%
Mathematics	63%	57%	▲60%

Base: Total, Wave 1 – 2,092, Wave 2 – 3,021, Wave 3 – 3,154.

The data shows that boys/men are significantly more confident than girls/women in all STEM subjects, excluding science, where confidence among boys/men is on par with that of girls/women (61% and 62% respectively). Girls/women are *least* confident when it comes to studying engineering (30%), followed by technology (57%) and mathematics (58%).

Figure 21: Net confidence in studying STEM (net: somewhat/very confident), by STEM subject, by gender

Q. How confident do you feel about studying each of the subjects that make up STEM?



Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

Below are other significant differences among key demographic groups.

Table 15: Significant differences between subgroups in confidence in studying subjects that make up STEM (net: somewhat/very confident).

Audience	WEIGHTED %
Location	
Metropolitan	87%
Regional / remote	82%
CALD	
Non-CALD	87%
CALD	84%
Country of birth	
Born in Australia	89%
Born overseas	85%

Several key differences are evident in the degree of confidence felt by students in studying the individual subjects that comprise STEM. Students from metro areas are more likely than their regional/remote counterparts to feel confident studying science (63% vs 56%), engineering (42% vs 37%) and mathematics (63% vs 54%). Students born overseas feel more confident studying science than do those born in Australia (69% vs 59%) as do CALD students (66% vs 58% for non-CALD students). CALD students are also likely to feel more confident studying maths than non-CALD students (66% vs 58%).

Consistent with other measures, a student's confidence in studying STEM is likely to be significantly higher (across all STEM subjects) when a parent has previously studied STEM themselves. Details of these differences are noted below:

Table 16: Confidence in studying STEM (net: somewhat/very confident) subjects by parent background.

Q. How confident do you feel that you can study and get good results in each of the following subjects?

Subject	Confidence in studying STEM (net: somewhat/very confident)			
	Parent study in STEM		Parent employment in STEM	
	Yes	No	Yes	No
STEM overall	▲89%	82%	91%	85%
Science	▲68%	54%	▲72%	61%
Technology	▲66%	62%	▲71%	63%
Engineering	▲46%	35%	▲56%	39%
Mathematics	▲65%	55%	69%	60%

Base: Wave 3 only. Parents who studied STEM – 1,621, parents who did not study STEM – 1,533, parents who work in STEM – 522, parents who do not work in STEM – 2,948.

Drivers of gender differences in confidence in STEM

It was found that the reasons girls/women lack confidence in engineering are primarily related to a lack of familiarity, having not studied the subject before (54%) and reportedly having 'no interest' in the subject (46%).

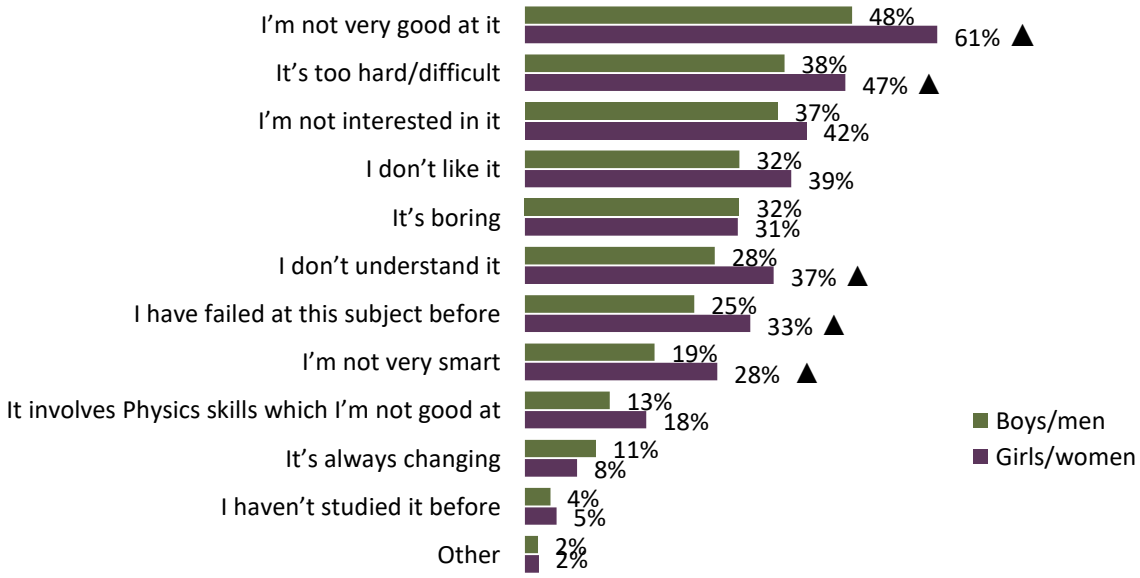
Considering technology, reasons for low confidence among girls/women are mostly related to not having studied the subject before (40%) and not having an interest in the subject (39%).

Drivers of low confidence in studying science among girls/women include a belief that they are simply 'not good at it' (47%), reportedly having 'no interest' in the subject (45%), and feeling like they 'don't understand it' (40%).

Similarly, data suggests that the reasons driving low confidence in mathematics are also more internalised and reflect the perceptions of girls/women regarding their own ability. Girls/women are significantly more likely than boys/men to attribute their low confidence in mathematics to 'not being very good at it' (61% vs 48%); finding it 'too hard/difficult' (47% vs 38%), 'not understanding it' (37% vs 28%), previous experience of 'failure' (33% vs 25%), and simply a feeling that they are 'not very smart' (28% vs 19%).

Figure 22: Reasons for not feeling confident in getting good results in mathematics, by gender.

Q. Why do you not feel confident about getting good results in mathematics?



Base: Wave 3 only, those who do not feel confident about getting good results in mathematics, boys/men – 273, girls/women – 352. Non-binary/other not shown due to low base size.

Confidence in participating in conversations regarding STEM topics outside of school/study has remained stable since Wave 2 (58% vs 59%).

Table 17: Confidence levels in understanding of science and technology outside of school/study.

Q. And what about outside of school/study, how confident is your understanding of science and technology when people are talking about it or when you watch or read about it on TV or online?

Confidence	Wave 1	Wave 2	Wave 3
Net: Confident	66%	58%	59%
Net: Not confident	9%	13%	13%

Base: Total. Wave 1 – 2,092, Wave 2 – 3,021, Wave 3 – 3,154.

Boys/men remain more confident than girls/women in discussing STEM topics outside of school/study (64% vs 55% in Wave 3), a finding that has been consistent across waves.

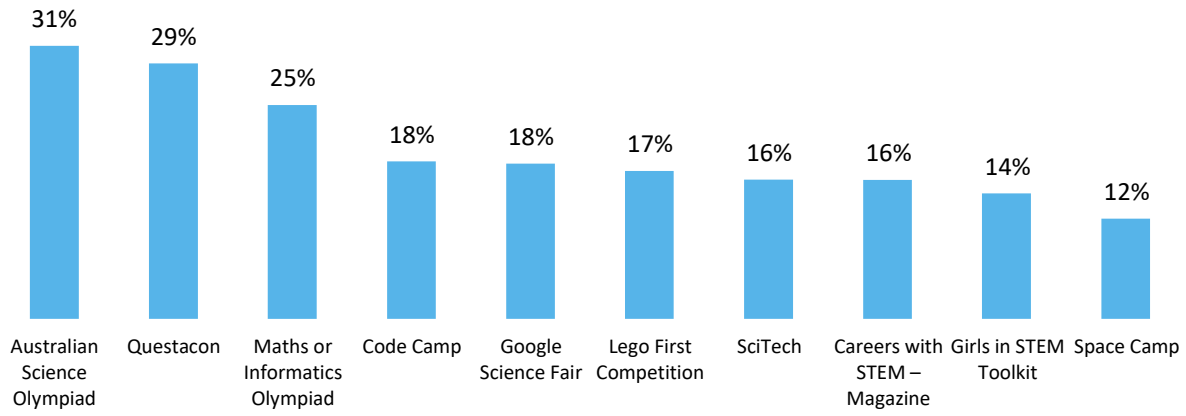
Those students in metro areas also feel more confident in discussing STEM topics outside of school/study than do students from regional/remote areas (61% vs 54%), as do students whose parents have studied STEM (64% vs 55% for those whose parents have not studied STEM) and students whose parents work in a STEM-related field (69% vs 59% for those whose parents do not work in a STEM-related field).

Participation in STEM activities and events

The research sought to understand students' awareness of and participation in STEM activities and events over the last 12 months. Awareness of activities and events related to STEM increased in the last 12 months from 85% in Wave 2 to 88% in Wave 3. The top 10 events that students are aware of are noted below.

Figure 23: Awareness of STEM events, activities and resources among those who had participated in a STEM activity or event. Showing top 10 events aware of only.

Q. And which of the below events, activities or resources have you heard of?



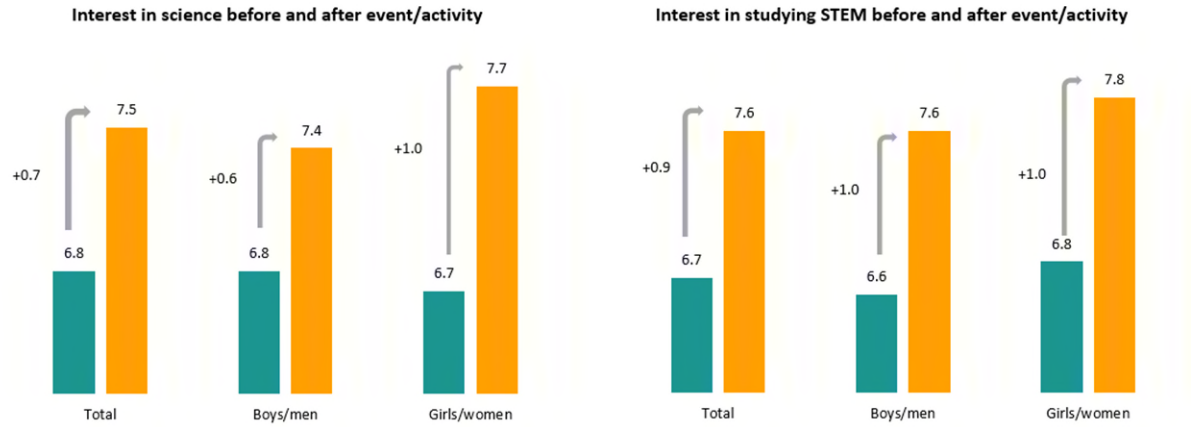
Base: Those who had participated in a STEM activity/event – Wave 3 – 1,250.

Participation in science-related activities outside of school/study has remained stable between Wave 2 and Wave 3 at 41%. This wave it was also found that 43% of students have participated in broader STEM-related activities outside of school/study.

Consistent with previous waves, the data suggests that participation in STEM activities and events does drive increases in interest in science as a whole and specifically in studying STEM. These activities and events are observed to have an incrementally greater impact on girls/women compared to boys/men.

Figure 24: Change in interest in science and studying STEM before and after participating in an event or activity (score out of 10).

Q. Please rate your interest in science before/after attending/participating/engaging with any of the earlier mentioned activities/events/resources. / Q. Please rate your interest in studying STEM before/after attending/participating/engaging with any of the earlier mentioned activities/events/resources.



Base: Those who had attended at least one event – Wave 3 – 497, boys/men – 299, girls/women - 186.

Future intentions for STEM

Impact of Covid-19 on study and career intentions

Given the ongoing global Covid-19 pandemic, students in the current wave of research were asked about any impact of the pandemic on their future study and career intentions. Research found that 38% of young people have experienced some change in their study and career intentions as a result of Covid-19. Of those that experienced some change, this was most likely to involve a change in general interests (17%) or a reconsideration of career options (14%). Boys/men are most likely to have been influenced by Covid-19 compared to girls/women (40% vs 35%), as are Aboriginal and/or Torres Strait Islander students compared to other students (53% vs 37%).

As a result of Covid-19, students also report being slightly or much more likely to consider study or work in STEM in the future, particularly boys/men.

Table 18: Impact of Covid-19 on likelihood to consider study or work in STEM in the future.

Q. How has COVID-19 influenced your decision to study or work in the following STEM areas in the future?

Subject	Net: slightly/much more likely to consider		
	Wave 3 Total	Girls/women	Boys/men
Science	25%	26%	25%
Technology	29%	26%	▲32%
Engineering	20%	15%	▲25%
Mathematics	20%	17%	▲23%

Base: Total, Wave 3 – 3,154, girls/women - 1,538, boys/men - 1,559

It was found that students born overseas are more likely than students born in Australia to report an increased consideration of study and jobs in science (31% vs 24%); and technology (35% vs 28%).

CALD students are more likely than students non-CALD students to report an increased in consideration of study and jobs in science (28% vs 24%); and technology (32% vs 28%).

Once again, students are more likely to report an increase in consideration of STEM study and jobs as a result of Covid-19 when a parent has previously studied STEM themselves or are employed in a STEM-related field. Details of these differences are noted below:

Table 19: Increase in consideration STEM study or job (net: slightly/much more likely) as a result of Covid-19 by parent background.

