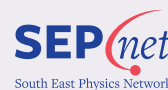




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Women in Science, Technology, Engineering and Mathematics: from Classroom to Boardroom

UK Statistics 2012



Produced for WISE by
Sue Botcherby & Lisa Buckner
Applied Research Associates

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Sue Botcherby has fifteen years of gender and research expertise. She held posts at Manchester Metropolitan University and the Equal Opportunities Commission, where she worked on partnership projects with UKRC and other organisations developing STEM related research. Currently a Director of Applied Research Associates, she specialises in qualitative and quantitative policy-applied research, including secondary analysis of datasets.

Applied Research Associates



UNIVERSITY OF LEEDS

Foreword

"At Intel, we are very pleased to support this publication. We know diversity comes with its own inherent benefits; this is why we continue to invest to maintain and advance diversity in our workplace. Intel is also helping to transform the lives of millions through education, and are committed to delivering education initiatives that ensure underserved and underrepresented communities and students have access to technology and are inspired to pursue careers in science, technology, engineering and mathematics (STEM).

We believe that a highly educated workforce and a strong technology infrastructure are the foundations for success in today's knowledge economy, and it is clear that gender should not be a criterion for success. This is why we both welcome and support campaigns such as this run by WISE.

The statistical analysis presented in this paper offers an invaluable and informed insight into why and when girls and women leave the STEM pipeline. The findings represent an excellent starting point to take decisive action to address the issues highlighted, and we hope that this will motivate more stakeholders, from the industry and academia alike, to join the campaign."

Danny Arati

Education Manager, Europe
Intel Corporation



Introduction

“Welcome to the latest statistics on women’s participation in science, technology, engineering and mathematics (STEM) in the UK. These figures provide a snapshot of the current position, from classroom to boardroom, based on data available in November 2012.

The positive news is that more young people of both sexes are studying STEM subjects and at GCSE girls are as likely as boys to do so. However, female participation drops off at ‘A’ Level, particularly in Physics, and very few females take up STEM apprenticeships. This reduces the talent pipeline going into the STEM workforce – only 13% of all STEM jobs in the UK are occupied by women. Fewer women in the workforce means STEM industries struggle to find women for senior roles or board appointments. It also means fewer women setting up STEM businesses – which in turn limits the potential for economic growth.

If we can turn this situation around, it will open up new and rewarding career pathways for women as well as bringing huge benefits to STEM industries and to the UK economy. Our vision is that at least 30% of the UK STEM workforce will be female by 2020, but we cannot do it alone.”

Helen Wollaston

Director
WISE



WISE
promoting female talent
in science, engineering and technology
from classroom to boardroom

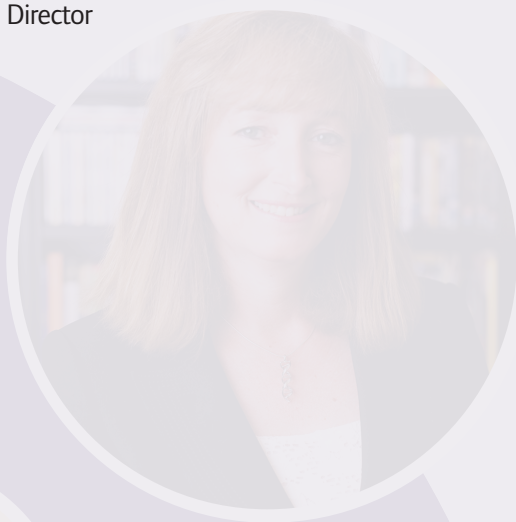
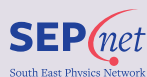
Log on to www.wisecampaign.org.uk for more information about getting involved with WISE in 2013.

“SEPnet (The South East Physics Network) is a consortium of physics departments in seven universities in the South East working together to promote physics and enhance physics teaching and research in the region. We are strongly committed to diversity and, in particular, to increasing the number of girls and women studying physics and continuing to pursue physics-related careers.

The WISE Stats Guide is a very valuable resource for industry and academia providing data and evidence to support the case for greater diversity in STEM.”

Veronica Benson

Employer Liaison Director
SEPnet



Summary

Secondary Education



GCSE

- Approaching equal percentages of girls and boys were entered for Science (Additional), Science, Mathematics, Biology, Statistics, Physics and Chemistry GCSEs in 2012.
- Of those who took these GCSEs, an equal or higher number of girls achieved A* - C grades compared to boys in all STEM subjects in 2012, except Mathematics (1 percentage point difference), Other Technology and Other Science.

TREND

The percentage of girls entered for Physics and Chemistry GCSE increased by 82% and 79% respectively between 2009 and 2012.

'A' Level

- At 'A' level, lower numbers of females took all STEM subjects, except Biology.
- Of those who did take STEM 'A' Levels, females achieved higher A* - C combined grades compared to males in all STEM subjects in 2012.

TRENDS

- **The number of females taking Chemistry 'A' Level rose in 2012 by 13% compared to 2009, although the number of males entered in the same time period increased at a higher rate (18%).**
- **Only 21% of Physics 'A' Level entrants were female, but the number participating rose by 13% compared to 2009. Again, the number of males entered in the same time period increased at a higher rate (19%).**
- **40% of Mathematics 'A' Level entries were female in 2012, a 17% rise compared to 2009. The numbers of males entered in the same time period increased at a higher rate (19%).**

Source: JCQ provisional results 2012.

Further Education



Apprenticeships

- Females completed 18% of ICT, 1% of Construction, Planning and the Built Environment and 4% of Engineering and Manufacturing apprenticeships in 2010/2011.
- The top five STEM apprenticeships completed by females in 2010/11 were IT User; IT and Telecoms Professionals including ICT; Engineering; Aviation and Construction. Of these, IT User apprenticeships and Aviation had the highest proportion of female completions, at 37% and 33% respectively.

Source: Apprenticeship Framework Achievements by Sector Framework Code, Level and Gender, The Data Service 2010/11.

NVQs / SVQs

- Females gained a higher percentage of NVQs/SVQs by one percentage point compared to males in Information and Communication Technologies in 2011.
- At the other end of the scale, only 2% of those gaining NVQs/SVQs in Construction, Planning and the Built Environment in 2011 were female.

TREND

The number of females achieving Engineering and Manufacturing Technologies NVQs/SVQs in 2011 declined 8% from 2008. By contrast, the numbers of males achieving these NVQs/SVQs increased by 19% in the same period.

Source: Achievement of NVQ/SVQs by Sector Subject Areas, by level of achievement and gender, The Data Service 2010/11.

Workplace



Higher Education

- At degree level, there are marked differences in the STEM undergraduate subjects which attract males and females:
 - Males dominated undergraduate degrees achieved in Engineering and Technology (85%), Computer Science (82%) and Architecture, Building and Planning (72%) in 2011.
 - Females dominated undergraduate degrees achieved in Subjects Allied to Medicine (83%), Veterinary Science (79%) and Agriculture and Related Subjects (65%) in 2011.
- In most subjects, the gender segregation is less marked at postgraduate level. In Architecture, Building and Planning, for example, 41% of postgraduate degrees were obtained by women, compared to 28% at undergraduate level in 2011.

