Youth in STEM Research

2019

Australian Government
Department of Industry, Innovation and Science

YouthInsight
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Report contents

- Background
- Objectives
- Sample Design and Weighting
- Summary of findings
- Detailed Findings

Background

In a world of constant change, it is critical that the Australian population has the right skills to take advantage of the opportunities presented by the technological and innovative advancements happening around the world. An understanding of science, technology, engineering and mathematics (STEM) is invaluable to developing these skills.

It's not just our scientists and coders who need STEM skills. STEM knowledge and skills lead to new products, more efficient services, and a more diverse, resilient and sustainable economy across all sectors.

In light of this, the Department of Industry, Innovation and Science commissioned YouthInsight to conduct a nationwide study of Australian students' attitudes and behaviours towards STEM education and careers in STEM-related fields.

The study was carried out online, and surveyed 2,000 students aged between 12 and 25 years from all states and territories. The results provide a national benchmark of awareness and perceptions held by young Australians towards STEM.

Nurturing and tapping into the entire pool of STEM talent will support a more innovative, inclusive and prosperous economy. As such, this report particularly focuses on the gender inequity found throughout STEM education and careers.

Research Objectives

The principal objective of the study was to create a national benchmark of young Australians' awareness and perceptions of STEM subjects and STEM-related careers, with a particular focus on the difference between male and female students.

More specifically, the study looks at:

- Evaluating the perceived importance of STEM subjects to students
- Determining student interest in considering further STEM education
- Determining student interest in STEM careers
- Assessing young Australians' engagement with STEM outside of education
- Understanding student awareness of STEM-related careers
- Identifying barriers and enablers to STEM careers
- Understanding the factors that influence career choices
- Determining student perceptions of technological advancements

Sample Design and Weighting

To ensure survey results are representative of the population of interest, rim weighting is used to correct for under or over representation of sub-groups within the survey respondents

The three major factors used in the rim weighting process were gender, age and state.

Age and gender: An equal balance of males and females within each age group (while taking into account those who do not identify with binary genders).

Sample of respondents aged 12 to 13 fell short of the target and hence other age groups were slightly inflated to still ensure we achieved final quota of 2,000 respondents.

State: The sample was weighted based on on ABS state population distribution.

Gender			
	Sample	**Target**	**Weighted sample**
Male	43%	50%	49%
Female	55%	50%	49%
Non-binary	2%	0%	2%
Age			
	Sample	**Target**	**Weighted sample**
12 to 13	4%	14%	6%
14 - 17	31%	29%	32%
18 -21	37%	31%	33%
22- 25	28%	26%	29%
State			
	Sample	**Target**	**Weighted sample**
NSW	36%	32%	32%
VIC	29%	26%	28%
QLD	14%	20%	18%
WA	12%	11%	11%
SA	6%	7%	7%
ACT	2%	2%	1%
TAS	1%	2%	2%
NT	0%	1%	1%

X

Education and Career

Summary of findings

- Looking at the elective subjects currently being undertaken and considered in the future, it's evident that STEM subjects are amongst the most popular and gaining popularity.
- This increase in popularity is evident from the average of 4 STEM subjects being undertaken by current Year 11 and 12 students compared to the average of 6 STEM subjects which current Year 9 and 10 students intend to select in their senior year of high school.
- Parents are the most influential people for students (54%) when it comes to selecting their subjects followed by friends (30%) and teachers (24%). Other top influencing factors when selecting subjects include students' own interests and skills/abilities.
- There are strong future intentions of studying STEM-related subjects with 46% of people considering future study in this area. This is driven more by males (52%) compared to females (40%).
- 7 out of 10 young people have some level of certainty about their future career. Of these, 31% are considering STEM-related roles, although this is strongly driven by males (41% vs 20%).
- The most popular profession among this young cohort is in the medical field as 'doctors' or 'nurses' followed by 'business ownership' and 'I.T'.
- The most popular STEM-related careers include 'computing or I.T.' (11%), 'Scientist' (11%) and 'Engineering' (10%).
- When choosing a career, 'good working conditions', 'job security' and 'interesting work' rank as the most important factors across all age groups and genders.

Awareness and attitudes

Summary of findings

- 62% of all respondents correctly spelled out the 4 subjects making up the STEM acronym, while 20% admitted to not knowing and the remaining 18% gave incorrect answers, with most tripping up on the letters ‘E’ and ‘M’.
- Spontaneous responses about what jobs a STEM degree/certificate can qualify people for saw a strong association with Engineering, with 7 out 10 people citing some form of engineering profession. ‘Scientists’ (43%), ‘educators’ (29%) and ‘mathematicians’ (23%) were other popular career associations.
- 8 out of 10 agree that ‘scientists make a positive impact on the world’ and 64% say ‘learning about science and technology is fun’.
- There is low engagement with parents with only around half saying that their ‘parents think it’s important to learn about science and technology’ and 43% ‘discussing science and technology with the family’.
- Over half of all people surveyed express a general interest in Science (64%), Technology (65%) and Maths (50%), however, only 42% claim to be interested in Engineering, which is concerning given this is the career most associated with STEM.
- There is a strong perception that knowledge and skills in all STEM subjects is important for future employment opportunities, with Technology (85%) and Maths (79%) ranking as most important.
- Engineering also recorded a high overall importance level of 59% but was significantly lower compared to other STEM subjects, with most people explaining that they feel it’s too specific a set of skills which are not required in most careers. However, it’s also evident that the majority of young people have a very low understanding about what Engineering entails.

Awareness and attitudes…(continued)

Summary of findings

- Two thirds of all people feel confident they could achieve good results in Science, Technology and Maths, but only 38% feel the same way about Engineering.
- The main reason for low confidence in Science, Technology and Engineering is lack of interest in these subjects, while for Maths it's more related to student's mindset that they're simply not good with numbers.
- Low levels of understanding of what Engineering entails coupled with perceptions of it being a very 'hard' subject are also major factors for the overall lower levels of engagement with this subject. This was seen with both genders but more pronounced among females.
- Similarly, the ambiguity of the term 'Technology' plays a part in students' lower confidence levels with many not even considering the subject as they perceive themselves as 'non-techy' people.
- Just under half (45%) of people have attended science activities outside of school/study in the past 12 months, with one quarter attending more than one activity.
- 45% say that their interest in in studying Science, Technology, Engineering or Mathematics subjects in the future had increased as a result of attending an event.

Key gender differences

Summary of findings

- From an early age the overall **selection of STEM subjects significantly skews towards males,** with 70% currently undertaking at least one STEM subject compared to only 32% of female students in Year 9 and 10.
- In year 11 and 12, **both genders have high selection rate of STEM subjects**, but males still surpass females with 99% selecting at least one STEM subject compared to 91% of females.
- In **higher education 26% of students are currently undertaking a STEM-related course**, which is largely driven by male students at 35% compared to female students at 18%.
- However, based on what current Year 9 and 10 students are intending to study in their senior years of high school, we do see a **shift in balance between genders with 93% of males and 95% of females considering at least one STEM subject**.
- The **male skew does re-emerge with in higher education**, with 58% of males considering at least one STEM course, compared to 36% of females.
- In addition to current and future STEM subject selections, **female students also have generally less favourable attitudes towards STEM subjects** and in particular towards Engineering and Technology.
- **Interest levels for all STEM subjects is significantly higher among males**, with the biggest discrepancies seen in **Engineering** with 55% of males interested in the subject compared to only 28% of females, and **Technology** with 75% males interested compared to 54% females.

Key gender differences…(continued)

Summary of findings

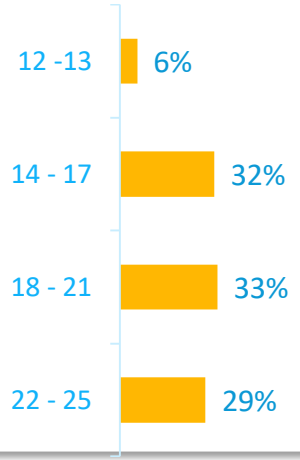
- Both genders have similar perceptions of the importance of skills and knowledge of STEM to secure future employment. **Over 70% of all respondents say it's important to have skills in Science, Maths and Technology**, while with Engineering, 65% of males agree of the importance compared to 54% of females.
- Following the same trend is **confidence in STEM**, where **both genders have similar confidence levels in achieving good results in Maths and Science** (60% say they're 'very' or' somewhat' confident), however, the **gap is much wider with Engineering** and **Technology**, where males recorded confidence levels of 50% and 74% for Engineering and Technology respectively compared to females with only 26% and 56%.
- Overall **males show higher levels of excitement towards science and technology**, have **higher levels of engagement** and a **higher proportion want to follow a career** in the related fields.
- The **majority of young people (81%) disagree that there is any gender superiority in STEM subjects**, however **Engineering** (24%) and **Technology** (20%) had highest proportion of respondents agreeing that **'boys are better than girls'**, which was driven more by male respondents.
- When asked to evaluate a list of professions and indicate if they were more male or female type jobs, the **majority of careers were seen as gender-neutral**, however, certain professions such as 'labourer' and 'technician' skewed male, while 'hairdresser' and 'community and personal services' skewed female.

Detailed Findings

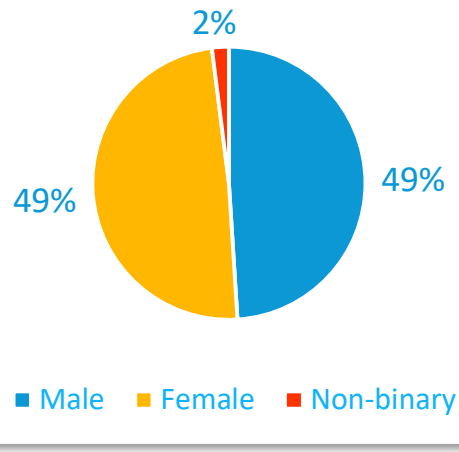
Correction: Country of birth - 84% and 16%

Demographic overview

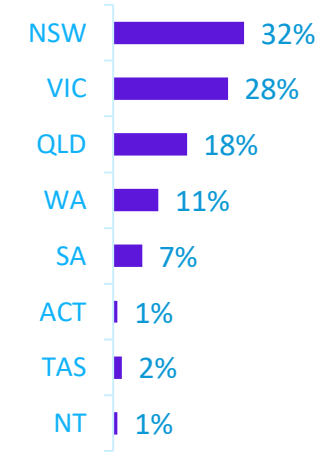
Age



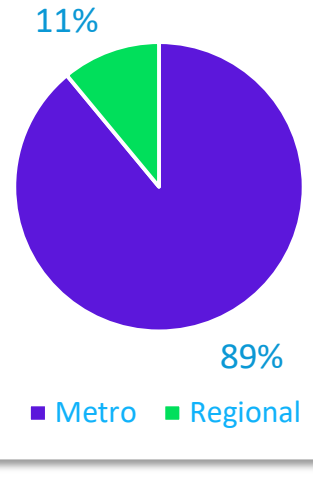
Gender



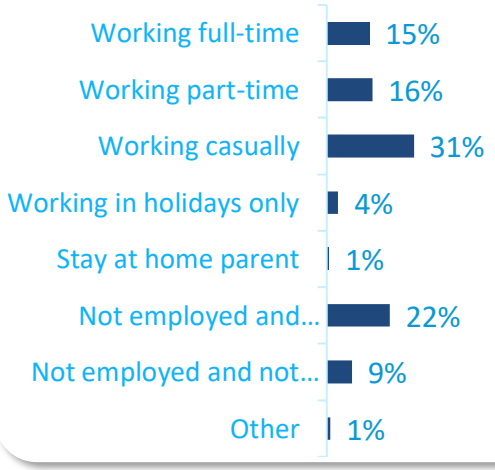
State



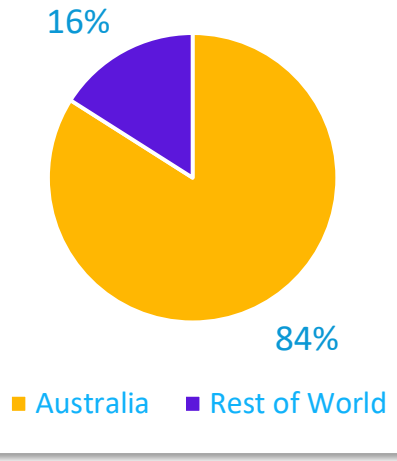
Region



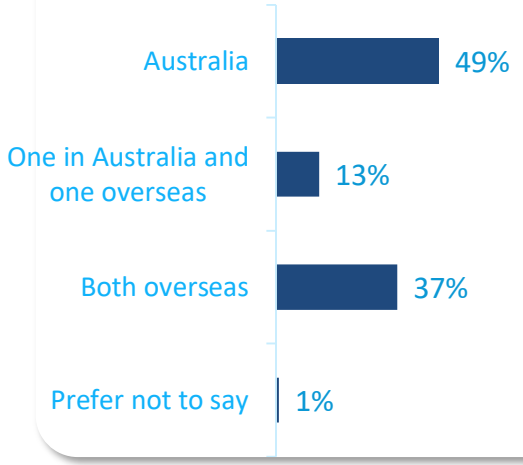
Employment Status



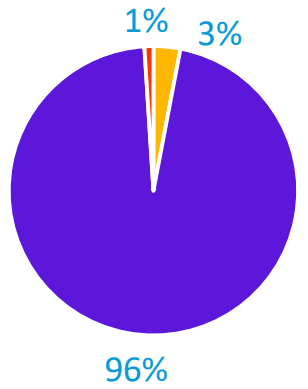
Country of Birth



Parents' Country of birth



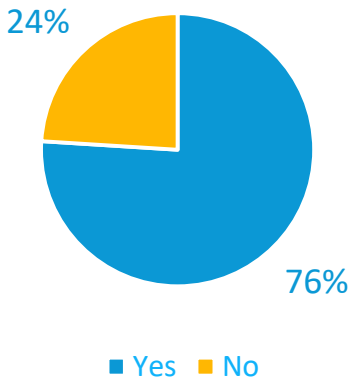
ATSI



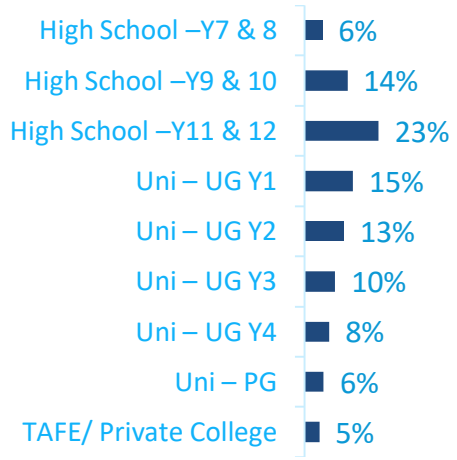
Education overview

Correction: Unrelated to STEM – 79%, STEM related – 26% (or 18% if remove trades), unemployed 4%, don't know 6%, other 14%

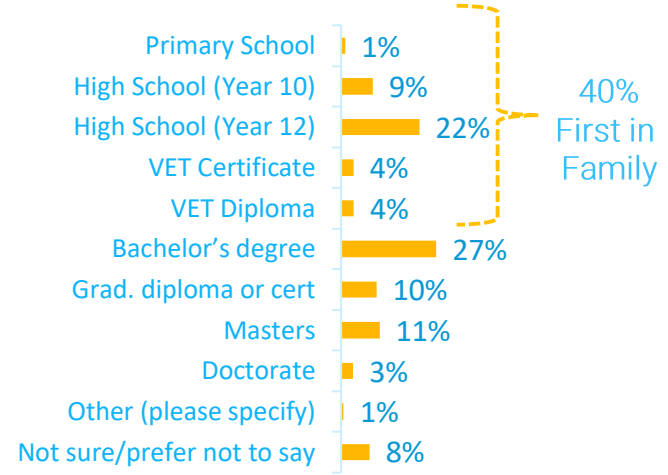
Currently Studying



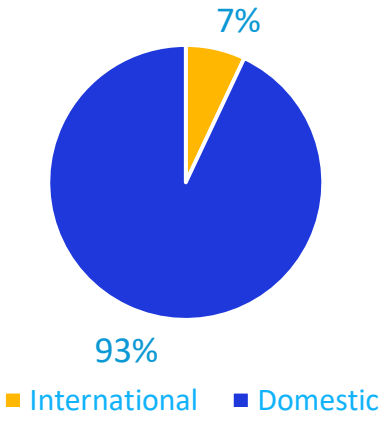
Year of Study



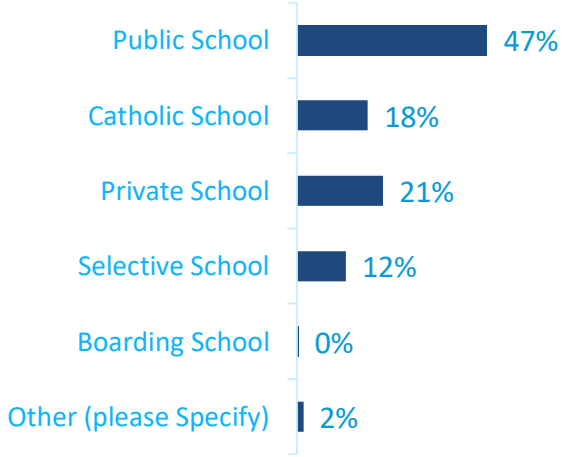
Parents' Highest Level of Education



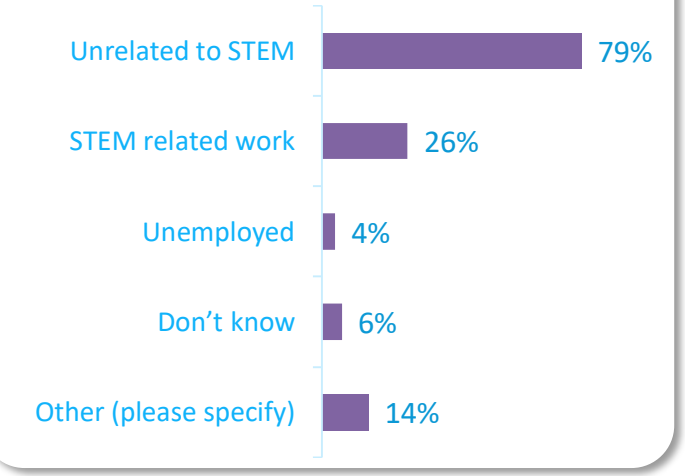
Student Type



Type of School



Parents' Employment



Learning area groupings and STEM subjects Years 9 and 10

Human Society & its Environment (HSIE) - Human Society and Its Environment - Business Studies, Economics, History, Legal, Geography, History (Modern, Ancient), History Extension, Human Society and Its Environment, Aboriginal Studies, Society and Culture, Studies of Religion, Citizenship and Legal Studies, Work and the Community Life Skills, Work Studies

Technologies - Agricultural Technology, Design and Technology, Food Technology, Graphics Technology, Industrial Technology, Information and Software Technology, Textiles Technology

Arts - Music, Visual Arts, Dance, Drama, Photography and Digital media

PDHPE - Child Studies, Physical Activity, Sports Studies

Mathematics - Advanced Maths, Maths Extension

Languages

VET - VET Courses in Years 9 and 10

STEM - Geography Elective, Agricultural Technology, Design and Technology, Graphics Technology, Industrial Technology, Information and Software Technology

Learning area groupings and STEM subjects Years 11 and 12

- Mathematics – General, Advanced, Extension
- HSIE - Human Society and Its Environment - Business Studies, Economics, History, Legal, Geography, History (Modern, Ancient), History Extension, Human Society and Its Environment, Aboriginal Studies, Society and Culture, Studies of Religion, Citizenship and Legal Studies, Work and the Community Life Skills, Work Studies
- Science - Chemistry, Biology, Physics, Extension, Earth and Environmental Science, Physical World Science Life Skills, Investigating Science, Earth and Space Science, Living World Science, Chemical World Science
- English – Advanced, Extension, Other
- Technologies - Agriculture, Computing Applications, Design and Tech, Engineering Studies, Food Tech, Industrial Tech, Information Processes and Tech, Marine Studies, Software Design and Development, Technology Life Skills, Textiles and Design
- PDHPE - Community and Family Studies, Sport, Lifestyle and Recreation Studies, Exploring Early Childhood
- Creative Arts - Visual Arts, Music, Drama, Creative Arts, Dance, Ceramics, Visual Design, Photography, Video and Digital Imaging
- Languages
- VET - Hospitality, Automotive, Construction, Business Services, Entertainment Industry, Tourism, Travel and Events, Human Services, Metal and Engineering, Primary Industries, Electrotechnology, Retail Services, Financial Services, Information and Digital Technology
- STEM - Mathematics, Biology, Chemistry, Mathematics Advanced, Mathematics Extension, Physics NEW, Automotive (VET), Information and Digital Technology (VET), Metal and Engineering (VET), Electrotechnology (VET), Industrial Technology, Agriculture, Engineering Studies, Information Processes and Technology, Geography, Design and Technology, Investigating Science NEW, Software Design and Development, Science Extension, Computing Applications, Living World Science, Earth and Environmental Science, Marine Studies, Chemical World Science, Earth and Space Science

STEM grouping higher education and STEM careers

STEM Higher Education Subjects - Agriculture, Computing and Information Technology, Engineering and Technology, Environmental Studies, Earth and Environmental Studies

STEM Career Groupings - Computing or information technology (IT), Engineer, Inventor, Mathematician, Scientist, Technician or trade worker (mechanic, electrician)

X

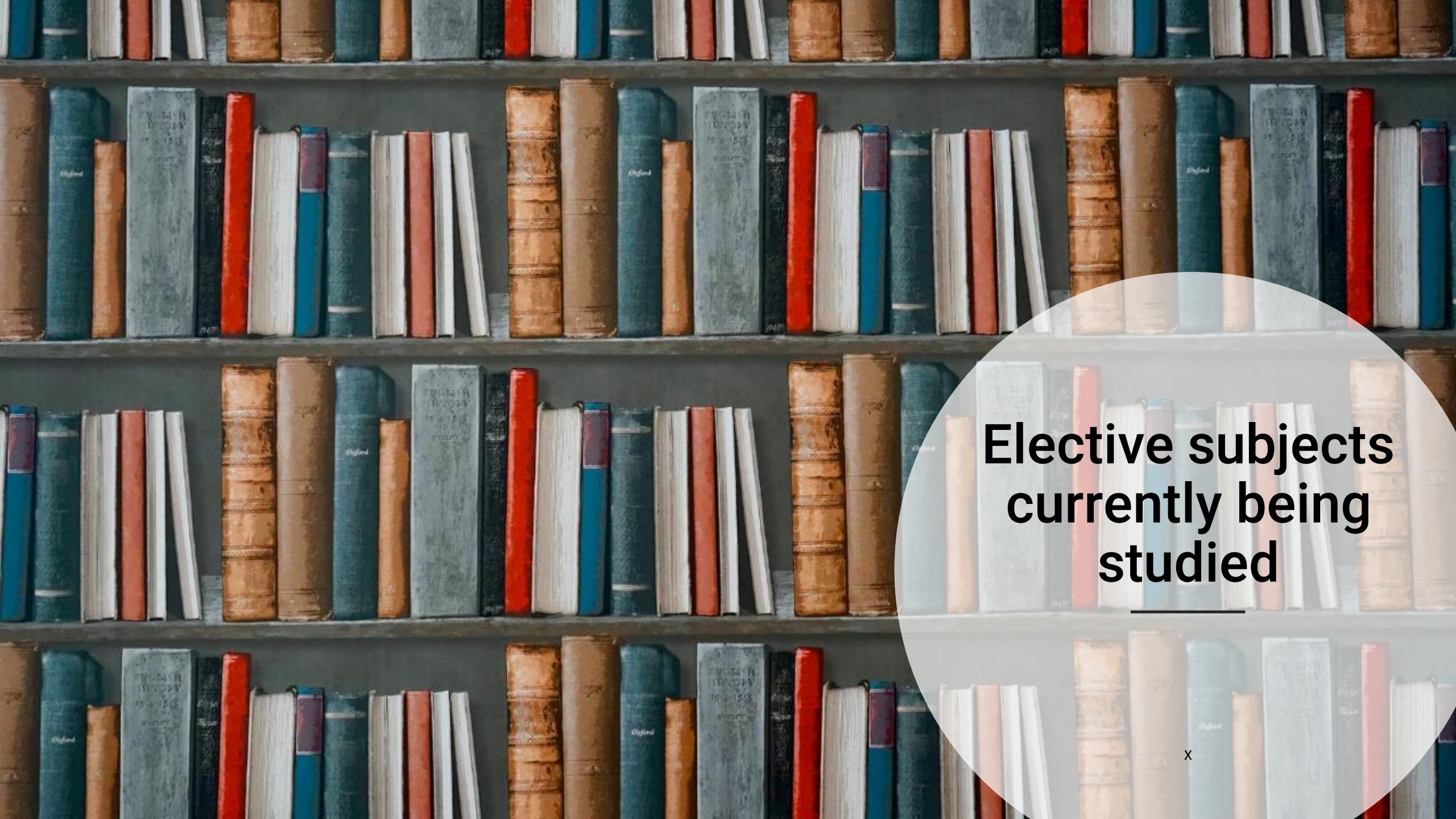
Significance testing

Throughout this report significant differences between respondent groups have been highlighted using the following symbols. These symbols highlight differences that are significant at a confidence level of 95% and a confidence interval of ±3%

▲ ▼ : Significantly higher or lower compared to the total population

▲ ▼ : Significantly higher or lower compared to males

▲ ▼ : Significantly higher or lower compared to females



Elective subjects currently being studied

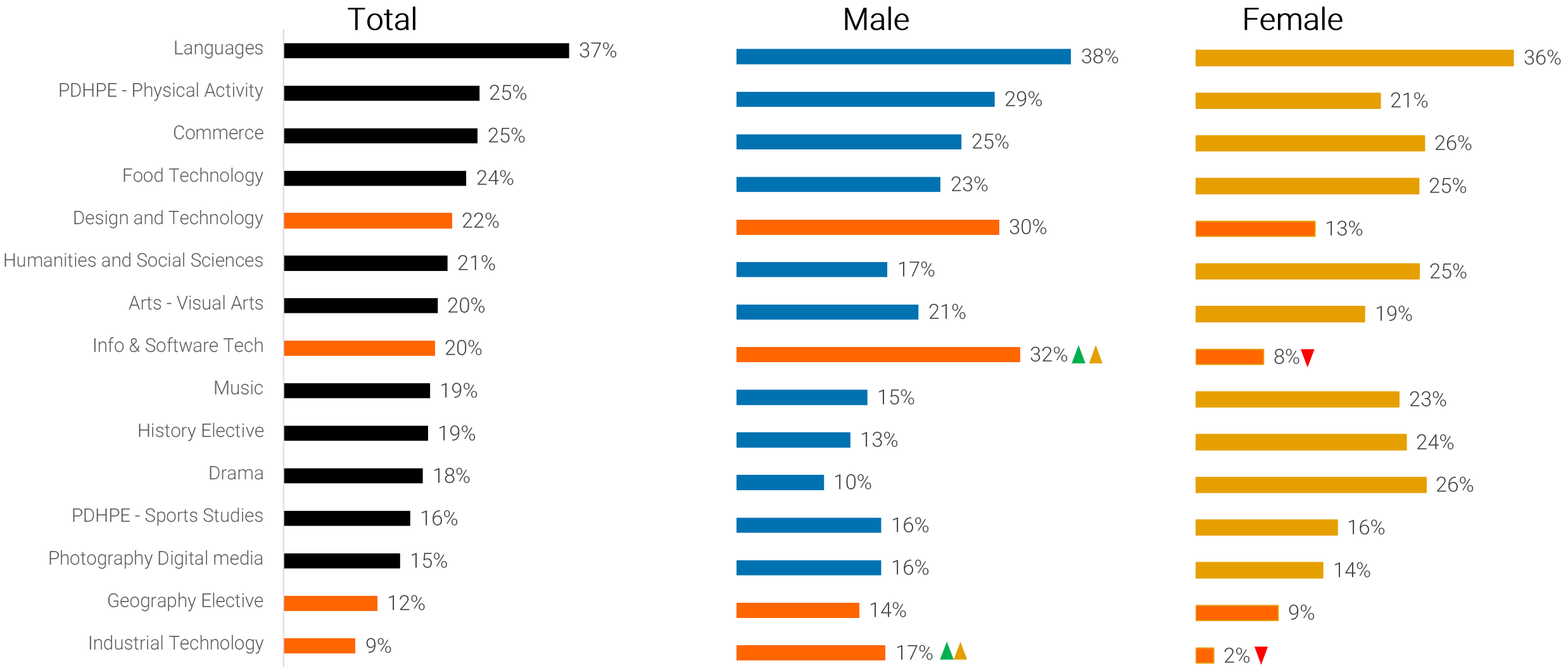
X

Year 9 and 10 current elective subject selections

From as early as Years 9 and 10, the overall selection of STEM subjects significantly skews towards males, with 70% selecting at least one STEM subject compared to only 32% of females.

- Languages is the most popular elective subject for Years 9 and 10 students (36%). Of the top 15 elective subjects currently selected, 3 are STEM subjects; Males have 4 in their top 15 and females have 2.
- Of all subjects selected by Year 9 and 10 students, the most salient differences between genders is Information and Software Technology and Industrial Technology which both significantly skew towards males.
- Within the learning area groupings, Technologies is the outright preferred among males with 74%, while females are divided between HSIE and Creative Arts with 66% preference for both.
- The only STEM subject which (indicatively) scored higher with females was Agricultural Technology.