Q. How has COVID-19 influenced your decision to study or work in the following STEM areas in the future?

Subject	Net: slightly/much more likely to consider			
	Parent study in STEM		Parent employment in STEM	
	Yes	No	Yes	No
Science	▲30%	20%	▲32%	25%
Technology	▲34%	24%	▲41%	28%
Engineering	▲24%	16%	▲28%	19%
Mathematics	▲24%	16%	▲28%	19%

Base: Wave 3 only. Parents who studied STEM – 1,621, parents who did not study STEM – 1,533, parents who work in STEM – 522, parents who do not work in STEM – 2,948.

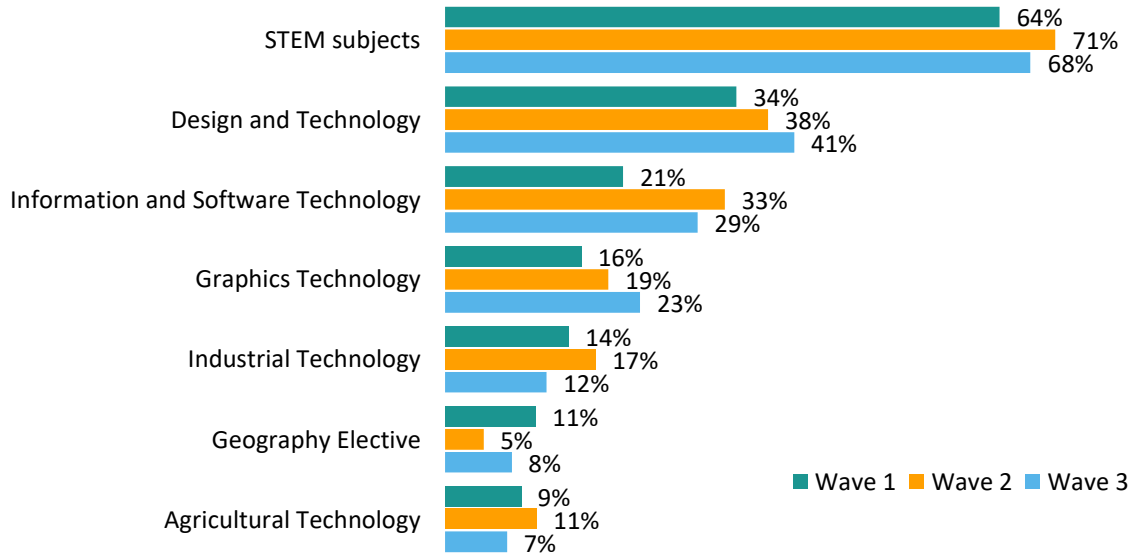
Intention to study STEM subjects in the future

Intentions for STEM electives at Year 9 and 10

When asked about studying STEM subjects in the future, the intentions of Years 6 to 8 students have remained stable (68% in Wave 3 compared to 71% in Wave 2). Although not significant, there has been a slight uplift in intention to study design and technology, and graphics technology.

Figure 25: Future STEM elective study intentions among students in Years 6 to 8, by wave.

Q. Which of the following subjects would you be interested in studying once you get the choice to select your subjects?

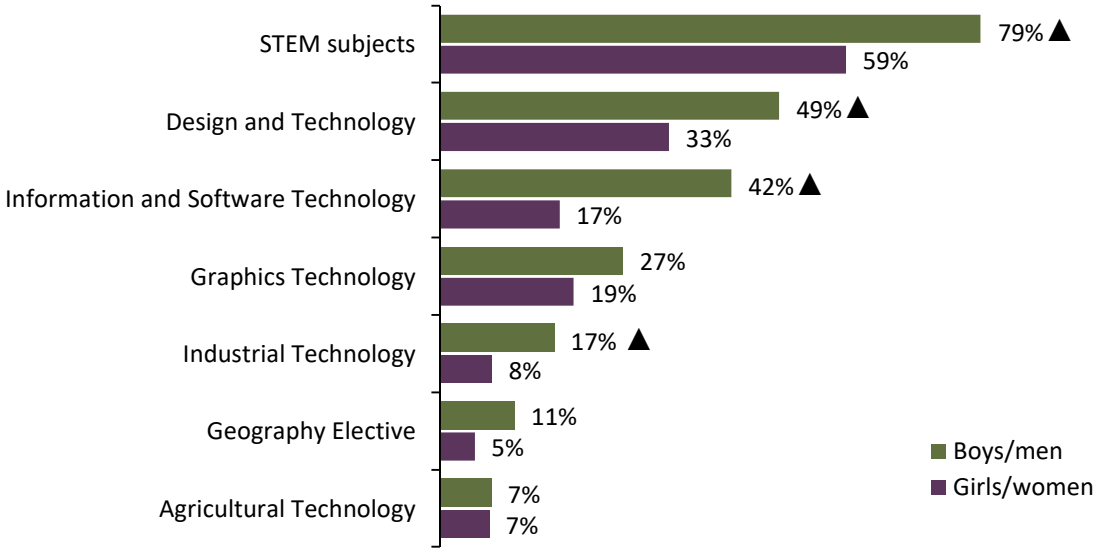


Base: Year 6-8s – Wave 1 – 67, Wave 2 – 289, Wave 3 – 221. (MC).

Consistent with the previous wave, boys/men in Years 6 to 8 remain significantly more likely to intend to study STEM subjects in future than do girls/women (79% compared to 59%). The data also shows that boys/men are significantly more likely than girls/women to express an intention to study design and technology (49% vs 33%), information and software technology (42% vs 17%) and industrial technology (17% vs 8%).

Figure 26: Future STEM elective study intentions among students in Years 6 to 8, by gender.

Q. Which of the following subjects would you be interested in studying once you get the choice to select your subjects?



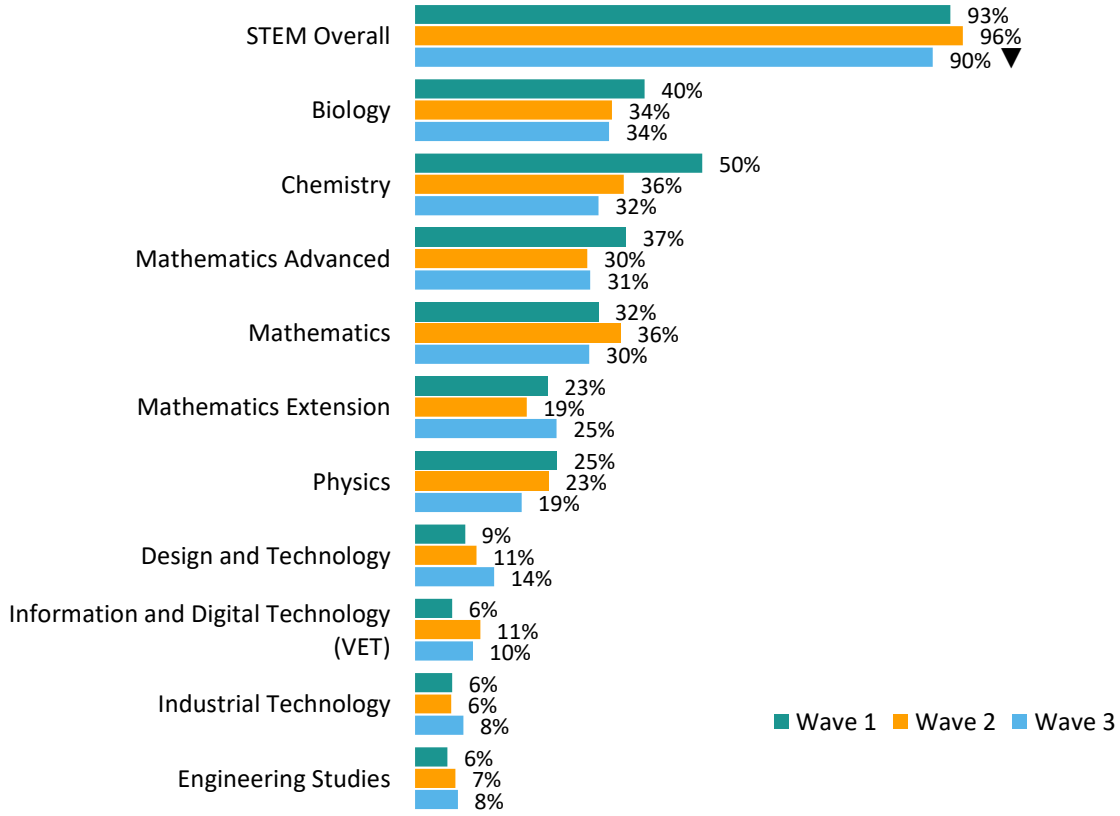
Base: Wave 3 only. Students in Years 6 to 8, boys/men – 102, girls/women - 116. Non-binary/other not shown due to low base size. (MC).

Intentions for STEM electives at Year 11 and 12

Among those in Year 9 and 10 there has been a significant decline in the proportion of young people intending to enrol in STEM subjects for Years 11 and 12 (from 96% in Wave 2, to 90% in Wave 3). This shift is not driven by any one subject in particular; rather a generalised small decline is evident across many individual STEM subjects, such as chemistry, mathematics, mathematics extension and physics.

Figure 27: Future STEM elective study intentions for Years 11 and 12 (among Year 9 and 10s). Showing top 10 only, by wave.

Q. Please select from the below list which elective subjects you are considering choosing for years 11 and 12.

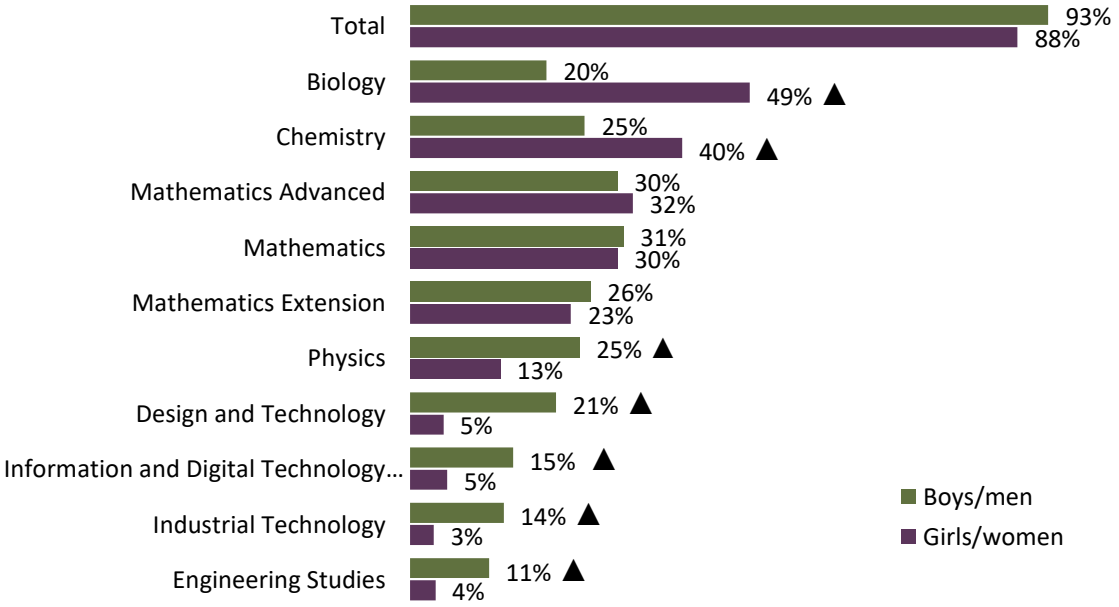


Base: Students in Years 9 and 10 – Wave 1 – 209, Wave 2 – 358, Wave 3 – 320. (MC).

Skews in STEM study intentions among Year 9 and 10 students are also evident in relation to gender. Girls/women in Years 9 and 10 were found to be significantly more likely than boys to express an intention to study biology (49% vs 20%); and chemistry (40% vs 25%). In comparison, it was found that Year 9 and 10 boys are more likely than girls to express intention to study physics (25% vs 13%), design and technology (21 vs 5%), information and digital technology (15% vs 5%), industrial technology (14% vs 3%) and engineering studies (11% vs 4%). These gender skews have remained consistent over time.

Figure 28: Future STEM elective study intentions for Years 11 and 12, among Year 9 and 10s, by gender.

Q. Please select from the below list which elective subjects you are considering choosing for years 11 and 12.



Base: Wave 3 only. Year 9 and 10s, boys/men – 166, girls/women - 148. Non-binary/other not shown due to low base size. (MC).

There is only one significant difference noted in the intention to study STEM overall in Year 11 and 12 among key demographic subgroups:

Table 20: Significant differences between subgroups in intention to study STEM subjects overall in years 11 and 12.

Audience	WEIGHTED %
Location	
Metropolitan	95%
Regional / remote	79%

However, several differences are evident at an individual subject level. Students in metro areas are more likely to intend to study biology than students in regional/remote areas (38% vs 23%), as are students born overseas (49% vs 30% for students born in Australia).