TRENDS

The number of females obtaining Engineering and Technology degrees increased by 21% between 2008 and 2011. The number of females obtaining degrees in Mathematical Sciences increased by 27% in the same period. However, the increase was greater for males than females.

Source: Qualifications obtained by students on HE courses at HEIs in the UK, HESA, 2010/11.

Employment

- 13% of all those working in occupations classed as STEM (including health occupations) are women (693,000).
- 27% of Science and Engineering Technicians, 15% of ICT professionals and 5.5% of Engineering professionals are female.

TRENDS

The proportion of Science and Engineering Technicians who were female in 2012 rose by 4.4 percentage points compared to 2008. The percentages of Engineering and ICT professionals who are female fell by 1.4 and 0.6 percentage points respectively since 2008.

Participation of Women in Industry

The STEM industries employing the lowest proportion of women are Construction (11%) and Mining and Quarrying (13%).

STEM Managers

Fewer than one in ten (9.8%) of STEM managers are female.

STEM Business Owners

Just over one in ten (11%) of STEM business owners are women, compared to one in three (33%) who are owners of non-STEM businesses.

Source: Labour Force Survey, March 2011-March 2012.

Women on Boards of Top Companies

- Two STEM companies were in the top five ranked FTSE 100 companies with the highest percentages of women on their Boards in 2012.
- Of FTSE 100 companies in STEM sectors, 13% of Board Directors are female compared to 17% of Board Directors of companies in other sectors.
- All those outside STEM sectors have at least one woman on their Board, but nearly one in five of STEM companies in the FTSE 100 have no women on their Board.

Source: The Female FTSE board report 2012, Cranfield University School of Management.

The Statistics

Secondary Education GCSE

These statistics present an overview of female participation in Science, Technology, Engineering and Mathematics (STEM) in the UK. We include data from secondary and higher education, vocational qualifications, workforce, industry, business ownership and women on boards of FTSE 100 companies. In 2010, the UKRC published a larger report of statistics on women in STEM (UKRC, 2010). Where possible, this analysis has used the same methodologies to produce a more up to date version of key statistics from this report. Comparisons are made with UKRC, 2010 findings where the analysis is identical and codes and categories have remained the same. We have also included new analysis and data to reflect the classroom to board room remit of the WISE campaign.

Data tables and supporting information are available as **Appendix 1** (<http://www.wisecampaign.org.uk/about-us/wise-resources/uk-statistics-2012>). Data relates to the United Kingdom (UK) where available, or otherwise specified.

The Joint Council for Qualifications provides data on GCSEs. **Figure 1** shows the percentages of girls and boys who were entered for STEM GCSEs in the UK in 2012. Almost equal percentages of girls and boys were entered for Science (Additional), Science, Mathematics, Biology, Statistics, Physics and Chemistry. The pattern alters for ICT, Design and Technology and Other Sciences¹ where fewer girls were entered for those subjects by 12, 14 and 20 percentage points respectively.

TRENDS

The number of girls entered for GCSE Physics and Chemistry rose dramatically at a higher rate than boys. 2012 brought an 82% increase in girls entered for Physics at 73,401 compared to 40,327 in 2009. For Chemistry, the increase was 79%, with 74,754 girls entered, compared to 41,684 in 2009.

The number of boys entered for Physics increased by 65% between 2009 (50,852) and 2012 (83,976), with an increase of 67% entered for Chemistry between 2009 (50,562) and 2012 (84,372).

Notes:

1. Other Sciences includes All Sciences except: Additional Science, Biology, Chemistry, Physics and Science. Provisional data is presented. Final data will be available in 2013 and may change very slightly.
2. Other Technology includes Technology based subjects other than Design and Technology.
3. If separated out the numbers become very small for females in some areas.



The highest degree of segregation was evident in Construction, a relatively new qualification, where 97% of the GCSE entries were male. The pattern was similar in Engineering (93% male) and Other Technology³ (92% male). The numbers entered for those subjects are small compared to other subjects (see **Table 1**).

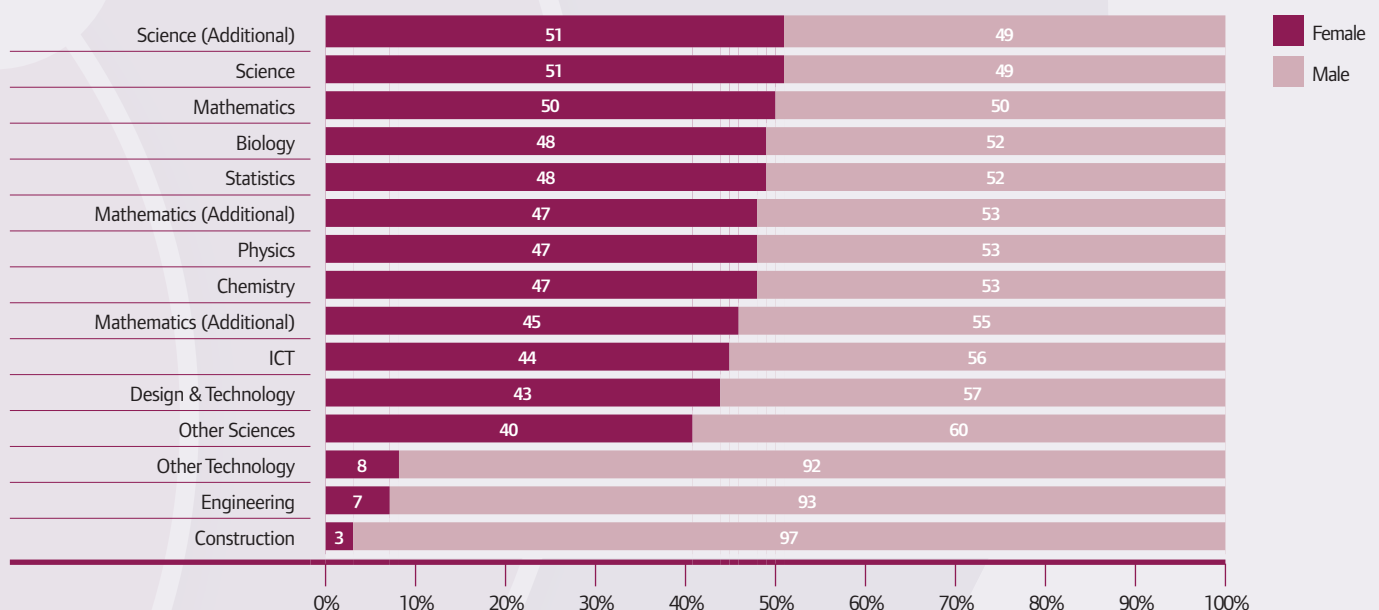
The number of girls entered for Construction fell from 34 in 2011 to 18 in 2012. The number of girls entered for Engineering fell from 152 in 2011 to 130 in 2012. The number of girls entered for Other Technology rose from 99 in 2011 to 111 in 2012.

Table 1 Number of females and males entered for STEM GCSEs UK 2012 (provisional)²

GCSE	Girls	Boys
Chemistry	74,754	84,372
Design & Technology	104,340	136,364
Mathematics	339,536	336,253
ICT	23,590	29,607
Mathematics (Further)	1,562	1,874
Other Sciences	3,786	5,617
Physics	73,401	83,976
Science	281,757	270,747
Statistics	24,311	26,309
Biology	79,521	86,647
Science (Additional)	148,282	141,668
Other Technology	111	1,336
Manufacturing	9	174
Construction	18	653
Engineering	130	1,998

Source: Joint Council for Qualifications, Provisional full course GCSE results, June 2012.