Year 9 and 10 current elective subject selections – Top 15



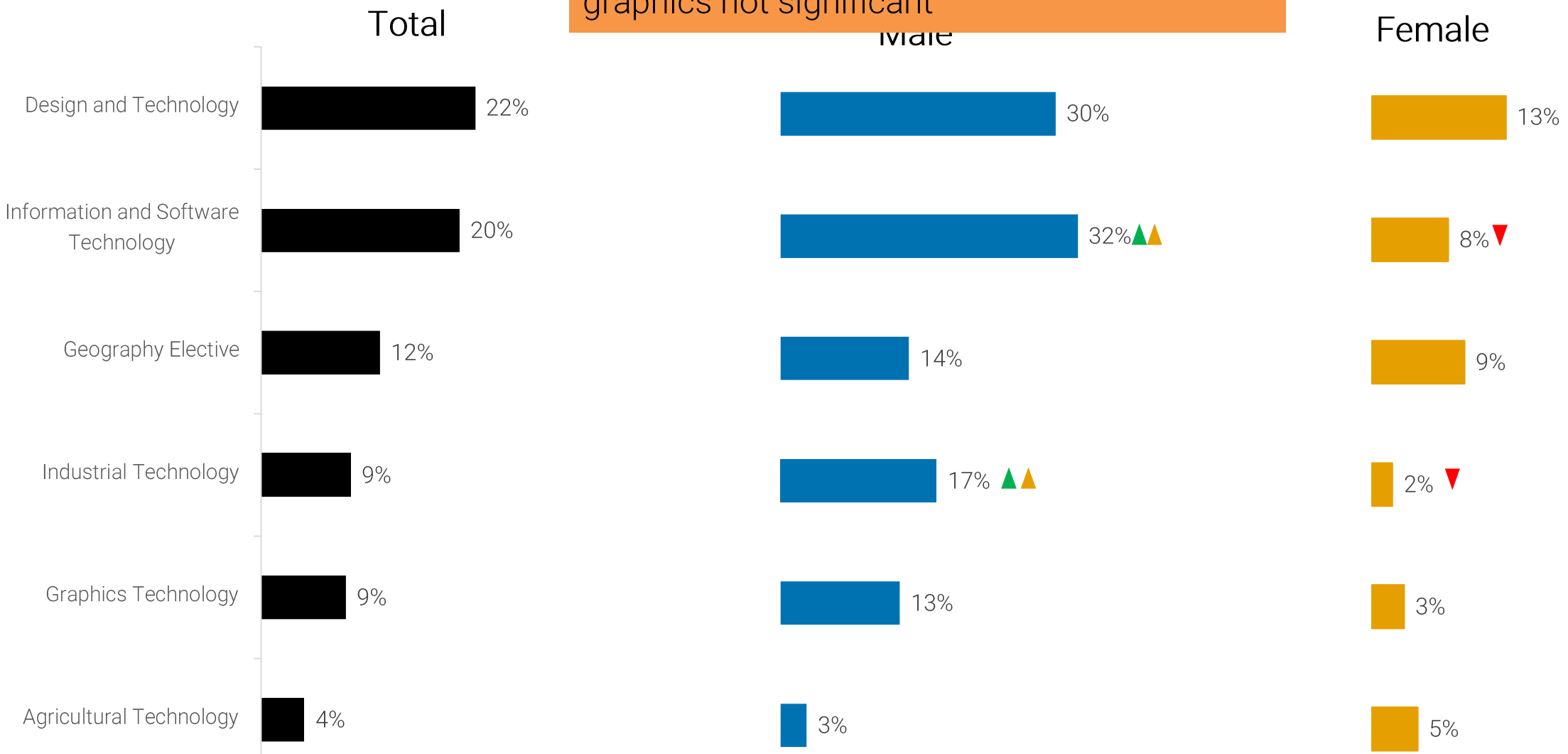
Q. Which of the following elective subjects best describes the subjects you have chosen to do in Years 9 and 10? Please select a maximum of 6 subjects and minimum of 3.
Base: Total – 194, Males - 104, Females - 87

Standard Maths and Science subjects are mandatory at this stage of school, hence they were not included in this question
*HSIE - Human Society and Its Environment

STEM Subjects.
▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Year 9 and 10 current elective subject selections – STEM Subjects only

Correction: Design and Tech not significant. graphics not significant



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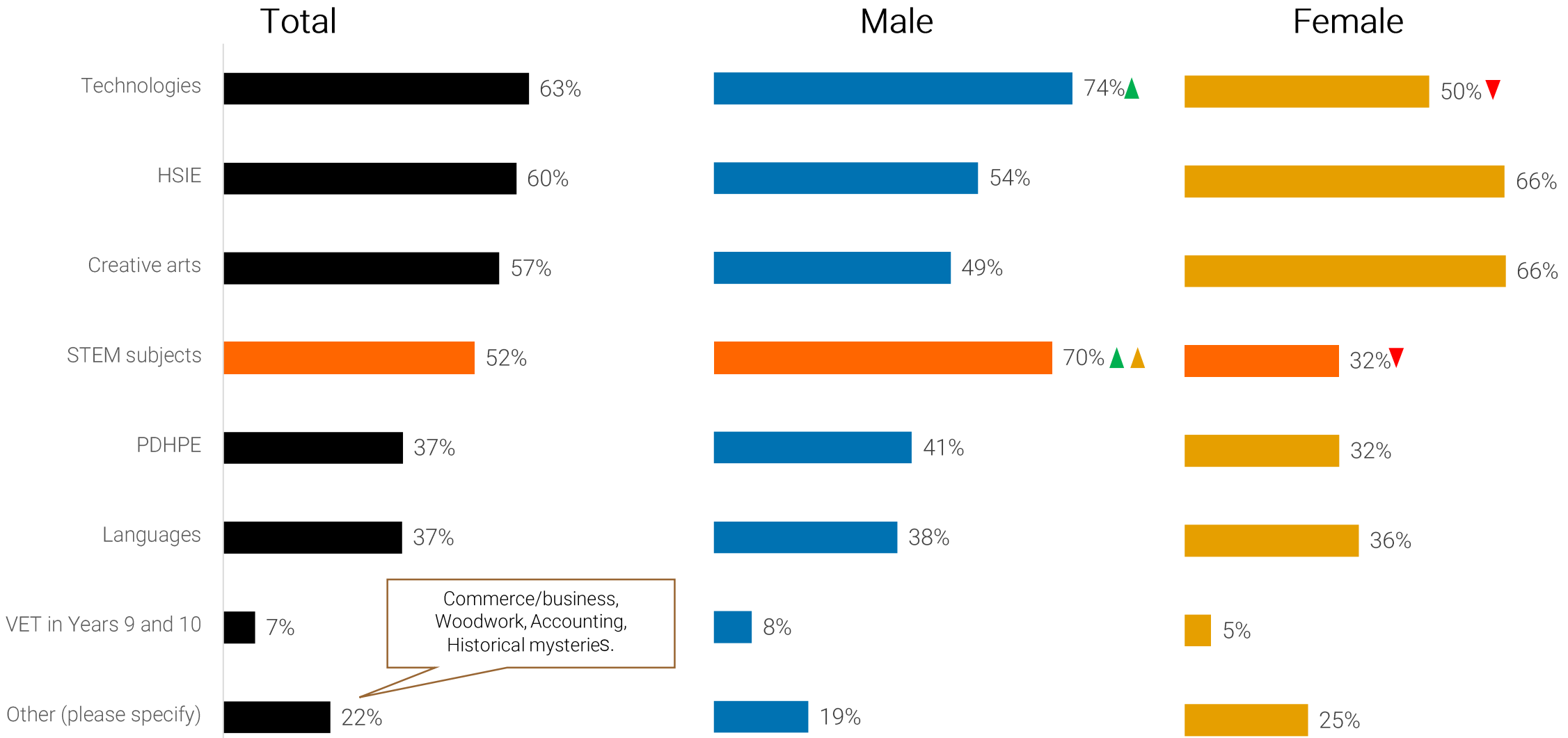
▲▼ Significantly higher/lower than counterpart.
Based on 95% confidence interval.

Year 9 and 10 current elective subject selections – Grouped by learning areas



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STEM Subjects.
▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

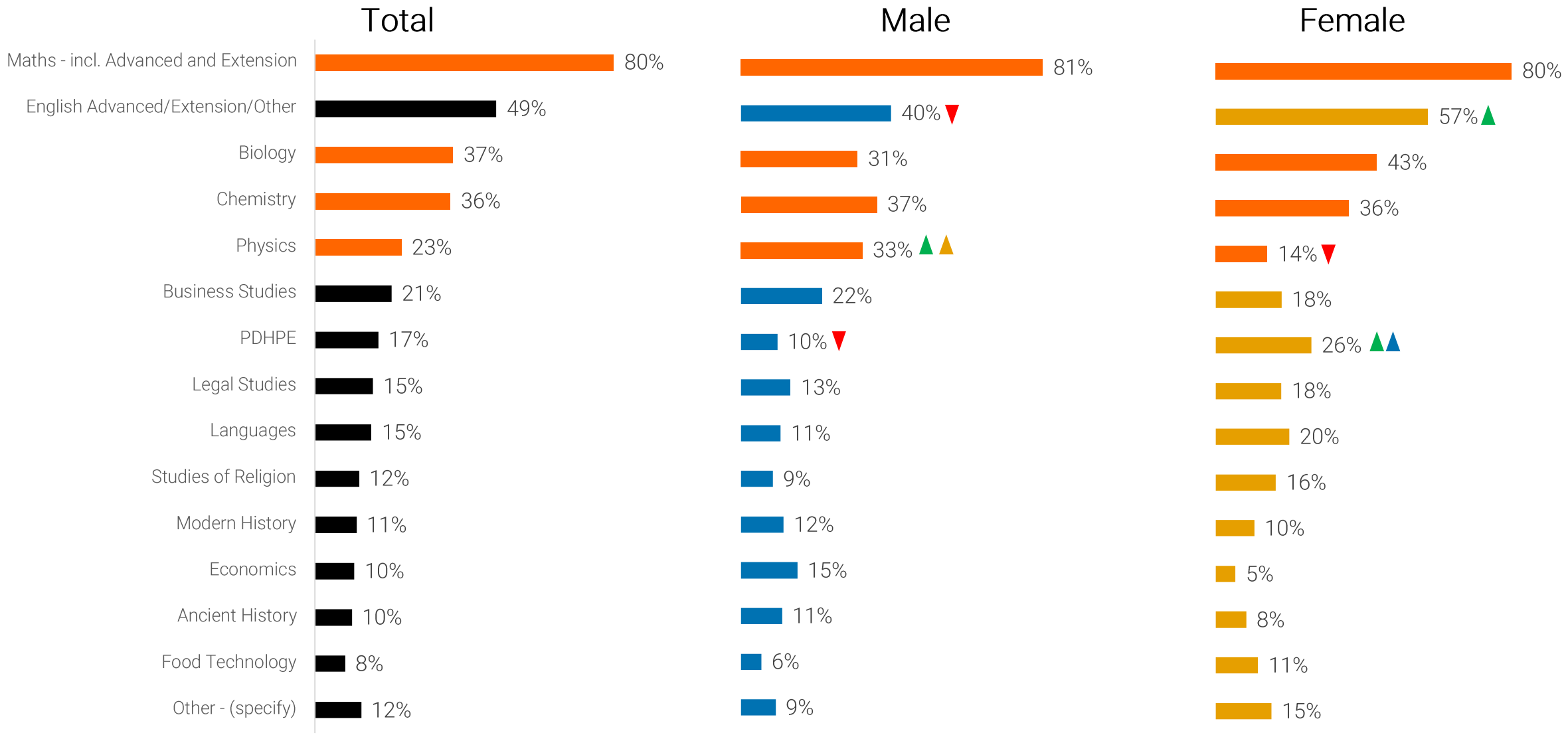
Year 11 and 12 current elective subject selections

Overall there is a high take-up of STEM subjects with almost all students selecting at least one of these subjects; males have a significantly higher take-up of these subjects compared female students.

- Mathematics ranks as the top elective subject for Years 11 and 12 with 4 out of 5 students choosing at least one of these subjects in their senior years. Of the top 15 elective subjects currently selected, 3 are STEM subjects; males have 5 in top 15 and females have 4.
- Of all subjects selected by Year 11 and 12 students, the largest discrepancies were seen with a significantly higher preference for PDHPE among females (26% vs 10% for males) while males favoured Physics (33% vs 14% for females).
- Among all STEM subjects the largest discrepancies between genders is the higher preference among male students for Maths Extension, Physics and VET courses. Biology was the only STEM subject preferred by female students.
- Within the learning area groupings, Mathematics is the preferred elective for both male and female students, with Science subjects and HSIE ranking in 2nd and 3rd for both genders.

Correction: Ancient History not significant

Year 11 and 12 current elective subject selections – Top 15



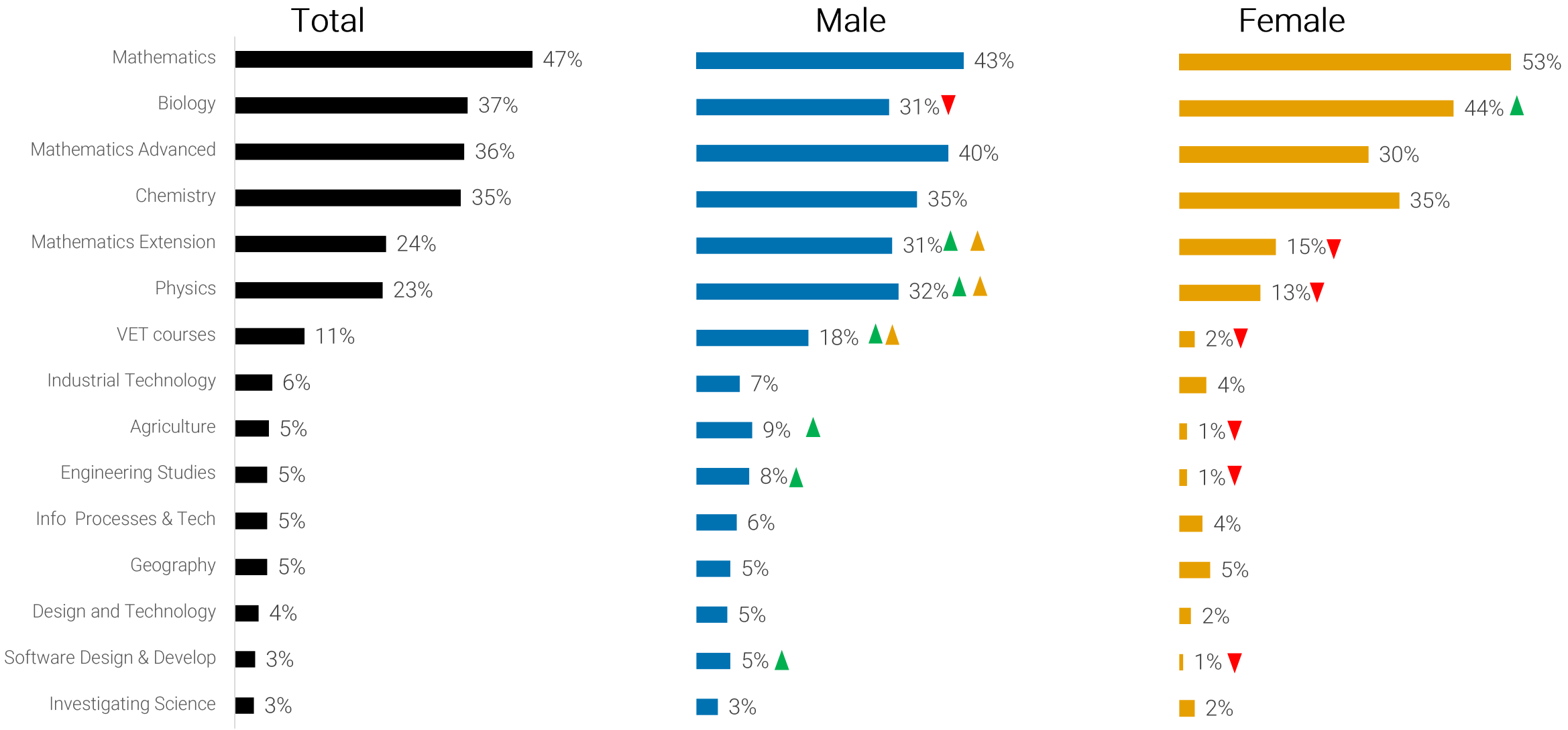
Q. Which of the following elective subjects best describes the subjects you have chosen to do in Years 11 and 12? Please select a maximum of 6 subjects and minimum of 3, Base: Total – 375, Males - 201, Females - 162

Standard English is mandatory at this stage of school, hence it is not included in this question

STEM Subjects.

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Year 11 and 12 current elective subject selections – STEM subjects only (Top 15)



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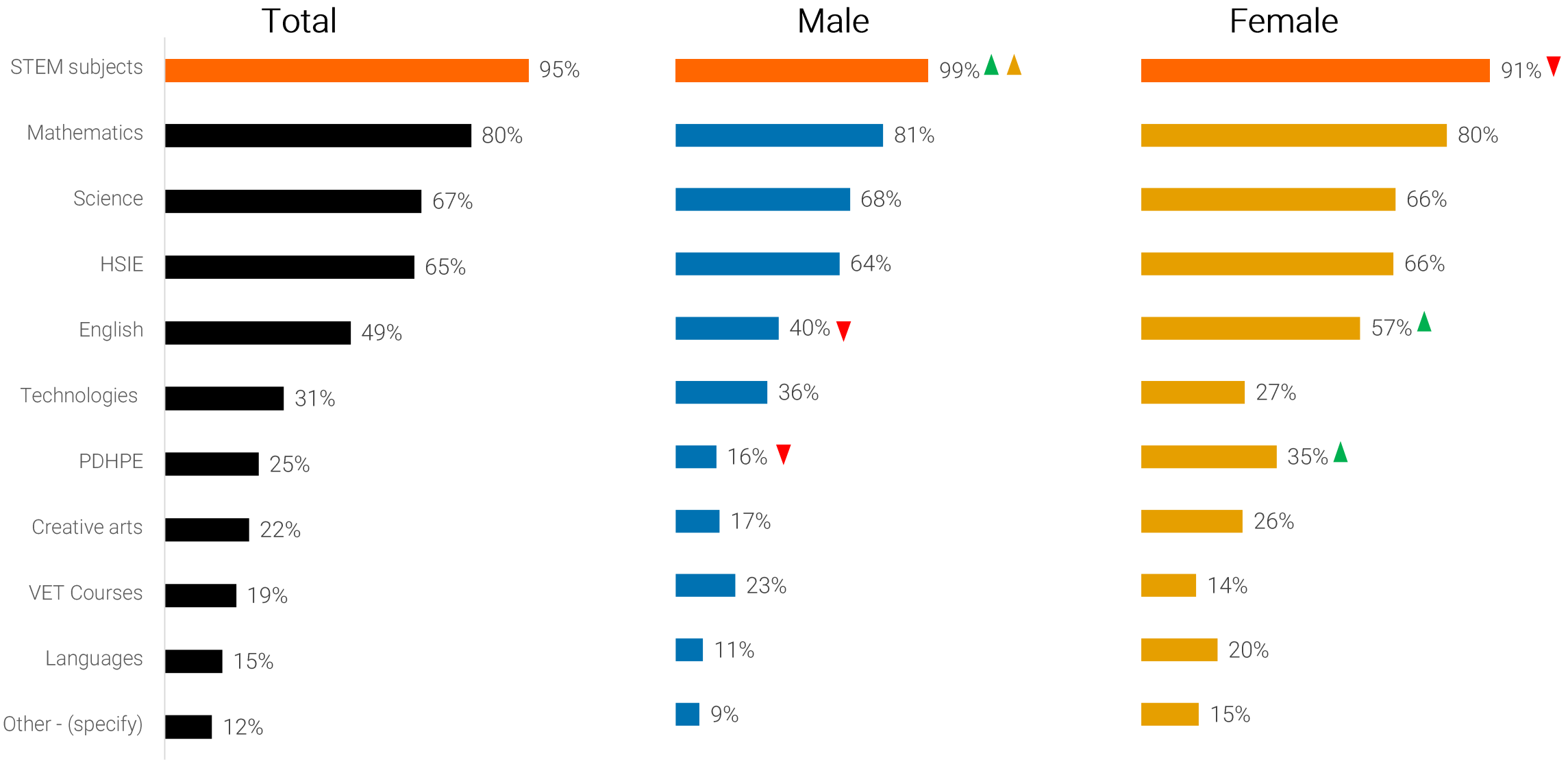
Standard English is mandatory at this stage of school, hence it is not included in this question

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Year 11 and 12 current elective subject selections – Grouped by learning areas



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Standard English is mandatory at this stage of school, hence it is not included in this question

STEM Subjects.

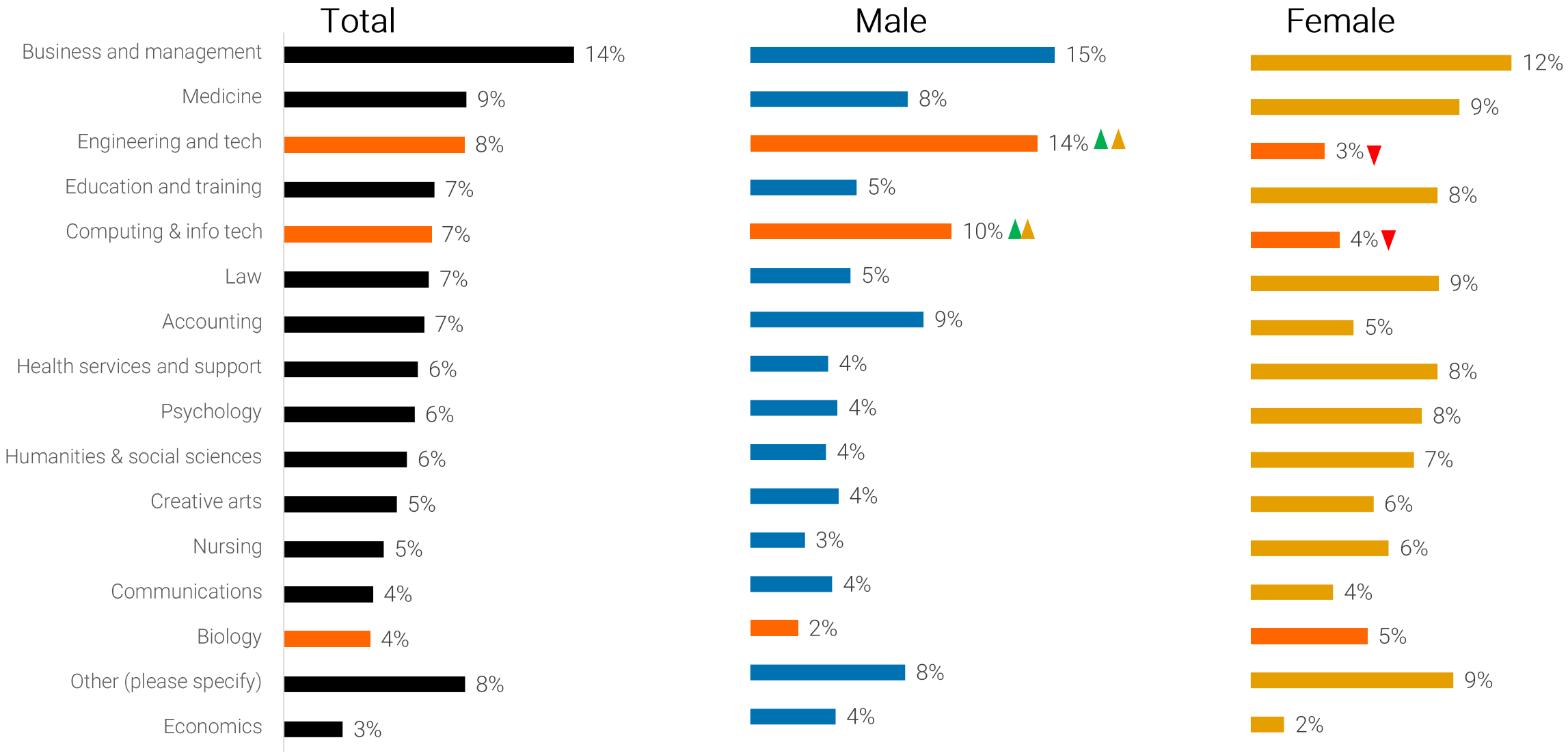
▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Higher education current course selections

Amongst higher education students, Business and Management (14%) is the number one course currently being undertaken followed by Medicine (9%).

- Of the top 15 courses, 3 are STEM courses. Males choose 4 STEM courses out of their top 15, and females choose 3.
- The major differences among the top 15 between genders is the male skew of two STEM courses, Engineering and Technology (14% vs 3%) and Computing and Information Technology (10% vs 4%).
- Overall, male students have a significantly higher STEM course selection compared to female students (35% vs 18% respectively).

Higher education current subject selections – Top 15



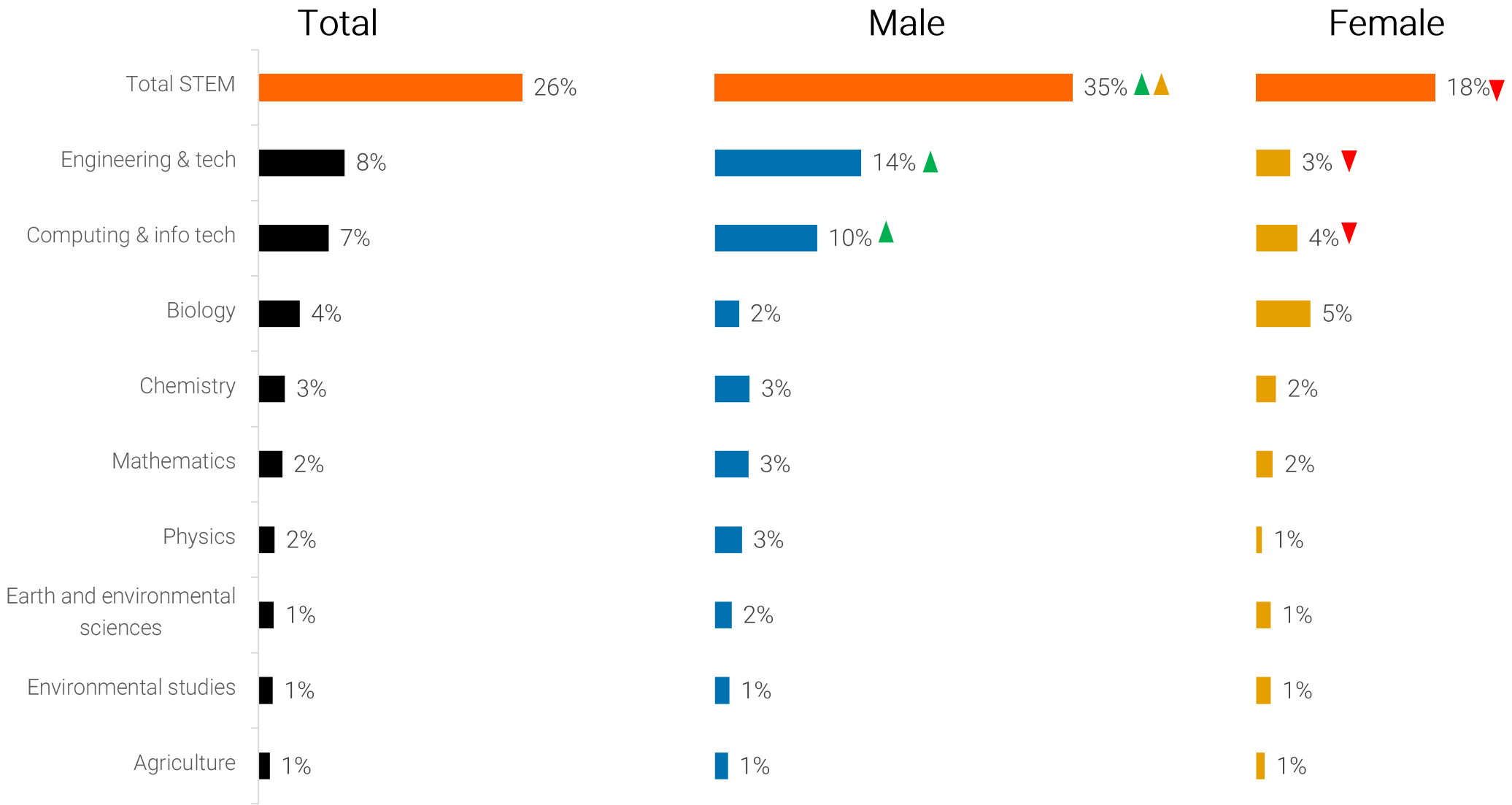
Q. Which of the below courses best describes the course you are currently studying in your higher education course? Please select a maximum of 2 subjects and minimum of 1
Base: Total – 929, Males -397, Females - 508

STEM Subjects.

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: Physics not significant and Comp & info tech – Females significantly lower

Higher education current subject selections – STEM subjects only



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Base: Total – 929, Males -397, Females - 508

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Future study intentions

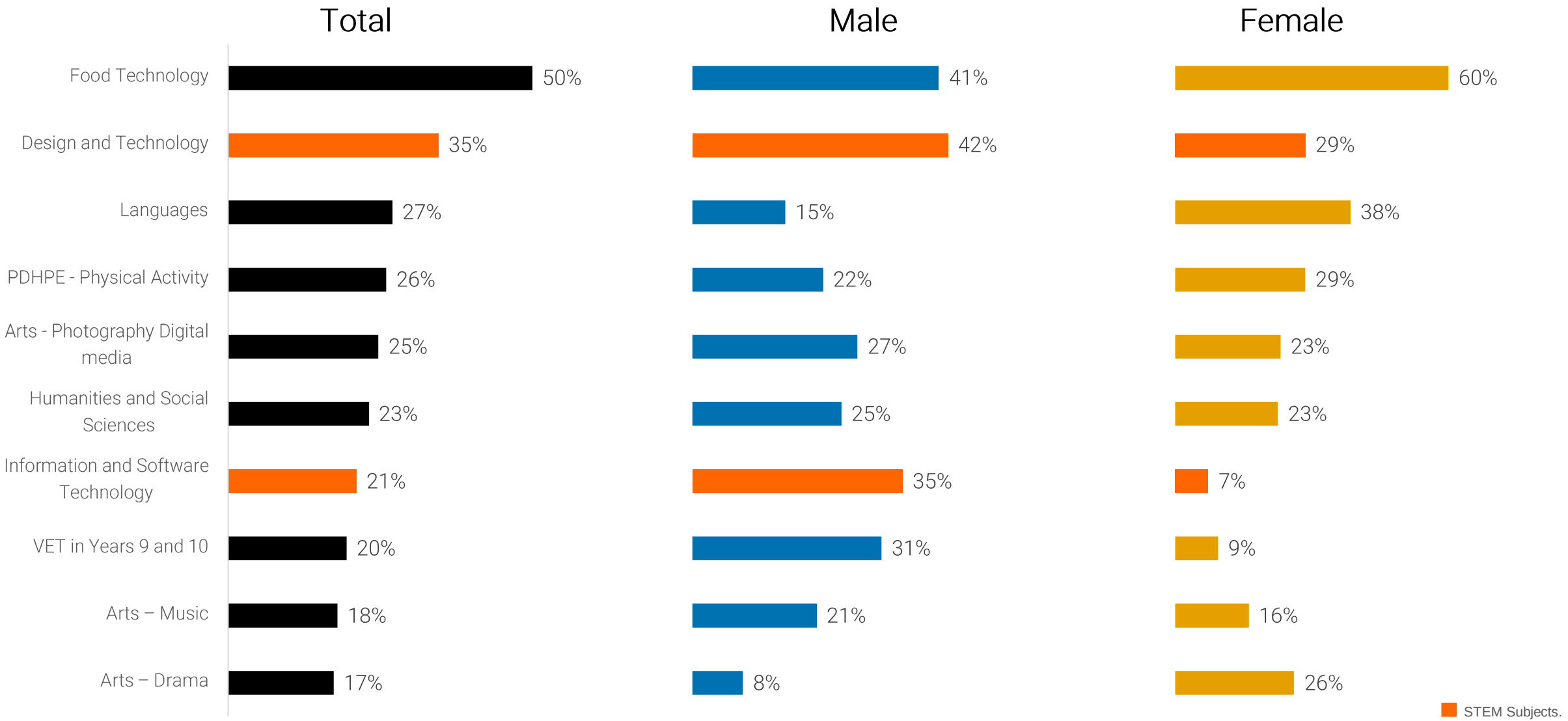
Elective subject intention for Years 9 and 10

Among their top 10 elective subjects to choose in Years 9 and 10, there were 2 STEM subjects. Males selected 4 STEM subjects out of their top 10, and females only 1.