Students born overseas are more likely to intend to study chemistry in Year 11 and 12 compared to students born in Australia (61% vs 24%), as are CALD students (45%) compared to non-CALD students (23%).

Similarly, students born overseas are more likely to intend to study mathematics advanced (52% vs 25%), as are CALD students (45%) compared to non-CALD students (20%). Mathematics extension is also more likely to be an intended subject choice by students born overseas (35% vs 22%) and CALD students (34%) compared to non-CALD students (18%). Mathematics (general) is more likely to be an intended choice for non-CALD students (37%) compared to 22% of CALD students.

Intention to study physics also skews significantly to students born overseas (31% vs 15%) and those with a CALD background (29% vs 11% for non-CALD students).

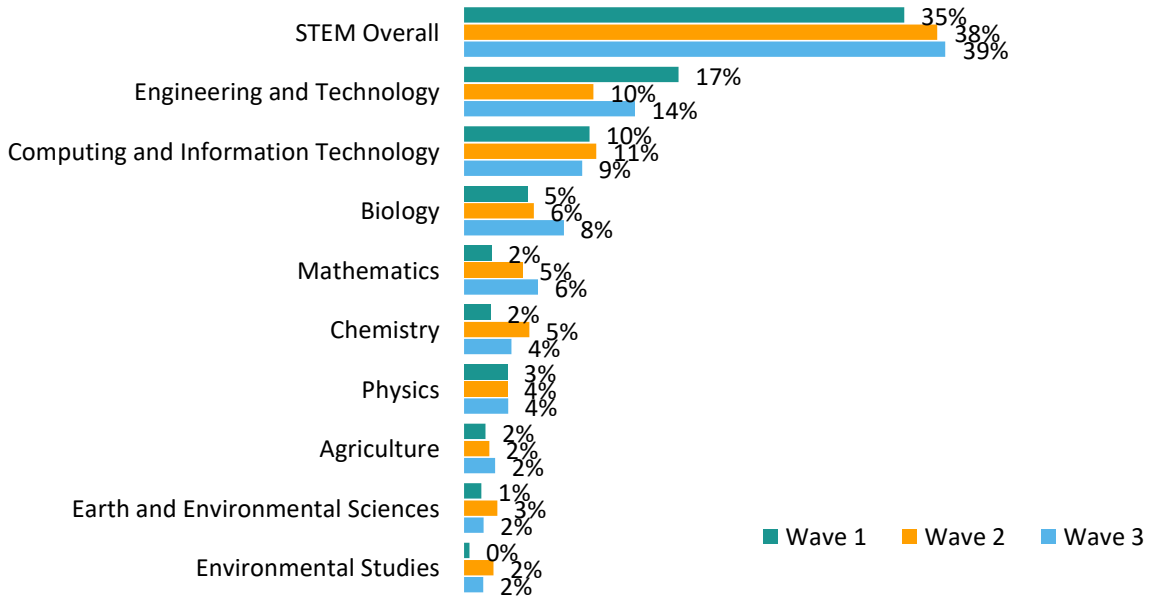
Consistent with earlier findings, significant differences are evident in intention to study STEM overall between those students with parents who have a STEM education compared to those students whose parents do not have a STEM education (95% vs 85%). Students whose parents have studied STEM are also significantly more likely to study Chemistry (38% vs 25%), Mathematics advanced (37% vs 22%), mathematics extension (34% vs 13%), and physics (26% vs 9%) when compared with students whose parents have not previously studied STEM.

Intentions for STEM at higher education

The intention of Year 11 and 12 students to study STEM at the tertiary level has remained stable overall for Wave 3, at 39%, compared to 38% in Wave 2. While not significant, the data shows a slight uplift in intention to study engineering and technology, and biology.

Figure 29: Future study intentions for STEM at higher education, among those in Year 11 and 12, by wave.

Q. Please select from the below list which course(s) you are considering after high school.

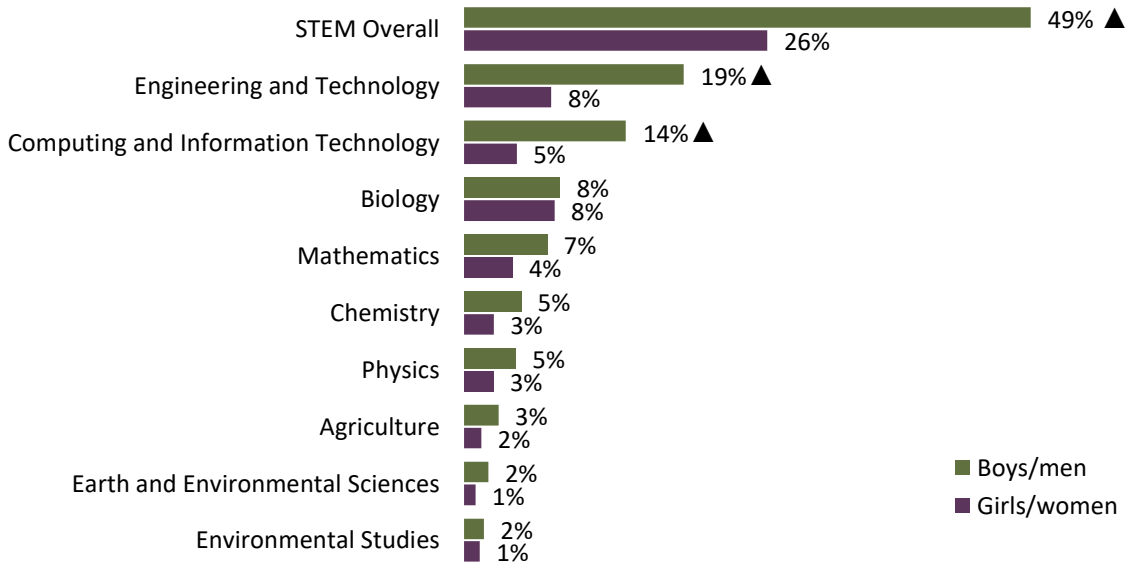


Base: Those in Years 11 and 12 – Wave 1 – 380, Wave 2 – 653, Wave 3 – 680. (MC).

Clear gender skews are evident in intention to study STEM at a tertiary level among Year 11 and 12 students. Intention to study STEM at a tertiary level overall is driven by boys/men rather than girls/women (49% compared to 26%). This pattern is driven by strong skews towards boys/men for engineering and technology (19% compared to 8% for girls/women), and computing and information technology (14% compared to 5%).

Figure 30: Future study intentions for STEM at higher education, among those in Year 11 and 12, by gender.

Q. Please select from the below list which course(s) you are considering after high school.



Base: Wave 3 only, those in Years 11 and 12, boys/men – 374, girls/women - 297. Non-binary/other not shown due to low base size. (MC).

There is only one significant difference noted in the intention to study STEM overall at a tertiary level among key demographic subgroups.

Table 21: Significant difference between subgroups in intention to study STEM subjects overall in years 11 and 12.

Audience	WEIGHTED %
Location	
Metropolitan	95%
Regional / remote	79%

At an individual subject level, engineering and technology is more likely to be an intended study choice for students from a lower socioeconomic status than a higher socioeconomic status (18% vs 11%). Conversely, biology is more likely to be an intended study choice among students with a higher socioeconomic background (11% compared to 5%).

Agriculture is more likely to be considered by students from a lower socioeconomic status compared to students from higher socioeconomic backgrounds (5% vs 1%) and students from regional/remote

areas compared to students from metro areas (5% vs 2%). Earth and environmental sciences is also more likely to be an intended choice for students from regional/remote areas than metro students (4% vs 1%).

Physics is more likely to be pursued by students born overseas than students born in Australia (7% vs 3%).

Once again, the intention to study STEM at a tertiary level is significantly higher among Year 11 and 12 students whose parents have an education in STEM compared to those whose parents do not have an education in STEM (44% vs 32%). This influence also extends to subject choice with students whose parents studied STEM more likely to intend to study biology than those whose parents did not study STEM. Similarly, intention to study is also higher among those Year 11 and 12 students whose parents are employed in a STEM career (50% vs 38%), driven by a greater preference to study chemistry among these students compared to those whose parents do not work in STEM (6% vs 3%).

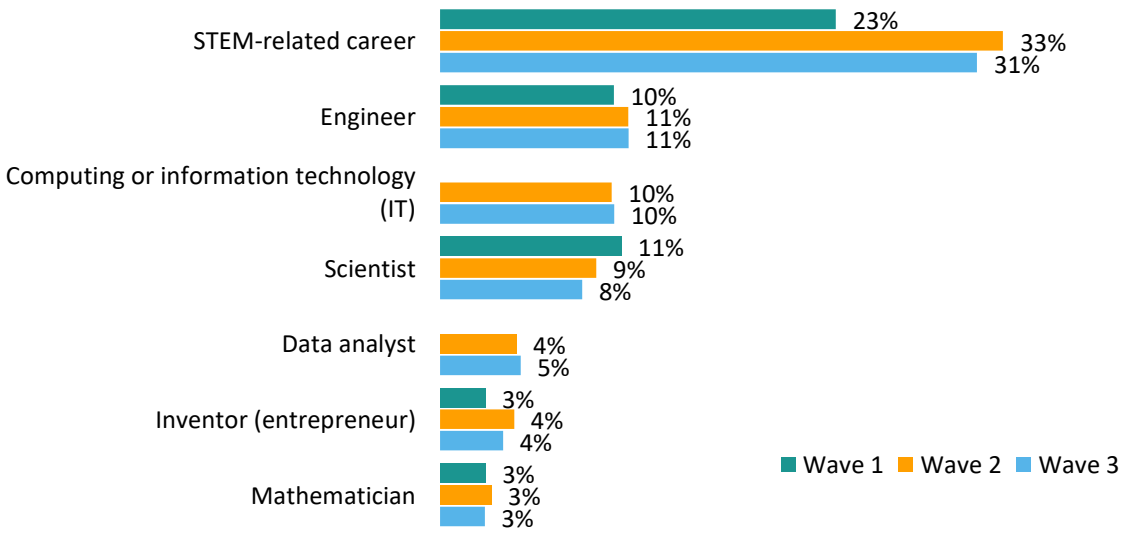
Career intentions

Respondents were asked about their certainty for their future career, and two thirds (68%) reported feeling fairly or very certain about what they want to do in the future. This is consistent over time.

When asked about future career aspirations, the intention to pursue a career in a STEM-related field has remained stable overall for Wave 3 (31% vs 33% in Wave 2).

Figure 31: STEM career intentions, by wave.

Q. What type of career would you like to have in the future?

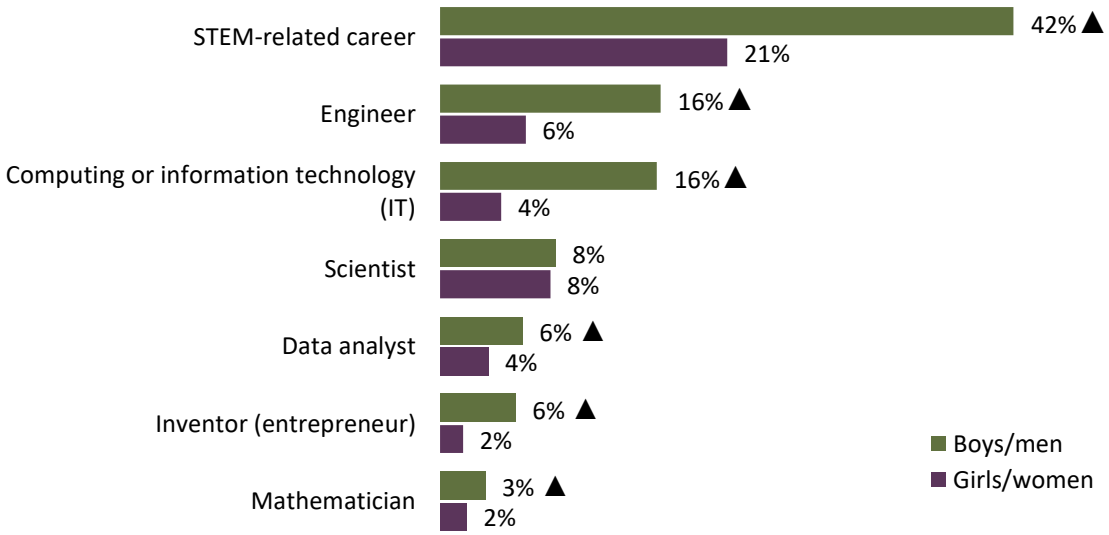


Base: Total – Wave 1 – 1,434, Wave 2 – 3,021, Wave 3 – 3,154.

Boys/men remain significantly more likely to intend to pursue a career in STEM overall than do girls/women (42% vs 21%). This is driven by significant gender skews in intention to pursue a career as an engineer; in the field of computing and information technology; a data analyst, inventor or mathematician – detailed in the chart below.

Figure 32: STEM career intentions, by gender.

Q. What type of career would you like to have in the future?



Base: Wave 3 only, boys/men – 1,559, girls/women – 1,538. Non-binary/other not shown due to low base size.

Below are other significant differences among key demographic groups.