Figure 1 STEM GCSE entries in the UK 2012 (provisional)

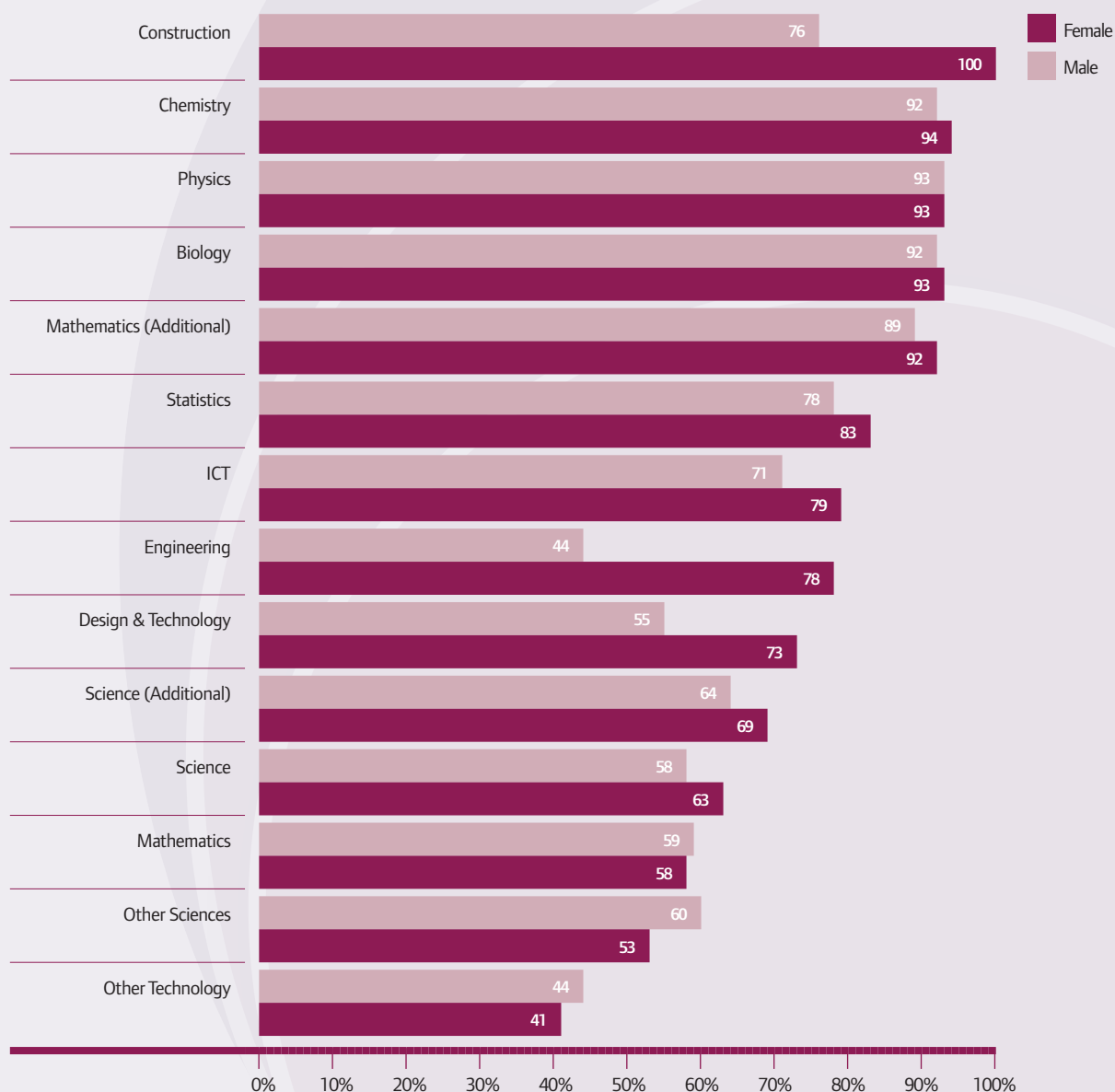


Source: Joint Council for Qualifications, Provisional full course GCSE results, June 2012. Notes: Decimals were rounded up or down to the nearest whole number.

Figure 2 shows the percentage of girls and boys achieving A*- C grades in GCSE STEM subjects in 2012 (provisional). The figure reveals that girls achieved better or equal A*- C GCSE combined grades compared to

boys in all STEM subjects except Mathematics (1 percentage point difference), Other Science and Other Technology.

Figure 2 STEM GCSE A*- C grades in the UK 2012 (%) (provisional)



Source: Joint Council for Qualifications, Provisional full course GCSE results, June 2012. **Notes:** Decimals were rounded up or down to the nearest whole number.

Secondary Education 'A' Level



The Joint Council for Qualifications provides data on GCE 'A' Levels. The STEM picture at 'A' level becomes more gender segregated compared to GCSE, with lower percentages of females compared to males being entered for all STEM subjects in 2012, except Biology. This is evident in the steeper diagonal pattern in **Figure 3** which shows the percentage of females and males entered for STEM 'A' levels in 2012.

The trend towards more equal gender participation in STEM subjects evident in some GCSEs continues with Chemistry 'A' level, where 47% of the entries were female. The number of females participating in Chemistry 'A' level rose in 2012 to 23,260, an increase of 13% compared to 20,571 in 2009 (UKRC, 2010). The number of males entered increased at a higher rate (18%) from 21,920 in 2009 to 25,974 in 2012.

Although 21% of Physics 'A' Level entrants were female, the number participating rose in 2012 to 7,361, an increase of 13% compared to 6,538 in 2009 (UKRC, 2010). The number of males entered increased at a higher rate (19%) from 22,898 in 2009 to 27,148 in 2012.

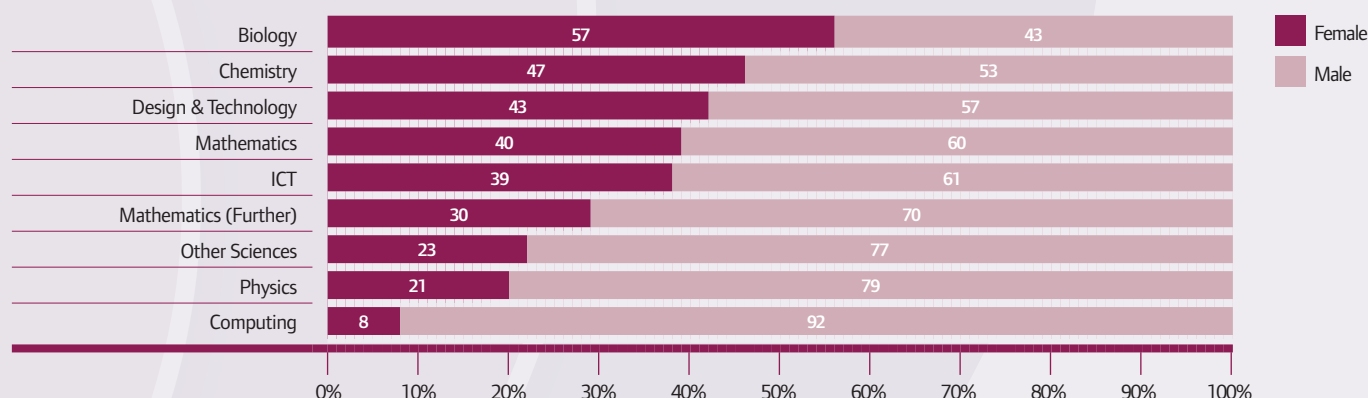
Four in ten (40%; 34,301) of Mathematics 'A' level entries were female in 2012, a 17% rise in numbers participating compared to 2009 (29,420) (UKRC, 2010). The number of boys entered increased at a higher rate (19%) from 43,055 in 2009 to 51,413 in 2012.