- When asked which subjects they're planning on selecting in Years 9 and 10, the youngest students aged 12-13 are most likely to select Technology subjects (82%), with females equally as likely to select Creative Arts subjects.
- Overall, two out three students in Years 7 and 8 plan to select at least one STEM subject as part of their electives; however this is largely driven by males (84% vs 53%).

Caution: Small sample size.
Sig testing not applicable

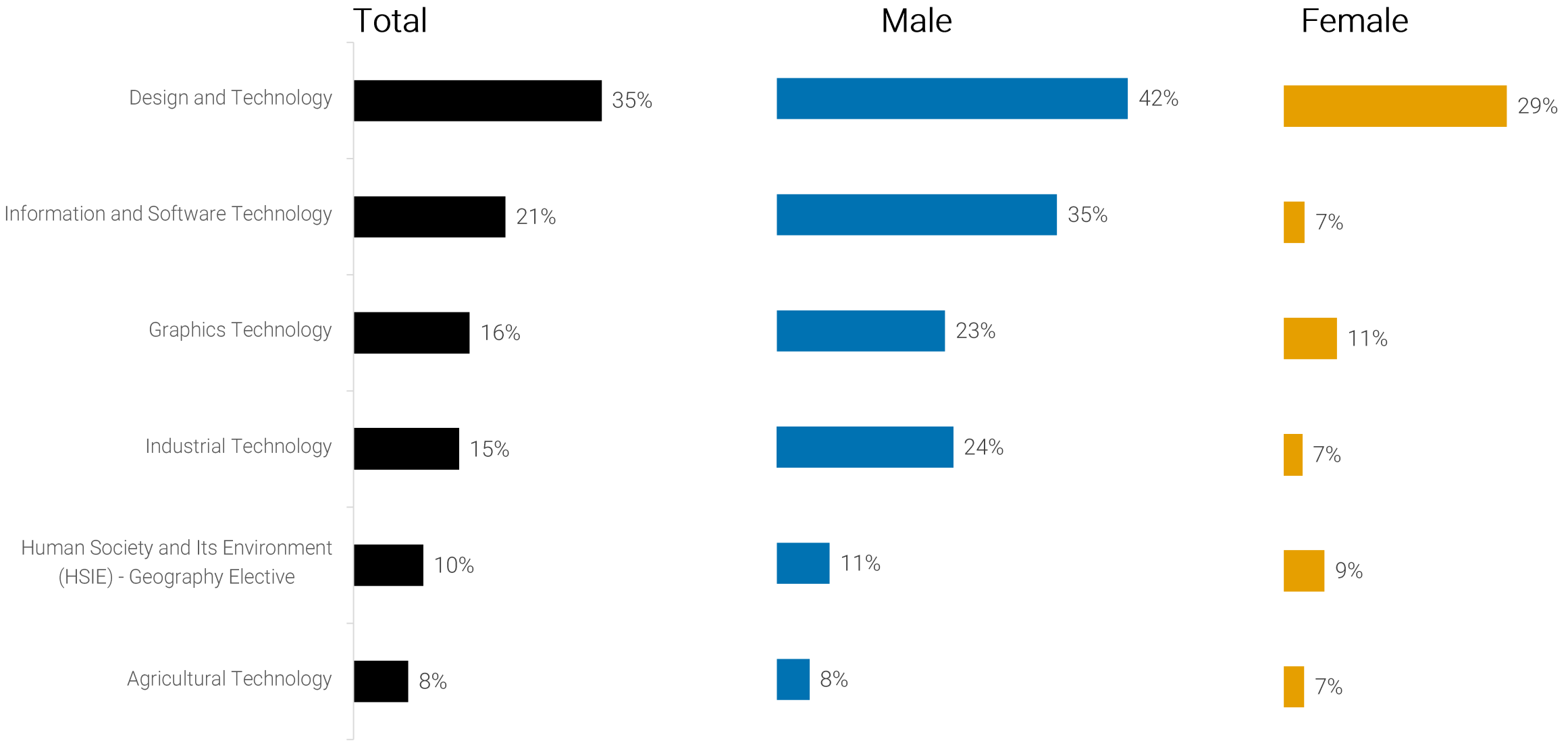
Elective subject intention for Years 9 and 10 – Top 10



Q. 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.Please select up to 5 subjects.
Base: Total – 65, Males - 24, Females - 40

Caution: Small sample size. Sig testing not applicable

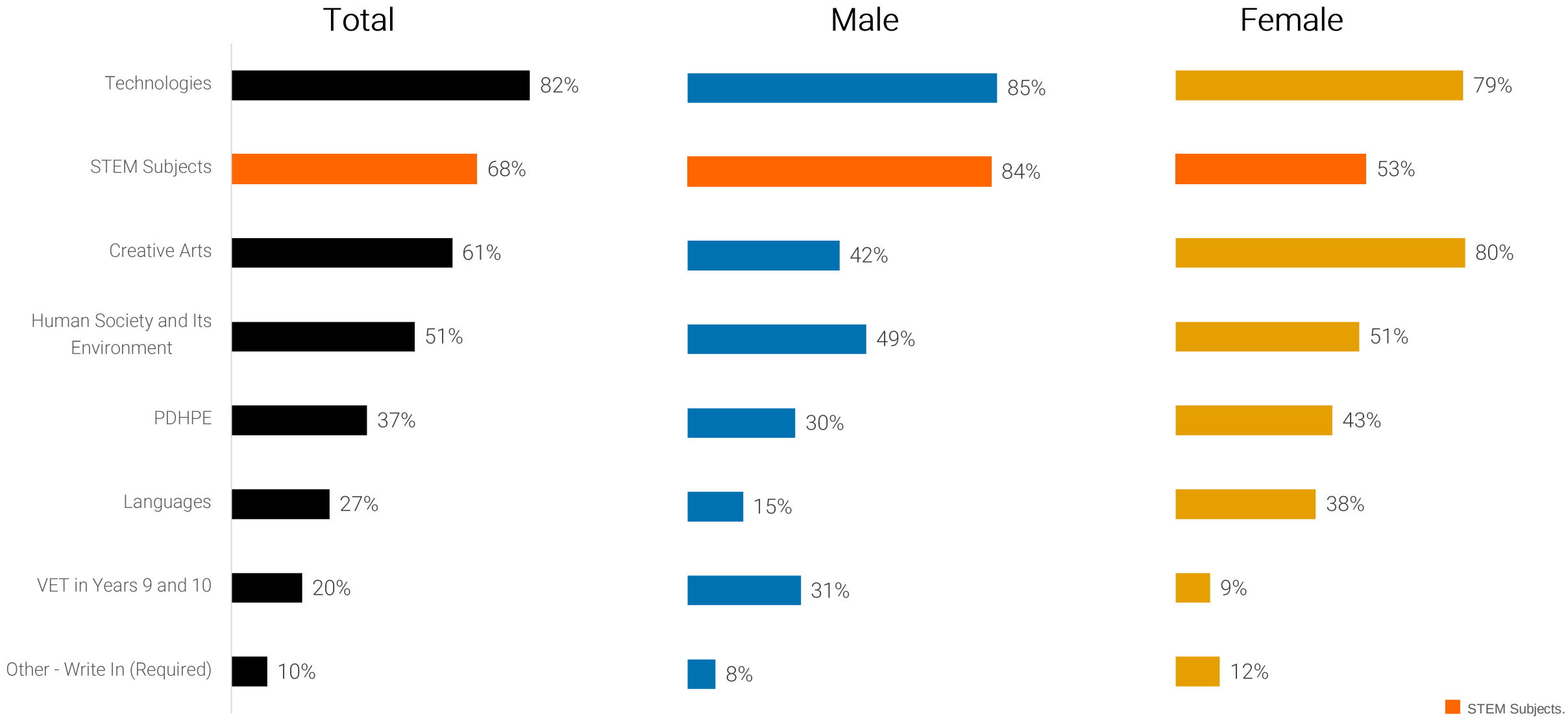
Elective subject intention for Years 9 and 10 – STEM Subjects only



Q. 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.Please select up to 5 subjects.
Base: Total – 65, Males - 24, Females - 40

Caution: Small sample size.
Sig testing not applicable

Elective subject intention for Years 9 and 10 – Grouped by learning areas



Q. 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. Please select up to 5 subjects.
Base: Total – 65, Males - 24, Females - 40

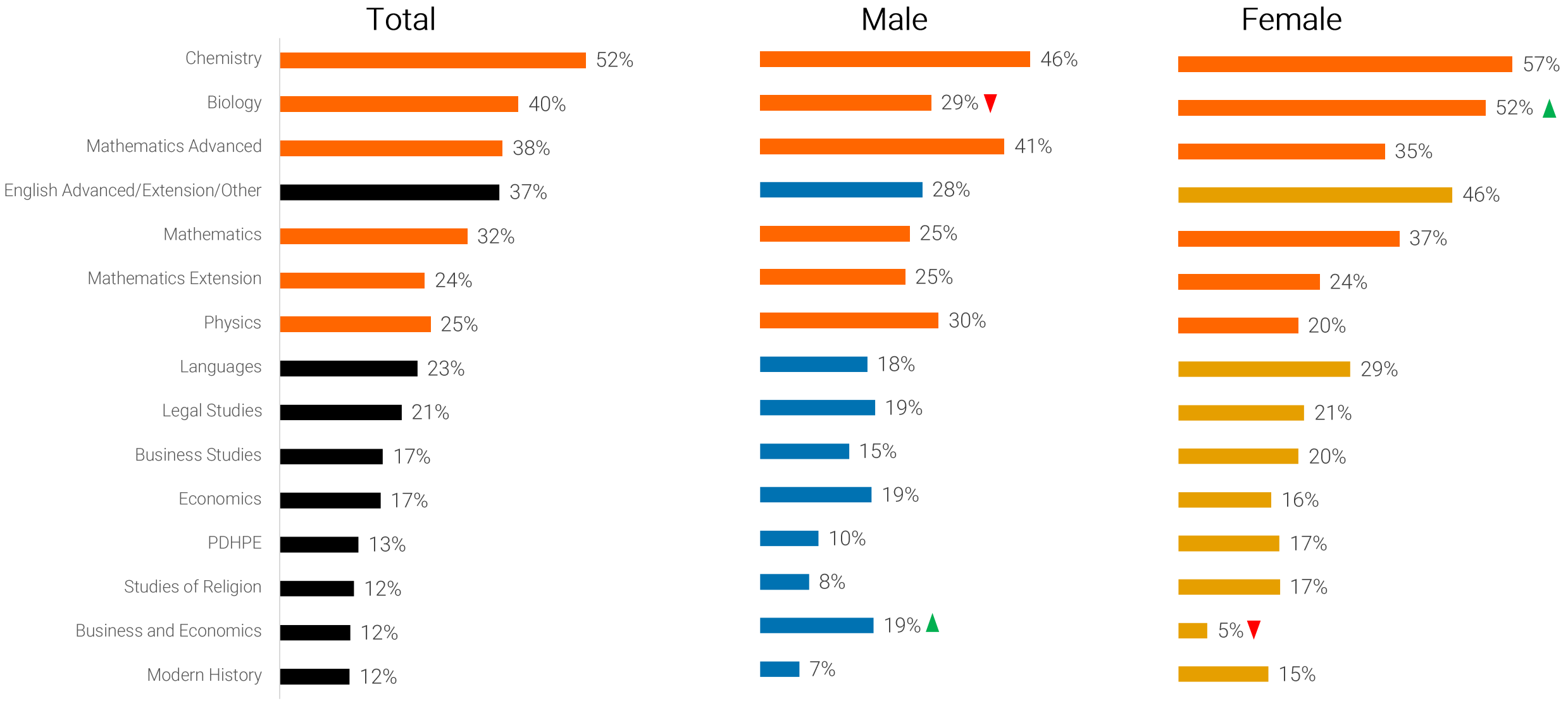
Caution: Small sample size. Sig testing not applicable

Elective subject intention for Years 11 and 12

Based on current subject selections and subjects intending to be selected, Year 11 and 12 is likely to see an increase in STEM subject selection from 4 to 6 subjects.

- Chemistry is the elective subject most students currently in year 9 and 10 intend to choose for in their senior years of high school with 52% of all students intending to select the subject.
- The second most popular subject was different among males and females with Biology ranking in second favourite among females (52% vs 29% males) and Mathematics Advanced for males (41% vs 35% females).
- Overall, 6 out of the top 15 subjects students intend on taking in years 11 and 12 are STEM subject; with males having as many as 8 and females 6.

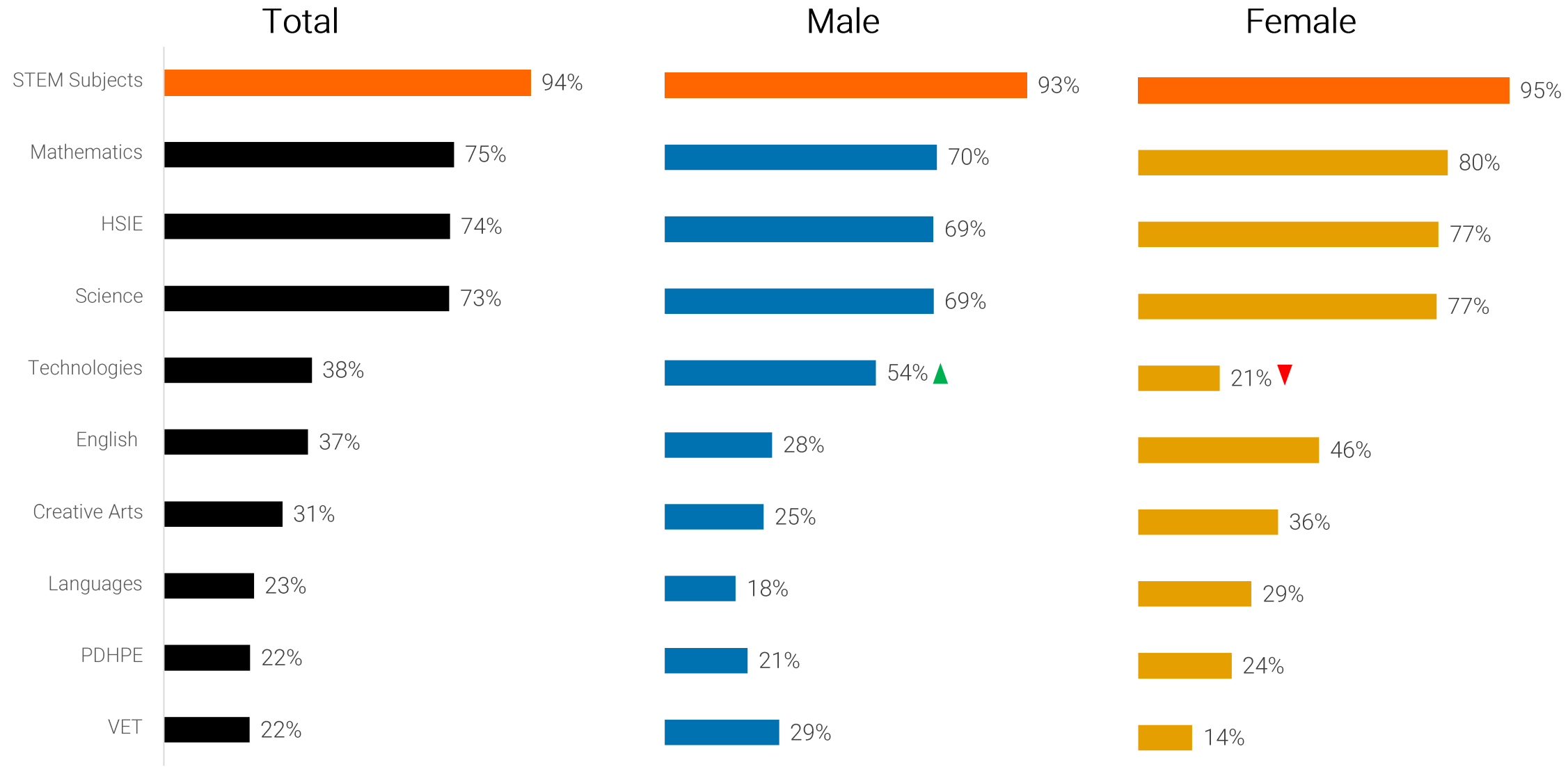
Elective subject intention for Years 11 and 12 – Top 15



Q. Please select from the below list which elective subjects you are considering choosing for Years 11 and 12. Please select up to 7 subjects.
Base: Total – 194, Males - 104, Females - 87

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Elective subject intention for Years 11 and 12 – Grouped by learning areas



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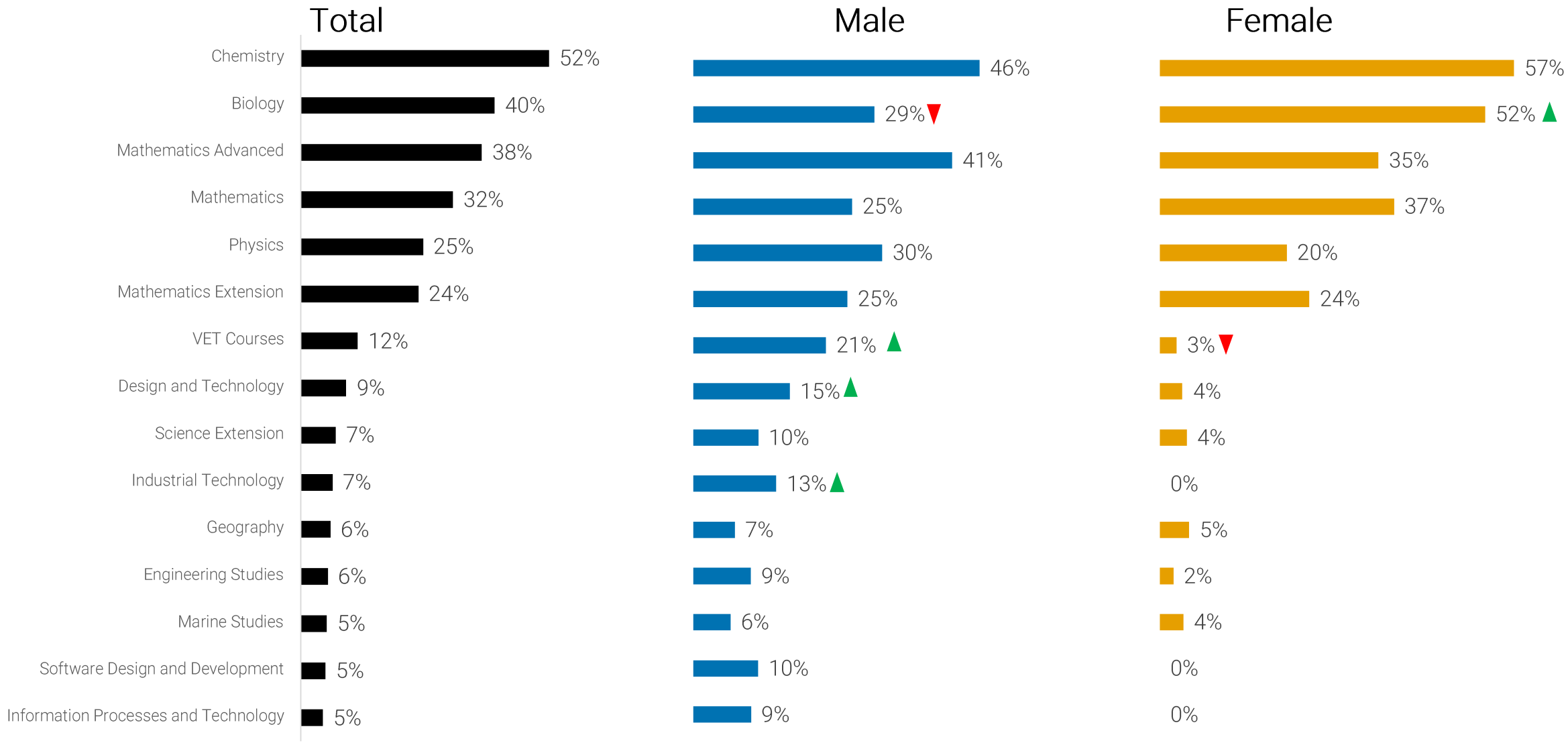
Base: Total – 194, Males - 104, Females - 87

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Elective subject intention for Years 11 and 12 – STEM subjects only (top 15)



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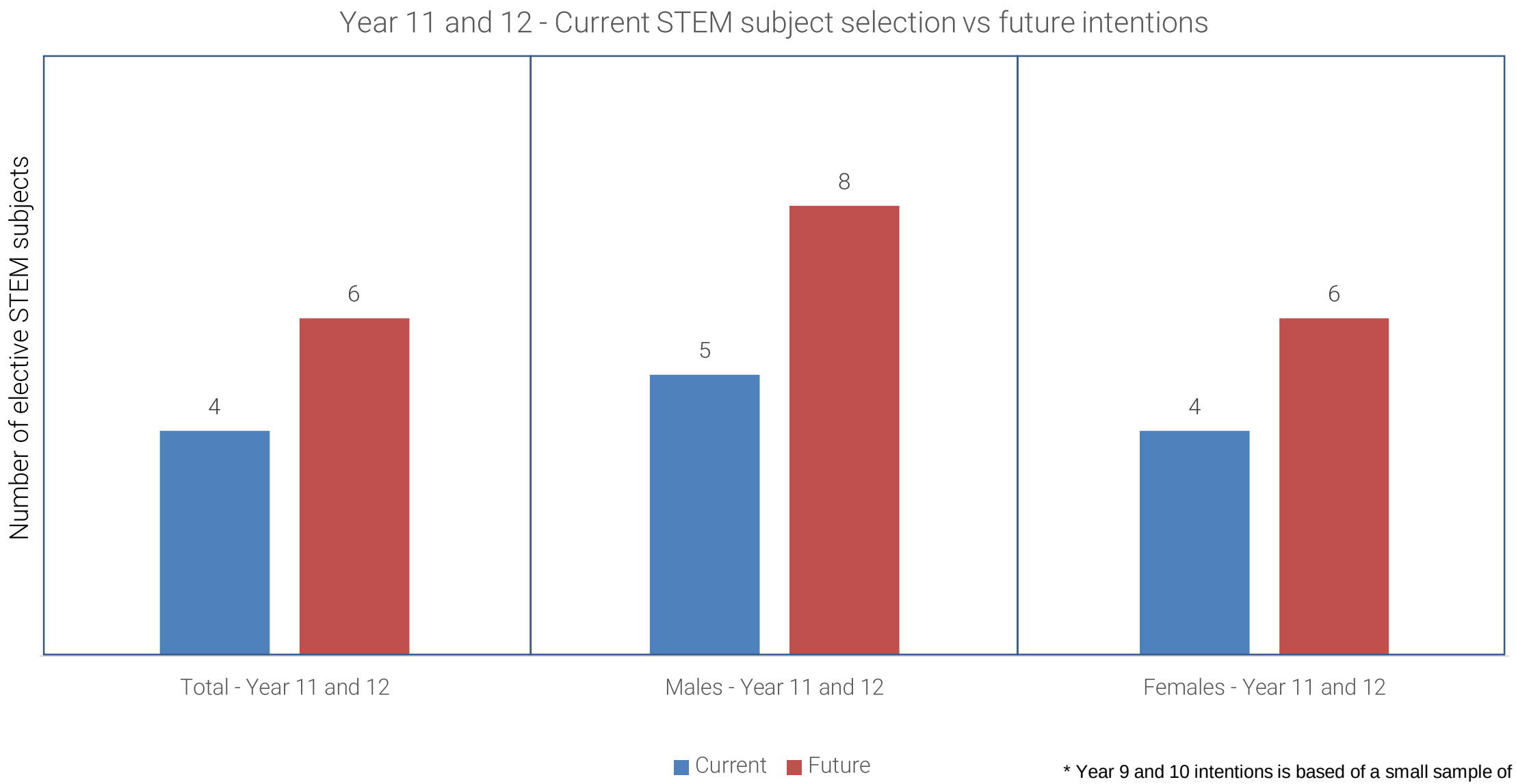
▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Year 11 and 12 is likely to see an increase in STEM subject selection



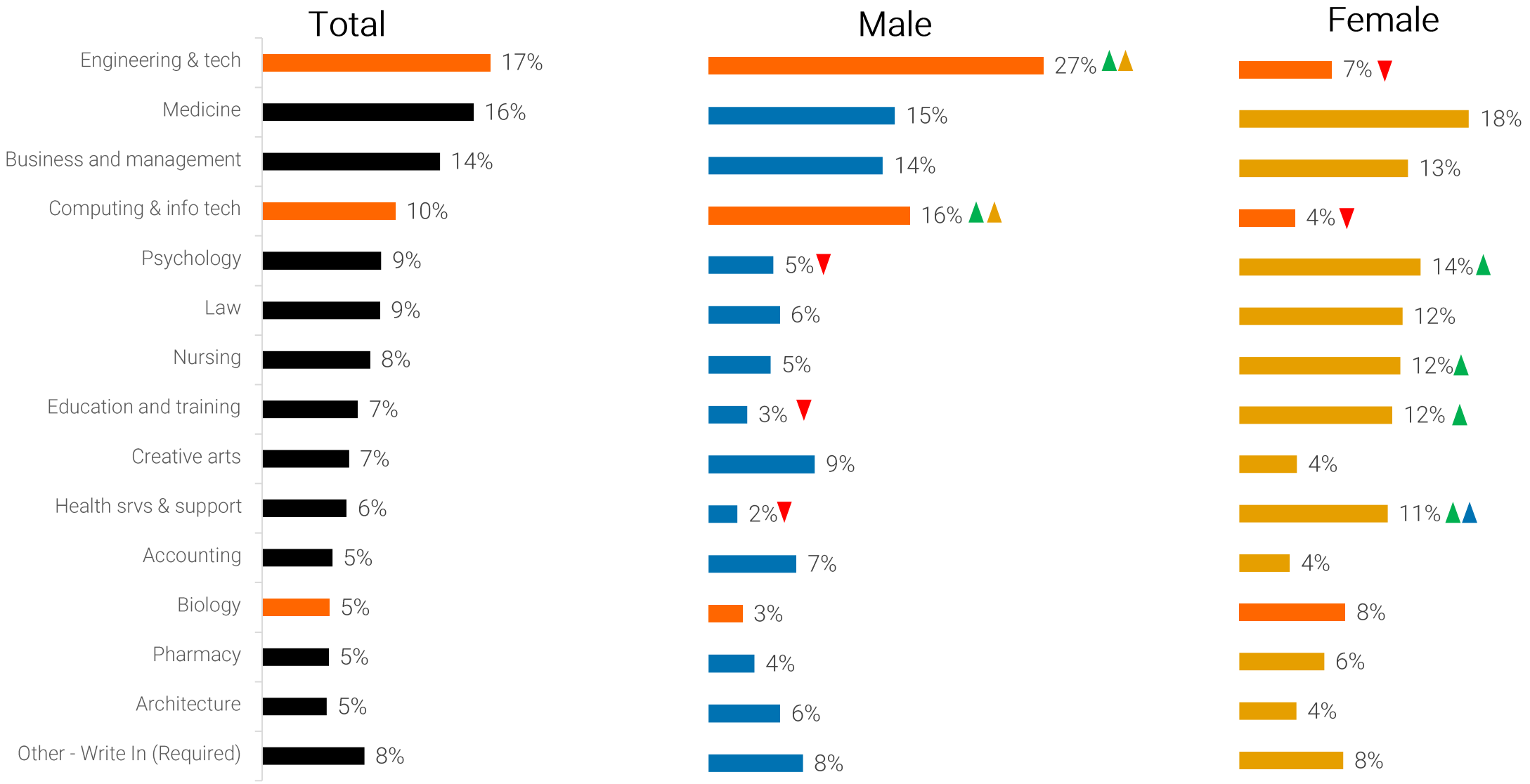
* Year 9 and 10 intentions is based of a small sample of current Year 7 and 8 students and so has not been displayed.

Courses considered for higher education

Among Year 11 and 12 students, there is a significant difference in higher education course preferences between genders, with 58% of males intending to undertake STEM-related courses compared to only 36% of females.

- The top higher education course among males is Engineering Technology (27%), while Medicine tops the female ranking (18%).
- Among all STEM subjects, Engineering and Technology along with Computing and Information Technology is where the biggest discrepancy lies between genders (27% vs 7% and 16% vs 4% respectively).
- Course preference for females have a stronger skew towards health related courses such as Medicine, Psychology, Nursing, Health Services and Support.