Table 22: Significant differences between subgroups – future STEM career intention.

Audience	WEIGHTED %
Socioeconomic status	
Lower SES (Decile 1 - 5)	29%
Higher SES (Decile 6 - 10)	33%
Location	
Metropolitan	33%
Regional / remote	26%
CALD	
Non-CALD	30%
CALD	34%
Country of birth	
Born overseas	36%
Born in Australia	30%

Those who wanted to become a scientist were asked what type of scientist they would like to become. The majority wanted to be biologists (34%) followed by earth or environmental scientists (22%). There was a slight gender skew, with boys/men being more likely to want to become a physicist (18% vs 7%).

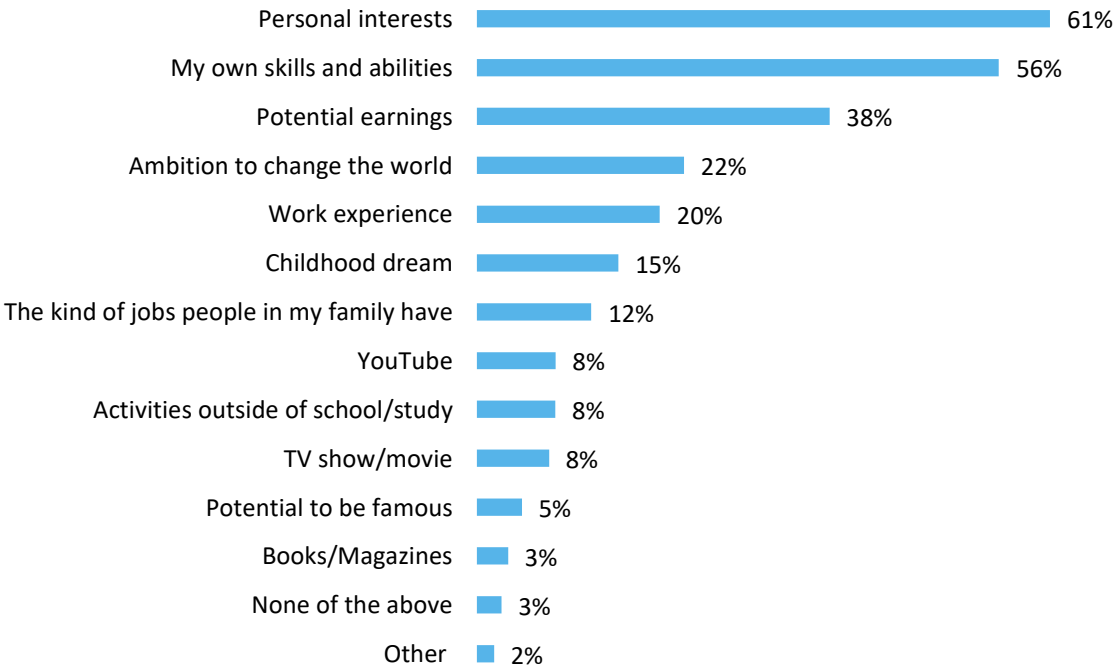
Factors influencing career intentions

Factors of influence

Key factors influencing the consideration of STEM career choices mirror those that influence intention to study: personal interest (61%); young people's perceptions of their own skills and abilities (56%); and earning potential (38%).

Figure 33: Factors influencing career intentions.

Q. Which factors influence the career you aspire to?



Base: Wave 3 only, total – 3,154. (MC).

These influences have significantly increased from Wave 2 while the influence of YouTube has decreased.

Table 23: Significant changes in factors influencing career choice by wave.

Q. Which factors influence the career you aspire to?

Factors influencing career choice	Wave 1	Wave 2	Wave 3
Personal interests	Not asked	59%	61%
My own skills and abilities	Not asked	53%	56%
Potential earnings	Not asked	32%	38%
YouTube	Not asked	10%	8%

Base: Total. Wave 2 – 3,021, Wave 3 – 3,154.

Gender differences are observed in the factors that influence career aspirations. Girls/women are more influenced than boys/men by personal interests (67% vs 56%), and an ambition to change the world (24% vs 20%). On the other hand, boys/men are more likely to be influenced than girls/women by the jobs of their family (14% vs 11%) and YouTube (12% vs 5%).

It was found that students from lower socioeconomic backgrounds are more likely than those from higher socioeconomic backgrounds to be influenced by childhood dreams (17% vs 14%), whereas those from higher socioeconomic backgrounds are more likely to be influenced by activities outside of school (9% vs 7%).

CALD students are also more likely to be influenced by a desire to change the world when compared to non-CALD students (24% vs 21%), as well as potential earnings (43% vs 34%).

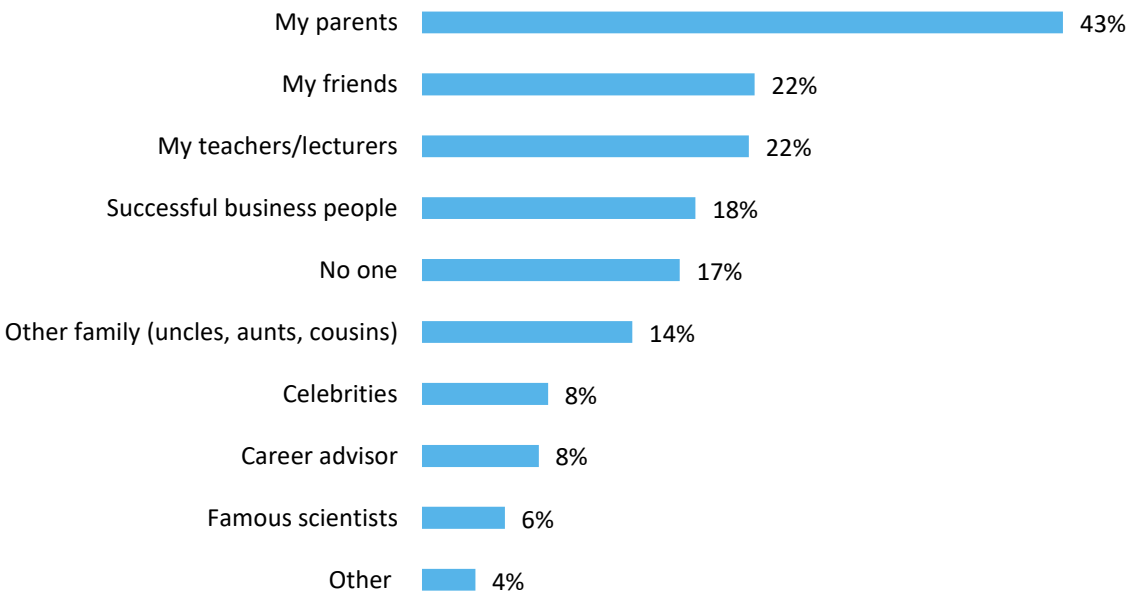
Students with parents who have a STEM education are more likely to be influenced by the kinds of jobs their family have than students whose parents do not have a STEM education (15% vs 9%), as are students whose parents work in a STEM-related field compared to those whose parents do not work in STEM (19% vs 12%).

People of influence

Consistent with learnings about the influence of a parent's education and career on student study preferences and behaviour, when it comes to specific people that influence career choices, parents are a key people of influence with regards to career choices (43%), with support from friends (22%) and teachers/lecturers (22%).

Figure 34: People influencing career intentions.

Q. Which of the below people influence the career you aspire to?



Base: Wave 3 only, total – 3,154. (MC).

Medical and science-based movies and television programs as a source of influence include programs such as sitcoms and drama programs including The Big Bang Theory, House M.D., The Good Doctor, Grey's Anatomy, Suits and Bones. These programs showcase jobs and careers related to STEM and demonstrate what can be achieved in these roles: *"Doctor and lawyer shows and movies make it look very interesting and world changing to be in these careers."*

Reality TV which showcases careers and experiences of medical professions, such as paramedics, demonstrate how students can help others through these career choices.

Consistent with influences for study choices, key figures inspiring career pathways include famous historical scientists (e.g. Marie Curie, Albert Einstein), modern day technology entrepreneurs (e.g. Jeff Bezos, Steve Jobs, Elon Musk, Gary Vee), celebrity scientists/environmentalists (e.g. David Attenborough, Bill Nye), social celebrities (e.g. YouTubers and TikTok influencers), and personal contacts (e.g. known professionals including doctors, business owners, lawyers etc.). These people demonstrate through action what is possible with STEM: *"Marie Curie is one of my biggest role models as well as Ada Lovelace. They both have done so much in STEM".*

Again, gender differences are evident. Boys/men are more likely than girls/women to be influenced by their friends (24% vs 20%) and celebrities (9% vs 7%). Conversely, girls/women are more likely than boys/men to be influenced by teachers/lecturers (24% vs 20%).

Those from a higher socioeconomic background are more likely than those from a lower socioeconomic background to be influenced by successful business people (20% vs 16%).

The role of parents' experience in STEM again comes to the fore with students whose parents have studied STEM more likely to be influenced by teachers/lecturers than those whose parents do not have a STEM education (24% vs 20%), successful business people (20% vs 17%) and famous scientists (7% vs 4%). Those students whose parents have *not* studied STEM are more likely to feel that they are not influenced by anyone when it comes to careers compared to those with STEM educated parents (23% vs 12%). Those with parents employed in STEM-related work are more likely to be influenced by famous scientists than those whose parents do not work in STEM (9% vs 5%).

Importance of factors when choosing a career

When asked about importance of several factors when considering choosing a future job or career, the top ten factors overall have remained relatively consistent between Wave 2 and Wave 3. Interestingly, there has been a significant uplift in the perceived importance of these factors on decision making.

Table 24: Importance of factors considered when choosing a career (net: somewhat/very important), by wave.

Q. How important are each of the following factors when choosing a career?

Statements	Wave 1	Wave 2	Wave 3
Has good working conditions	92%	87%	▲92%
Job security	89%	86%	▲89%
Is a fun environment to work in	87%	84%	▲88%
Subject matter is interesting	89%	84%	▲87%
Has lots of opportunities for on-the-job training and learning new skills	86%	80%	▲84%
Positively impacts society	Not asked	80%	▲83%
Helping people	79%	78%	▲82%
High salary	82%	76%	▲82%
Provides structure and consistency	Not asked	78%	▲81%
Offers a lot of variety within the role	Not asked	78%	▲81%

Base: Those aged 14+ – Wave 1 – 2,015, Wave 2 – 2,752, Wave 3 – 2,974.

All of the top 10 factors in Wave 3, excluding 'high salary' are significantly more important to girls/women than they are to boys/men.

Table 25: Importance of factors considered when choosing a career (net: somewhat/very important), by gender.

Q. How important are each of the following factors when choosing a career?

Top 10 statements (Wave 3)	Boys/men	Girls/women
Has good working conditions	89%	▲95%
Job security	86%	▲93%
Is a fun environment to work in	85%	▲90%
Subject matter is interesting	83%	▲91%
Has lots of opportunities for on-the-job training and learning new skills	80%	▲88%
Positively impacts society	77%	▲89%
Helping people	76%	▲87%
High salary	81%	83%
Provides structure and consistency	79%	▲85%
Offers a lot of variety within the role	78%	▲85%

Base: Those aged 14+, boys/men – 1,475, girls/women – 1,443. Non-binary/other not shown due to low base size.

The data suggests that those born overseas are significantly more motivated than students born in Australia by jobs that positively impact society (88% vs 82%), allow them to help people (85% vs 81%), and earn a high salary (85% vs 81%).

Similarly, CALD students are more motivated than non-CALD students by jobs that offer on-the job training and learning new skills (86% vs 82%), positively impact society (85% vs 81%), offer an opportunity to help people (84% vs 80%), a high salary (86% vs 79%), and structure and consistency (83% vs 80%).

The STEM journey: perspectives and behaviours

Focusing on the relationship between awareness (understanding), current behaviours and future intentions regarding STEM is a useful way to start to think about some of the challenges in progressing student engagement with STEM in schools. Funnels give the ability to trace the proportions of a given population from understanding to current behaviour and future intention. By looking at the conversion rates between these measures (e.g. considering those currently studying STEM as a proportion of those aware of STEM) it is possible to identify where blockages exist and where we can focus to build momentum for STEM among young people.

At an overall level, understanding of STEM can be regarded as moderate; there is room to improve awareness and understanding of STEM as a concept.