Table 2 Number of females and males entered for STEM 'A' Levels UK 2012 (provisional)

'A' Level	Females	Males
Biology	35,664	27,410
Chemistry	23,260	25,974
Design & Technology	7,298	9,807
Mathematics	34,301	51,413
ICT	4,284	6,804
Mathematics (Further)	3,972	9,251
Other Sciences	762	2,613
Physics	7,361	27,148
Computing	297	3,512

Source: Joint Council for Qualifications, Provisional GCE 'A' Level Results, June 2012.

Figure 3 STEM 'A' level entries in the UK 2012 (provisional)

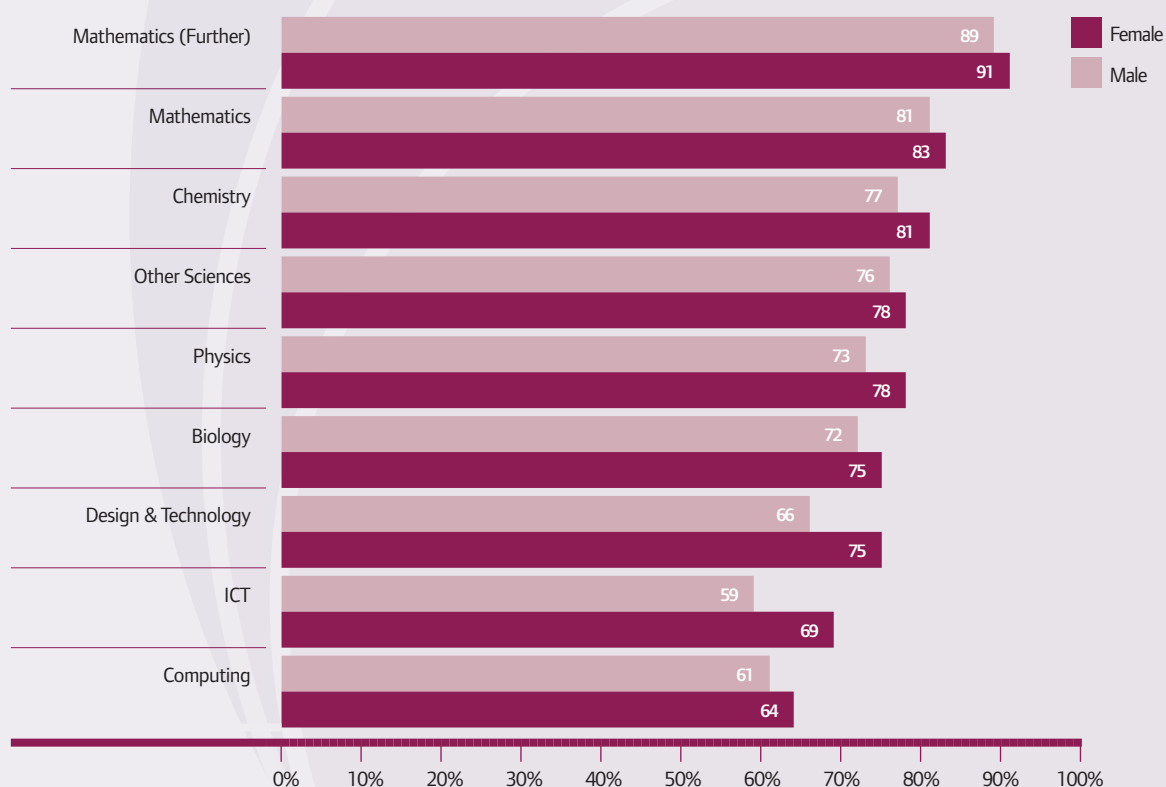


Source: Joint Council for Qualifications, 2012. Notes: Decimals were rounded up or down to the nearest whole number.

Figure 4 shows the percentage of females and males achieving A*–C grades in 'A' level STEM subjects in 2012 (provisional). The figure reveals that females achieved higher A*–C combined grades compared to males in all STEM subjects at 'A' level in 2012. Females (69%) outperformed males (59%) by 10 percentage points in ICT at 'A' level.

This pattern is repeated in non-STEM subjects. Females outperformed males in **all** A*–C combined grades at 'A' level in 2012, except in French, German and Spanish.

Figure 4 STEM 'A' level A*–C grades in the UK 2012 (provisional)



Source: Joint Council for Qualifications, 2012. Notes: Decimals were rounded up or down to the nearest whole number.

Vocational Qualifications Apprenticeships



The Data Service provides data on apprenticeships. This section analyses apprenticeship data from 2010/11. The commentary is about all apprenticeships completed by combining intermediate, advanced and higher apprenticeships. The data presented is for three frameworks: Engineering and Manufacturing Technologies, Construction Planning and the Built Environment and Information and Communication Technology. For information on how apprenticeships were classified into the three frameworks see **Appendix 1** (<http://www.wisecampaign.org.uk/about-us/wise-resources/uk-statistics-2012>).

Females completed 18.1% (1,900) of ICT, 1.4 % (250) of Construction, Planning and the Built Environment and 4.3% (1,140) of Engineering and Manufacturing apprenticeships in 2010/2011.

The top five STEM types of apprenticeships completed by numbers of females in 2010/11

