

questions

Section 1: *In brief*

- Q1** Do you believe progress has been made towards achieving gender equality in the STEM workplace in Scotland since 2012? (~~Yes~~/no).
- Q2** If yes, what action(s) do you believe have had the greatest impact on improving gender equality in STEM in Scotland? (List maximum of 3).
- Q3** Where you do not believe progress has been made, or could be improved upon, what do you believe have been the key limiting factors? (List maximum of 3).

SQA attainment evidence suggests that nationally participation in STEM subjects is stable. This may mask areas of local success. A significant increase in participation is required if the aspirations for gender equality are to be realised.

- Q4** Which of the recommendations made in the 2012 *Tapping All Our Talents* report do you believe should be prioritised going forward? (List maximum of 3).

3d promote culture change to enhance diversity

5b champion gender equality

- Q5** What further recommendations (if any) would you make to policy-makers, educators or employers to tackle gender inequality in STEM in Scotland? (List maximum of 3).

Promote STEM careers in schools and colleges

Challenge popular stereotypes of STEM careers

Section 2: *In detail*

Women in STEM in Scotland 2018

- Q6** What lessons do you believe have been learned from initiatives undertaken since 2012 to tackle gender inequality in the STEM workforce across the public, academic and/or industry sectors? Examples of good practice would be useful.

Many employers recognise the importance of promoting STEM with the next generation, enabling employees to become STEM ambassadors. Without a good supply of potential STEM employees, it will never be possible to tackle gender inequality in the STEM workforce.

Q7 In 2018's economic, political and social context, what do you consider to be the key influencers (positive and negative) on gender equality in STEM in Scotland?

Popular culture is one of the strongest influences on the choices young people make, parental beliefs are similarly important. Changing public perceptions of STEM will be a long term task that will require considerable and sustained effort across the entire public sector.

Q8 To what extent do you believe that the issue of gender inequality in STEM is being recognised as a priority and to what extent do you believe that rhetoric is being met with action?

STEM is recognised as a priority by the Scottish government. There are numerous exciting initiatives around STEM in education and the community. Whilst nationally there is little discernible impact, there may be local success stories that need to be sought out and publicised. There needs to be a concerted and sustained effort to realise a step change in public perceptions and behaviour.

Education

Q9 What do you believe should be done to encourage more girls and young women to engage with STEM subjects in early years, primary and secondary education?

Analysis of SQA data shows participation in STEM subjects at SCQF levels 5-7 is stable, with female participation consistent with popular stereotypes. The table below summarises 2017 data with some information about trends.

| Subject | SCQF5 | | | SCQF6 | | | SCQF7 | | |
|--------------------------------|----------------------------------|-------------------------------|--|----------------------------------|-------------------------------|--|---------------------------------|-------------------------------|--|
| | 2017 participation (nearest 100) | 2017 female participation (%) | average female participation 2014-2017 (%) | 2017 participation (nearest 100) | 2017 female participation (%) | average female participation 2014-2017 (%) 2016-17 (%) | 2017 participation (nearest 10) | 2017 female participation (%) | average female participation 2014-2017 (%) 2016-17 (%) |
| Biology | 21400 | 67 | 67 | 7600 | 65 | 65 | 2250 | 70 | 67 |
| Chemistry | 16400 | 51 | 52 | 10100 | 51 | 51 | 2520 | 54 | 52 |
| Computing Science | 7400 | 20 | 20 | 4500 | 15 | 17 | 640 | 12 | 13 |
| Design and Manufacture | 5000 | 25 | 26 | 3000 | 30 | 29 | 80 | 51 | 53 |
| Engineering Science | 1700 | 9 | 8 | 1100 | 8 | 8 | 80 | 5 | 5 |
| Environmental Science | 300 | 48 | 49 | 500 | 57 | 52 | n/a | | |
| Fashion and Textile Technology | 500 | 97 | 98 | 300 | 97 | 96 | n/a | | |
| Health and Food Technology | 1800 | 77 | 79 | 1400 | 82 | 83 | 40 | 87 | 88 |
| Human Biology | n/a | | | 5900 | 69 | 70 | n/a | | |
| Lifeskills Mathematics | 2600 | 53 | 50 | n/a | | | n/a | | |
| Mathematics | 42200 | 52 | 52 | 18900 | 47 | 47 | 3590 | 37 | 37 |
| Mathematics of Mechanics | n/a | | | n/a | | | 270 | 19 | 19 |
| Physics | 14200 | 28 | 28 | 9000 | 26 | 27 | 1860 | 21 | 21 |
| Practical Electronics | 200 | 5 | 5 | n/a | | | n/a | | |
| Practical Metalworking | 1200 | 8 | 7 | n/a | | | n/a | | |
| Practical Woodworking | 4600 | 14 | 13 | n/a | | | n/a | | |

Despite all the different STEM initiatives there is no evidence of increasing participation of females in STEM subjects since 2012. In STEM Higher Nationals, females make up just 13% (on average) of the cohort. There is an enormous task to increase these participation rates if gender equality is to be realised in the STEM workforce.

- Q10** What innovative or impactful practice do you know of or believe should be taking place in universities and colleges to tackle issues of gender disparities in STEM subjects?
What do you think can be done to embed STEM gender equality thinking across universities and colleges?

Ensure teachers are aware of the resources that can help them to raise awareness of STEM careers, and the various initiatives that can help them to enrich the curriculum for their learners e.g. through the STEM ambassador programme. There may be some schools and colleges whose results are not consistent with the national picture – it would be worth identifying them and investigating what they are doing to make a difference and secure more equitable engagement with STEM subjects and qualifications.

Cultural Change

- Q11** In what ways do you believe industry can lead by example to tackle inequality within workplace culture?

Promote 'good news' stories that show how men and women can succeed in STEM careers. Encourage employees to take on voluntary roles to support STEM in the local community e.g. with schools and colleges.

- Q12** What do you believe are the most effective ways to challenge and change deep-rooted attitudes and institutional culture in order to improve gender equality in STEM?

Better information and more opportunity for public engagement e.g. events in local museums, schools, colleges, businesses that promote public understanding of STEM. Set national targets that are both challenging and achievable.

- Q13** How do you suggest culture change can be measured in a meaningful way?

Monitoring participation of learners in STEM qualifications is one way to find out if all the initiatives are actually influencing choices. Working with employers on their need for STEM skills and the extent to which suitable training and qualifications exist that work for them. As well as SQA attainment, STEM degree participation, representation of women in STEM jobs, would be useful measures relative to some clearly defined baseline against which progress can be measured.