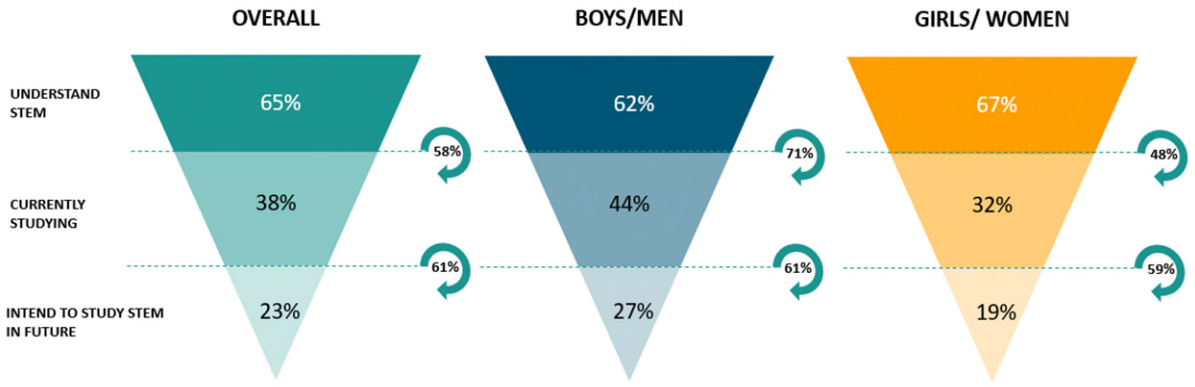
Fewer students are currently studying STEM than have an understanding of the STEM concept, suggesting that 'conversion to study' is relatively weak – the proposition for studying STEM needs support/promotion to drive uptake of STEM study options.

Intention to study in future is also relatively weak; fewer students intend to study STEM in future than are studying STEM currently. While this may reflect some natural attrition as tertiary students complete their education it may also suggest some challenges in the experience of studying STEM or weakness in the understanding of the role of STEM in jobs and careers more broadly (as examples).

A similar pattern plays out across gender, however the conversions are weaker for girls/women confirming that there is a significant job to be done to grow participation in STEM among girls/women.

Figure 35: Participation funnels by gender.

Q. Please write below what you believe the term 'STEM' stands for. / Which of the following elective subjects best describes the subjects you have chosen to do (at Years 9 and 10 / at Years 11 and 12 / in your higher education course). / Please select from the below list which elective subjects you are considering choosing (at Years 1 and 10 / at Years 11 and 12 / in your higher education course).



Base: Wave 3 – total – 3,154. boys/men – 1,559, girls/women – 1,538.

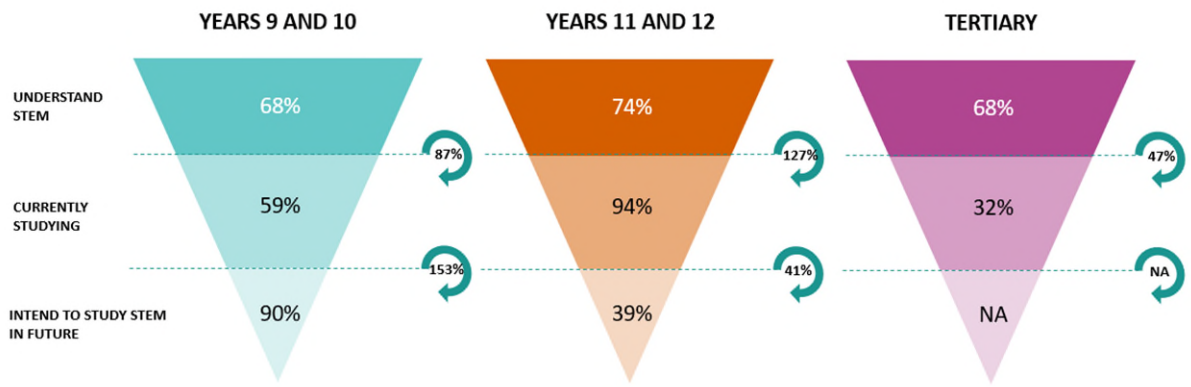
Looking across year levels we can see strong forward momentum for STEM in Years 9 and 10. Increases are evident in understanding of STEM as a concept and the proportion of Year 9 and 10 students currently studying STEM. Of particular note is the strong conversion on intention to study with almost all students in Years 9 and 10 expecting to have to study some STEM subjects in their final years of Secondary School – regardless of whether they have studied them previously or not.

We see another increase in the understanding of the subjects involved in STEM among Year 11 and 12 students, yet some students still end up studying STEM subjects without fully understanding the concept. In addition, slightly more students in Year 11 and 12 end up studying STEM electives than had intended in Years 9 and 10. Of particular note is the drop off in intention to study STEM post Year 11 and 12 schooling. While nearly all students study subjects related to STEM in years 11 and 12, only 39% indicate an intention to continue studying STEM in the future. This indicates a strong need to understand not only the motivations to study STEM in year 11 and 12 (among Year 9 and 10 students) and what changes for Year 11 and 12 students as they contemplate study and careers post-secondary school, but also to understand the experience in studying STEM at the Year 11 and 12 level within secondary schools as well as supporting messaging.

At a tertiary level, understanding of STEM eases, and participation in STEM subjects is seen to decrease.

Figure 36: Participation funnels by year level.

Q. Please write below what you believe the term 'STEM' stands for. / Which of the following elective subjects best describes the subjects you have chosen to do (at Years 9 and 10 / at Years 11 and 12 / in your higher education course). / Please select from the below list which elective subjects you are considering choosing (at Years 1 and 10 / at Years 11 and 12 / in your higher education course).



Base: Year 9 and 10s – 320, Year 11 and 12s – 680, tertiary students – 1260. (MC).

Reasons Year 11 and 12 students step away from STEM

Too hard/difficult

- *“I choose not go down this path as it’s beyond my capabilities.”*
- *“I believe that STEM just puts more unnecessary pressure on students because it's very pointless when we have VET and Uni prep courses.”*
- *“Too difficult for me.”*
- *"I don't have an aptitude for it.”*
- *“They require very high ATAR to get into which I can't achieve.”*
- *“I'm not good at them at all.”*

Not related to chosen career/future study

- *“It's not my preferred career path.”*
- *“Personal interest, more interested in the business and commerce side.”*
- *“Because I would like to be a primary school teacher.”*
- *“I want to be a medical doctor. I believe this will have a much more positive impact on the world around me than anything in STEM.”*
- *“I'm more of an English and writing person. I think communication through language is the basis to everything and without language we couldn't learn about science so I love English.”*
- *“The job that I would like to have doesn't include STEM.”*
- *“Because I want to pursue marketing and not a job that involves science.”*
- *“I'm considering something more on the physical side, e.g. physiotherapy or psychology; something with no maths.”*

Subjects are not interesting/enjoyable

- *“It isn't an area I am interested in.”*
- *"Because I don't enjoy it as much as humanities.”*
- *“Boring.”*
- *“Because I don't find it interesting and I don't enjoy the subjects.”*
- *“I am more of a people person.”*
- *“It doesn't sound fun and something that I want to do for the rest of my life.”*
- *“I'm just not interested in those subjects.”*

STEM only as a pathway to something else

- *“I am more interested in history rather than how a plant grows or what Newton’s laws are. I am studying maths as it is a prerequisite to a Bachelor of Education at uni, but I don't care about maths.”*
- *“I am interested in studying health sciences in the future and although biology, chemistry and physics are prerequisites for some of the courses I am interested in, as it is health science, they do not fall under STEM subjects.”*

Male dominated

- *“I don't know, I feel like as a girl I won't get taken as seriously within STEM because it's so heavily dominated by males. I also don't think that schools are making STEM accessible enough to female students or giving them the support they need to pursue STEM. That’s why I'm hesitant to study STEM.”*

The verbatims give a sense that continuation with STEM study post-secondary school is hampered by a number of factors including perceived degree of difficulty, role as prerequisite subjects, challenge for subjects taught in secondary school to engage and inspire students and support girls in particular to participate, along with a relatively narrow sense of what constitutes a STEM career, misconceptions about what STEM careers look like and a limited understanding of how skills in STEM can benefit and contribute to parallel career paths.

Impact of STEM messaging on future intentions

Towards the end of the survey, respondents were given the following explanation about STEM careers:

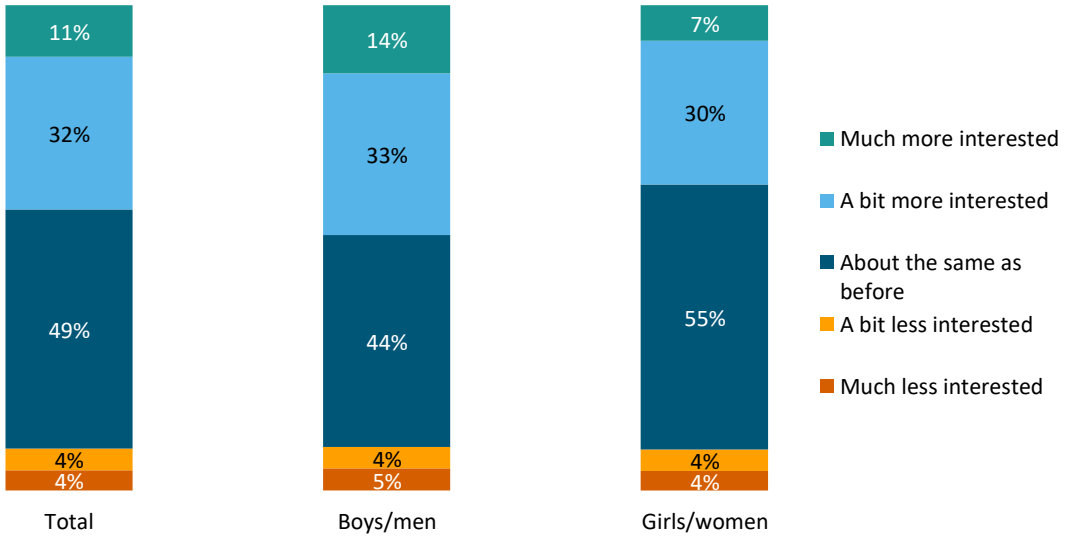
> *"There is a huge variety of industries you can work in with a STEM degree. Just a few examples include information technology; mining; construction of cars; aeroplane and rocket design; medical instrument design; wind turbine and solar panel design and construction; environmental contaminant testing; fisheries; curating natural history exhibitions; 3D printing; sustainable fashion; and mathematical modelling of the impact of humans on the planet."*

They were then asked, upon reading the explanation, how their interest in getting a STEM degree has changed, with 42% saying that they were more interested upon reading the description.

There is opportunity to increase future consideration for STEM through communicating messages about future job and career pathways. Wave 3 data demonstrates that even with basic messaging about job and careers linked to STEM study, it is possible to increase interest in STEM study among both boys/men and girls/women.

Figure 37: Change in interest in STEM degree once they have read about STEM careers.

Q. Now you have read the explanation, has your interest in getting a STEM degree changed?



Base: Wave 3 only, those aged 15+ – 2,838, boys/men – 1,412, girls/women – 1,374. Non-binary/other not shown due to low base size. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Table 26: Change in interest in STEM degree once they have read about STEM careers (Net: a bit more interested, much more interested), by wave.

Q. Now you have read the explanation, has your interest in getting a STEM degree changed?

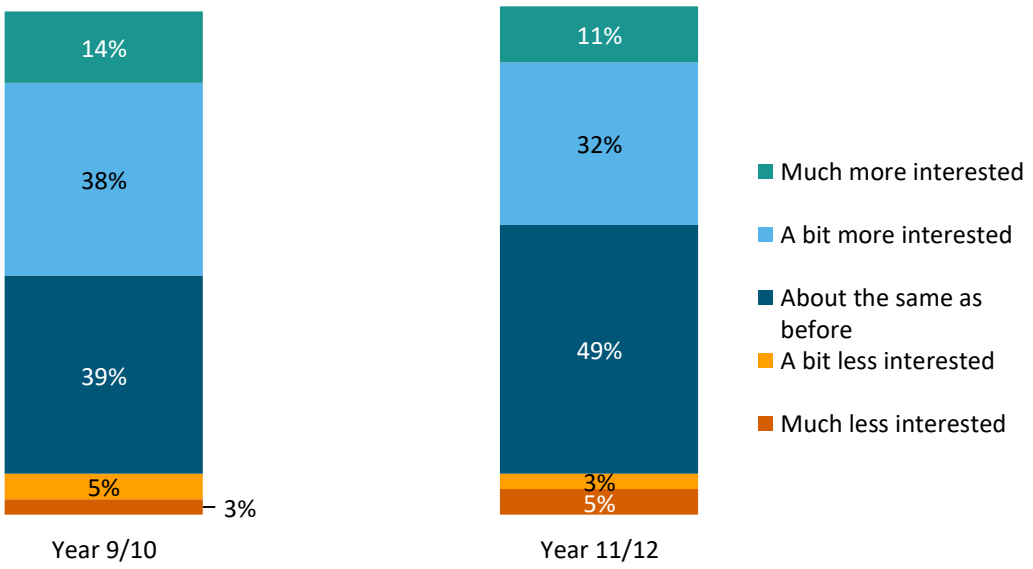
Interest	Wave 1	Wave 2	Wave 3
Net: A bit/much more interested in getting a STEM degree	Not asked	42%	42%

Base: Wave 3 only, those aged 15+ – 2,838.

The same pattern is seen for both Year 9 and 10 students as well as Year 11 and 12 students.

Figure 38: Change in interest in STEM degree once they have read about STEM careers, by Year Level.