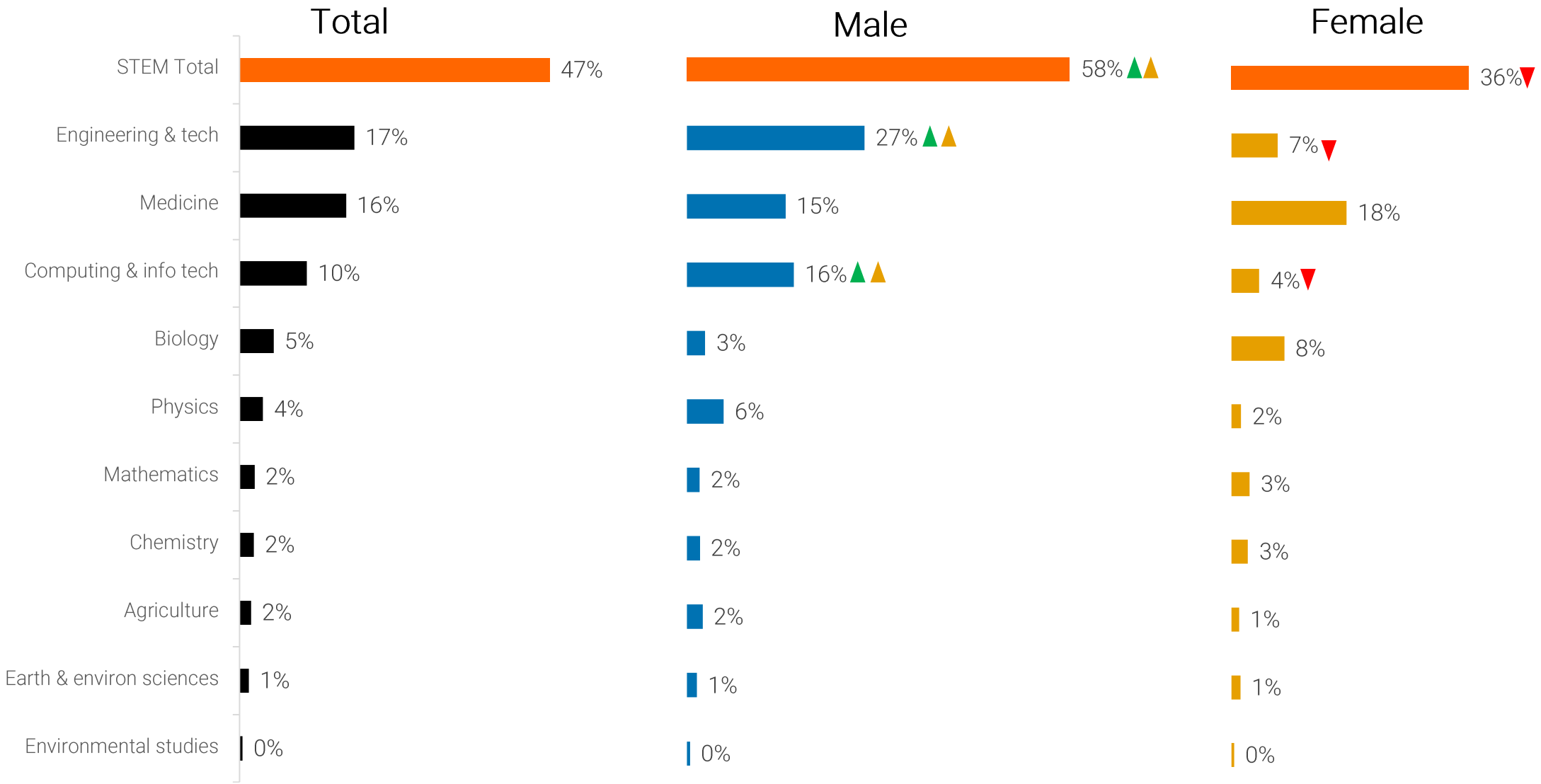
Courses considered for higher education - Top 15



Q. Please select from the below list which course(s) you are considering after high school. Please select up to 2 courses. .
Base: Total – 375, Males - 201, Females - 162

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Courses considered for higher education – STEM only subjects



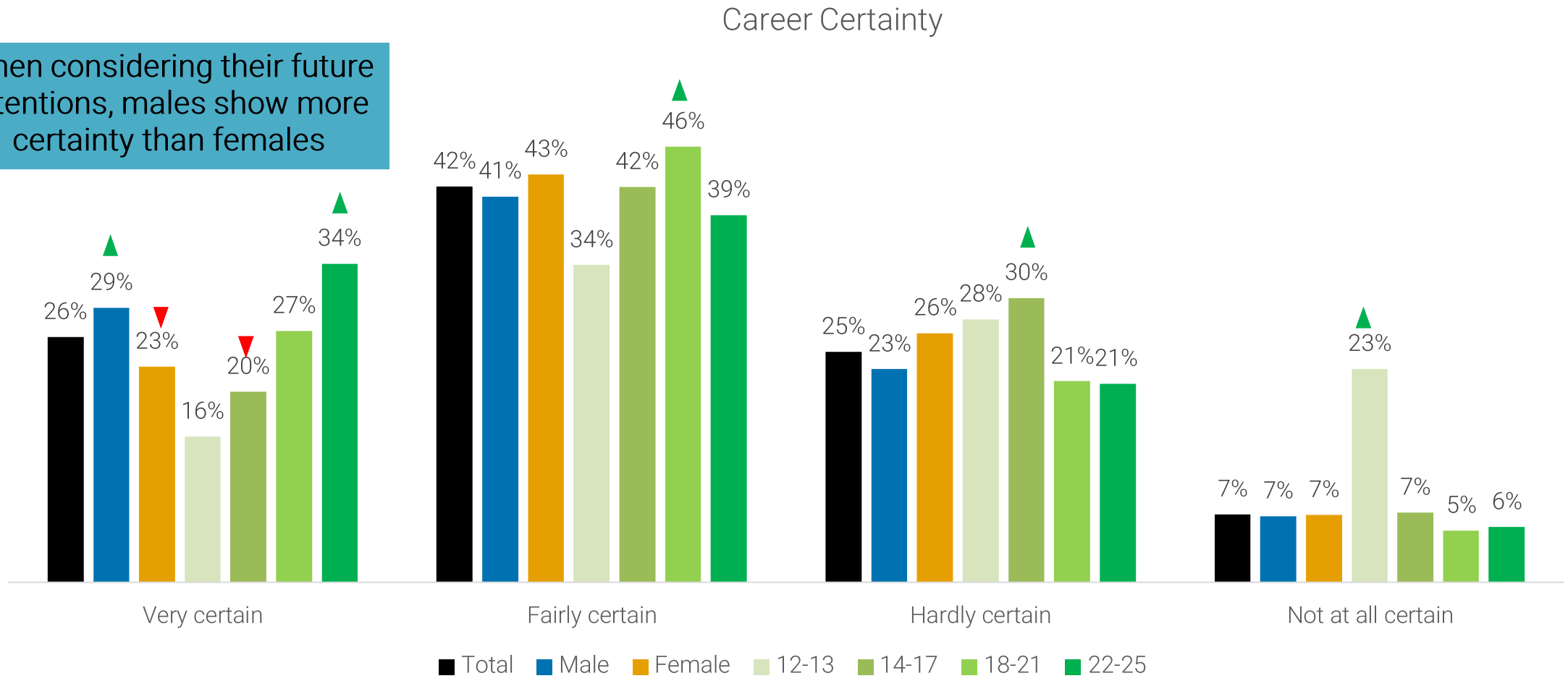
Q. Please select from the below list which course(s) you are considering after high school. Please select up to 2 courses. .
Base: Total – 375, Males - 201, Females - 162

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Career Intentions

1 in 4 students feel very certain about their future career, while one third feel ‘hardly’ or ‘not at all’ certain

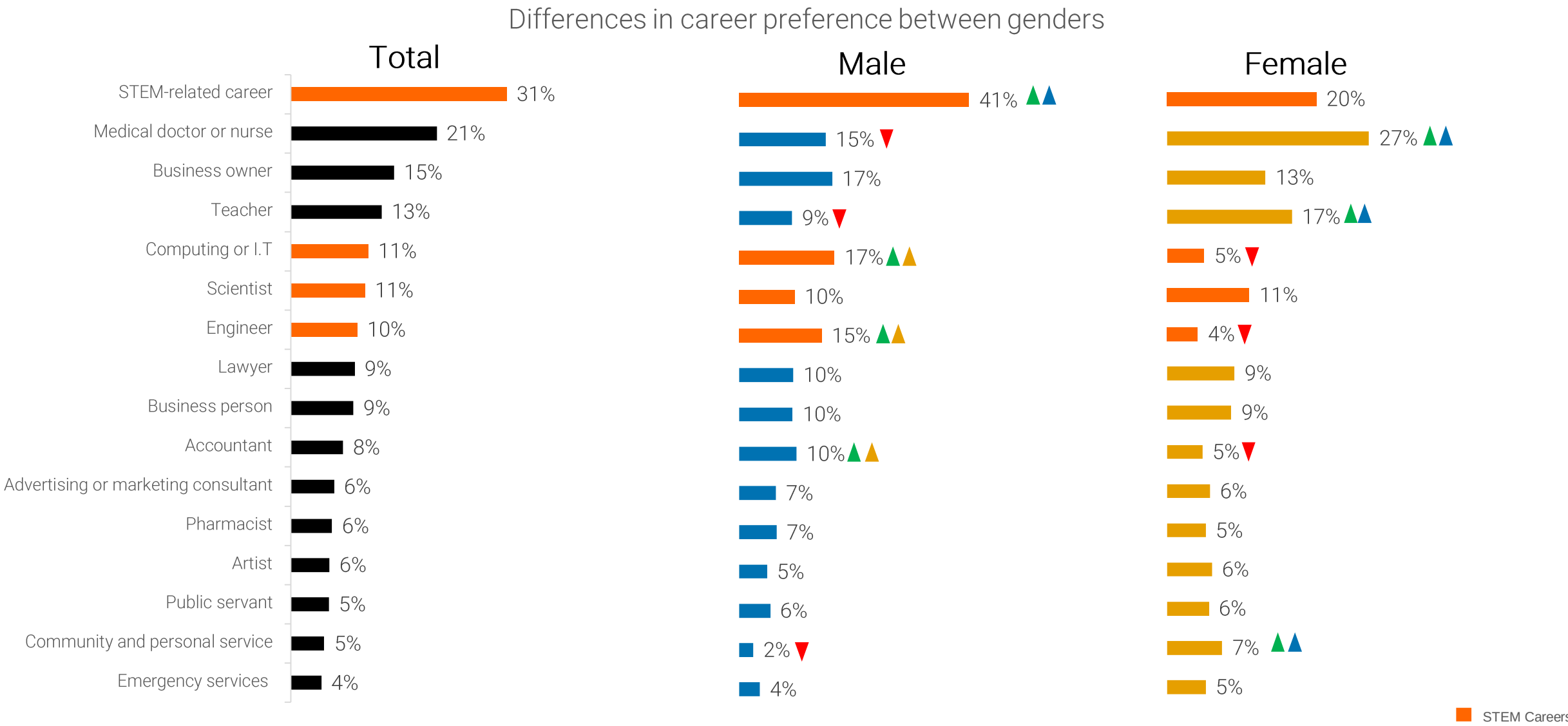
When considering their future intentions, males show more certainty than females



Thinking about what type of career you want after you finish school, which of the following best describes you?
Base: Total - 2,092, Males – 978, Females – 1069, Ages 12-13 - 77; 14-17 - 650; 18-21 - 771; 22-25 - 594

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Females choose the medical field while males opt for business and IT; males show overall higher preference for STEM-related careers

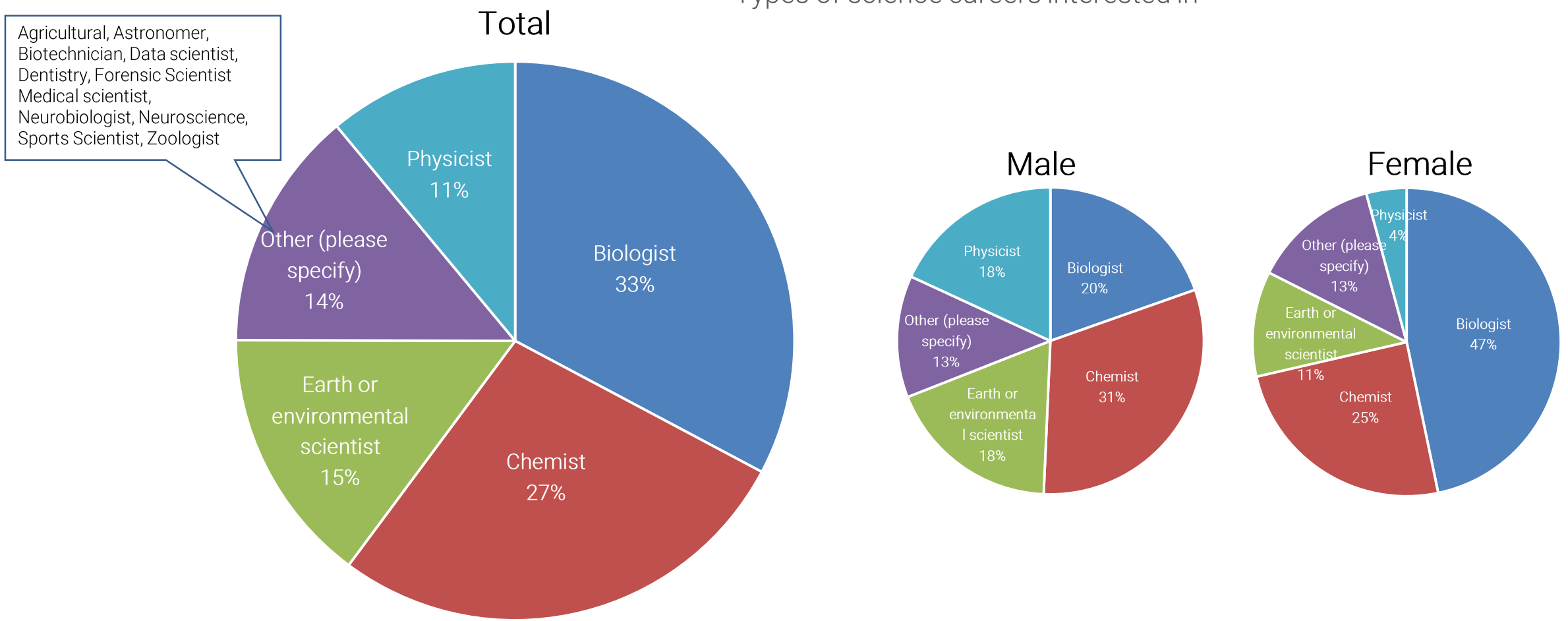


Q. And what type of career would you like to have in the future? Select up to 3 choices
Base: Total – 1,434, Males - 691, Females - 714

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Among those aiming for science careers, biology fields are most sought out by females, while males lean more towards becoming chemists

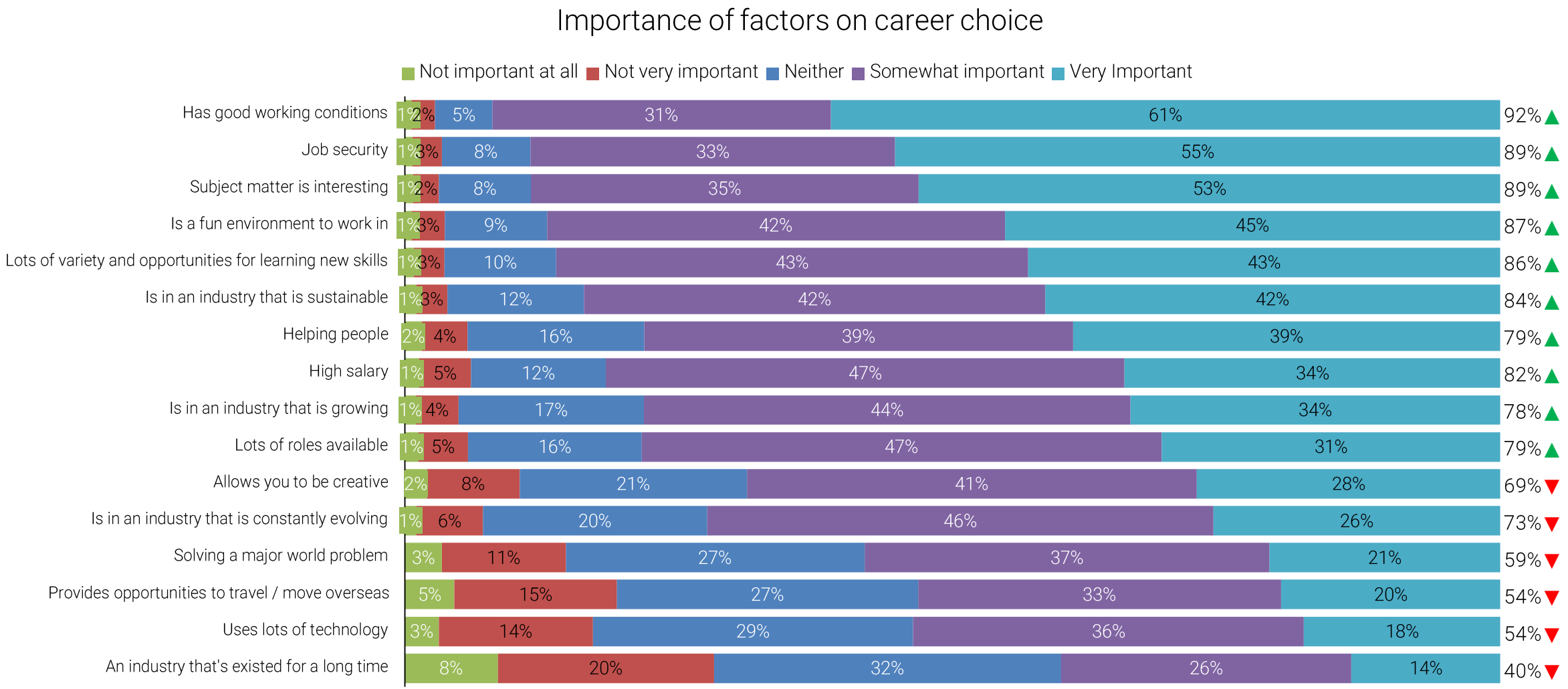
Types of science careers interested in



Q. 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?
Base: Total – 154, Male – 71, Female - 78

Caution: Small sample size.
Sig testing not applicable

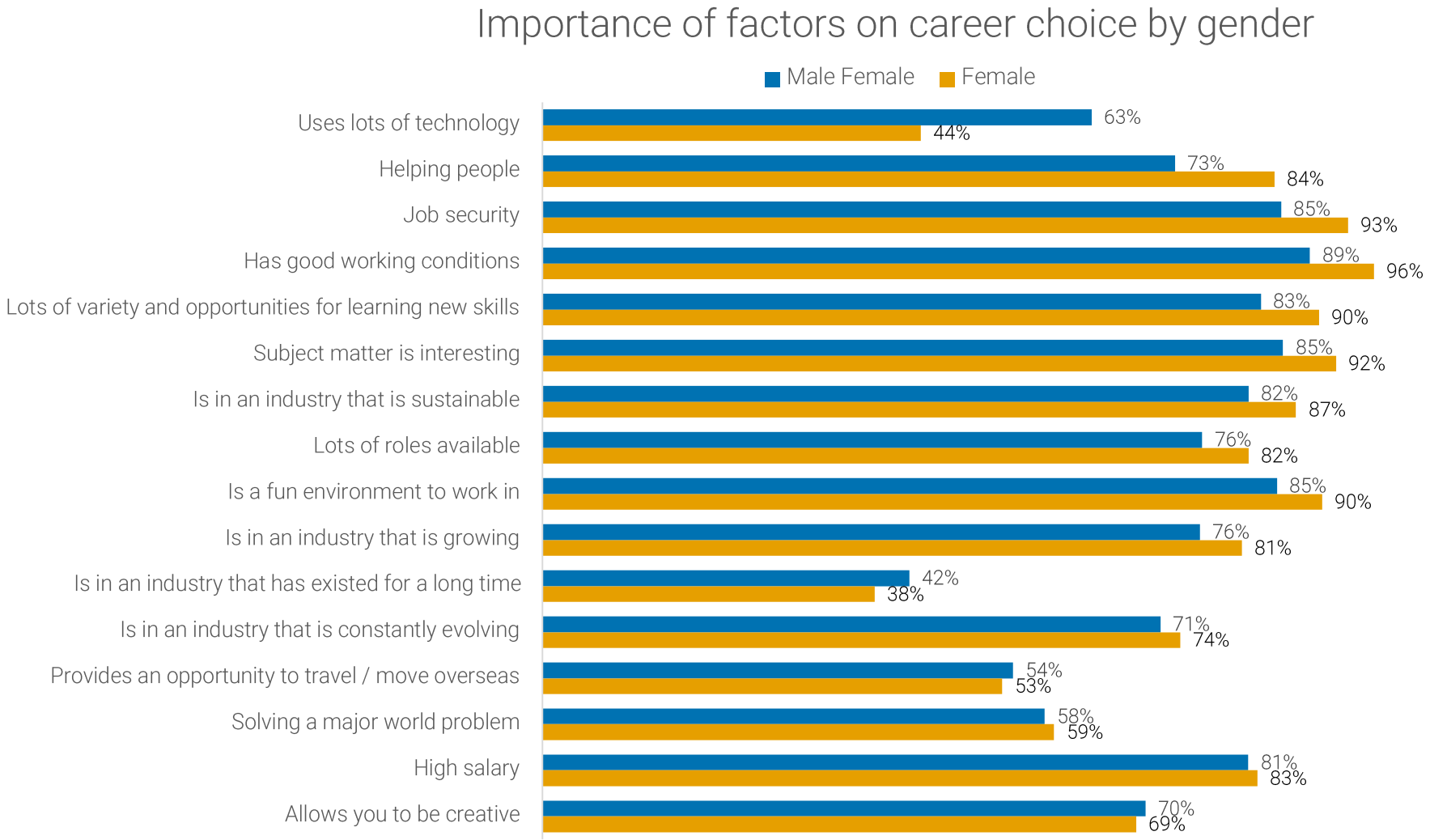
Working conditions and job security are the top factors when choosing a career, followed by interesting work and fun environment



Q. How important are each of the following factors when choosing a career?
Base: Total – 2,015 (only asked of people aged 14+)

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Technology is the most dividing factor between genders, with females ranking it as the second least important factor



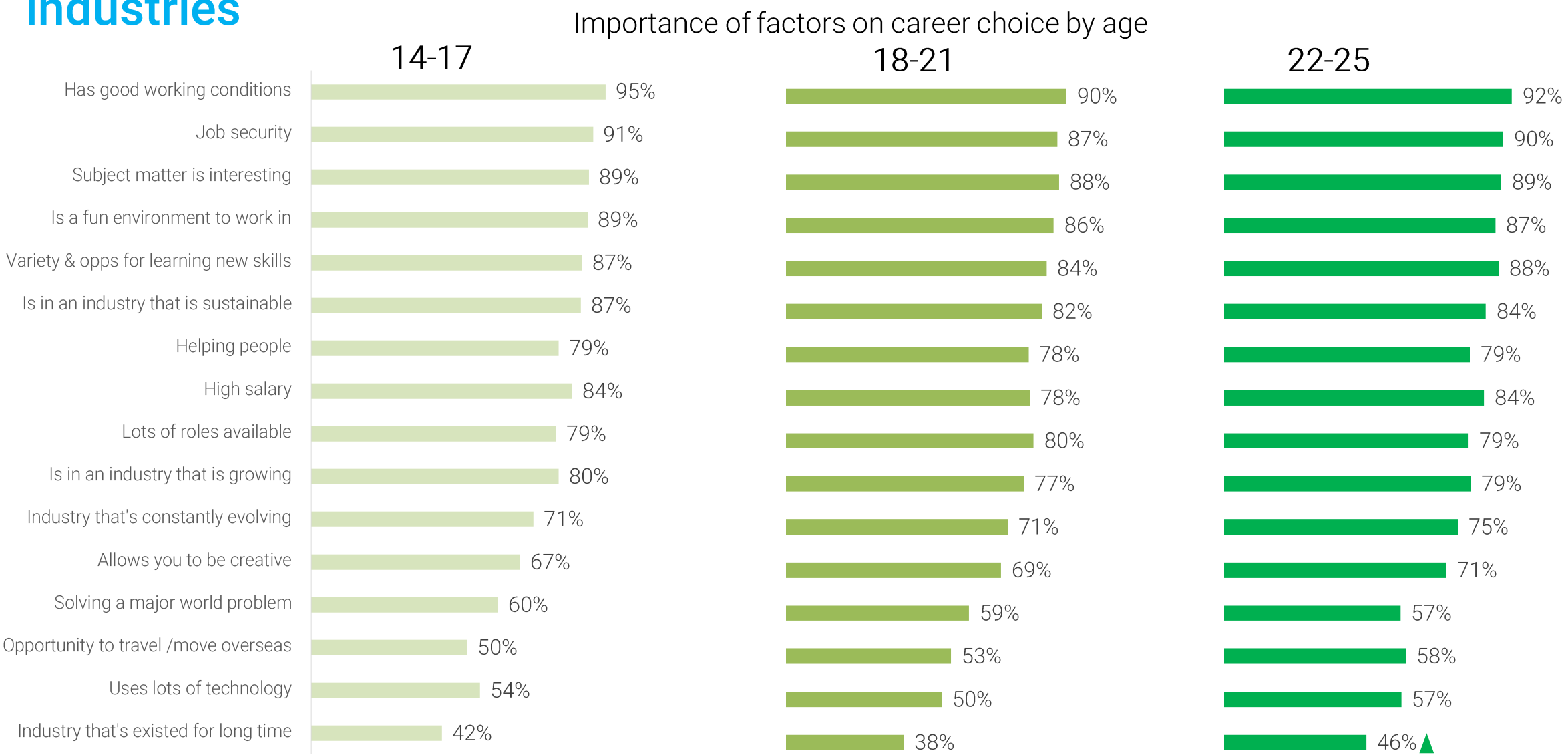
Generally females score higher on all factors with the exception of 'Has lots of technology and 'Industries which have existed for a long time'.

Both genders ranked 'good working conditions' as the top most important factor when choosing a career.

Q. How important are each of the following factors when choosing a career?
Base: Males – 955, Female - 1,015

Similar importance [illegible] ups with the older group seeking more travel opportunities and security of longstanding industries

Correction: no significance except for ‘existed for a long time’

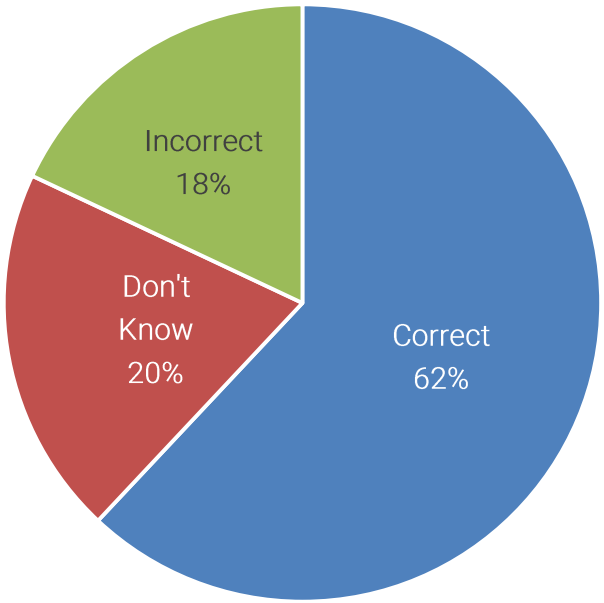


Q. How important are each of the following factors when choosing a career?
Base: Ages 14-17 - 650; 18-21 - 771; 22-25 - 594

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Understanding and Attitudes Towards STEM

Around a third of students don't know what STEM stands for, with Engineering tripping most people up



No significant differences in correct responses between males and females, however, students aged 14-17 had the highest proportion of correct responses with 68%.