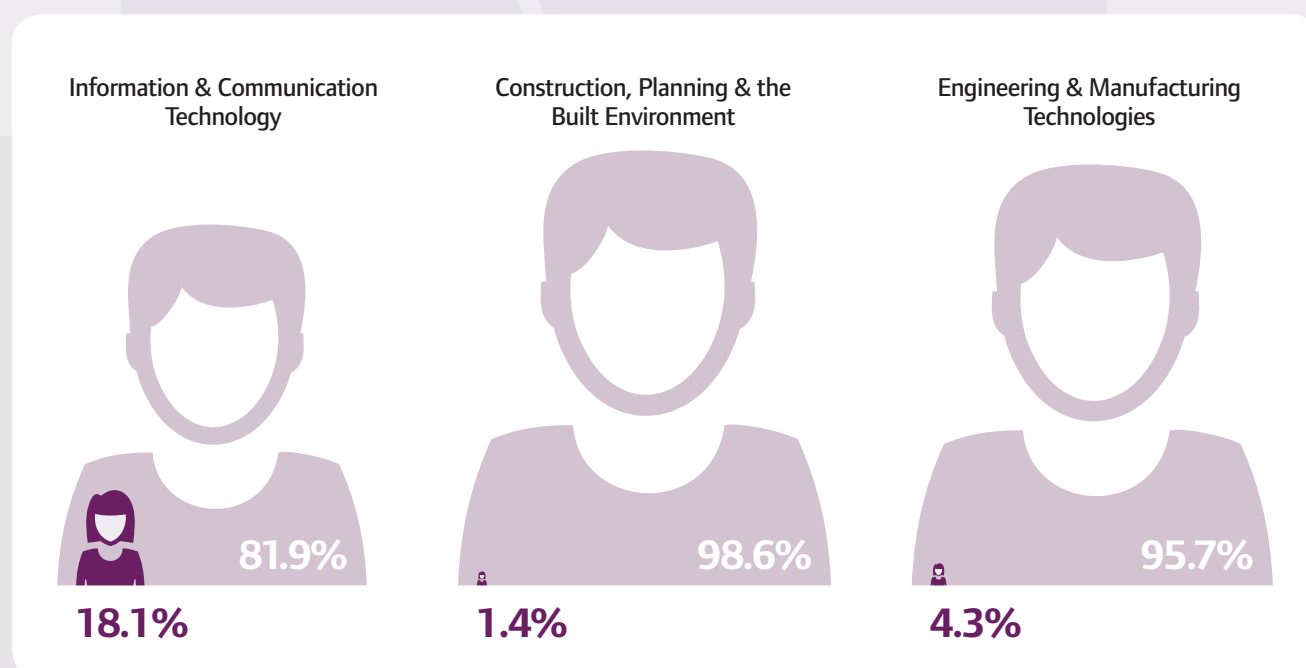
(see **Table 3**) were: IT User (1,110), IT and Telecoms Professionals including ICT (790), Engineering (430), Aviation (220) and Construction (130). Of the top five, IT user apprenticeships were the least gender segregated, with 36.6% of females completing, followed by Aviation, with 32.8% of females completing.

Table 3 Female completions of STEM apprenticeships, 2010/2011

Apprenticeship	Number of females and % completions	Number of males and % completions
IT User	1,100 (36.6%)	1,930 (63.4%)
IT and Telecoms Professionals inc. ICT	790 (10.6%)	6,610 (89.4%)
Engineering	430 (3.81%)	10,830 (96.19%)
Aviation	220 (32.8%)	450 (67.2%)
Construction	130 (1.4%)	9,120 (98.6%)

Source: The Data Service, Apprenticeship Framework Achievements by Sector Framework Code, Level and Gender (2010/11). **Notes:** Numbers were rounded to the nearest ten.

Figure 5 Apprenticeships completed in 2010/11 by STEM framework and gender



Source: The Data Service, Apprenticeship Framework Achievements by Sector Framework Code, Level and Gender (2010/11). **Notes:** Where numbers dropped below five they were not included. Numbers were rounded to the nearest ten.

Vocational Qualifications NVQs / SVQs



The Data Service provides data on NVQs/SVQs achieved. This analysis combines all levels of NVQs/SVQs. In 2010/11, 700 females gained NVQs/SVQs in Construction Planning and the Built Environment compared to 44,900 males. NVQs/SVQs in Engineering and Manufacturing Technologies were gained by 8,400 females and 114,100 males, and Information and Communication Technologies 5,500 females and 5,300 males.

Figure 6 shows the percentages of females and males who gained NVQs and SVQs in STEM subjects in 2011. Females gained a higher percentage of NVQs/SVQs by one percentage point compared to males in Information and Communication Technologies in 2011.

The largest gender gap is evident in Construction, Planning and the Built Environment where 2% females gained NVQs/SVQs in 2011.

UKRC (2010) reported 9.1 thousand females gaining Engineering and Manufacturing Technologies NVQs/SVQs in 2008. The 2011 figure of 8.4 thousand represents an 8% decline in numbers from 2008. By contrast, the numbers of males achieving NVQs/SVQs increased by 19% from 95.7 thousand in 2008 to 114,100 in 2011.

In the same report, the authors noted a dramatic increase in Information and Communication Technologies NVQs/SVQs gained by females from 2005 (2.7 thousand) to 2008 (15.1 thousand).

The 2011 figure of 5,500 females achieving ICT NVQs/SVQs represents a dramatic decline compared to 2008. Equally, the numbers of males achieving NVQs/SVQs declined from 13.7 thousand in 2008 to 5,300 in 2011.

Data on females achieving NVQs/SVQs in Construction Planning and the Built Environment is unavailable from 2008 as numbers below one thousand were counted as zero at that time, which means it is not possible to compare numbers to 2011.

Figure 6 NVQs/SVQs gained by STEM subject area and gender 2010/2011

Information & Communication
Technology



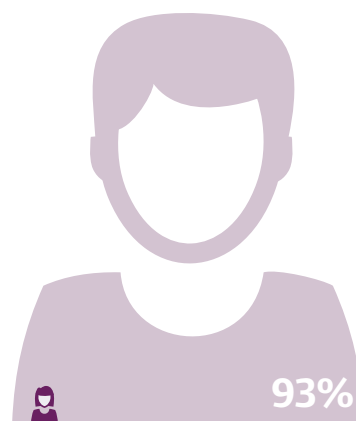
51%

Construction, Planning & the
Built Environment



2%

Engineering & Manufacturing
Technologies



7%

Source: The Data Service 2010/11, Achievement of NVQs/SVQs by Sector Subject Area, by Level of Achievement and Gender. Notes: Numbers were rounded to the nearest hundred. Decimals were rounded up or down to the nearest whole number.

Higher Education Degrees



The Higher Education Statistics Agency (HESA) provides data on the numbers of undergraduates and postgraduates obtaining degrees in STEM subjects. This analysis presents data on all undergraduate and all postgraduate males and females obtaining degrees in 2011 in STEM related categories defined by HESA.

Figure 7 shows the percentage of females and males who obtained undergraduate degrees in STEM related subjects. The clear pattern in **Figure 7** is a visual indicator of female and male dominated subject areas, or areas where there is a greater gender balance in STEM subjects.

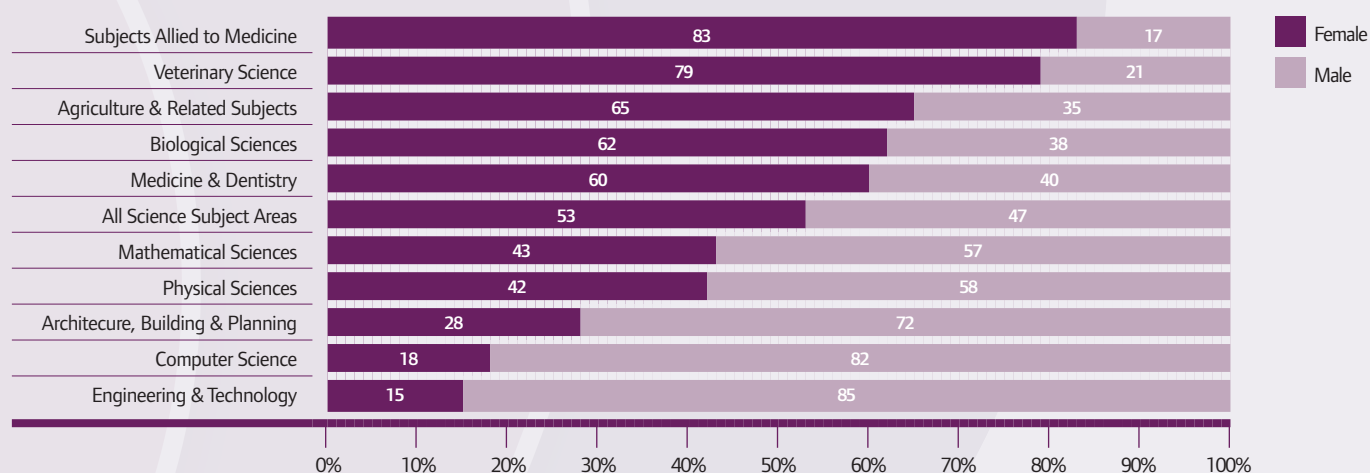
In Engineering and Technology (85%), Computer Science (82%) and Architecture, Building and Planning (72%), males dominated undergraduate degrees in 2011.