Q. Now you have read the explanation, has your interest in getting a STEM degree changed?



Base: Wave 3 only, those aged 15+ in Year 9 or 10 – 237, those in Year 11 or 12 – 678. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Boys/men were significantly more likely to say that they were more interested in STEM careers after reading the explanation than girls/women (47% vs 37%), while girls were more likely to say their interest had not changed (55% vs 44%), possibly due to girls/women already having a greater understanding of STE.

Appendix: Questionnaire

Note on accessibility: The following questionnaire is presented in the format we use online and includes programming instructions in square brackets. It also contains tables listing questionnaire items. Tables don't have header rows or alt text, and some have blank cells. Questionnaire items appear in the left column with response options in the right column/s. If you have difficulty navigating the information in this questionnaire, please contact YouthInsight at support@youthinsight.com.au

[PROGRAMMING INSTRUCTIONS PROVIDED IN RED]

[SC = Single choice question | MC = Multi choice question | OE = Open ended response required]

SECTION 1: DEMOGRAPHICS

Thank you for your participation in this important research. To begin, we first need to ask a few questions to get to know you better.

1. How old are you?

[ASK ALL. DROP DOWN from 12 to 25. SCREEN OUT <12 AND >25]

[ASK IF AGED 12 TO 13]

As you are under 14 years of age, we will need to get parental consent for you to complete this survey. We will need one of your parents or a legal guardian to complete this next question before you can progress to the survey.

Dear Parents and Legal Guardians,

This questionnaire is about young people's attitudes and behaviour towards STEM (Science, Technology, Engineering, Maths) related subjects and activities. The research is being conducted by Student Edge on behalf of the Department of Industry, Innovation and Science.

All answers provided in this research are anonymous and confidential and will only be used for the purposes of this research.

For any queries please contact Student Edge – support@youthinsight.com.au

To provide consent for your child to take part on this study you will need to answer a few questions below

- Name?
- Are you over 18 years of age?
- What is your relationship to the child?
- Email Address
- Do you consent for your child to take part on this study?
- Do you give Student Edge permission to contact you to verify that the information you have provided is correct and true?

[IF NOT FULLY COMPLETED OR CONSENT IS NOT GIVEN – TERMINATE]

2. And which of the following do you identify as?
[ASK ALL. SC.]

		[AIM FOR]
Man/Boy	1	49%
Woman/Girl	2	49%
Non-binary / other	98	2%

3. Where do you live?
ASK ALL. SC.

		[AIM FOR]
Sydney – City / Suburbs	1	32%
NSW – Regional	2	
Melbourne – City / Suburbs	3	26%
VIC – Regional	4	
Brisbane – City / Suburbs	5	20%
QLD – Regional	6	
Perth – City / Suburbs	7	11%
WA – Regional	8	
Adelaide – City Suburbs	9	7%
SA – Regional	10	
ACT	11	2%
Hobart – City/Suburbs	12	2%
TAS – Regional	13	
Darwin – City/Suburbs	14	1%
NT – Regional	15	

4. Please enter your postcode
[ASK ALL. OE. RESPONDENTS TO BE ASSIGNED TO METRO OR REGIONAL AND LOW OR HIGH SES BASED ON POSTCODE.]

5. Are you of Aboriginal and/or Torres Strait Islander origin?
[ASK ALL. SC.]

Yes	1
No	2
Prefer not to specify	3

6. Are you currently enrolled in any studies?
[ASK ALL. SC.]

Yes	1

No	2

Q6a. As you are under 15 years of age, please provide a reason below of why you are not currently enrolled in any studies?

[ASK IF NOT CURRENTLY ENROLLED IN ANY STUDIES AND AGED UNDER 15]

_____
_____
_____

Q6b. What's the highest level of education you have attained?

[ASK IF NOT CURRENTLY ENROLLED IN ANY STUDIES AND AGED 15+]

Year 10	1
Year 12	2
VET Certificate	3
VET Diploma	4
Bachelor's degree	5
Graduate diploma or certificate	6
Postgraduate degree	7
Other (please specify)	98

7. Which of the below best describes the level you're currently studying at?
   Please select the year you started in 2019
   [ASK IF Q6= CODE 1. SC.]

Primary school – Year 6 or below	1
High School – Year 7	2
High School – Year 8	3
High School – Year 9	4
High School – Year 10	5
High School – Year 11	6
High School – Year 12	7
University – Undergrad Year 1	8
University – Undergrad Year 2	9

University – Undergrad Year 3	10
University – Undergrad Year 4+	11
University – postgrad	12
TAFE/ Private College – Y1	13
TAFE/ Private College – Y2	14
TAFE/ Private College – Y3	15
TAFE/ Private College – Y4	16
Other (specify)	98

8. And what type of school do you attend?
   [ASK IF Q7 = CODES 1-7. SC.]

Public School	1
Catholic School	2
Private School	3
Selective School	4
Boarding School	5
Other (Please Specify)	6

9. And is your school a single sex or coed school?
   [ASK IF Q7 = CODES 1-7. SC.]

Single sex school	1
Coed school	2

10. Are you an international student or a domestic student?
    [ASK IF Q6= CODE 1. SC.]

International student	1
Domestic student	2

11. In what country were you born?
    [ASK ALL. SC.]

Australia	1
Other (specify)	2

12. How long have you been living in Australia?
    [ASK IF Q11 = CODE 2. SC]

Less than 1 year	1
1 – 2 years	2
2 - 3 years	3
3 – 4 years	4
4 – 5 years	5
5+ years	6

13. Do you speak a language other than English at home?
[ASK ALL. SC.]

No, English only	1
Yes	2

14. Which other languages do you speak at home (other than English)?
[ASK IF Q13 = YES. MC.]

Arabic	1
Bengali	2
Cantonese	3
Dutch	4
French	5
German	6
Greek	7
Hausa	8
Hindi	9
Italian	10
Japanese	11
Javanese	12
Korean	13
Malay	14
Mandarin	15
Portuguese	16
Punjabi	17
Russian	18

Spanish	19
Tagalog	20
Filipino	21
Telugu	22
Turkish	23
Urdu	24
Vietnamese	25
Other (specify)	98

15. Which of the following best describes your current employment situation?
[ASK ONLY PEOPLE AGED 15 AND OVER. SC.]

Working full-time	1
Working part-time	2
Working casually	3
Working in holidays only	4
Stay at home parent	5
Not employed and looking for work	6
Not employed and not looking for work	7
Other	98

16. To the best of your knowledge, what's the highest level of education either of your immediate parents(s) or guardian(s) have attained?
[ASK ALL. SC]

Primary School	1
High school (Year 10)	2
High School (year 12)	3
VET Certificate	4
VET Diploma	5
Bachelor's degree	6
Graduate diploma or certificate	7
Masters	8
Doctorate	9

Other (please specify)	98
Not sure/prefer not to say	99

17. To the best of your knowledge, have your parent(s) or guardian(s) completed a degree or certificate in any of the following areas?
[ASK ALL. MC]

Accounting	1
Architecture	2
Computing	3
Engineering	4
Law	5
Marketing	6
Mathematics	7
Medicine	8
Nursing	9
Science	10
I don't know	98
None of the above	99

18. And to the best of your knowledge what type of job do your parent(s) or legal guardian(s) work in? *If your parents are retired, please tell us what they did before they retired. Select up to 2 choices. If they have more than one job, please select what you believe to be their main job.*
[ASK ALL. MC.]

		STEM RELATED
Accountant	1	
Advertising or marketing consultant	2	
Architect	3	
Artist	4	
Banker or finance	5	
Business owner	6	
Clerical and administration (office support)	7	
Community and personal service (aged care, childcare)	8	

Computing or information technology (IT)	9	STEM
Corporate management	10	
Data analyst	11	STEM
Economist	12	
Emergency services (police, fire or ambulance)	13	
Engineer	14	STEM
Farmer	15	
Hairdresser or beauty therapist	16	
Hospitality	17	
Inventor (entrepreneur)	18	STEM
Labourer (construction, grounds maintenance, factory worker)	19	
Lawyer	20	
Machinery operator or driver	21	
Mathematician	22	STEM
Medical doctor	23	
Nurse	24	
Pharmacist	25	
Professor or lecturer	26	
Public servant (includes Defence Force - Army, Airforce, Navy)	27	
Public transport operator (Bus driver, train conductor)	28	
Retail worker	29	
Salesperson	30	
Scientist	31	STEM
Social worker	32	
Stay at home parents	33	
Taxi driver or ride share driver	34	
Teacher	35	
Technician or trade worker (mechanic, electrician, carpenter)	36	
Unemployed	37	
Don’t know	98	

Other (Specify)	99	

SECTION 2: CURRENT & FUTURE STUDY INTENTIONS

Great, thanks. Now in this next section we would like to ask you some questions **about your current & future study intentions.**

Q19a. What are you intending to do after school?
[ASK IF NOT IN TERTIARY EDUCATION]

Go to University	1
Do a TAFE course or something similar	2
Get a job	3
Do an apprenticeship	4
Take a gap year	5
Other (please specify)	97
Not sure yet	99

19. Which of the following **elective** subjects best describes the subjects you have chosen to do in years 9 and 10?
Please select a maximum of 6 subjects and minimum of 3
Please note that different states and schools offer different choices of electives, so please select the elective subjects that best describe the ones you are considering from the list below.
[ASK YEAR 9 TO 10 STUDENTS MC. RANDOMISE]

		STEM RELATED
Arts – Music	1	
Arts - Visual Arts	2	
Arts – Dance	3	
Arts – Drama	4	
Arts - Photography Digital media	5	
Languages	6	
Commerce	7	
Humanities and Social Sciences	8	
Human Society and Its Environment (HSIE) - Aboriginal Studies	9	
Human Society and Its Environment (HSIE) – Commerce	10	

Human Society and Its Environment (HSIE) - Geography Elective	11	STEM
Human Society and Its Environment (HSIE) - History Elective	12	
Human Society and Its Environment (HSIE) - Work Education	13	
PDHPE - Child Studies	14	
PDHPE - Physical Activity	15	
PDHPE - Sports Studies	16	
VET in Years 9 and 10	17	
Agricultural Technology	18	STEM
Design and Technology	19	STEM
Food Technology	20	
Graphics Technology	21	STEM
Industrial Technology	22	STEM
Information and Software Technology	23	STEM
Textiles Technology	24	
Other (specify)	98	

20. Which of the following **elective** subjects best describes the subjects you studied in years 9 and 10?
Please select a maximum of 6 subjects and minimum of 3
Please note that different states and schools offer different choices of electives, so please select the elective subjects that best describe the ones you studied. below.
[ASK YEAR 11 TO 12 STUDENTS MC. RANDOMISE]

		STEM RELATED
Arts – Music	1	
Arts - Visual Arts	2	
Arts – Dance	3	
Arts – Drama	4	
Arts - Photography Digital media	5	
Languages	6	
Commerce	7	
Humanities and Social Sciences	8	
Human Society and Its Environment (HSIE) - Aboriginal Studies	9	

Human Society and Its Environment (HSIE) – Commerce	10	
Human Society and Its Environment (HSIE) - Geography Elective	11	STEM
Human Society and Its Environment (HSIE) - History Elective	12	
Human Society and Its Environment (HSIE) - Work Education	13	
PDHPE - Child Studies	14	
PDHPE - Physical Activity	15	
PDHPE - Sports Studies	16	
VET in Years 9 and 10	17	
Agricultural Technology	18	STEM
Design and Technology	19	STEM
Food Technology	20	
Graphics Technology	21	STEM
Industrial Technology	22	STEM
Information and Software Technology	23	STEM
Textiles Technology	24	
Other (specify)	98	

21. Which of the following **elective** subjects best describes the subjects you have chosen to do in years 11 and 12?
Please select a maximum of 12 subjects and minimum of 4
Please note that different states and schools offer different choices of electives, so please select the elective subjects that best describe the ones you are considering from the list below.
[ASK YEAR 11 TO 12 STUDENTS MC.]

Subjects	STEM RELATED	Subjects	STEM RELATED
Aboriginal studies		Human Society and Its Environment	
Agriculture	STEM	Industrial Technology	STEM
Ancient History		Information and Digital Technology (VET)	STEM
Automotive (VET)		Information Processes and Technology	STEM
Biology	STEM	Investigating Science	STEM
Business and Economics		Languages	

Business Services (VET)		Legal Studies	
Business Studies		Living World Science	STEM
Ceramics		Marine Studies	STEM
Chemical World Science	STEM	Mathematics	STEM
Chemistry	STEM	Mathematics Advanced	STEM
Citizenship and Legal Studies		Mathematics Extension	STEM
Community and Family Studies		Metal and Engineering (VET)	
Computing Applications	STEM	Modern History	
Construction (VET)		Music	
Creative Arts		Personal Development, Health and Physical Education	
Dance		Photography, Video and Digital Imaging	
Design and Technology	STEM	Physical World Science Life Skills	
Drama		Physics	STEM
Earth and Environmental Science	STEM	Primary Industries (VET)	
Earth and Space Science	STEM	Retail Services (VET)	
Economics		Science Extension	STEM
Electrotechnology (VET)	STEM	Society and Culture	
Engineering Studies	STEM	Software Design and Development	STEM
English Advanced/Extension/Other		Sport, Lifestyle and Recreation Studies	
Entertainment Industry (VET)		Studies of Religion	
Exploring Early Childhood		Technology Life Skills	
Financial Services (VET)		Textiles and Design	
Food Technology		Tourism, Travel and Events (VET)	
Geography	STEM	Visual Arts	
History Extension		Visual Design	
Hospitality (VET)		Work and the Community Life Skills	
Human Services (VET)		Work Studies	
		Other (please specify)	

22. Which of the following **elective** subjects best describes the subjects you did when you were in years 11 and 12?
Please select a maximum of 12 subjects and minimum of 4
Please note that different states and schools offer different choices of electives, so please select the elective subjects that best describe the ones studied.
[ASK HIGHER EDUCATION MC.]