Of all incorrect responses, it was primarily Engineering which most students got wrong or couldn't remember. Below are some of the most common responses:

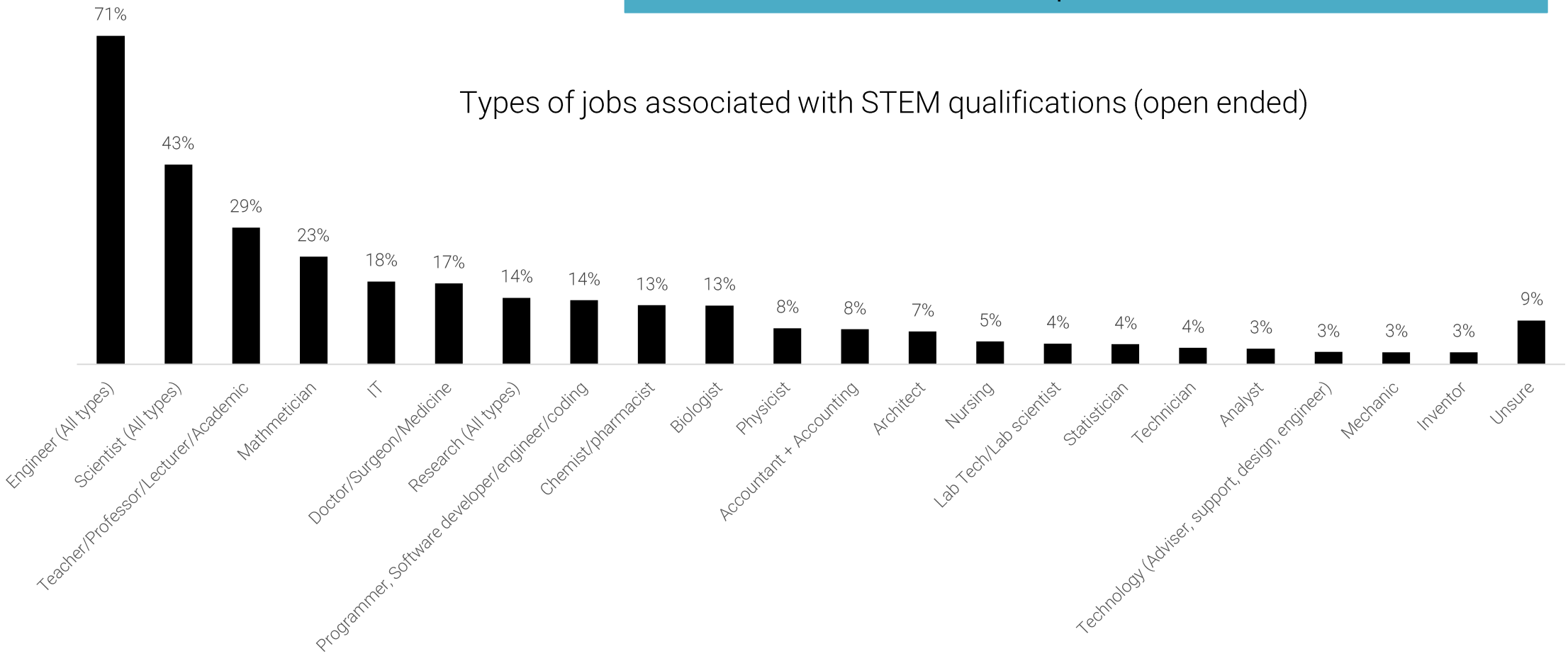
Sample of incorrect responses

- Science, Technology, English, Maths
- Science, Technology, Environment, Maths
- Science, Technology, Economics, Maths
- Science, Technology, Education, Maths
- Science, Technology, Electronics, Maths
- Science, Technology, Enterprise, Maths
- Science, Technology, Evolving, Maths
- Science, Technology, Ecology, Maths
- Science, Technology, Energy, Maths
- Science, Technology, Engineering, Marketing
- Science, Technology, Engineering, Medicine
- Science, Technology, Engineering, Mining
- Science, Technology, Engineering, Machines
- Science , Technology, Engineering, Management
- Science, Technology, Engineering, Mechanics
- Scientific, Technological, Evolutionary, Methods

Please write below what you believe the term STEM stands for?
Base: Total – 2,092

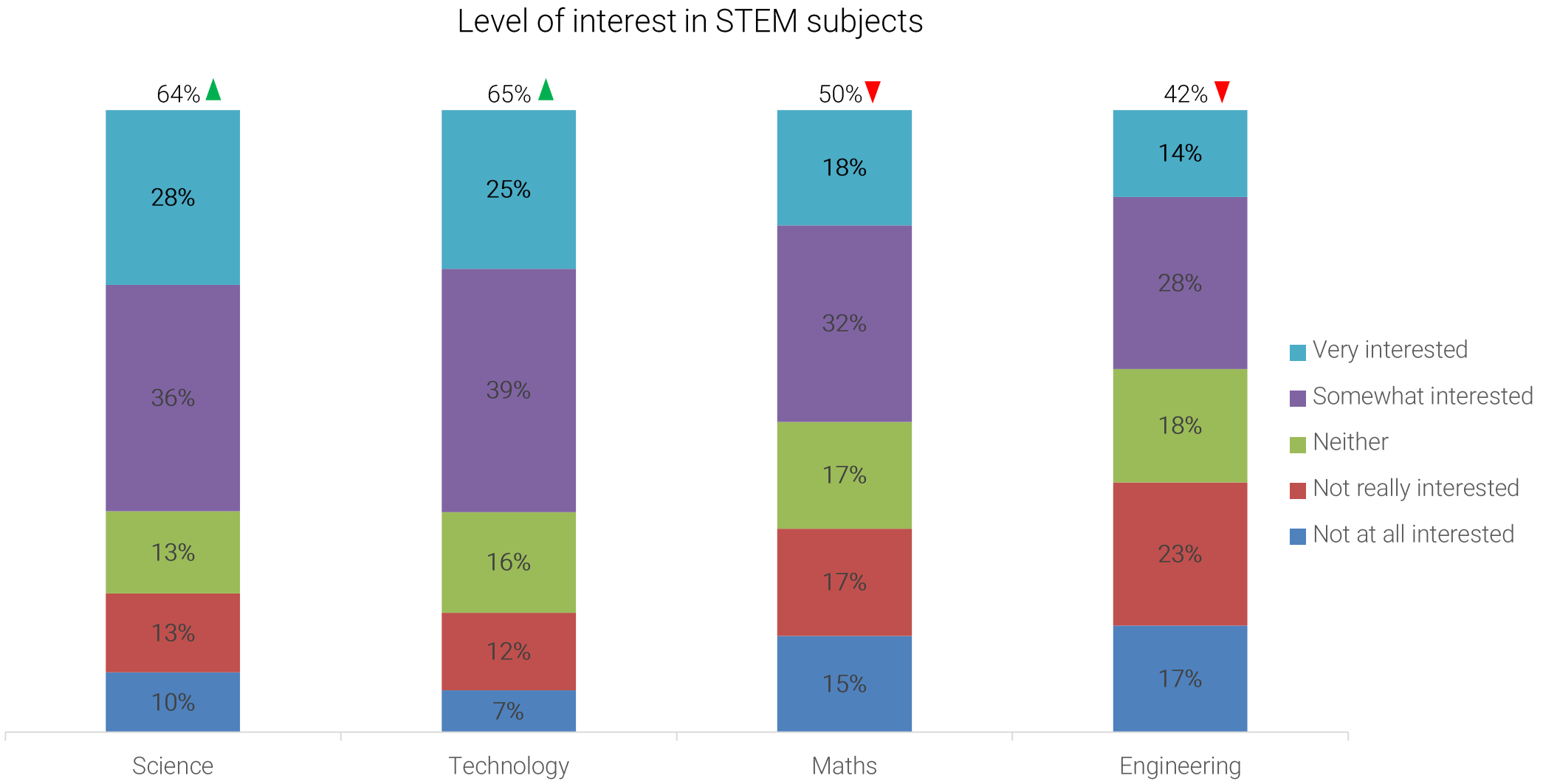
Engineering roles have the highest association with STEM qualifications followed by science and teaching

A higher proportion of females stated engineering (75%) as a STEM career compared to 67% of males



Q. What type of jobs do you think you would be able to get if you have a STEM degree or certificate
Base: Total – 2,092

Students show highest interest for science and technology and lowest interest in engineering, the career most associated with STEM

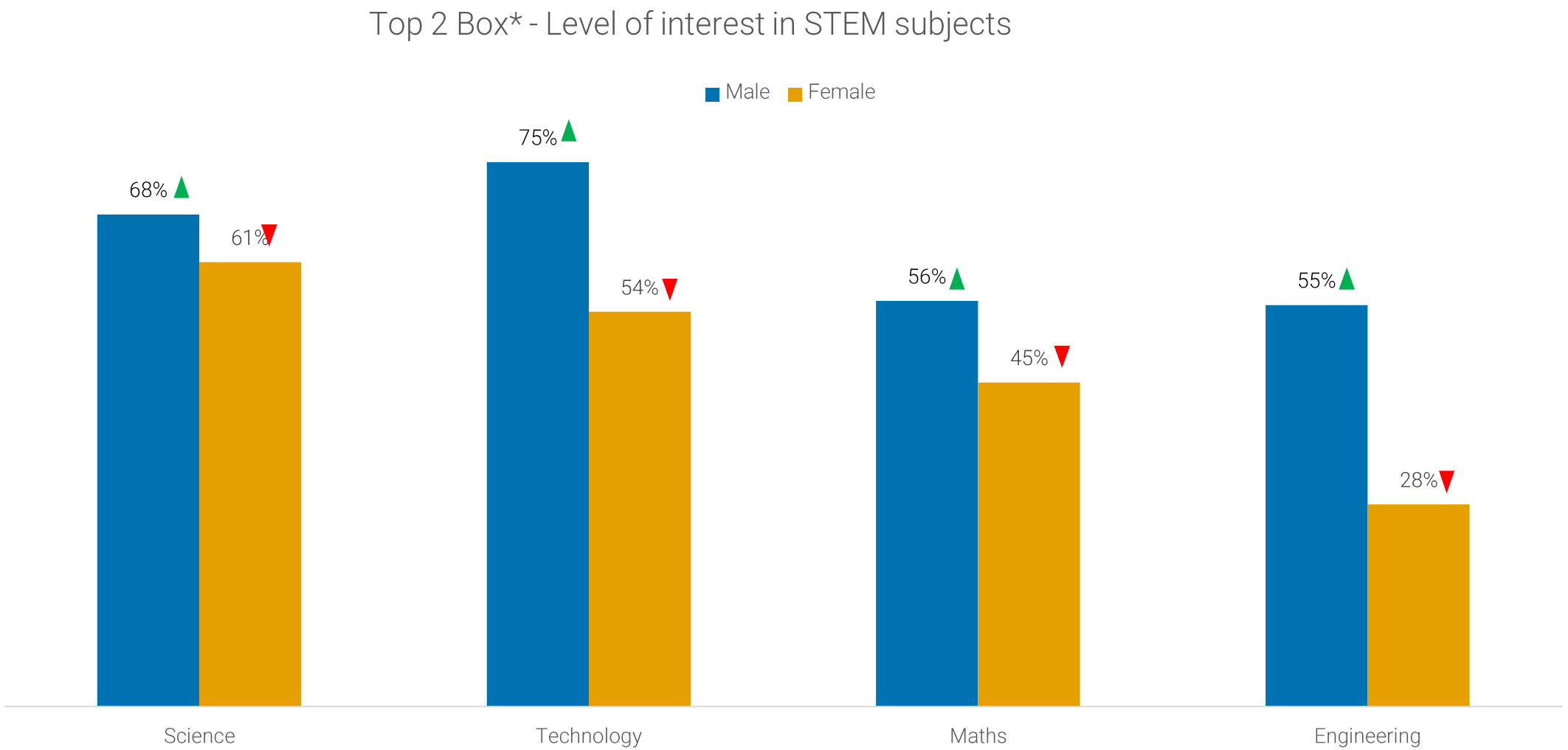


Q. How interested are you in each of the below subjects?
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: updated male and female base - Males 978, Females 1069

Males show sign[illegible]ds STEM subjects with technology and engineering showing the largest discrepancy

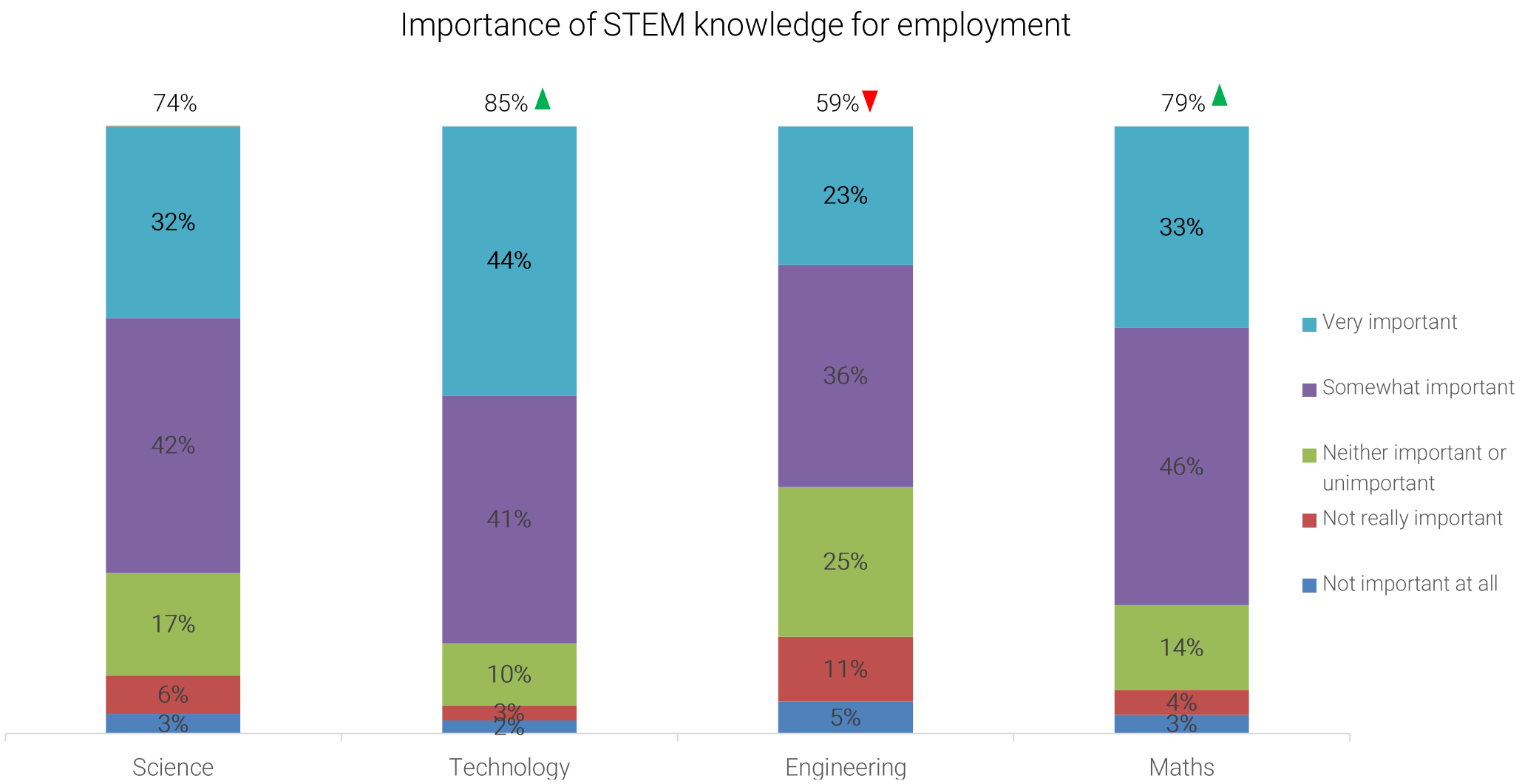


Q. How interested are you in each of the below subjects?
Base: Males – 978, Females – 1,069

* Top 2 box – Respondents who selected very or somewhat interested

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Skills in science and technology seen as important to get a good job in the future

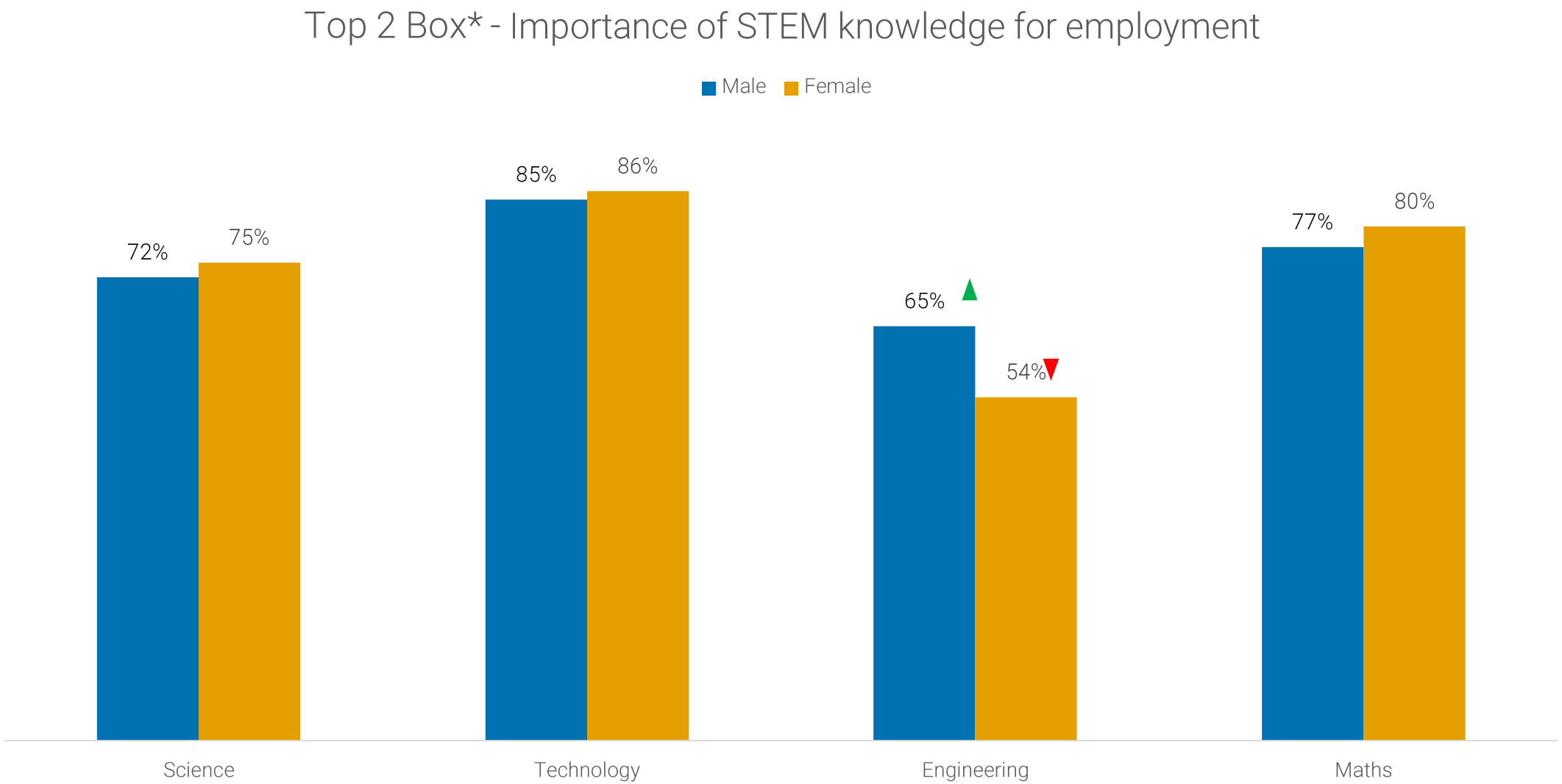


Q. Thinking about getting a good job in the future, how important do you believe it is to have knowledge and skills related to each of the subjects that make up STEM? Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: updated male and female base - Males 978, Females 1069

STEM skills and importance towards employment



Q. 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? Base: Males – 813, Females – 1,051

* Top 2 box – Respondents who selected very or somewhat important

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Reasons for and against studying Science

Science is shaping the future
"It represents the future, science teaches us a lot about the world which is important." Male, 25

Helps understand how the world works
"Science is the basis of almost everything; human behaviour to machinery and technology." Female, 19

Science is broad/teaches various skills
"Science has a lot of skills such as team skills, research and allows the individual to absorb a different way of thinking or perspectives than such as business studies." Female, 17

Prepares people for good jobs
"Science is one of the main driving forces behind today's innovations and new creations. By having a large quantity of knowledge about science it would allow someone to get a good job." Male, 18

Science skills are in high demand.
"Most employers these days are seeking candidates with technology knowledge and the skills that one gains in a STEM degree." Female,18

Irrelevant
"For me personally, that's not applicable. And for the majority of jobs, I cannot see how it's relevant." Female, 16

Too specific
"Because science is a very specific field in my opinion." Male, 17

"Science is a specific subject and personally doesn't relate to what I am interested in pursuing as a career" Female, 19

Don't like it
"Because science is boring and useless." Male, 16

Q. You mentioned that it's not important to have knowledge and skills in science to get a good job Why do you think that? Base: Agree: - 1,519, Disagree - 210

Reasons for and against studying Technology

Keeping up with the pace of technology
"Technology is evolving and one day, it may make up most of our jobs so understanding it is vital." Female, 14

Requirement for good jobs
"Technology is being more heavily integrated with all occupations in modern society. Having fundamental knowledge and skills in the area will be helpful, perhaps even crucial, in order to find a good job" Female, 15

It's everywhere
"Technology is virtually involved in every career whether it be through making simple spreadsheets on Excel for an accountant or monitoring cameras as a security officer, people should have a basic or advanced understanding of technology depending on their career choice." Female, 19

It's the future
"Technology represents the future including computers, AI, robots and automation." Male, 25

Not important for employment
"Being an event manager doesn't really require an in-depth knowledge of technology." Female, 23

"Most of the jobs I could see myself doing use little or no technology." Non-binary, 15

"You don't have to be skilled in tech to get many jobs." Female, 22

Only basic knowledge is required
"Most jobs only require a basic knowledge of technology." Male, 24

Not interested - Don't like it
"I don't want a job that needs a technology skill set." Female, 25

Q. You mentioned that it's not important to have knowledge and skills in technology to get a good job Why do you think that? Base: Base: Agree - 1,763, Disagree - 115

Reasons for and against studying Engineering

Problem solving skills essential for workforce
"Problem solving skills can be applied to any life or work situation." Female, 17

Promotes, creativity, innovation and logical thinking
"A lot of the skill set in the jobs available requires the ability to be creative and innovative." Male, 19

"Engineering sparks creativity as well as logical thinking and reasoning." Female, 14

Important to have basic knowledge
"It is important to know a bit about how things in life are developed and how they work." Female, 19

Allows us to build new things
"Engineering gives someone knowledge of how things are built and how to create things, which is good." Male, 18

Many jobs don't require these skills
"There are many other jobs that are not related to engineering such as jobs in the health and teaching field." Female, 18

Too specific
"Unless you want to become an engineer I don't see it being useful in other professions." Male, 19

Unrelated to my career choice
"I think it's not important because I want to get a business job." Female, 20

Don't know what you learn in engineering
"I don't have a good understanding of what engineering actually consists of. I feel like there should be more education around engineering and what it is." Female, 17

Q. You mentioned that it's not important to have knowledge and skills in engineering to get a good job Why do you think that? Base: Base: Agree - 1,239 Disagree - 344

Reasons for and against studying Maths

Basic maths knowledge is important for all jobs

"Every job will use some bits of maths, the most basic being able to know how to add, subtract, multiply and divide." Female, 17

Essential life skill

"Maths is a basic life skills which is involved in everyday life. Knowledge of these skills allows you to develop more skills and have more options." Female, 16

"Maths can help develop problem solving skills and a logical mind set which can be an asset in almost all jobs." Female, 18

Foundation for all STEM subjects

"All thorough understanding of science, technology and engineering involves a certain level of mathematical comprehension and therefore knowledge of maths is important in order to get a good job." Female, 24

High paying jobs

"A lot of high-paying jobs require skills in maths." Male, 19

Many jobs don't require these skills

"Maths is mostly useless unless you do accounting or anything with numbers. It does not assist one in developing legal arguments or liaising with clients." Female, 18

Too specific

"" Unless you want to work in a science or mathematical industry maths is not that significant." Female, 16

Unrelated to my career choice

"Although it is helpful, an event manager does not need to be incredibly mathematical in order to secure a good job." Female, 23

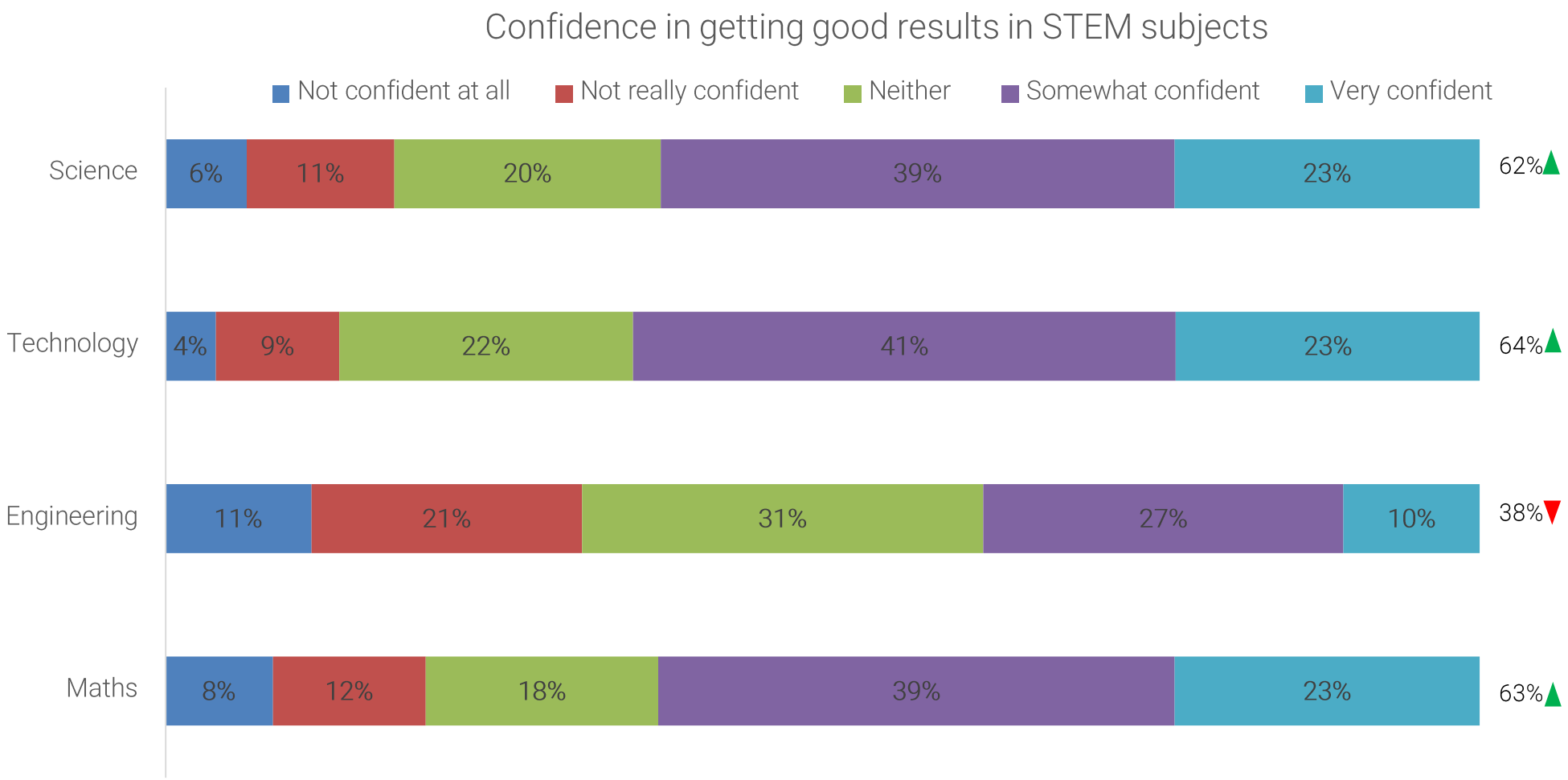
Machines do it better

"Computers do everything and is generally more time efficient and free from human error." Female, 23

Q. You mentioned that it IS /IS NOT important to have knowledge and skills in maths to get a good job Why do you think that? Base: Base: Agree - 1,631, Disagree -169

Confidence in STEM

Confidence in getting good results in STEM subjects

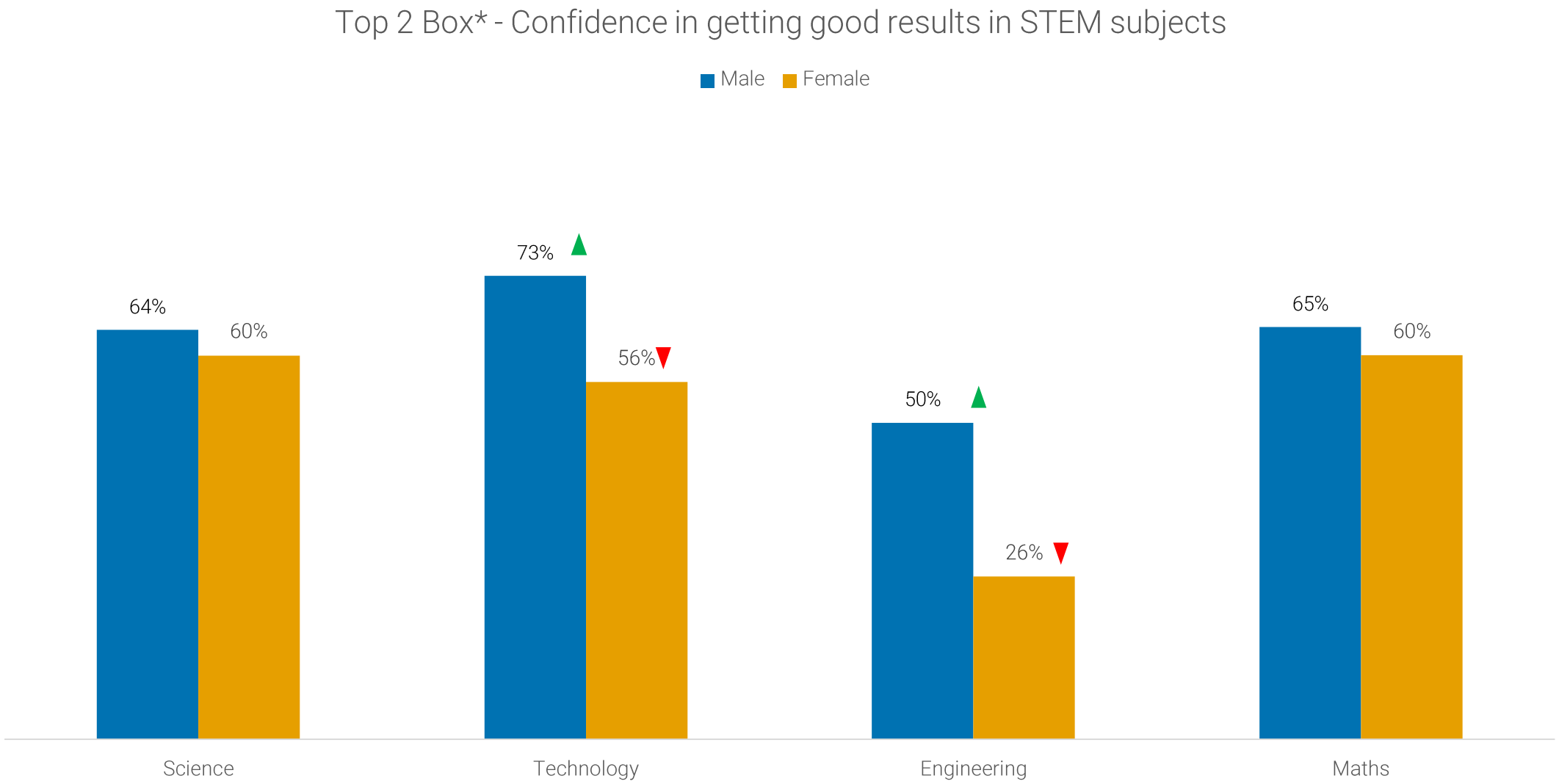


Q. How confident do you feel that you can study and get good results in each of the following subjects? Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: updated male and female base - Males 978, Females 1069

Confidence in getting good results in STEM subjects



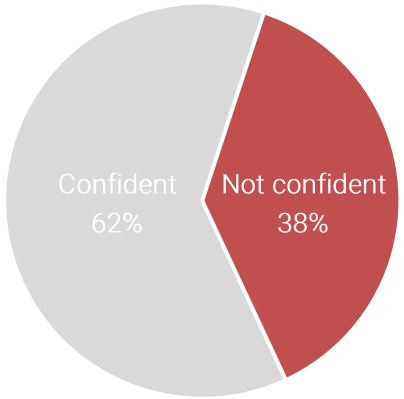
Q. How confident do you feel that you can study and get good results in each of the following subjects?
Base: Males – 813, Females – 1,051