In Subjects Allied to Medicine (83%), Veterinary Science (79%) and Agriculture and Related Subjects (65%), females dominated undergraduate degrees in 2011. In other STEM related subjects, the gender imbalance was less marked, for example 42% of females and 58% of males obtained degrees in the Physical Sciences.

In 2011, 4,345 undergraduate and 3,970 postgraduate females obtained Engineering and Technology degrees, a total of 8,315.

A total of 10,840 (7,495 undergraduate and 3,345 postgraduate) females obtained degrees in the Physical Sciences. A further 4,445 (3,575 undergraduate and 870 postgraduate) females obtained degrees in Mathematical Sciences.

Figure 7 Undergraduate Science qualifications obtained by students on HE courses at HEIs in the UK by gender, 2010/11



Source: HESA, 2010/11. Qualifications obtained by students on HE courses at HEIs in the UK. Notes: Decimals were rounded up or down to the nearest whole number.

Figure 8 shows the percentage of females and males who obtained postgraduate degrees in STEM related subjects. The clear pattern in **Figure 8** is a visual indicator of female and male dominated subject areas, or areas where there is a greater gender balance in STEM subjects.

In most postgraduate subjects, gender segregation decreases when compared to undergraduate subjects. In Architecture, Building and Planning, for example, females obtained 41% of postgraduate degrees, compared to 28% at undergraduate level.

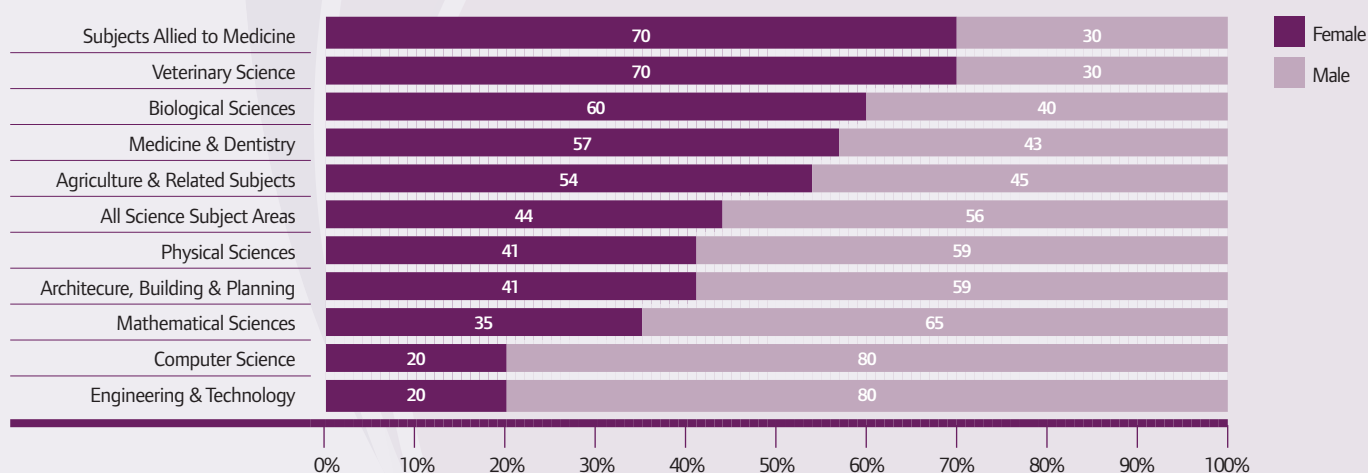
There was an 8 percentage point difference in the percentage of females obtaining postgraduate degrees in Mathematical Sciences in 2011 compared to first degrees.

The number of females obtaining all Engineering and Technology degrees (8,315) increased by 21% in 2011, compared to 6,895 in 2008. The number of males (41,230) in 2011 increased by 25% compared to 2008 (33,105).

The number of females obtaining degrees in the Physical Sciences (10,840) increased by 14% compared to 9,545 in 2008. The number of males (15,055) in 2011 increased by 20% compared to 2008 (12,500).

The number of females obtaining degrees in Mathematical Sciences (4,445) increased by 27% compared to 3,500 in 2008. The number of males (5,530) in 2011 increased by 16% compared to 2008 (6,415).

Figure 8 Postgraduate Science qualifications obtained by students on HE courses at HEIs in the UK by gender, 2010/11



Source: HESA, 2010/11. Notes: Decimals were rounded up or down to the nearest whole number.

Employment Industry



The secondary analysis of employment begins with a focus upon industries using the Labour Force Survey (LFS) April to June 2012⁴. It uses the UK Standard Industrial Classification 2007 (UK SIC 2007) and presents data on major groups⁵. Industries are classified as STEM or non-STEM for the purposes of the analysis (see **Appendix 1** <http://www.wisecampaign.org.uk/about-us/wise-resources/uk-statistics-2012>).

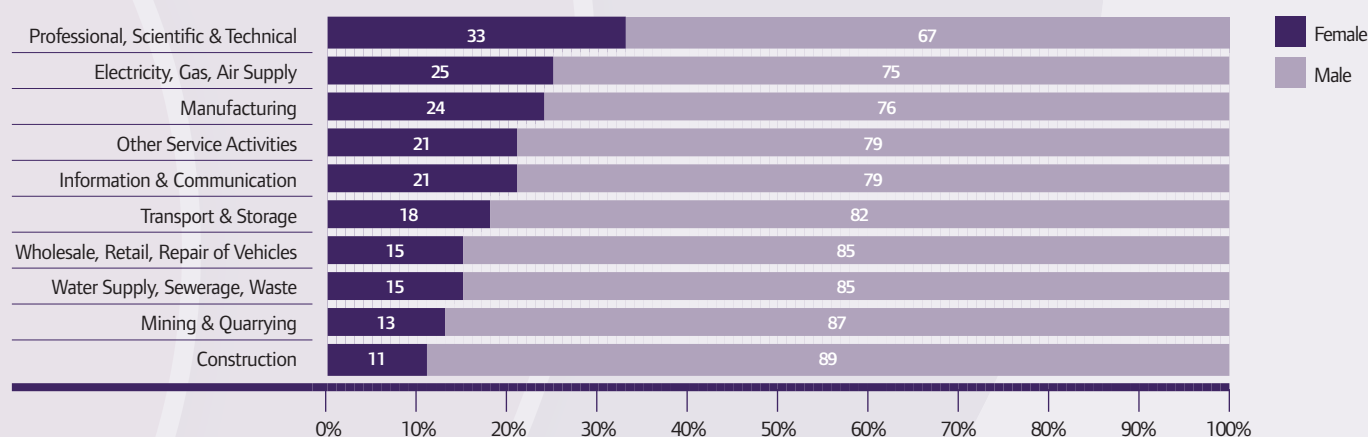
Figure 9 is a profile of females and males in STEM industries. The industry profile tells us nothing about the types of occupations that women and men are in. Occupations are explored in the next section. The industry profile simply tells us about the numbers of females and males in a whole range of jobs ranging including administration and professional roles.