Subjects	STEM RELATED	Subjects	STEM RELATED
Aboriginal studies		Human Society and Its Environment	
Agriculture	STEM	Industrial Technology	STEM
Ancient History		Information and Digital Technology (VET)	STEM
Automotive (VET)		Information Processes and Technology	STEM
Biology	STEM	Investigating Science	STEM
Business and Economics		Languages	
Business Services (VET)		Legal Studies	
Business Studies		Living World Science	STEM
Ceramics		Marine Studies	STEM
Chemical World Science	STEM	Mathematics	STEM
Chemistry	STEM	Mathematics Advanced	STEM
Citizenship and Legal Studies		Mathematics Extension	STEM
Community and Family Studies		Metal and Engineering (VET)	
Computing Applications	STEM	Modern History	
Construction (VET)		Music	
Creative Arts		Personal Development, Health and Physical Education	
Dance		Photography, Video and Digital Imaging	
Design and Technology	STEM	Physical World Science Life Skills	
Drama		Physics	STEM
Earth and Environmental Science	STEM	Primary Industries (VET)	
Earth and Space Science	STEM	Retail Services (VET)	
Economics		Science Extension	STEM

Electrotechnology (VET)	STEM	Society and Culture	
Engineering Studies	STEM	Software Design and Development	STEM
English Advanced/Extension/Other		Sport, Lifestyle and Recreation Studies	
Entertainment Industry (VET)		Studies of Religion	
Exploring Early Childhood		Technology Life Skills	
Financial Services (VET)		Textiles and Design	
Food Technology		Tourism, Travel and Events (VET)	
Geography	STEM	Visual Arts	
History Extension		Visual Design	
Hospitality (VET)		Work and the Community Life Skills	
Human Services (VET)		Work Studies	
		Other (please specify)	

23. Which of the below courses best describes the course you are currently studying in your higher education course?
Please select a maximum of 2 subjects and minimum of 1.
Please note that different higher education providers offer different choices of courses, so please select the subjects that best describe the ones you are considering from the list below.
ASK IF Q7 = CODES 8-16. MC.

		STEM RELATED
Accounting	1	
Agriculture	2	STEM
Architecture	3	
Built environment	4	
Business and management	5	
Communications	6	
Computing and information technology	7	STEM
Creative arts	8	
Dentistry	9	
Economics	10	
Education and training	11	

Engineering and technology	12	STEM
Environmental studies	13	STEM
Health services and support (eg. Nutrition, occupational therapy)	14	
Humanities and social sciences	15	
International relations		
Languages	16	
Law	17	
Mathematics	18	STEM
Medicine	19	
Nursing	20	
Para-legal studies	21	
Pharmacy	22	
Psychology	23	
Rehabilitation (eg. physiotherapy, chiropractic)	24	
Biology	25	STEM
Chemistry	26	STEM
Physics	27	STEM
Earth and environmental sciences	28	STEM
Social work	29	
Sport and leisure	30	
Surveying	31	
Tourism and hospitality	32	
Veterinary science	33	
Other (specify)	98	

24. Thinking about high school, which of the following subjects would you be interested in studying once you get the choice to select your subjects. Please select from the below list which elective subjects you would be interested in for years 9 and 10.
[ASK STUDENTS IN YEARS 6, 7 AND 8. Q7 = CODE 1-3]
Please note that different states and schools offer different choices of electives, so please select the elective subjects that best describe the ones you are considering from the list below.
Please select up to 5 subjects.

25. Please select from the below list which elective subjects you are considering choosing for years 11 and 12.
    [ASK STUDENTS IN YEARS 9 AND 10. Q7 = CODE 4-5]
    Please note that different states and schools offer different choices of electives, so please select the elective subjects that best describe the ones you are considering from the list below.
    Please select up to 7 subjects.

26. Please select from the below list which course(s) you are considering after high school.
    [ASK STUDENTS IN YEARS 11 AND 12. Q7 = CODE 6-7. INCLUDE CODE FOR NOT CONTINUING WITH STUDY]
    Please note that different tertiary education providers offer different choices of courses, so please select the subjects that best describe the ones you are considering from the list below.
    *Please select up to 2 courses. **

    Includes option for 'Not Continuing Study'

SECTION 3: CAREER ASPIRATIONS

Great, thanks. Now in this next section we would like to ask you some questions **about your career aspirations.**

27. Thinking about what type of career you want after you finish school, which of the following best describes you?
    If you have finished your studies and are already working, please answer this based on your level or certainty of whether your current career is the career you want to pursue or if you are still uncertain.

    [ASK ALL. SC.]

Very certain: I definitely know what I want to do.	1
Fairly certain: I'm pretty sure I know what I want to do.	2
Hardly certain: I have an idea of what I might do but nothing is decided / I'm likely to change my mind.	3
Not at all certain: I have no idea what I want to do.	4

28. And what type of career would you like to have in the future?
    Select up to 3 choices.
    [ASK ALL.MC. RANDOMISE ORDER.]

		STEM RELATED
Accountant	1	
Advertising or marketing consultant	2	
Architect	3	
Artist	4	

Banker or finance	5	
Business owner	6	
Clerical and administration (office support)	7	
Community and personal service (aged care, childcare)	8	
Computing or information technology (IT)	9	STEM
Corporate management	10	
Data analyst	11	STEM
Economist	12	
Emergency services (police, fire or ambulance)	13	
Engineer	14	STEM
Farmer	15	
Hairdresser or beauty therapist	16	
Hospitality	17	
Inventor (entrepreneur)	18	STEM
Labourer (construction, grounds maintenance, factory worker)	19	
Lawyer	20	
Machinery operator or driver	21	
Mathematician	22	STEM
Medical doctor	23	
Nurse	24	
Pharmacist	25	
Professor or lecturer	26	
Public servant (includes Defence Force - Army, Airforce, Navy)	27	
Public transport operator (Bus driver, train conductor)	28	
Retail worker	29	
Salesperson	30	
Scientist	31	STEM
Social worker	32	
Stay at home parents	33	
Taxi driver or ride share driver	34	

Teacher	35	
Technician or trade worker (mechanic, electrician, carpenter)	36	
Don't know	98	
Other (Specify)	99	

29. You mentioned that you are interested in becoming a scientist in the future. From the list below what kind of scientist would you like to be?
[ASK IF SELECTED SCIENTIST ABOVE]

Biologist	1
Chemist	2
Physicist	3
Earth or environmental scientist	4
Other (Specify)	5

30. From the below list, which **factors** influence the **career** you aspire to? Please select up to 3 factors which influence you the most.
[ASK ALL. MC.]

TV show/movie	1
Activities outside of school/study	2
Books/Magazines	3
YouTube	4
My own skills and abilities	5
Work experience	6
Childhood dream	7
Personal interests	8
The kind of jobs people in my family have	9
Potential earnings	10
Potential to be famous	11
Ambition to change the world	12
Other (Please specify)	13
None of the above	98

31. You mentioned that your career choice is inspired by a TV show/movie. Please list below any that come to mind that have inspired you?
[ASK IF SELECT CODE1 ABOVE. OE]

_____
_____
_____

32. And which of the below **people** influence the **career** you aspire to? Please select up to 2 groups of people who influence you the most.
[ASK ALL. MC.]

My teachers/lecturers	1
My parents	2
Career advisor	3
Celebrities	4
My friends	5
Successful business people	6
Famous scientists	7
Other family (uncles, aunts, cousins)	8
No one	9
Other (please specify)	98

33. You mentioned that your career choice is inspired by celebrities, successful business people or famous scientists. Please list below any people that come to mind that have inspired you?
[ASK IF CODES 4, 6 or 7 ABOVE. OE]

_____
_____
_____

34. How important are each of the following factors when choosing a career?
[ASK ALL AGED 14+. SC PER ITEM. RANDOMISE ORDER.]

	Not important at all	Not very important	Neither	Somewhat important	Very Important
Job security	1	2	3	4	5
Is in an industry that is growing	1	2	3	4	5
Lots of roles available	1	2	3	4	5
Offers a lot of variety within the role	1	2	3	4	5

Is in an industry that is constantly evolving	1	2	3	4	5
Uses lots of technology	1	2	3	4	5
Has lots of opportunities for on-the-job training and learning new skills	1	2	3	4	5
High salary	1	2	3	4	5
Allows you to be creative	1	2	3	4	5
Subject matter is interesting	1	2	3	4	5
Positively impacts society	1	2	3	4	5
Helping people	1	2	3	4	5
Is in an industry that is sustainable	1	2	3	4	5
Provides structure and consistency	1	2	3	4	5
Has good working conditions	1	2	3	4	5
Is in an industry that has existed for a long time	1	2	3	4	5
Is a fun environment to work in	1	2	3	4	5
Provides an opportunity to travel / move overseas	1	2	3	4	5
Solving a major world problem	1	2	3	4	5

SECTION 4: UNDERSTANDING AND PERCEPTIONS OF STEM

Great, thanks. Now in this next section we would like to ask you some questions **about your understanding and perceptions of STEM.**

35. Please write below what you believe the terms 'STEM' stands for.
    [ASK ALL. OE]

_____
_____
_____

36. What type of jobs do you think you would be able to get if you have a STEM degree or certificate?
    [ASK ALL. OE]

1. _____
2. _____
3. _____

4. _____
5. _____

EXPLANATION ONLY*: STEM *stands for* ***science, technology, engineering*** *and* ***mathematics.***

In this survey, science means things like biology, chemistry, physics, and earth and environmental sciences. It doesn't include medicine, nursing, psychology or health sciences.

Technology means things like information technology and programming, mechanics, electronics, and all other types of technology. Some technology courses could also be called engineering.

There are many types of engineering, like aerospace and environmental engineering, and many types of mathematics, such as geometry, logic and statistics.

37. Thinking about conversations you have with your **parents or guardians**, which of the following opinions/views have you heard from them about careers that need science, technology, engineering and maths skills?
    Choose any which may apply from the below list. If NONE of these apply to you, please select the option 'I haven't heard them talk about this' and move onto the next question.
    [ASK ALL. SC PER ROW.]

These jobs offer job security		These jobs do not offer job security
These are well paid jobs		These jobs are not well paid
There are lots of jobs in these fields		There are very few jobs in these fields
These jobs positively impact society		These jobs have no impact on society
These jobs have good working conditions		These jobs have poor working conditions

I haven't heard them talk about this [EXCLUSIVE]

38. Thinking about your **teachers or careers advisors**, which of the following opinions/views have you heard about careers that need science, technology, engineering and math skills?

    Choose any which may apply from the below list. If NONE of these apply to you, please select the option 'They don't talk to me about this' and move onto the next question.

    [ASK ALL. SC PER ROW.]

These jobs offer job security		These jobs do not offer job security
These are well paid jobs		These jobs are not well paid

There are lots of jobs in these fields		There are very few jobs in these fields
These jobs positively impact society		These jobs have no impact on society
These jobs have good working conditions		These jobs have poor working conditions

I haven't heard them talk about this [EXCLUSIVE]

39. How interested are you in each of the below subjects?
[ASK ALL. SC]

	Not at all interested	Not really interested	Neither	Somewhat interested	Very interested
Science	1	2	3	4	5
Technology	1	2	3	4	5
Engineering	1	2	3	4	5
Maths	1	2	3	4	5

40. Thinking about **getting a good job in the future**, how important do you believe it is to have knowledge and skills related to each of the subjects that make up STEM: science, technology, engineering and mathematics?
[ASK ALL. SC]

	Not important at all	Not really important	Neither important or unimportant	Somewhat important	Very important
Science	1	2	3	4	5
Technology	1	2	3	4	5
Engineering	1	2	3	4	5
Maths	1	2	3	4	5

41. You mentioned that it **was not important** to have knowledge and skills in [insert subject] to get a good job. Why do you think that?
[ASK THOSE WHO SAID 'NOT IMPORTANT AT ALL' OR 'NOT REALLY IMPORTANT' TO EACH SUBJECT. MC]

42. You mentioned that it **was important** to have knowledge and skills in [insert subject] to get a good job. Why do you think that?