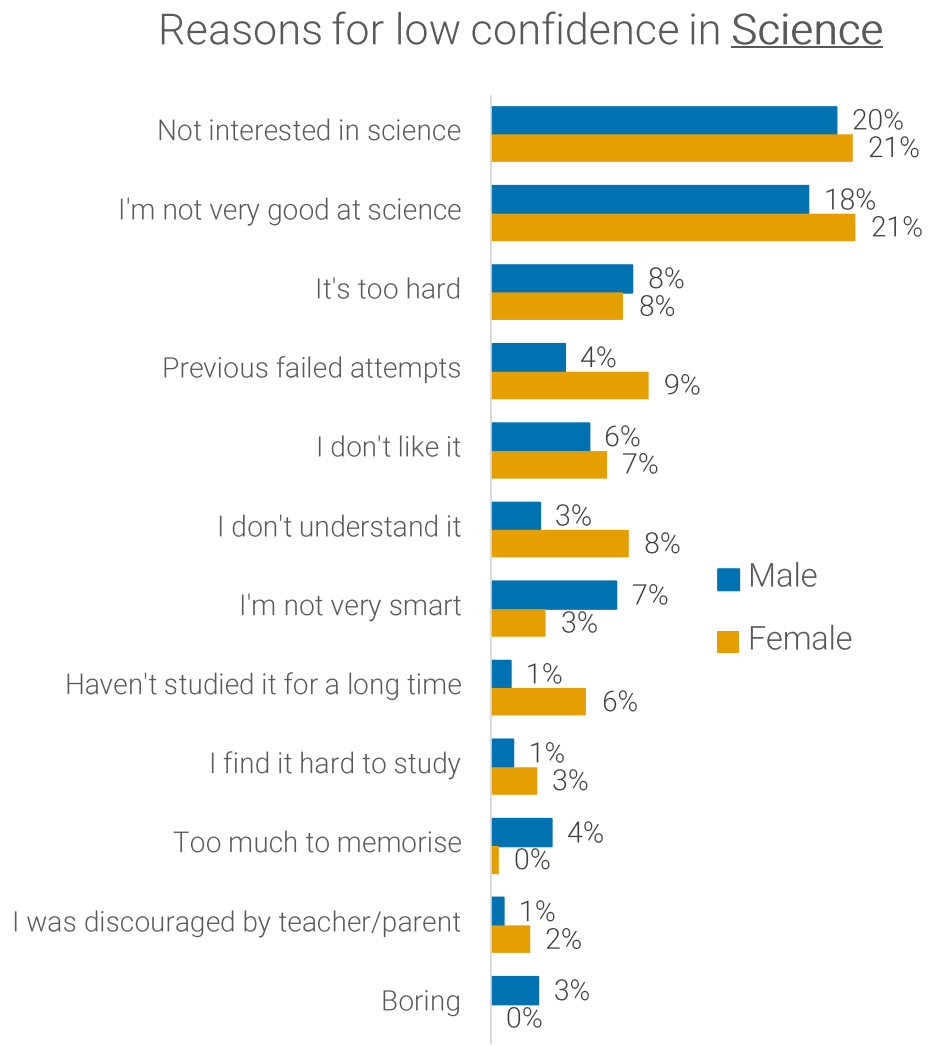
* Top 2 box – Respondents who selected very or somewhat confident

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: Base is 341

Lack of confidence in science is attributed to low interest, previous bad experiences and perceptions of the subject being too complex





"I've never been that interested in science so I find it hard to remember." Female, 20

"I find it difficult to grasp the concepts. Not motivated to learn and put effort in as I have no real interest in it." Male, 16

"I have always been an average student in science in high school, and I don't learn about it anymore." Female, 19

"I get lost and overwhelmed with all of the different terms and logic in science." Female, 25

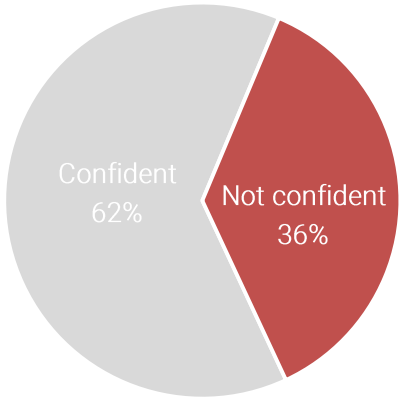
"I struggle to understand some concepts in science, and I wish I had a better science teacher to help me learn about them." Female, 15

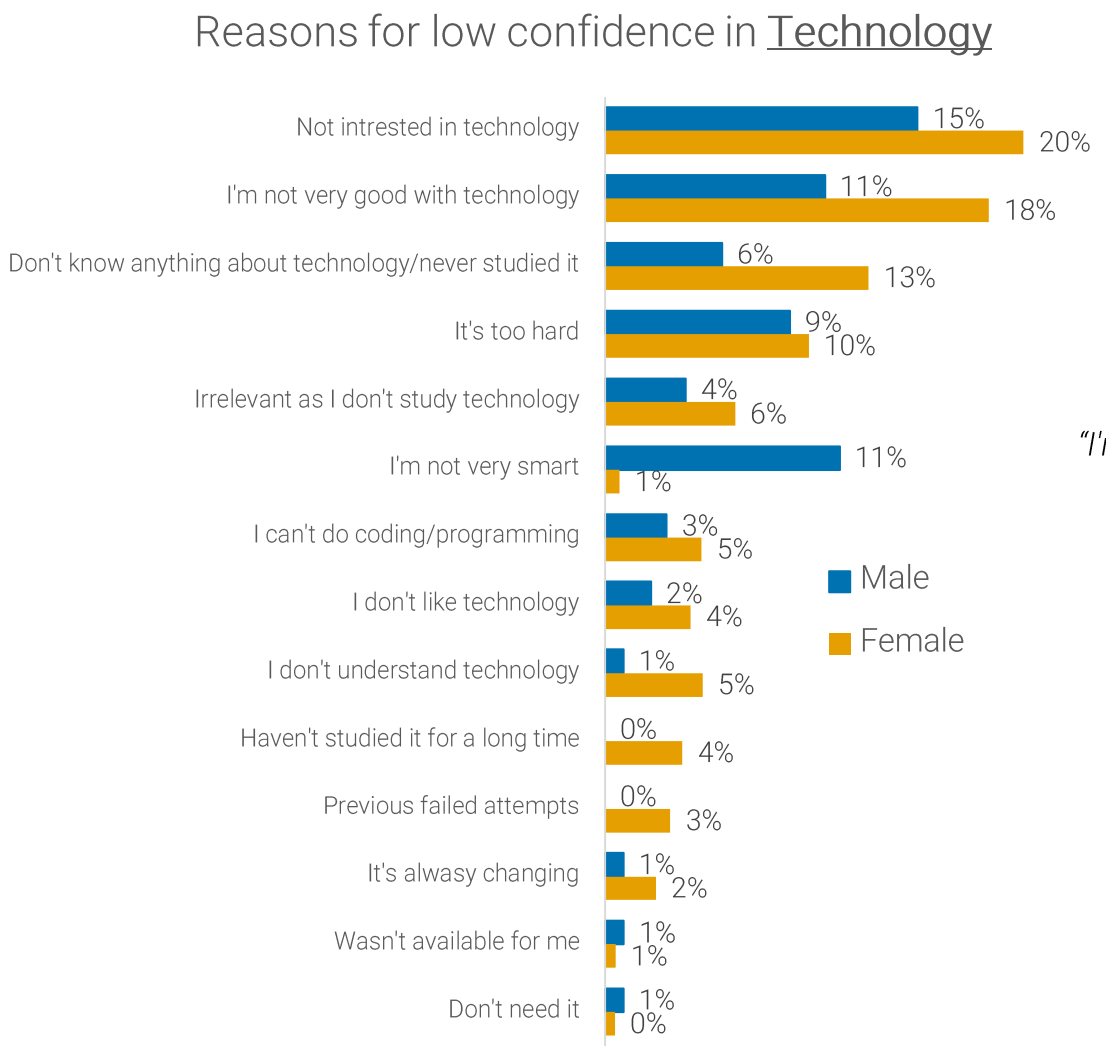
"I've never been that good in science at school and now I feel like I know less so I wouldn't consider it." Female, 21

"I haven't done well in the subject since Year 8." Female, 16

Q. Why do you not feel confident about getting good results with science subjects?
Base: Total – 341

Lack of familiarity with technology causes an element of anxiety which discourages students from wanting to start to learn about it





"I don't know much about technology nor have I expressed much interest." Female, 18

"I am terrible at anything technology related." Female, 19

"Because I struggle using new software." Male, 14

"I'm terrible with technology and never studied it." Female, 19

"I have never studied much to do with technology. It would be hard at first to get some basic knowledge." Female, 24

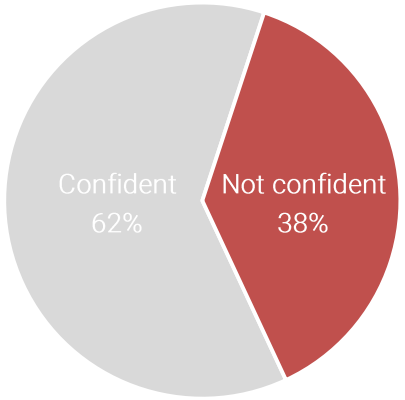
"I don't understand what it consists of but I assume its coding etc and I know I am not good at ." Female, 17

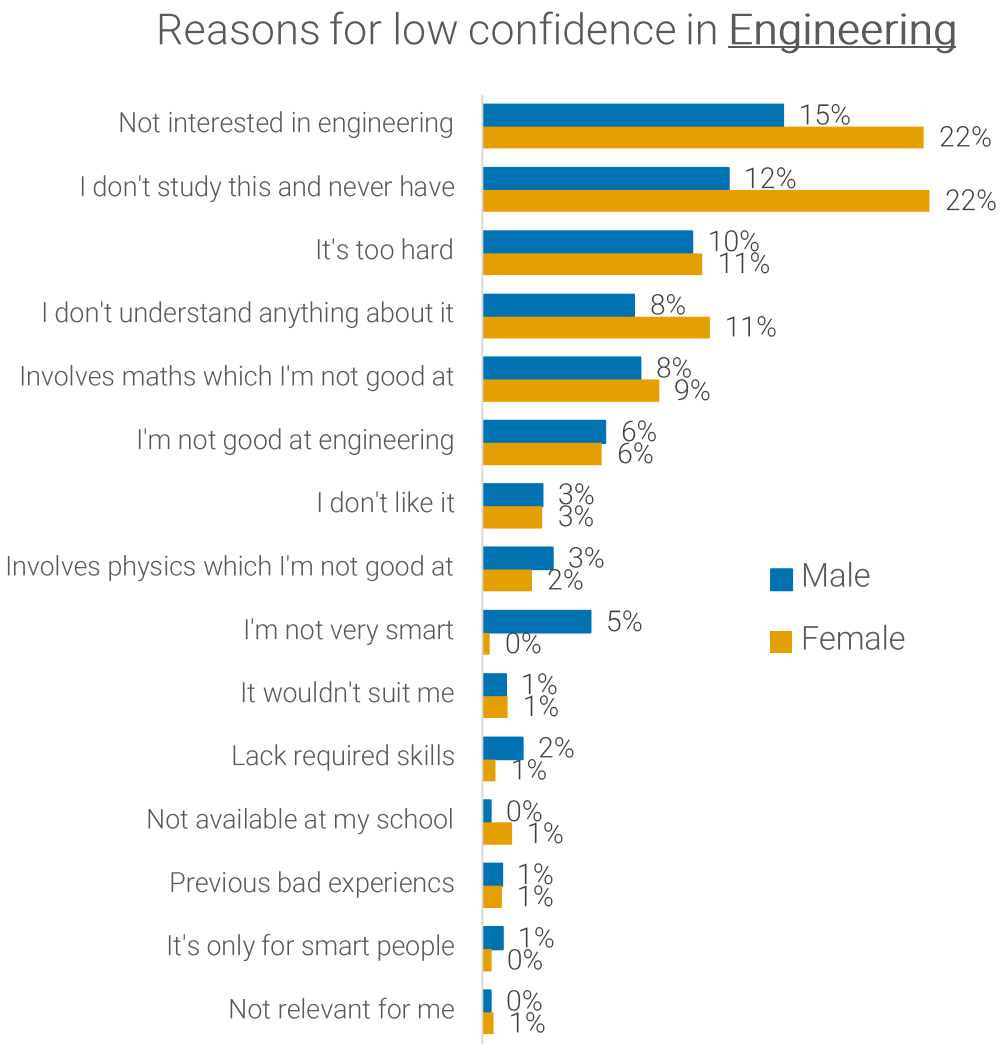
"I've never really been good with the programming/coding side of technology. I can use it and get the hang of it, but programming and coding is something I didn't pick up." Male, 15

"It just sounds confusing, lots of terms I don't understand." Male, 19

Q. Why do you not feel confident about getting good results with technology subjects?
Base: Total – 273

Low understanding of engineering is a major driver for low confidence; females have significantly lower exposure to the subject





"It is something I've never explored and was never encouraged in school to explore. As a female, there were never many role models that we could take courage and direction from in the sector." Female, 20

"Once again, I'm not sure what it consists of thus I assume I would be bad at it." Female, 17

"I haven't learnt anything about engineering so I have no knowledge or skills to get good results." Female, 15

"Since engineering is very difficult from what I have heard. I don't think I would be ready for it." Female, 20

"Subjects are hard to pass." Female, 19

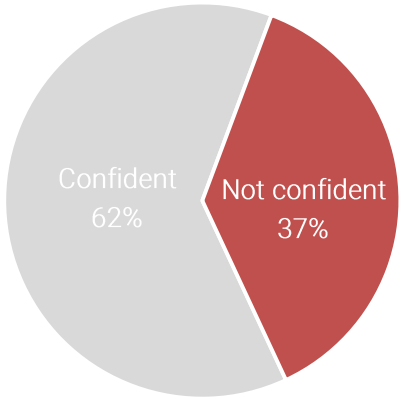
"I have no knowledge about engineering in general." Female, 23

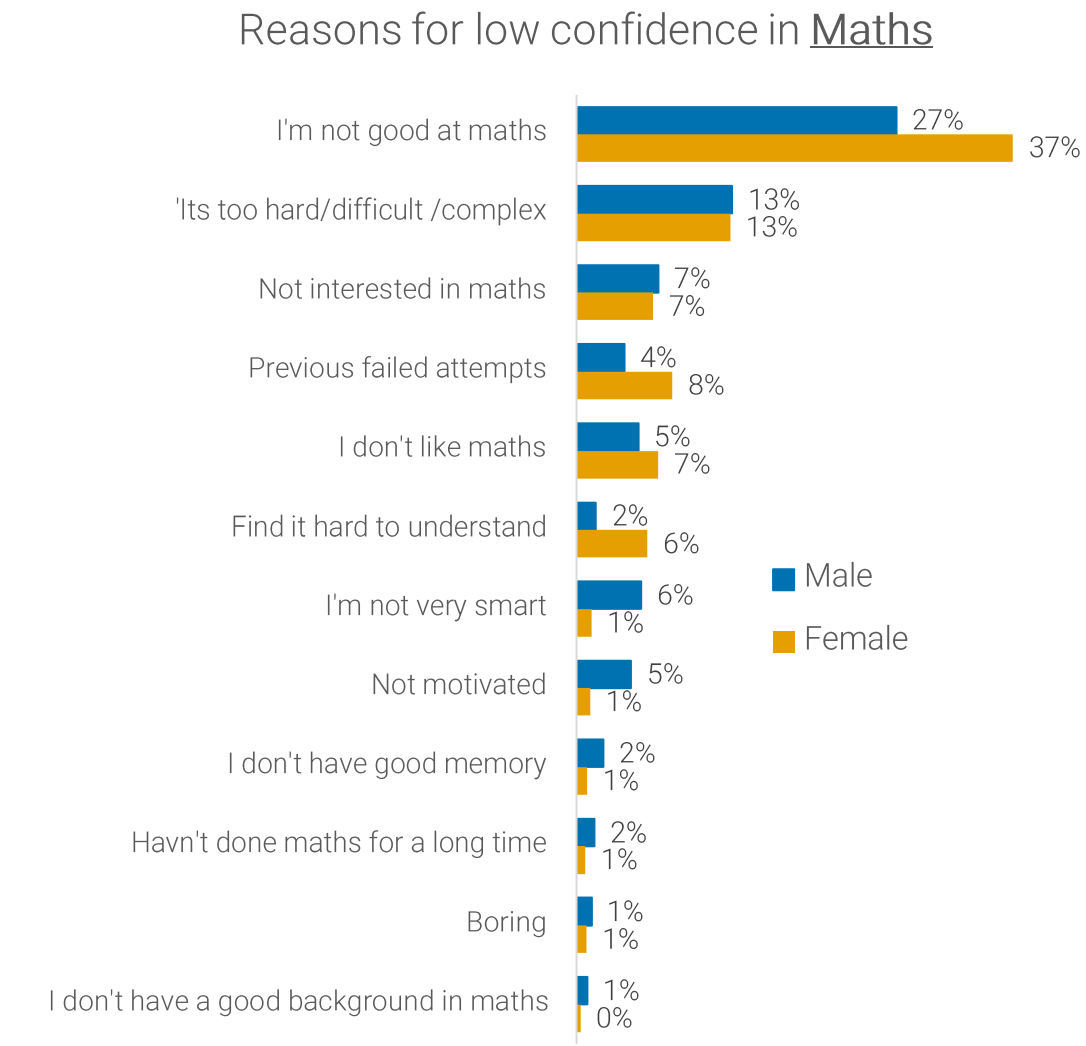
"Engineering is a very challenging degree and involves a lot of maths. I am not good at maths." Female, 18

"Engineering is a subject that involves many aspects that I'm not confident in." Female, 17

Q. Why do you not feel confident about getting good results with engineering subjects?
Base: Total – 675

There is an overarching perception for many students that they're simply not good with maths; this is as high as 37% among females





"Because I've never been good at maths." Male, 20

"I suck." Female, 23

"I'm TERRIBLE at maths and my dumb brain doesn't understand anything." Female, 16

"Never been good at this subject due to my mentality but I'd love to try again." Female, 17

"It's difficult and requires lots of practice. I get distracted very easily and maths isn't something you cram you need constant practice." Male, 22

"Maths is a hard concept to grasp and often leaves me very confused." Female, 18

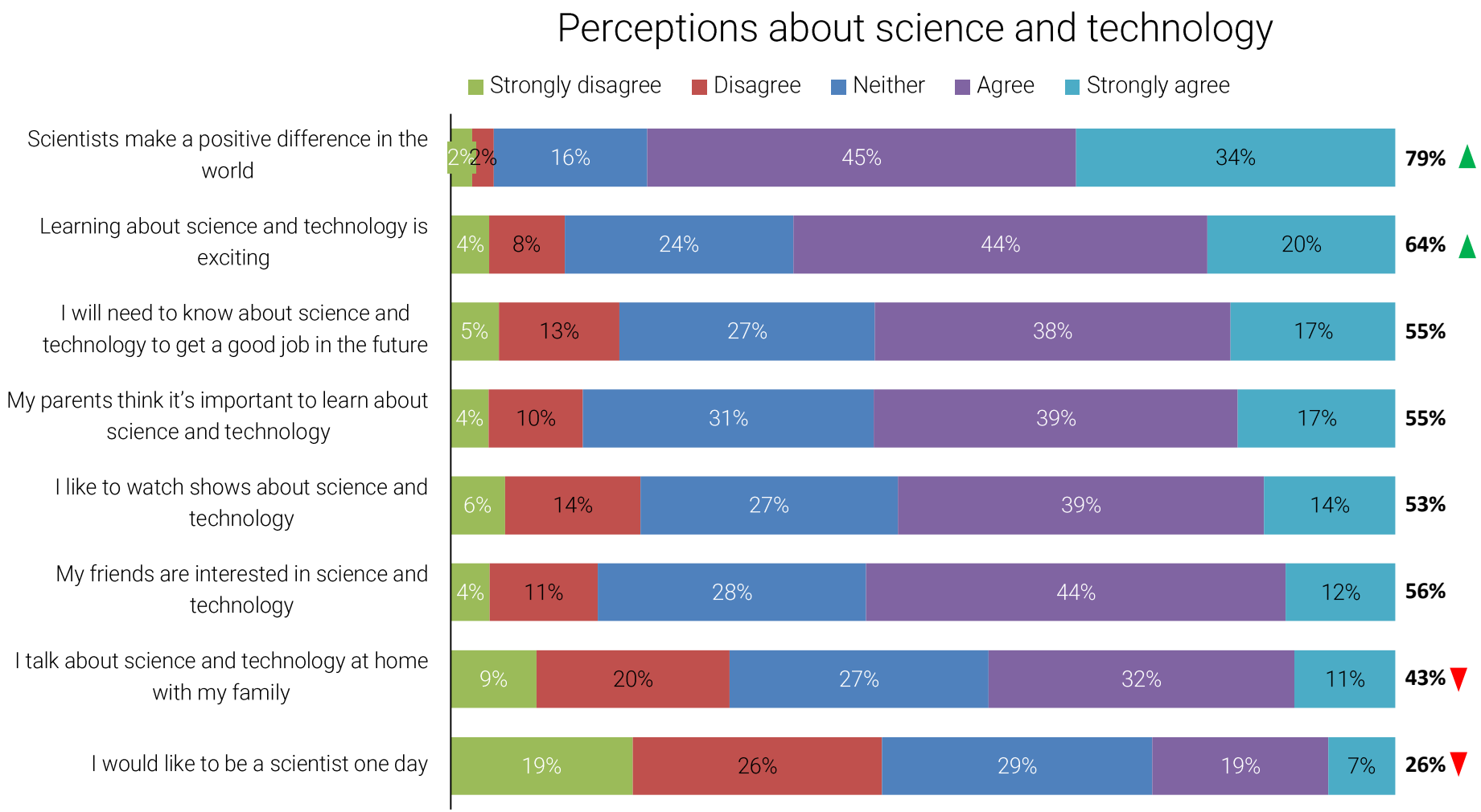
"Not interested and have struggled with the subject throughout high school." Female, 18

"Maths was a subject I was good at, until a teacher in high school failed me as a student. I am no longer confident." Female , 23

"Cos I'm hopeless at it, my teacher reckons I have maths anxiety and I just freeze whenever I see a maths problem." Female, 15

Q. Why do you not feel confident about getting good results with maths subjects?
Base: Total – 406

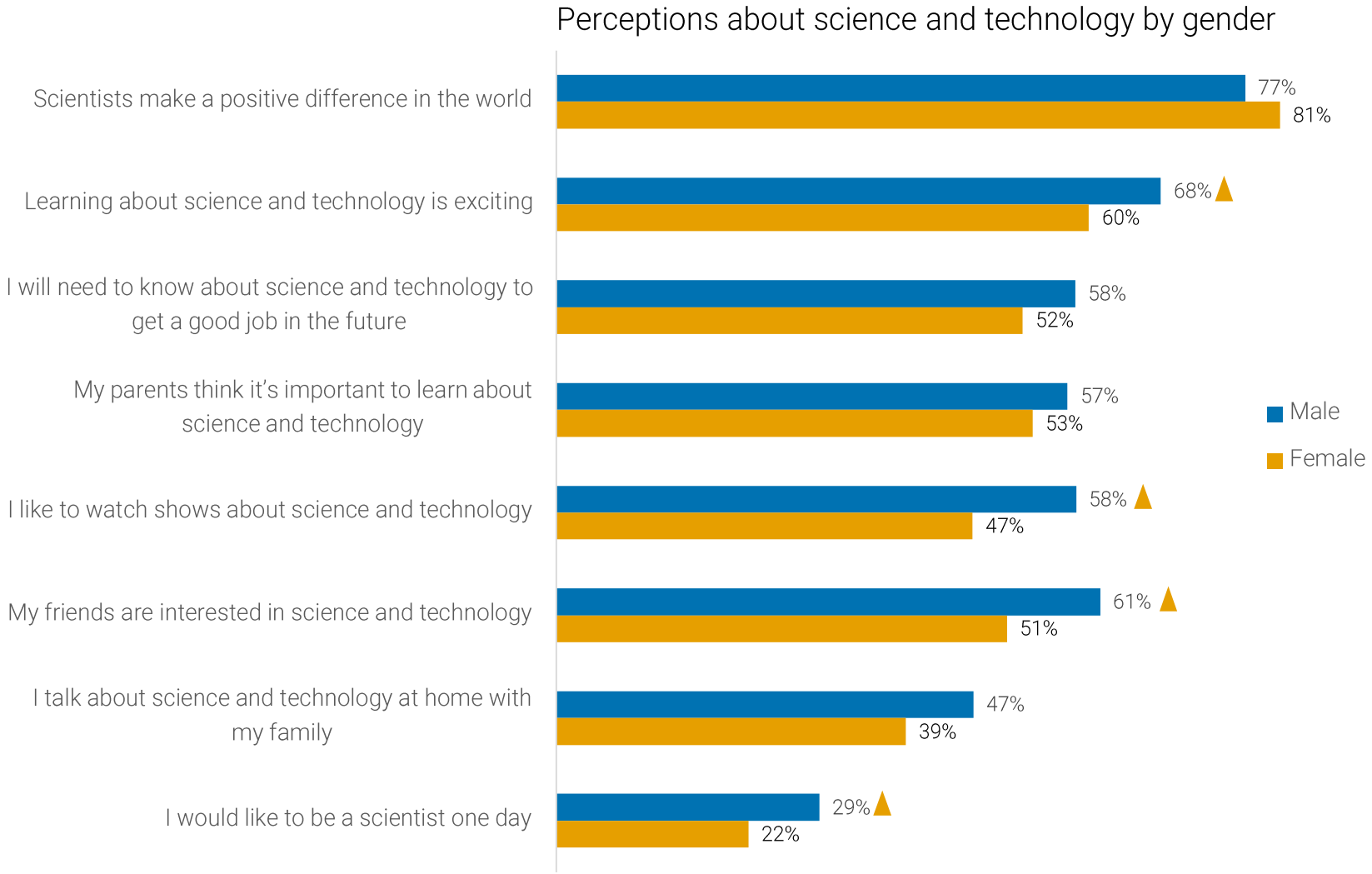
While 4 in 5 people appreciate the positive impact science has on the world, only half believe it's important for employment, and only half discuss science with family and friends



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: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

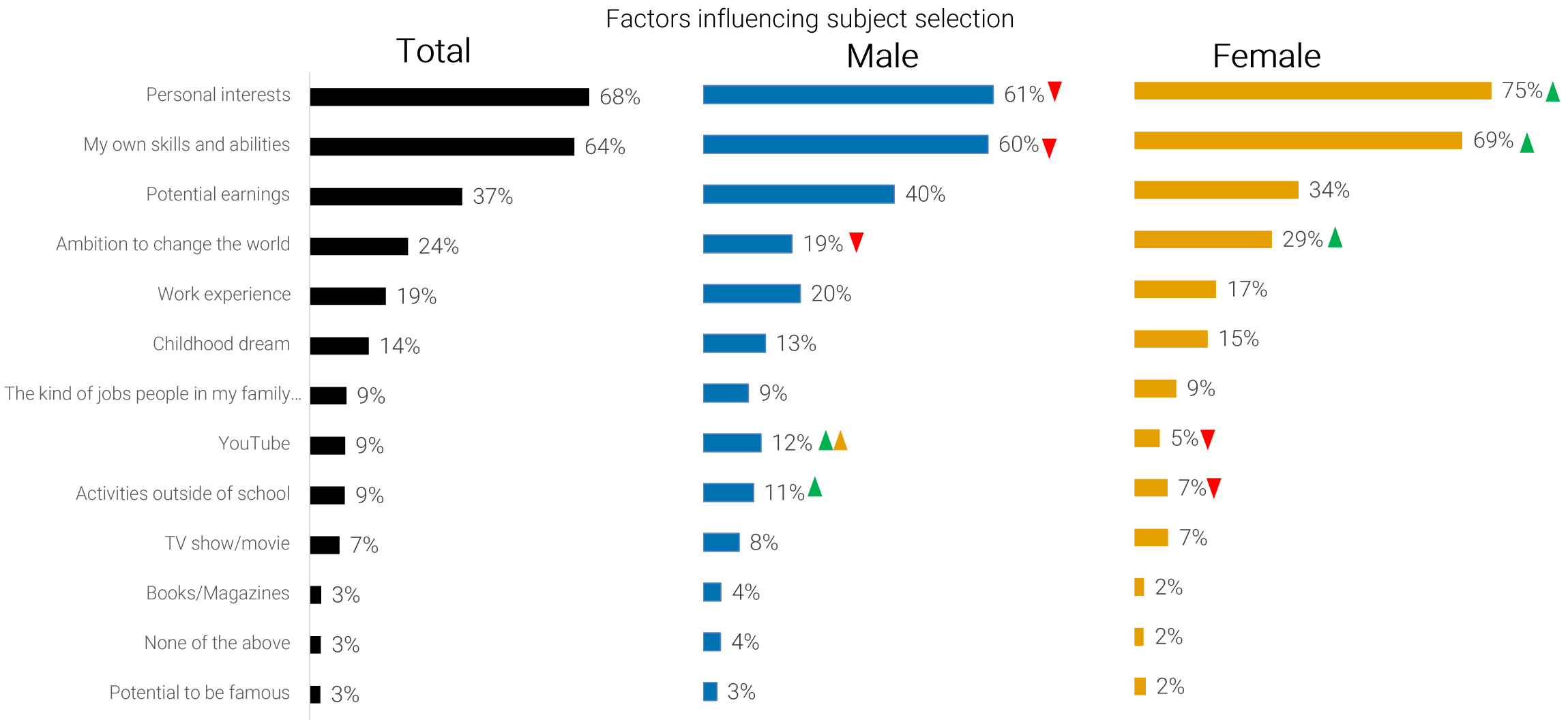
Males show higher levels of excitement towards science and technology, have higher levels of engagement and a higher proportion want to follow a career in the field



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: Males – 978, Females – 1,069

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

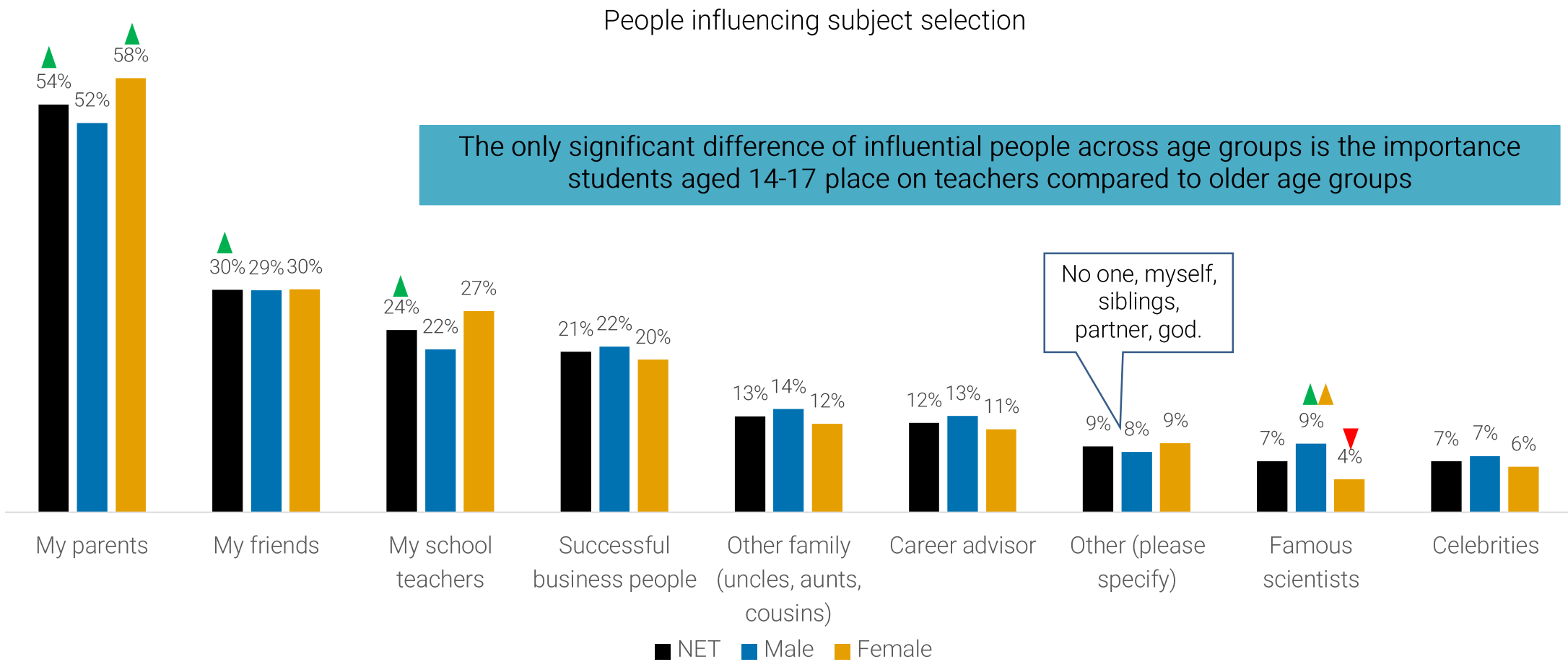
The main factors influencing subject selection are intrinsic values and interests and skills/abilities; males are more influenced by external stimuli while females are driven by an ambition to change the world