The most gender-segregated industries in this analysis are Construction which is 11% female (241,0006) and 89% male (1.9 million) and Mining and Quarrying which is 13% female (17,000) and 87% male (107,000).

Notes:

4. The Office for National Statistics, Social Survey Division and Northern Ireland Statistics and Research Agency, and the UK Data Archive bear no responsibility for the further analysis or interpretation of the LFS data. Crown copyright material is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland.
5. See <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html> for a comprehensive explanation of Industrial Classification for data purposes. The Major classification of industries is into 21 categories.

Figure 9 Percentage of females and males in UK STEM Major Group Industries 2012



Source: Labour Force Survey, April – June 2012. Notes: Males aged 16-64 and females aged 16-59. Decimals were rounded up or down to the nearest whole number.

Employment Occupations



The secondary analysis of occupations within industries uses the UK Standard Occupational Classification 2010 (UK SOC, 2010) and presents data on major and minor groups⁶. Occupations have been classified as STEM or non-STEM for the purposes of the analysis – see **Appendix 1** (<http://www.wisecampaign.org.uk/about-us/wise-resources/uk-statistics-2012>).

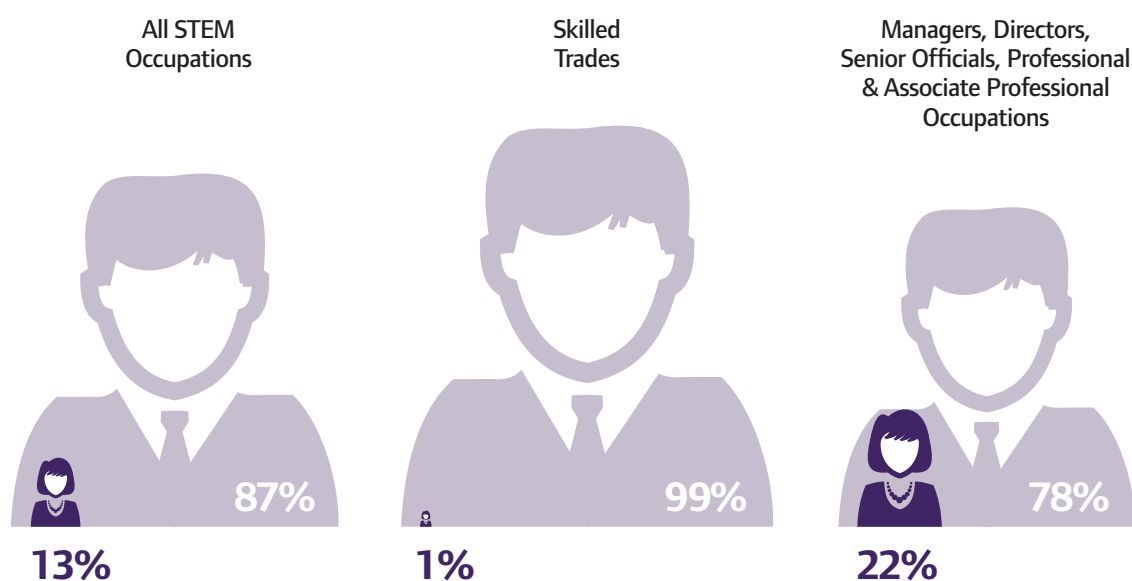
Figure 10 starts to break down the occupational structure and shows the proportion of females and males in two large occupational groups and all STEM occupations (including health). **Figure 11** breaks down the occupational structure even further into minor group occupations.

13% of all those working in STEM occupations in the UK are women (693,000 – including health), compared to 4.5 million men. 22% (661,000) of those employed as STEM managers, directors, senior officials, or professional/associate professionals are female, but the main explanation for this finding is the higher numbers employed in health. This compares with 2.4 million men (78%). Skilled Trades STEM occupations are just 2% female (32,000) and 98% male (2.1 million).

Note:

6. See <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/index.html> for a comprehensive explanation of Occupational Classification for data purposes. This analysis presents the Major SOC Occupations in three groups. This analysis presents thirteen Minor SOC occupations.

Figure 10 Females and males in UK STEM Major Group Occupations 2012 (%)



Source: Labour Force Survey, April – June 2012. **Notes:** Males aged 16-64 and females aged 16-59. Decimals were rounded up or down to the nearest whole number.

Figure 11 shows the proportions of females and males in 13 minor occupational groupings classed as STEM – see **Appendix 1** for how these were classified (<http://www.wisecampaign.org.uk/about-us/wise-resources/uk-statistics-2012>). Decimals are not rounded in **Figure 11**, as this would obscure the findings where the percentages are under 0.5, for example the Skilled Construction and Building Trades (0.4%).

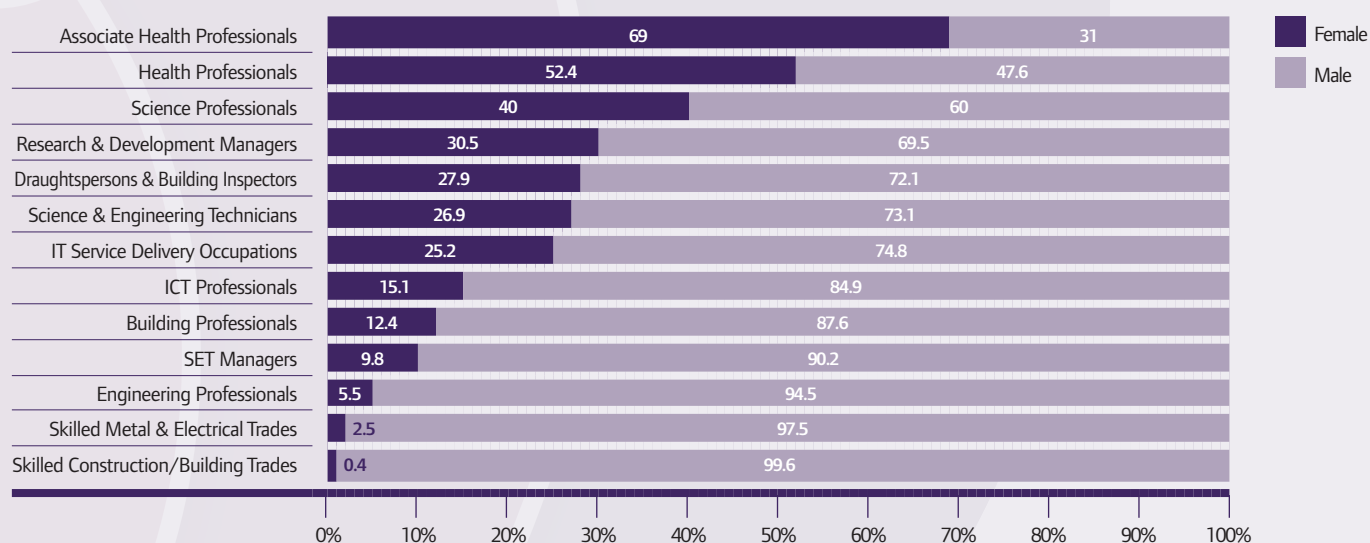
The dominance of the Health Sector is clear from the pattern in **Figure 11**. Females account for around two-thirds of Associate Health Professionals (69%; 53,500) compared to males (31%; 24,100). Females (52.4%; 200,000) also outnumber males (47.6%; 182,000) as Health Professionals.