[ASK THOSE WHO SAID 'SOMEWHAT IMPORTANT' OR 'VERY IMPORTANT' TO EACH SUBJECT. MC]

This subject helps us understand how the world works	1
Skills are transferrable to other areas	2
It prepares you for good jobs	3
This subject teaches you critical thinking skills	4
[Show for tech] Technology is shaping the future/constantly evolving	5
You have to use these skills in the workplace	6
This subject teaches problem solving skills	7
This subject teaches analysis skills	8
Gives you a wide range of careers options	9
This subject teaches you creativity skills	10
This subject teaches you how to be innovative	11
This subject teaches you logical thinking	12
It is an essential life skill	13
These skills are needed for well-paying jobs	14
These skills are in high demand	15
Other (please specify)	98

43. How **confident** do you feel that you can study and get good results in each of the following subjects?
[ASK ALL. SC]

	Not confident at all	Not really confident	Neither confident or not confident	Somewhat confident	Very confident
Science	1	2	3	4	5
Technology	1	2	3	4	5
Engineering	1	2	3	4	5
Maths	1	2	3	4	5

44. Why do you think you don't feel confident with the [insert subject]?
[ASK THOSE WHO SAID 'NOT CONFIDENT AT ALL' OR 'NOT REALLY CONFIDENT TO EACH SUBJECT'. MC]

I'm not very good at it	1
I'm not interested in it	2
I don't like it	3
It's too hard/difficult	4
I don't understand it	5
I'm not very smart	6
I have failed at this subject before	7
It's boring	8
I haven't studied it before	9
It's always changing	10
It requires Maths skills which I'm not good at [SHOW FOR SCIENCE, TECH, ENG]	11
It involves Physics skills which I'm not good at	12
Other (please specify)	98

45. And what about outside of school/study, how confident do you feel you understand science and technology when people are talking about it or when you watch or read about on TV or online (e.g. a new discovery on the news, documentary on TV etc.)
[ASK ALL. SC]

Not confident at all	1
Not really confident	2
Neither confident or unconfident	3
Somewhat confident	4
Very confident	5

46. Are you considering studying any STEM-related subjects in the future? `
If you are already studying at a tertiary level, please answer based any further studies such as a postgraduate degree, PHD, branching into different areas of STEM or any other education qualification.
STEM stands for Science, Technology, Engineering and Maths, but it also includes subjects such as biology, chemistry, physics, computing, programming, coding, mechanical and electrical trades and other related subjects.
[ASK ALL. SC]

Yes	1

No	2
Not sure	3

47. Why are you considering studying subjects related to STEM in the future?
[ASK IF YES ABOVE. MC]

I'm interested in a specific STEM career (specify)	1
I have a general interest in STEM	2
It is important for future job opportunities	3
Because I'm good at it	4
Because I enjoy it	5
It will give me important skills for the future	6
I already work in/study STEM	7
It's fun	8
Other (please specify)	98
Don't know	99

48. Why are NOT you considering studying subjects related to STEM in the future?
[ASK IF NO ABOVE. MC]

It's not interesting	1
It's too hard/difficult	2
I prefer creative subjects	3
I'm interested in something else	4
I'm already studying something else	5
It's boring	6
I'm not smart enough	7
I don't need STEM skills	8
I want to pursue a different career path	9
I already finished my studies	10
I am already working in another area	11
I'm not interested in future study	12
Other (please specify)	98

Don’t know	99

49. How, if at all, has COVID-19 influenced your choices for the future?
[ASK ALL. MC]

I am considering studying at different university	1
I am considering studying a different course (please specify)	2
I am now considering a different career option	3
I am considering moving to another state	4
My general interests have changed	5
Other (please specify)	98
No influence	99

50. How, if at all, has COVID-19 influenced your decision to study or work in the following STEM areas in the future?
[ASK ALL. SC PER SUBJECT]

It has made me…	Science	Technology	Engineering	Maths
Much more likely to consider	1	1	1	1
Slightly more likely to consider	2	2	2	2
Has not impacted my decision	3	3	3	3
Slightly less likely to consider	4	4	4	4
Much less likely to consider	5	5	5	5

51. Below are some statements people have made about reasons which prevent them from studying subjects related to STEM? Thinking about yourself, how much do agree or disagree with these statements.
[ASK IF NOT CONSIDERING FURTHER STUDY IN STEM. SC PER ITEM.]

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
I'm not really interested in these subjects	1	2	3	4	5
Don't think I'm smart enough	1	2	3	4	5
None of my friends are doing these subjects	1	2	3	4	5
They are too hard for me	1	2	3	4	5
I'm not very good at science	1	2	3	4	5
I'm not very good at math	1	2	3	4	5
The teachers/lecturers of these subjects are not very good	1	2	3	4	5
It's not related to the career I want	1	2	3	4	5

52. In your opinion, who is better at the following subjects:
[ASK ALL. SC PER ITEM]

	Boys are much better than girls	Boys are a bit better than girls	Neither girls or boys are better	Girls are a bit better than boys	Girls are much better than boys
Maths	1	2	3	4	5
Science	1	2	3	4	5
Technology	1	2	3	4	5
Engineering	1	2	3	4	5

53. Below is a list of careers, based on your understanding do you think these jobs are more for boys, more for girls or for both?
[ASK ALL. SC. THIS QUESTION IS SPLIT INTO TWO PAGES FOR RESPONDENT EXPERIENCE.]

	More for boys	More for girls	For either	Not sure
Accountant	1	1	1	1
Advertising or marketing consultant	2	2	2	2
Architect	3	3	3	3
Artist	4	4	4	4
Banker or finance	5	5	5	5

Business owner	6	6	6	6
Clerical and administration (office support)	7	7	7	7
Community and personal service (aged care, childcare)	8	8	8	8
Computing or information technology (IT)	9	9	9	9
Corporate management	10	10	10	10
Data analyst	11	11	11	11
Economist	12	12	12	12
Emergency services (police, fire or ambulance)	13	13	13	13
Engineer	14	14	14	14
Farmer	15	15	15	15
Hairdresser or beauty therapist	16	16	16	16
Hospitality	17	17	17	17
Inventor (entrepreneur)	18	18	18	18
Labourer (construction, grounds maintenance, factory worker)	19	19	19	19
Lawyer	20	20	20	20
Machinery operator or driver	21	21	21	21
Mathematician	22	22	22	22
Medical doctor	23	23	23	23
Nurse	24	24	24	24
Pharmacist	25	25	25	25
Professor or lecturer	26	26	26	26
Public servant (includes Defence Force - Army, Airforce, Navy)	27	27	27	27
Public transport operator (Bus driver, train conductor)	28	28	28	28
Retail worker	29	29	29	29
Salesperson	30	30	30	30
Scientist	31	31	31	31

Social worker	32	32	32	32
Stay at home parents	33	33	33	33
Taxi driver or ride share driver	34	34	34	34
Teacher	35	35	35	35
Technician or trade worker (mechanic, electrician, carpenter)	36	36	36	36

54. Below is a list of statements people have made about **science** and **technology**. Please indicate, how much you agree with each of these statements.
[ASK ALL. SC PER ITEM]

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
My parents think it's important to learn about science and technology	1	2	3	4	5
I talk about science and technology at home with my family	1	2	3	4	5
My friends are interested in science and technology	1	2	3	4	5
I like to watch shows about science and technology	1	2	3	4	5
Scientists make a positive difference in the world	1	2	3	4	5
I would like to be a scientist one day	1	2	3	4	5
Learning about science and technology is exciting	1	2	3	4	5
I will need to know about science and technology to get a good job in the future	1	2	3	4	5
STEM skills are important when considering employment opportunities	1	2	3	4	5

SECTION 5: ENABLERS, BARRIERS AND INFLUENCERS

55. From the below list, which **factors** influence your decision of the **subjects you choose** to study? Please select up to 3 factors which influence you the most.
[ASK ALL. MC.]

TV show/movie	1
Activities outside of school /study	2

Books/Magazines	3
YouTube	4
My own skills and abilities	5
Work experience	6
Childhood dream	7
Personal interests	8
The kind of jobs people in my family have	9
Potential earnings	10
Potential to be famous	11
Ambition to change the world	12
To help with my ATAR score	13
Other (Please specify)	14
None of the above	98

56. You mentioned that your subject choice is inspired by a TV show/movie. Please list below any that come to mind that have inspired you?
[ASK IF SELECT 1 ABOVE. OE]

57. And which of the below **people** influence your decision of the **subjects you choose** to study? Please select up to 2 group of people which influence you the most.
[ASK ALL. MC.]

My teachers/lecturers	1
My parents	2
Career advisor	3
Celebrities	4
My friends	5
Successful business people	6
Famous scientists	7
Other family (uncles, aunts, cousins)	8
Other (please specify)	98

58. You said your subject decision was inspired by celebrities, successful business people or famous scientists. Please list below any people that come to mind that have influenced you.
[ASK ALL. OE]

SECTION 6: STEM EXTRA CURRICULAR ACTIVITIES

Great, thanks. Now in this **last** section we would like to ask you some questions **about your extracurricular activities.**

59. Have you participated in any science activities outside of school/study in the past 12 months?
    This could be anything from a science fair to a museum, an expo, reading a science magazine or website or any other event related to science.
    [ASK ALL. SC]

Yes, I've participated in a few	1
Yes, I've participated in one	2
No, haven't participated in any	3

60. And have you participated in any activities related to science, technology, engineering or maths outside of school/study in the past 12 months?
    This could be anything from a fair or a visit to the museum, an expo, a competition, reading a magazine or website related to STEM or any other event related to STEM.
    [ASK ALL. SC]

Yes, I've participated in a few	1
Yes, I've participated in one	2
No, haven't participated in any	3

61. And which of the below events, activities or resources have you heard of?
    [ASK IF CODE 1 OR 2 SELECTED IN Q60. SHOW A-Z]

Girls in STEM Toolkit	1
STAR Portal	2
Maths or Informatics Olympiad	3
Australian Science Olympiad	4
4x4 in schools	5
Space camp	6
FIRST Robotics	7
ConocoPhilips Science Experience	8
BHP Billiton Science and Engineering Awards	9
National Indigenous Science Program	10

Bebras Challenge	11
Young ICT Explorers	12
Curious Minds	13
digIT program	14
National Science Week	15
F1 in Schools	17
National Youth Science Forum	18
Questacon	19
Questacon Smart Skills	21
Questacon Science Circus	22
Careers with STEM – Magazine	23
Days of STEM	24
Google Science Fair	25
Lego First Competition	27
AMSI Choose Maths	28
NXplorers [WA RESPONDENTS ONLY]	31
Governor's School STEM Awards	32
RoboCup Junior	33
RMIT EnGenius [VIC RESPONDENTS ONLY]	35
SciTech	36
Future You	37
Other (specify)	98
None of these	99

62. And which of the below events or activities have you participated in within the last 12 months? This also includes magazines or websites you might have read.
[INSERT RESPONSES FROM ABOVE – EVENTS OR ACTIVITIES AWARE OF. ONLY ASK IF NONE OF THESE NOT SELECTED]

63. How would you describe your experience of these activities/events/resources?
[ASK IF PARTICIPATED IN ABOVE SCIENCE EVENTS. INSERT EACH OPTION IF SELECTED ABOVE. SC]

INSERT EVENTS MENTIONED ABOVE	I hated it	I didn't really like it	Didn't like or dislike	It was ok	I really enjoyed it
National Science Week	1	2	3	4	5
F1 in Schools	1	2	3	4	5
Other events and activities participated in in the past 12 months	1	2	3	4	5

64. For this next question we'd like you to rate your general interest in science on a scale of 1-10 using a slider scale, where 1 is not interested at all and 10 is very interested.

    In the first slider scale, we'd like to know how interested you were in science before attending/participating/engaging with any of the earlier mentioned science activities/events/resources.

    Then in the second slider scale, we'd like to know your interest in science after attending/participating/engaging with at least one of these science activities/events/resources.
    [ASK IF BEEN TO AT LEAST ONE EVENT]
    [INSERT SLIDER SCALE BELOW]

Before	1
After	2

65. Now we would like you to rate your interest in studying science, technology, engineering or mathematics subjects at school/university/VET on a scale of 1-10 where 1 is not interested at all and 10 is very interested.

    In the first slider scale, we'd like to know how interested you were in studying science, technology, engineering or mathematics before attending/participating/engaging with any of the earlier mentioned science activities/events/resources.

    Then in the second slider scale, we'd like to know your interest in studying science, technology, engineering or mathematics after attending/participating/engaging with any of the earlier mentioned science activities/events/resources.
    [ASK IF BEEN TO AT LEAST ONE EVENT]
    [INSERT SLIDER SCALE BELOW]

Before	1
After	2

STEM CAREERS EXPLANATION: *There are a huge variety of industries you can work in with a STEM degree. Just a few examples include: information technology; mining; construction of cars; aeroplane and rocket design; medical instrument design; wind turbine and solar panel design and construction; environmental contaminant testing; fisheries; curating natural history exhibitions; 3D printing; sustainable fashion; and mathematical modelling of the impact of humans on the planet.*

66. Based on this information, has your interest in getting a STEM degree changed?
    [ASK ALL 15+]

Much more interested	1
A bit more interested	2
About the same as before	3
A bit less interested	4
Much less interested	5