Q. From the below list, which factors most influence your decision of the subjects you choose to study? Please select up to 3 factors which influence you the most. Base: Total – 2,092, Males - 978, Females – 1,069

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

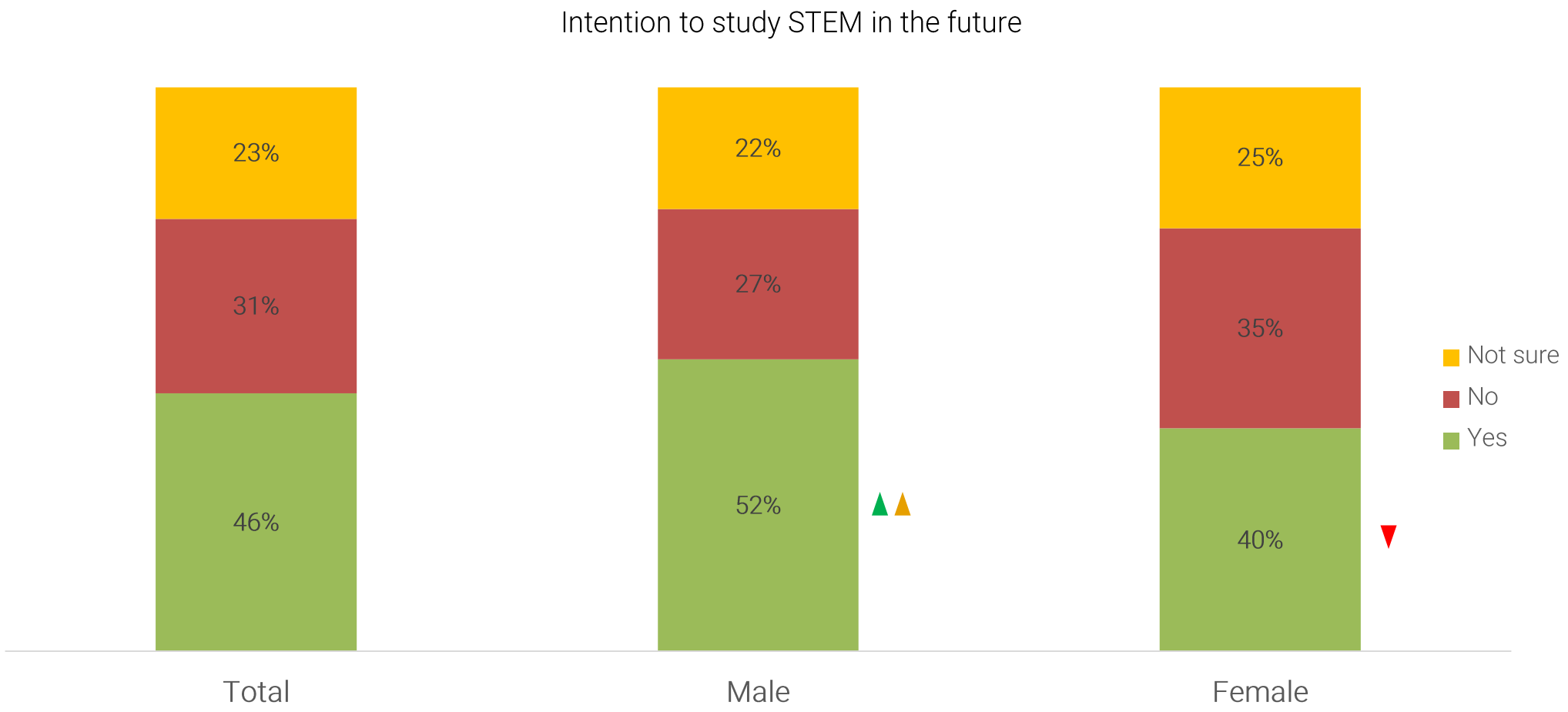
Parents are the most influential people for students selecting their subjects, slightly more so for females



Q. And which of the below people most influence your decision of the subjects you choose to study? Please select up to 2 groups of people which influence you the most? Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Almost half of all people are considering studying STEM-related subjects in the future; this was largely driven by males

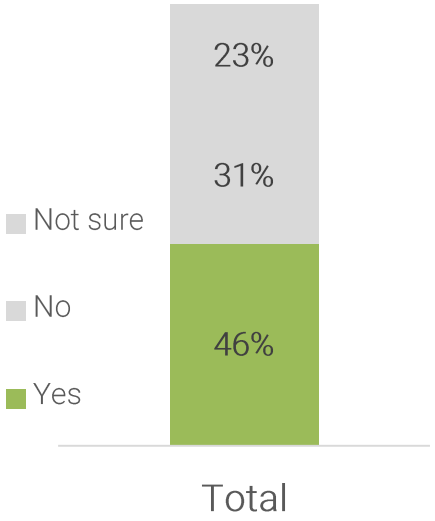


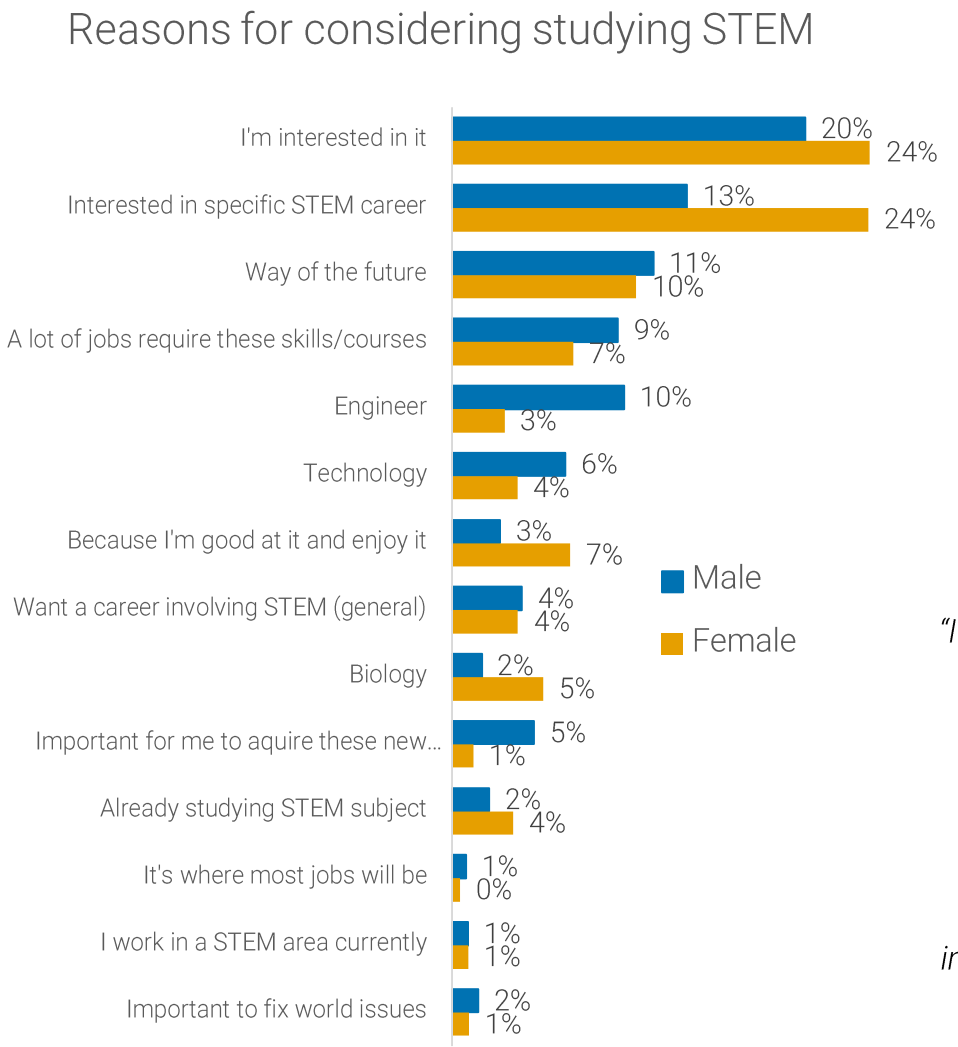
Q. Are you considering studying STEM related subjects in the future? STEM stands for Science, Technology, Engineering and Maths, but it also includes subjects such as biology, chemistry, physics, computing, programming, coding, mechanical and electrical trade.
Base: Total – 2,092, Male - 978, Female - 1,069.

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: Base changed to 826

Many students already have good idea about the STEM career they want to pursue





Accounting, Actuary, Anatomy and physics, App design and media (film and tv), Architecture, Astronomer, Biomedicine, Chemistry, Coding, Computer Science, Computing, Data science, Doctor, Electrical trades, Hospitality, Marine biology, Maths, Medicine, Neurosurgeon, Nursing, Other Science, Paramedical Sciences, Pathology, Pharmacy, Physics, Psychiatrist, Psychologist, Science, Software developer, Sports science, Teacher, Technician, Vet.

"Because I want to be an engineer." Male, 15

"I am just extremely interested in STEM, with the minimal amount of females interested it makes me aspire to study STEM related subjects to close the gender gap." Female, 16

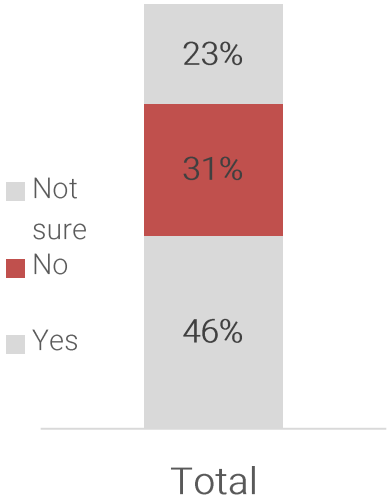
"STEM helps to shape the future and is needed to keep the world constantly moving." Female, 17

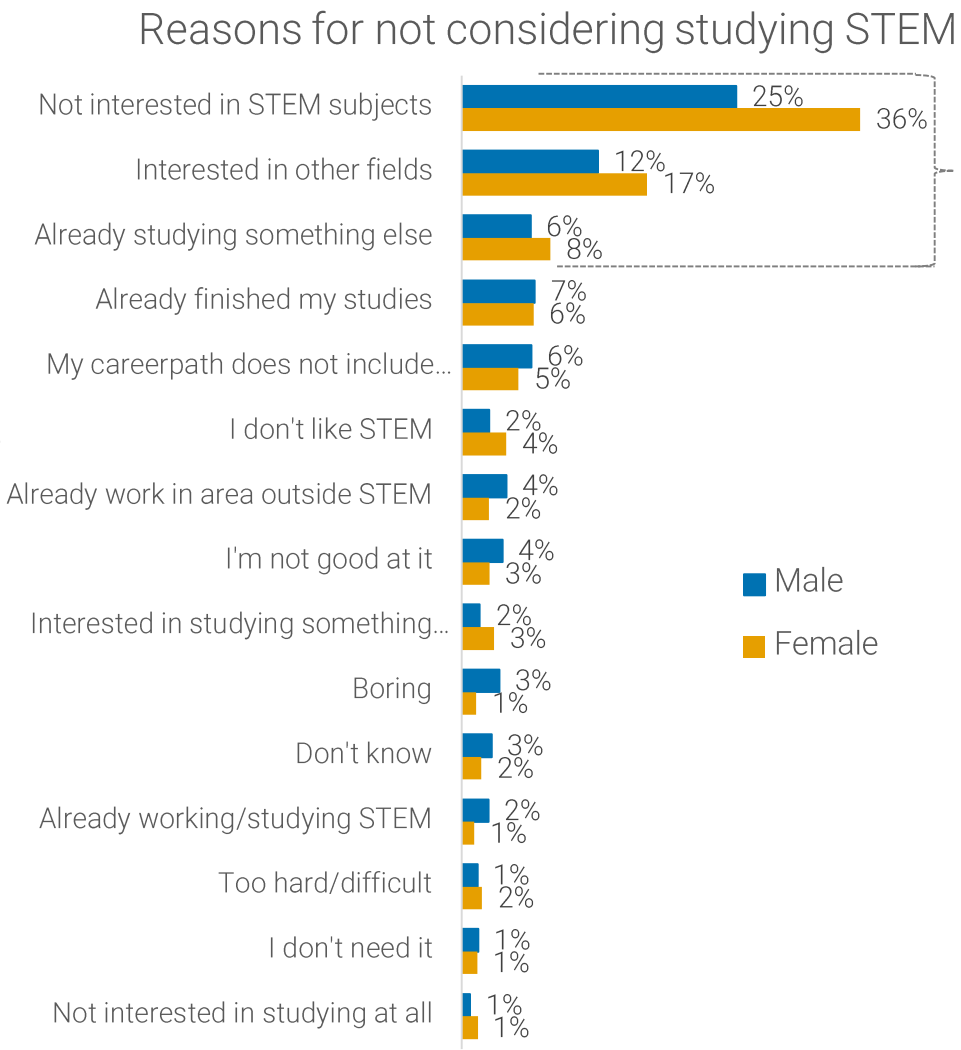
"As they are in high demand across many industries and it's important that women explore STEM within the future for subject to become less male dominant." Female, 17

Q. Why are you considering studying subjects related to STEM in the future?
Base: Total – 826

Correction: Base changed to 658

More than half of those not considering studying STEM simply have other interests; only small minority have negative connotation towards STEM





Total: 54%
Males: 43%
Females: 61%

"I'm not interested in Science, it never matched being a business owner" Male, 17

"It just doesn't fit with my interests, knowledge and abilities." Female, 23

"I'm not interested in the field. I am more interested in English, language, fine arts, creativity." Female, 19

"Because I'm not interested in it and I'm more focused on working with people." Male, 13

"Because I have my heart set on studying tourism, events and hospitality. I am good at this and it's what I enjoy." Female, 19

"I am an UX designer so I already know coding." Female, 22

"Because I am keen on health subjects such as OT and Physio." Male, 19

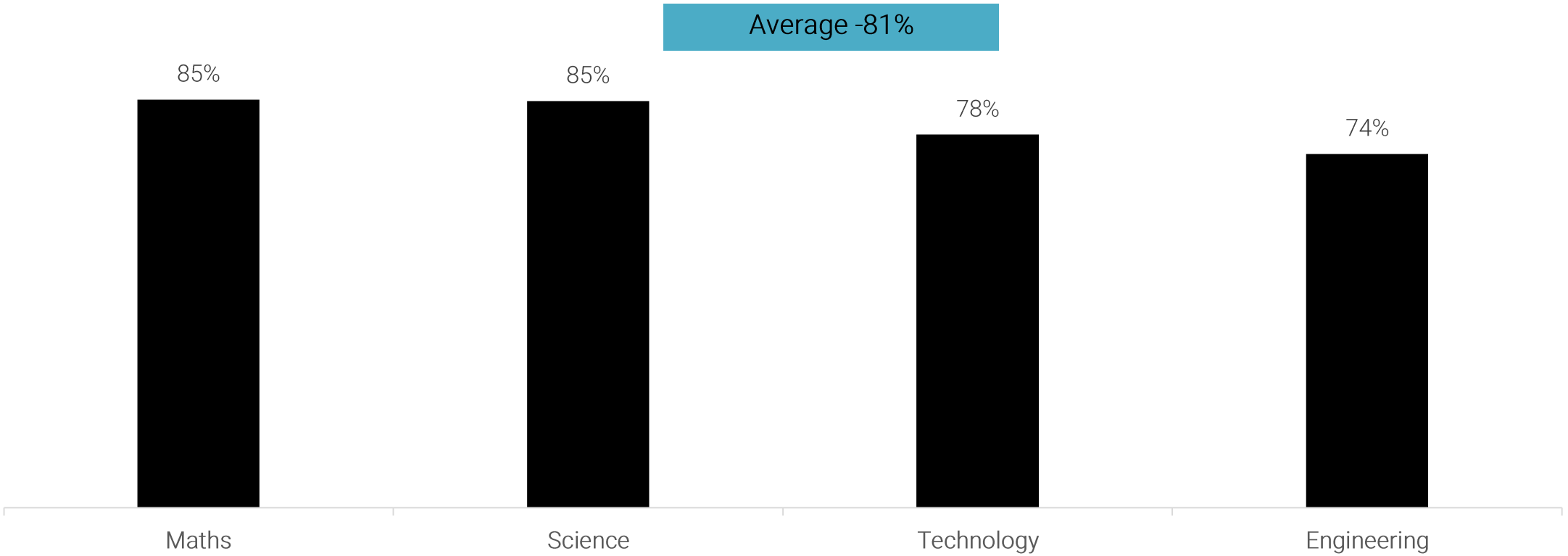
"Not precisely related to Finance." Male, 24

Q. Why are you NOT considering studying subjects related to STEM in the future?
Base: Total – 658

Perception about STEM and Gender Differences

The majority of people disagree that there is any gender superiority across all STEM subjects

Perceived gender superiority across all STEM subjects
Summary – 'Boys and girls are as good as each other'

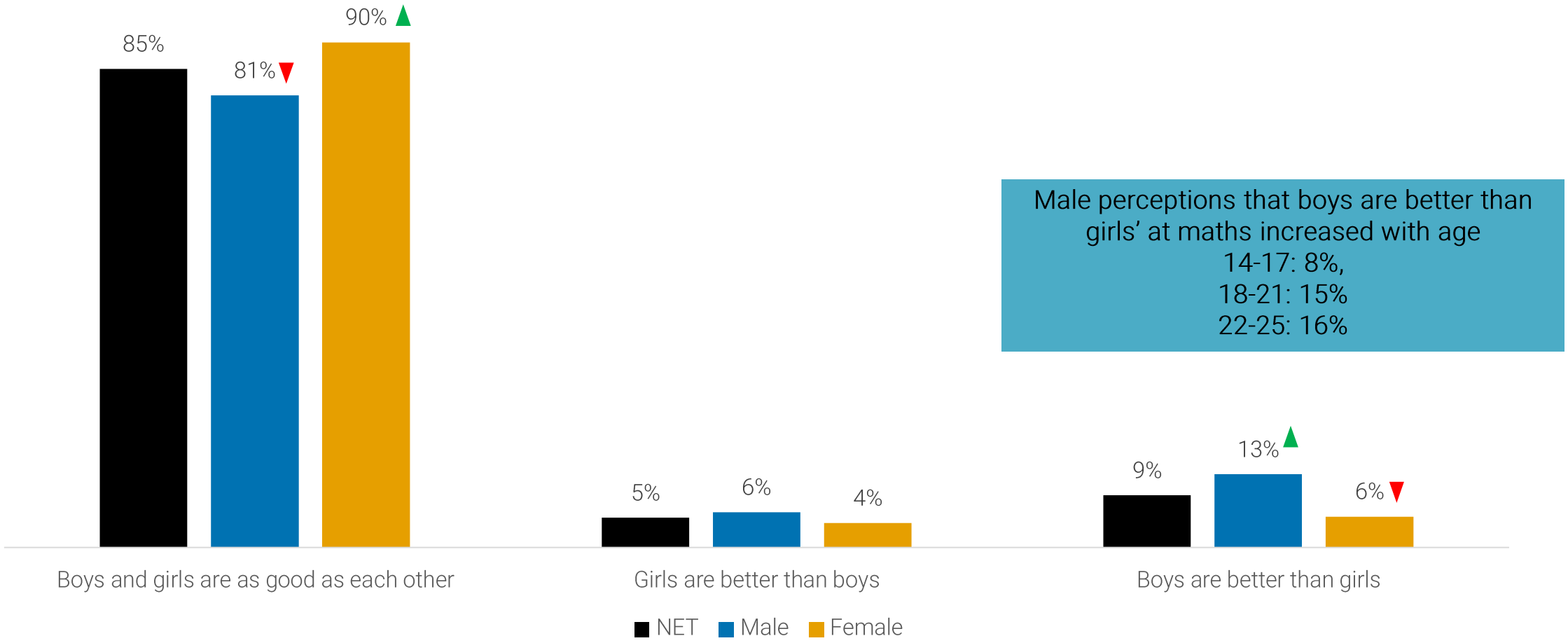


Q. In your opinion, when it comes to studying Maths/Science/Technology/Engineering how much do you agree or disagree with the following:
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

The majority believe both genders are equally ‘good’ at maths, but a slightly higher proportion of males believe ‘boys are better than girls’ at maths

Perceived gender superiority in Maths

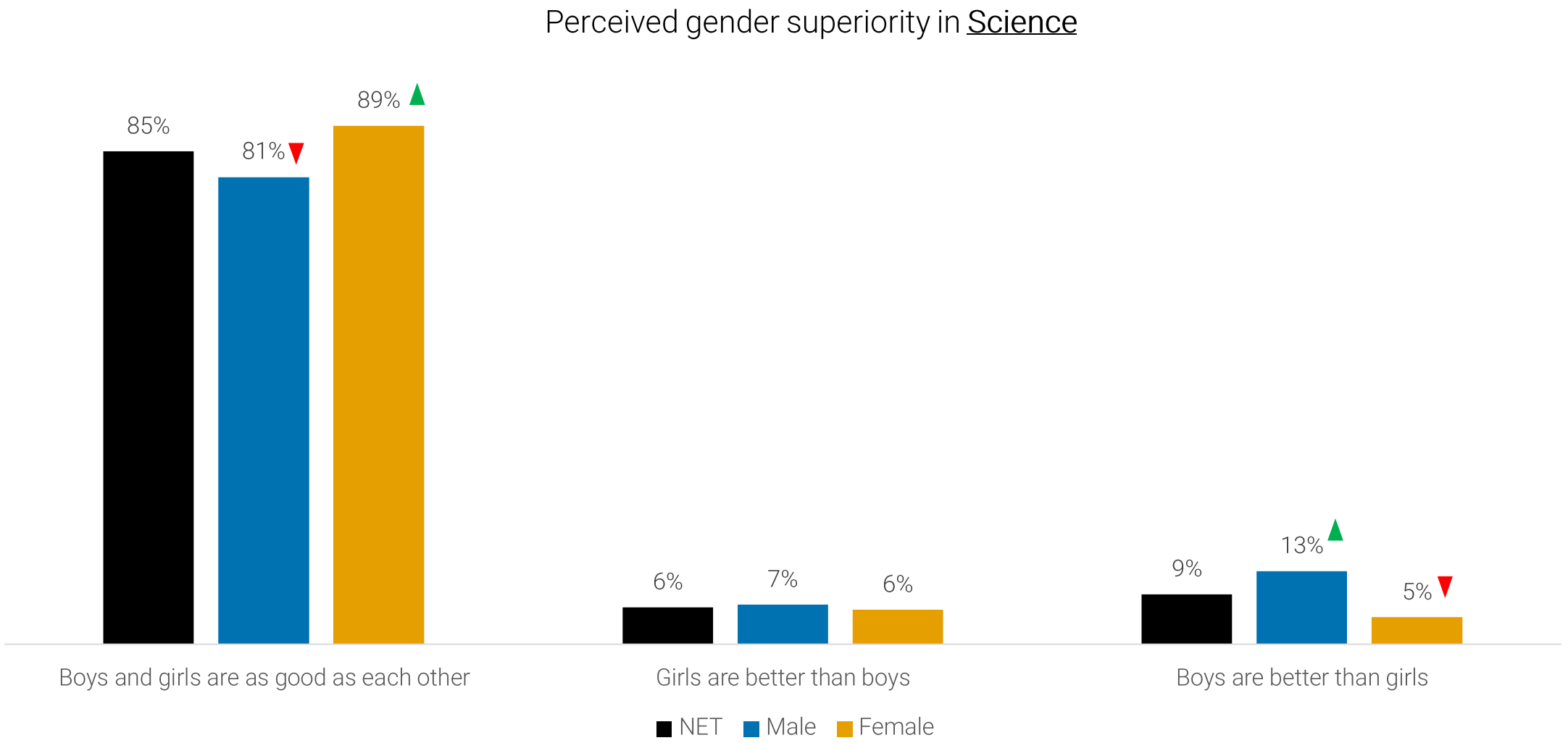


Male perceptions that boys are better than girls’ at maths increased with age
14-17: 8%,
18-21: 15%
22-25: 16%

Q. In your opinion, when it comes to studying maths how much do you agree or disagree with the following:
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

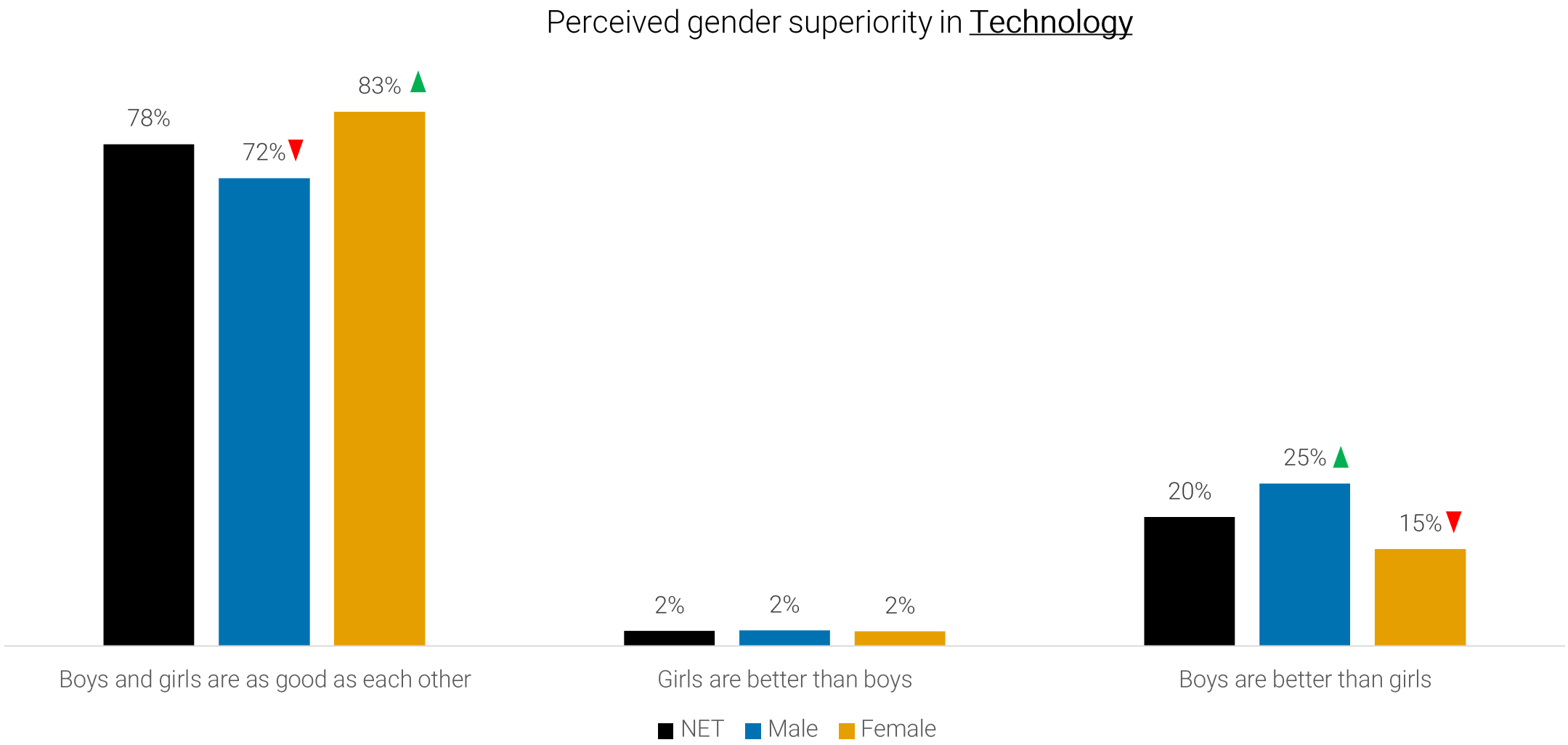
The majority believe both genders are equally ‘good’ at science, but a slightly higher proportion of males believe ‘boys are better than girls’ at science



Q. In your opinion, when it comes to studying science how much do you agree or disagree with the following:
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