Four in ten (40%; 46,800) Science Professionals are females as are around three in ten Research and Development Managers (30.5%; 10,700). 26.9% (65,700) of Science and Engineering Technicians, 15% (120,300) of ICT Professionals and 5.5% of Engineering Professionals (23,000) are female.

The proportion of Science and Engineering Technicians who are female in 2012 was an increase of by 4.4 percentage points from 2008 (then 22.5%). The percentage of Engineering Professionals who are female decreased by 1.4 percentage points from 2008 (then 6.9%). ICT Professionals who are female have fallen 0.6 percentage points since 2008 when they were 14.4% (UKRC, 2010).

One in ten (9.8%; 50,500) of STEM managers are female (including health). The most extreme gender segregation is in the Skilled Construction and Building Trades where 0.4% (4,400) are female and the Skilled Metal and Electrical Trades where 2.5% (27,300) are female.

Figure 11 Females and males in UK STEM Minor Occupation Groups 2012 (%)



Source: Labour Force Survey, April – June 2012. **Notes:** Males aged 16–64 and females aged 16–59. Decimals were NOT rounded up or down to the nearest whole number, as this would obscure the findings on Skilled Construction and Building Trades.

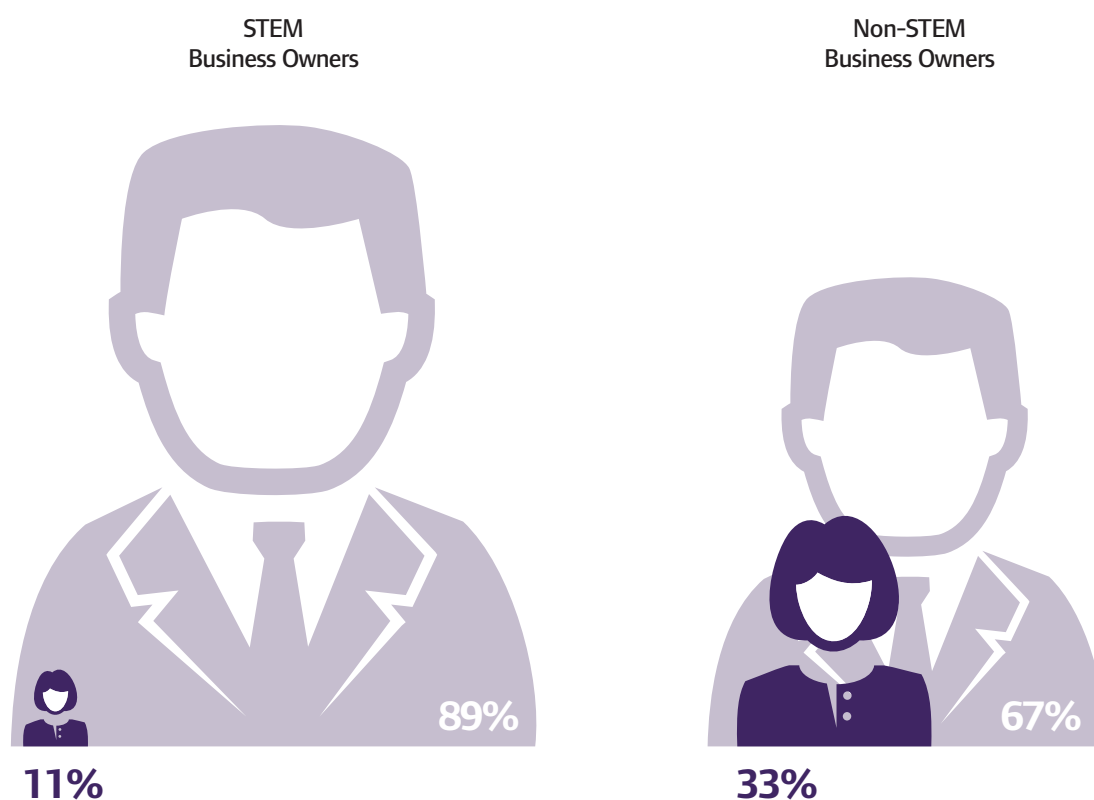
Employment Self-employment



The definition of STEM business owners used in this analysis is those who are self-employed and STEM Directors/Managers. This is a proxy definition derived from variables in the Labour Force Survey.

Figure 12 shows the comparison between females and males who are STEM and non-STEM business owners. Around one in ten (11%; 9,700) of STEM business owners are women, compared to one in three (33%; 190,400) who are owners of non-STEM businesses.

Figure 12 Comparison between females and males self-employed who are STEM managers (business owners) and non-STEM managers (business owners) 2012



Source: Labour Force Survey, April – June 2012. Notes: Males aged 16-64 and females aged 16-59.

Employment Women on Boards of FTSE 100 Companies



This section explores female representation on the Boards of the Financial Times Stock Exchange (FTSE) 100 companies in STEM and non-STEM sectors. The secondary analysis uses data from the Cranfield University School of Management Female FTSE 100 report 2012 (Sealy and Vinnicombe, 2012). The report ranks the FTSE 100 companies according to the percentages of women they have on their Boards. From this list, 57 companies are classified as STEM and 43 non-STEM – see **Appendix 1** for further information (<http://www.wisecampaign.org.uk/about-us/wise-resources/uk-statistics-2012>).

At the time the Cranfield report was published, 15% of Board Directors of FTSE 100 companies were female (Sealy and Vinnicombe, 2012). 13% of the Board Directors of STEM FTSE 100 companies were female compared to 17% of non-STEM Board Directors.

Closer analysis reveals important differences (see **Table 4**) in numbers of women on Boards. All non-STEM FTSE 100 companies have at least one woman on their Board. Almost two in ten FTSE 100 STEM companies have no women on their Board. Equally, around six in ten non-STEM FTSE 100 companies have two or more women on their Board compared to around four in ten STEM FTSE 100 companies.

Table 4 FTSE 100 STEM and non-STEM companies with women on their Board

	STEM companies	Non-STEM companies
Number of companies	57	43
Companies with no women on their board	11 (19%)	0
Companies with one woman on their board	22 (39%)	17 (39%)
Companies with two or more women on their board	24 (42%)	26 (61%)

Source: The Female FTSE 100 Board Report 2012. Cranfield University School of Management.

The Cranfield report (2012) ranks the following companies as their top five with the highest percentages of women on their Boards:

Diageo PLC	44.4%
Pearson PLC	37.5%
Burberry PLC	33.3%
Morrison	28.5%
Whitbread	27.2%
Astra Zeneca	27.2%

Two of these are classed as STEM companies in this analysis (Diageo PLC and Astra Zeneca).

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