IOP | Education

Making your STEM club inclusive

Ten tips for teachers

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ROYAL AIR FORCE

IOP Institute of Physics

In secondary school, girls perform as well, if not better than boys in physics. But girls only make up about 20% of those that continue with the subject post-16. Through its work in schools the Institute of Physics (IOP) has identified a number of reasons why despite being capable of taking the subject further many girls are choosing not to. They include:

- Girls underestimating their ability in physics
- Lack of knowledge of the careers physics can lead to
- Societal gender stereotypes leading to physics being seen as a subject more suitable for boys

Although STEM clubs provide an opportunity to tackle these issues from age 11 upwards, girls are often underrepresented in them. This guide provides ten ideas to help increase their participation.

01 Collect participation data

Before you start, check if your school has data on:

- The number of girls and boys that progress to different subjects post-16
- The gender balance of STEM clubs, school trips or other physics related extracurricular activities.

If data does not exist, collect your own to act as a baseline for the future.

02 Find out your student's interests and availability

Before setting up your club, ask your students to complete a quick survey. Questions could include:

- What type of jobs are you thinking about doing in the future?
- What are your interests and hobbies?
- Would you like to join a STEM club? Why?
- Would it be easier for you to attend an after school club or one at lunchtime?
- Do any times clash with other clubs you attend?

Use the results to inform the activities and timing of your STEM club.

03 Monitor your classroom interactions

Boys often dominate discussions in physics lessons, often without the teacher realising. Do a self-evaluation or ask a colleague to monitor one of your lessons or STEM clubs. Record how many times boys and girls:

- Ask a question
- Call out answers
- Have a question directed at them
- Are selected for a hands up question

04 Counter self-selection

STEM club participants are often self-selecting. Those already engaged with science are most likely to attend. You could try:

- Inviting pupils directly (share the reasons for the invitation with parents or carers)
- Running some activities for girls only (emphasise that they are being invited to participate because of their potential, not because of their gender)
- Running a large taster activity for a whole year group

"One of our approaches was to select a large STEM challenge and run it for the whole of S2 [ages 12–14]. Every S2 pupil got to take part in it and then only after they'd all experienced it did we ask for groups of volunteers to continue with it further. We ended up with mixed gender groups, which we wouldn't normally have had. Speaking to the girls who had been involved, they wouldn't have volunteered normally to take part. It gave them the opportunity to experience STEM in action"

Science teacher, Scotland

05 Engage all age groups

You could:

- Run an activity based club for 11-14 year olds
- Run a project based club for 15-16 year olds
- Arrange for older students to present science activities to younger ones

"In terms of benefits, the KS3 pupils who did outreach to local primary schools gained confidence in presenting to others and it really helped strengthen their own relationship with science"

Science teacher, England

06 Involve mentors

Instead of running the STEM club yourself, give older students responsibility.

"Having A-level students around means that they are able to answer questions such as what continuing with physics was like and finding common ground such as favourite hobbies"

Science teacher, England

07 Give students a say

Try not to over plan your activities. Let your pupils lead or use opportunities provided by external organisations.

"I was able to do my own investigations (with the Institute for Researchers in Schools) – it isn't as scary as it first seemed. I also gained a sense of adventure and realised that getting things wrong is a part of science. It is a major reason why I study physics A-level now"

Female student, England

08 Collaborate with another school club

Running cross-curricular projects will help students see how science overlaps with other subjects.

For example, you could work with the history department to run a joint history and STEM club using the RAF100 schools activities (find these at **rafyouthstem.org.uk/resources**).

09 Reward participation

Celebrating achievements in STEM clubs through an external scheme can boost confidence.

For example, you could use the CREST award idea included in activity 8 of the RAF100 schools activities (or see **crestawards.org** for more ideas).

10 Share with the community

Raise the profile of the STEM club by engaging parents, carers and the local community through the school social media and newsletter.

"...we used our social media feeds. Not just to disseminate information and celebrate things that happen in the school but also to challenge the thinking around gender and science in the school community"

Head teacher, Scotland

For more information and resources from the IOP on gender balance see **iop.org/genderbalance**

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