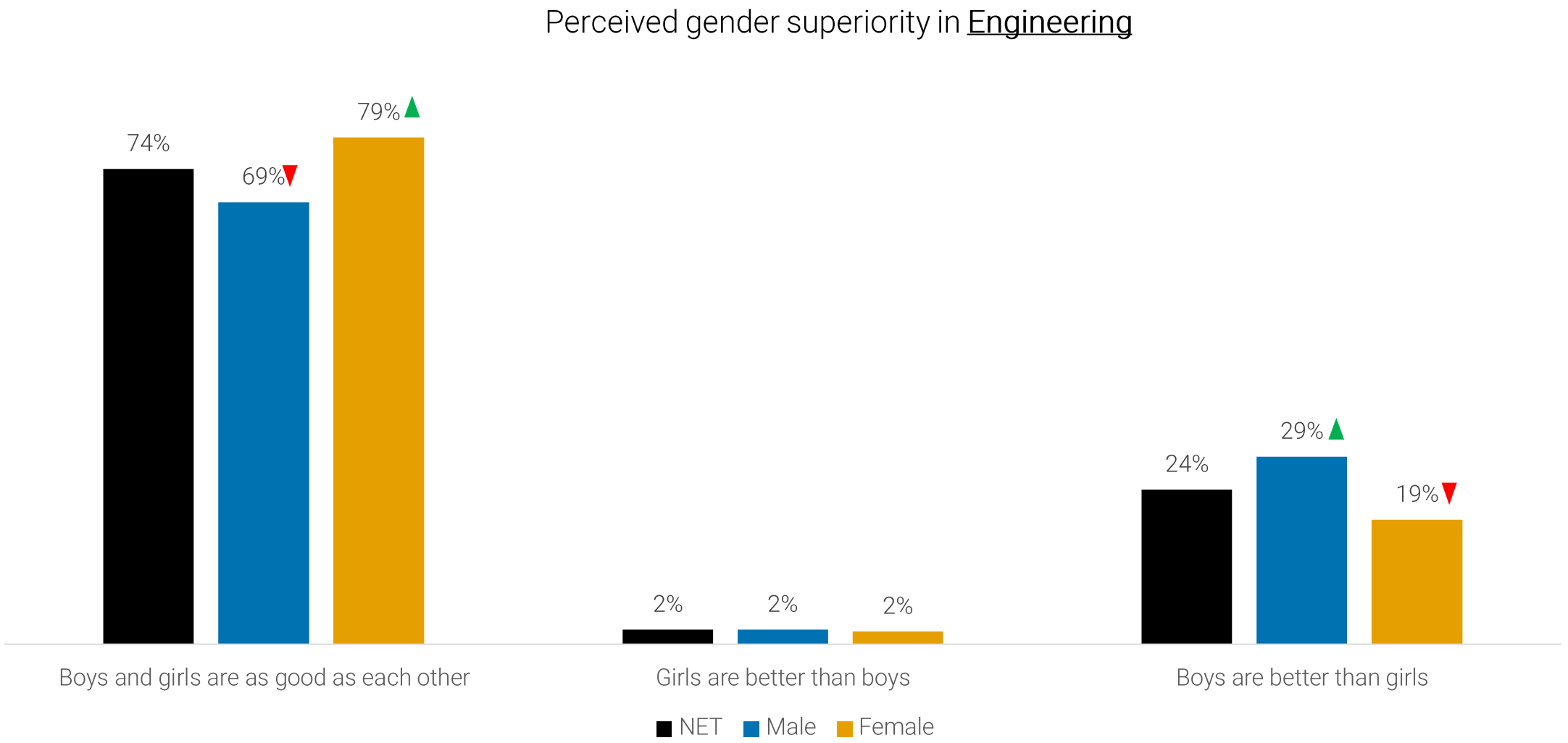
Technology and engineering have highest proportion of males who believe ‘boys are better than girls’ in these subjects



Q. In your opinion, when it comes to studying technology how much do you agree or disagree with the following:
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

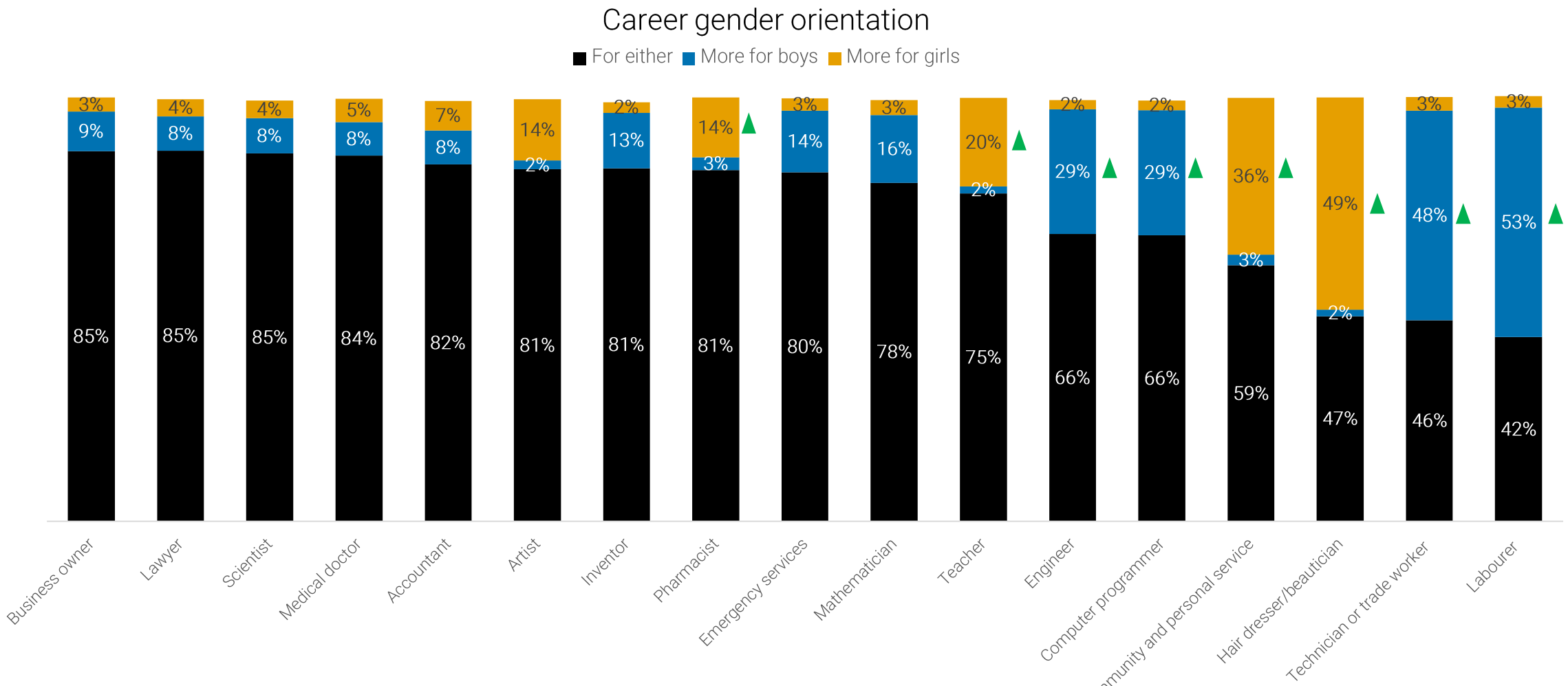
Technology and engineering have highest proportion of males who believe ‘boys are better than girls’ in these subjects



Q. In your opinion, when it comes to studying engineering how much do you agree or disagree with the following:
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

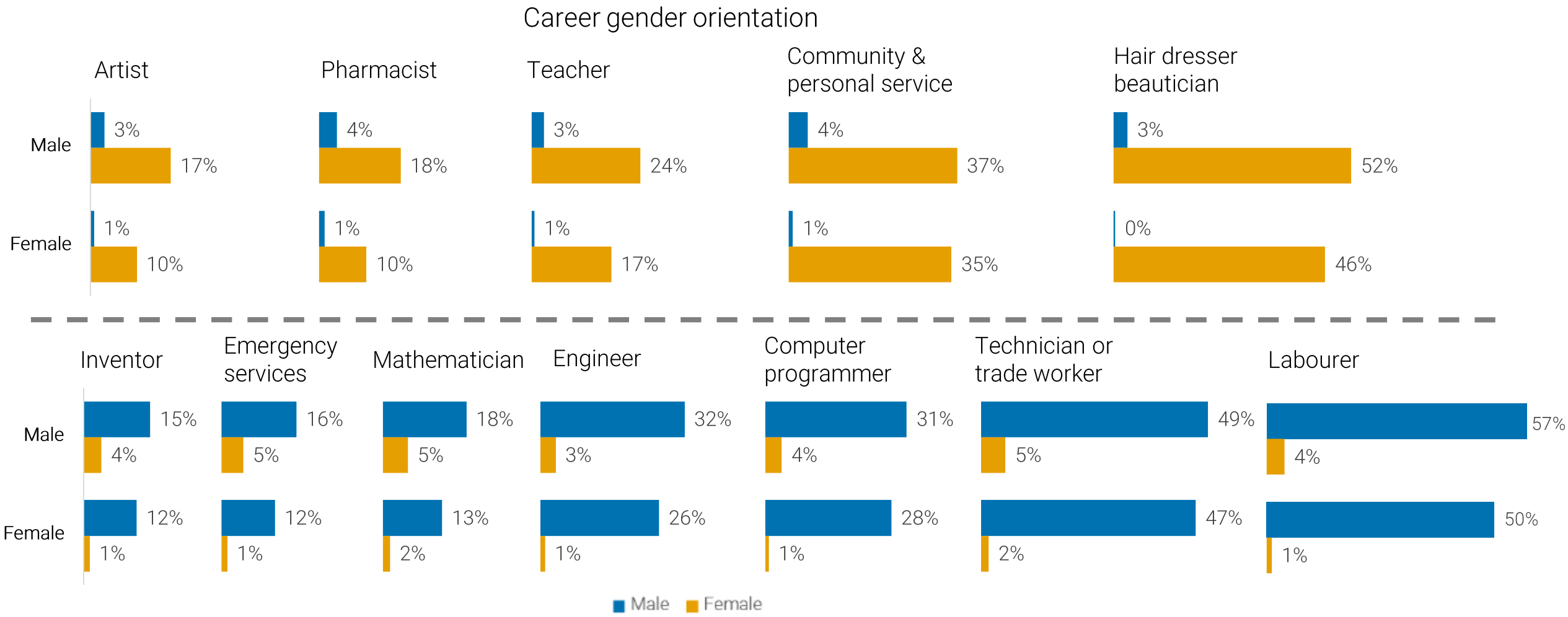
The majority of careers are seen as gender-neutral, however, certain career gender stereotypes such as ‘labourer’ and ‘hairdresser’ still prevail



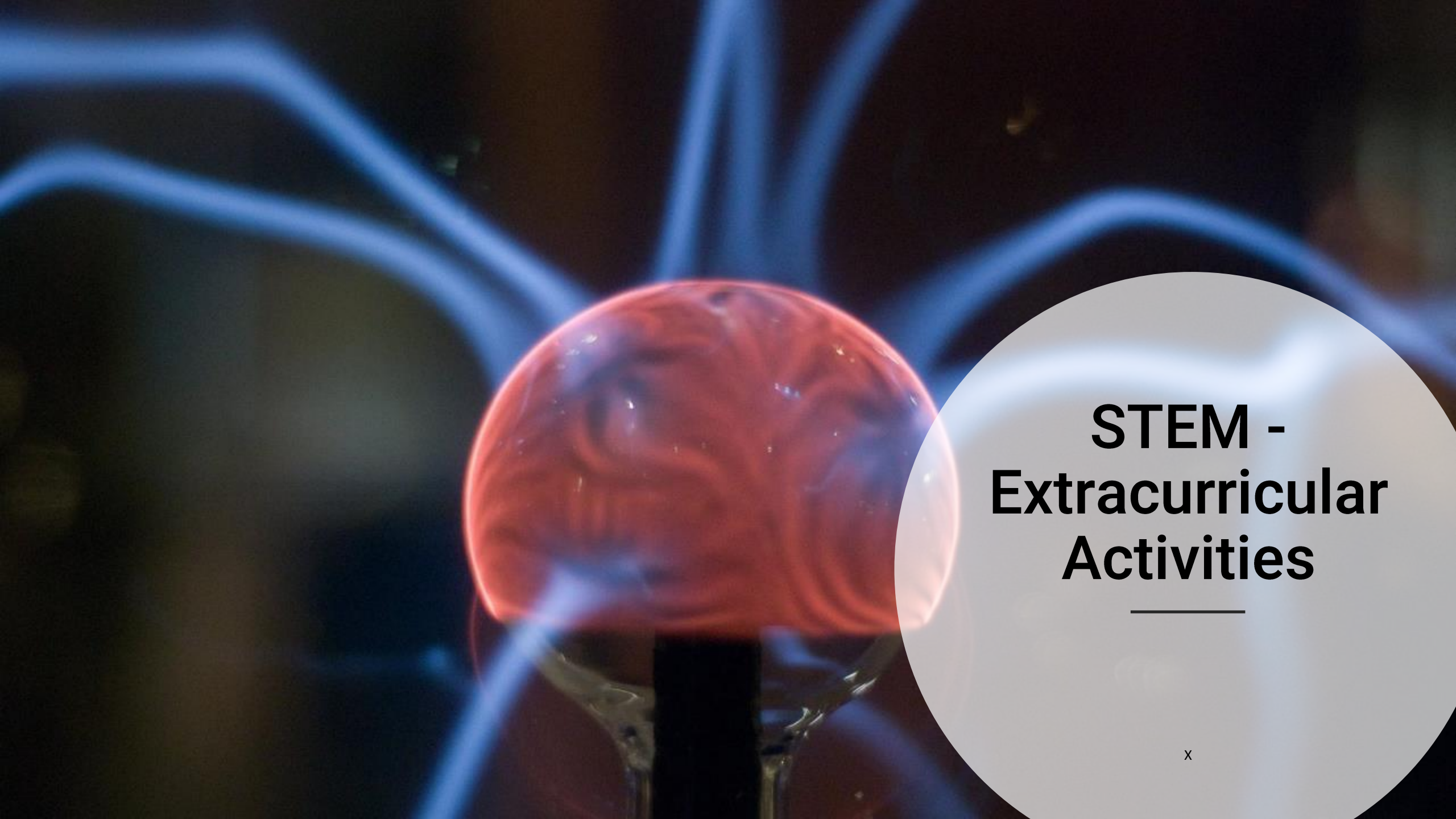
Q. Below is a list of careers, thinking about what you know do you think these jobs are more for boys, more for girls or for both?:
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

STEM careers such as inventor, mathematician, engineer and programmers perceived to be male-oriented careers by both genders



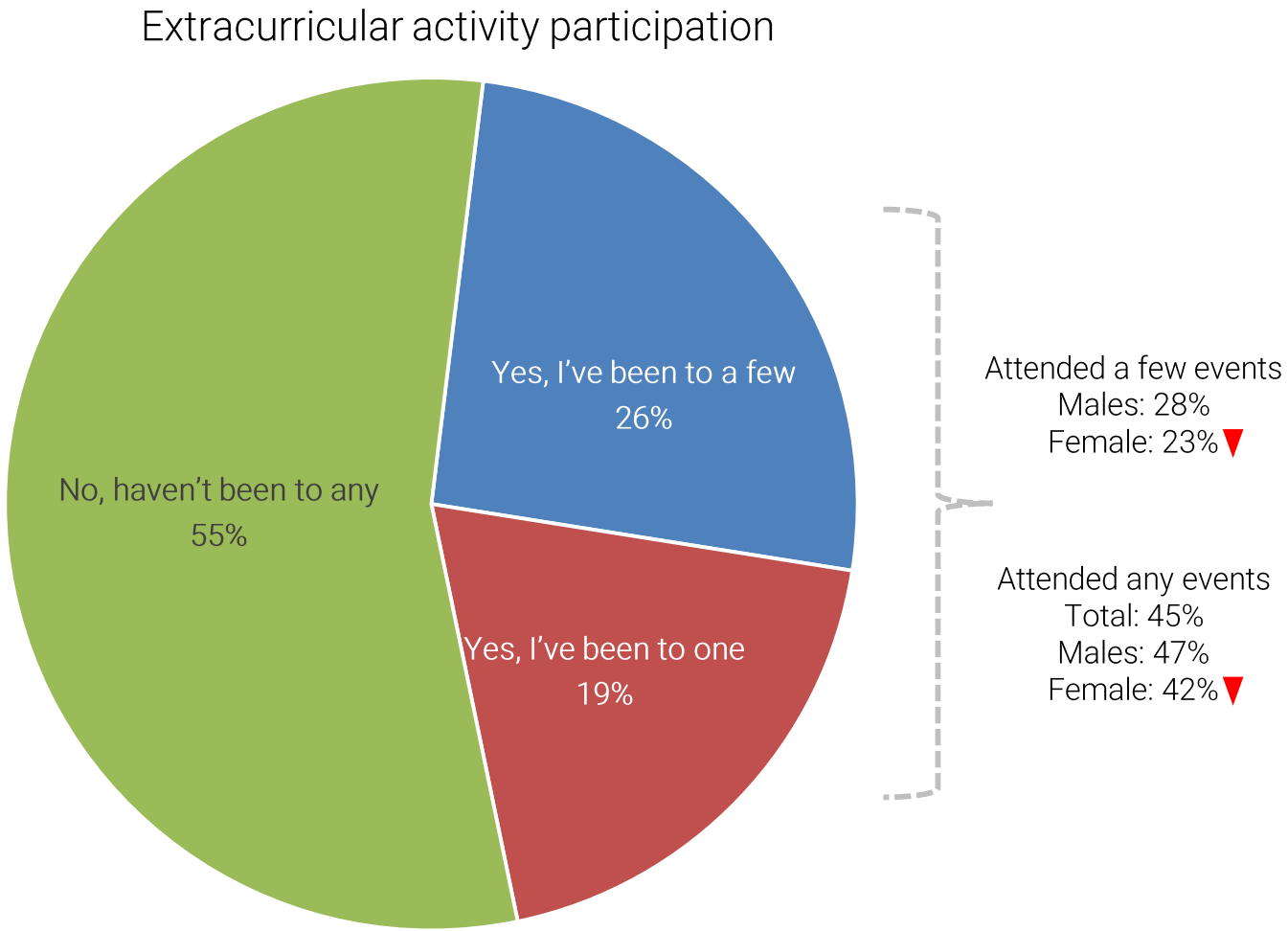
Q. Below is a list of careers, thinking about what you know do you think these jobs are more for boys, more for girls or for both?:
Base: Total – 2,092



STEM - Extracurricular Activities

x

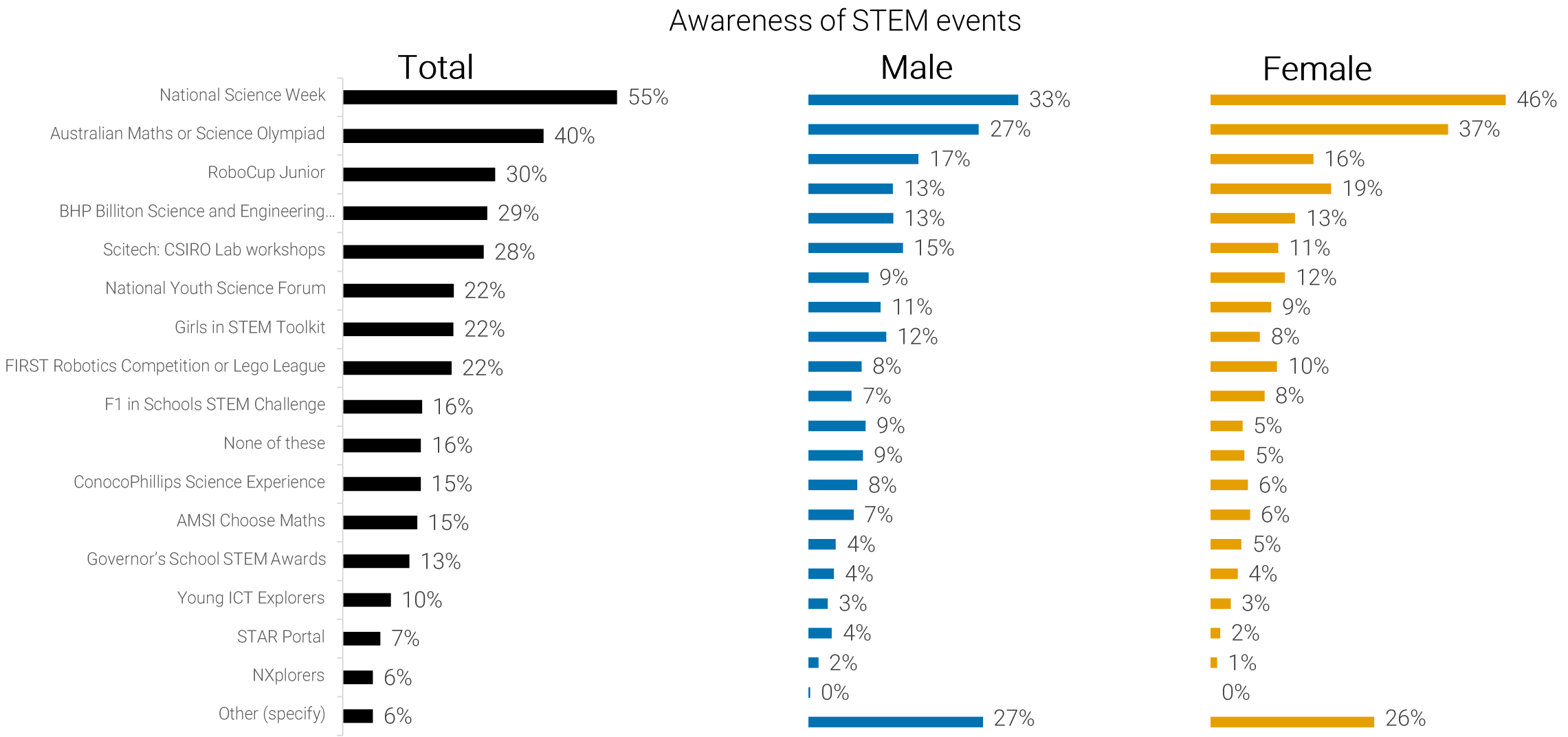
45% have attended events in the past 12 months with a quarter going to more than one; attendance is more popular with males



Q. Have you attended 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 or any other event related to science ?
Base: Total – 2,092

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

2 out of 5 people are aware of National Science Week and one third know about Questacon, with females showing higher levels of awareness

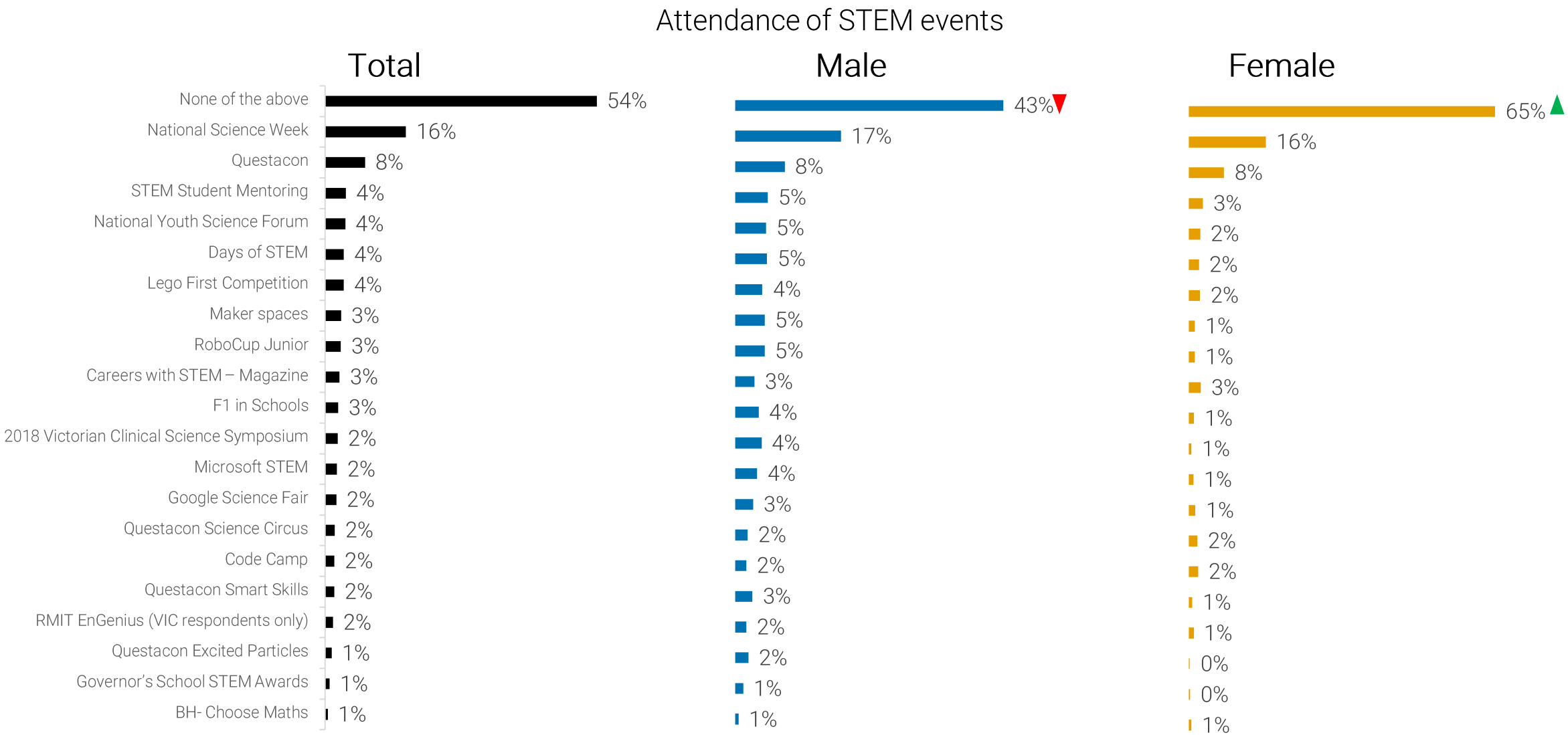


Q. And which of the below events or activities have you heard of?
Base: Total – 2,092, Males - 978, Females – 1,069

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

National Science … ular STEM-related events among y…

Correction: Base – Total 772, Male 394, Fem 353
Numbers slightly out – None of the Above is 54% total, 43% Male, 65% Female

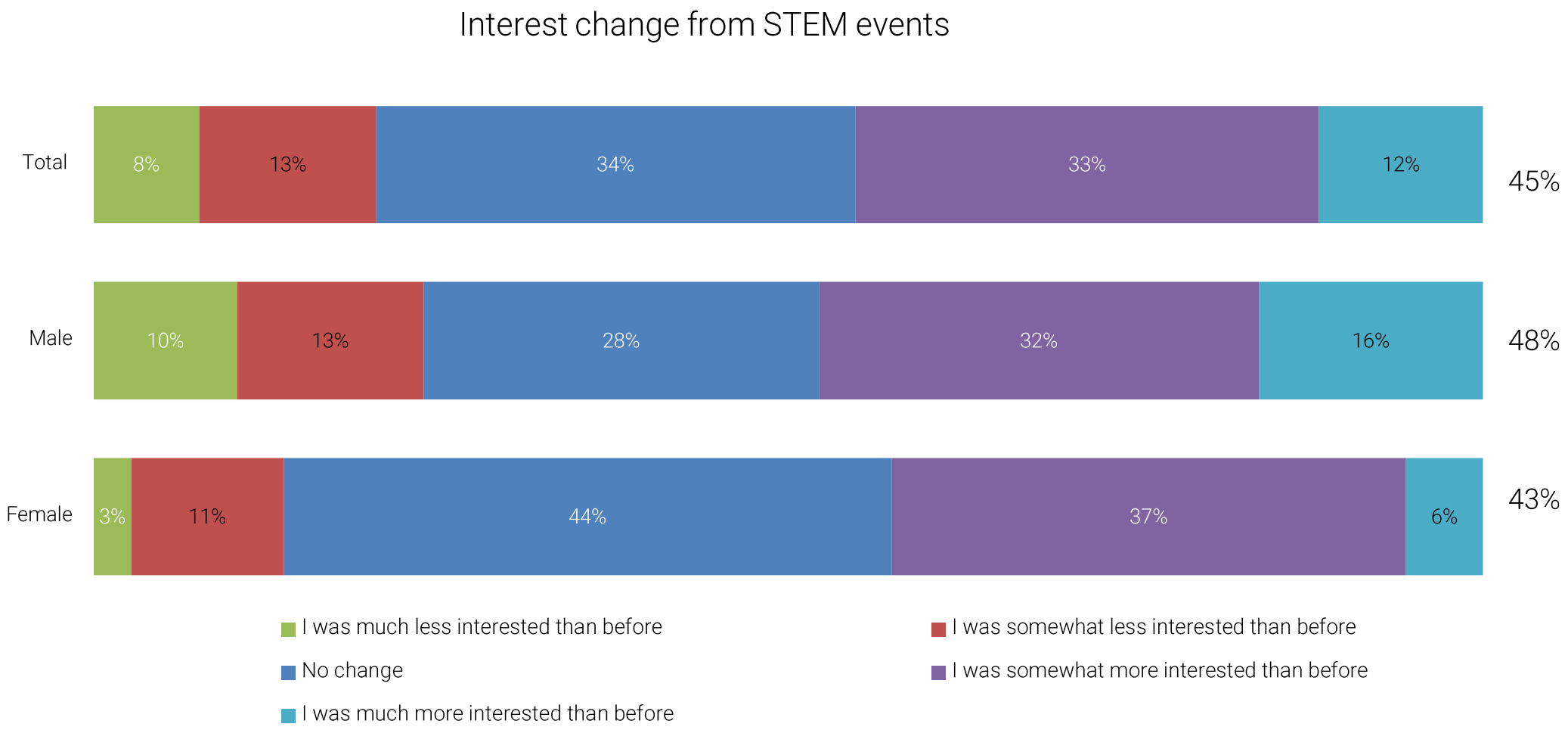


Q. And which of the below events or activities attended in the last 12 months?
Base: Total – 772, Males - 394, Females – 353

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

Correction: Base – Total 426, Male 247 Female 169

45% of people who attended the events say it increased their interest in studying STEM-related subjects



Q. And how did your interest in studying science, technology, engineering or mathematics subjects in the future change after attending these events? Base: Total – 426, Males - 247, Females – 169

▲▼ Significantly higher/lower than counterpart. Based on 95% confidence interval.

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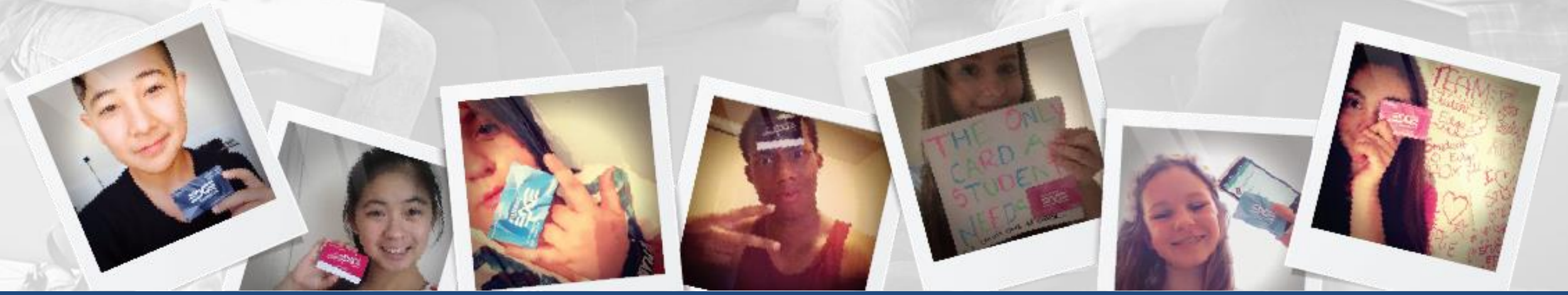

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