#SAISWeek



STEM AMBASSADORS IN SCOTLAND

# 

30 January - 03 February 2023

**PRACTITIONERS HANDBOOK** 

# **INTRODUCTION**

STEM Ambassador in Scotland Week 2023 (30 Jan – 03 Feb 2023) is a celebration of all things STEM in Scotland through the experiences of our STEM Ambassadors.

For 2023's week we have chosen 'storytelling' as a theme. From linking literacy and STEM through online events to STEM Ambassadors sharing their STEM career stories. The week is an opportunity to discover new topics, themes and careers through STEM Ambassadors in Scotland.

STEM Ambassadors are volunteers who work in or study a STEM field with a passion for working with young people to shine a light on the different opportunities available. All our volunteers are trained and have a PVG and can support you in lots of different ways. The STEM Ambassadors in Scotland Hub's role is to support you to make the most out of the programme, making it easier to engage with STEM and to find resources, opportunities and people to bring it to life.

As a practitioner you can get involved by participating in our events; make use of our resources and request your own STEM Ambassador for your setting.

This celebratory week links with:

- Career Education Standards: It sets out what children and young people will learn and what parents/carers, teachers/practitioners, employers and Skills Development Scotland will do to support their learning. Implementation of the standard will improve the quality and consistency of learning about work and careers.
- Scottish Education Curriculum for example, Topical Science
  - Third level SCN 3-20a: I have collaborated with others to find and present information on how scientists from Scotland and beyond have contributed to innovative research and development.
  - Fourth level SCN 4-20a: I have researched new developments in science and can explain how their current or future applications might impact modern life.
- **Learning for Sustainability**: Promoting careers in Science and its potential impact on the wider world supports conversations around global citizenship, sustainability and equitable societies.
- **GTCS Professional Standards**: 3.1.3 Effectively utilise partnerships for learning and wellbeing (example, develop partnerships which connect relevance of learning to skills for life, learning and work).

#### • Young STEM Leader Programme:

- Non-formal programme: Engaging with inspirational role models in STEM is a
  useful way to explore the Discover and Inspire badges for YSL2, YSL3 and YSL4.
  Particularly the themes of inspirational role models, stereotypes, opportunities,
  pathways and futures and STEM in Scotland.
- Formal programme: STEM Ambassadors can provide input to leadership skills, qualities, and behaviours; health and safety, and the specific themes of each level.

For all levels of YSLP, STEM Ambassadors can support Young STEM Leaders with resources and activities to support their leadership hours.

If you would like to be kept up to date on all things STEM Ambassadors in Scotland Week complete <u>this form</u>.

You can also visit our STEM Ambassadors in Scotland Week webpage to find all our events, resources and latest information.

The aim of this handbook is to help you plan and participate in STEM Ambassadors in Scotland Week (SAIS Week) by providing resources, activities and ideas to help you get involved.



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Get social during the week by telling us your own STEM Stories about what you've been up to during the week on social media. Has your class attended one of our events? Have you used some of our resources? Have you invited a STEM Ambassador for a visit? Take a picture and post it on Twitter or Facebook and tag us @ScotSTEMAmb on Twitter or 'STEM Ambassadors in Scotland' on Facebook using the hashtag #SAISWeek23. Or, if your school doesn't use social media send us a picture that we can share on your behalf.



Once the week is over, we'll randomly pick one of the posts and that school will win a bundle of STEM books.

To help you we've included some suggested posts to get started!

'We met a STEM Ambassador during #SAISweek23!'

'Future engineers/coders/biologists/etc at work! We've had a great time using the (insert resource) from @ScotSTEMAmb during #SAISweek23'

'Class XX signing in for an exciting talk with @ScotSTEMAmb during #SAISweek23'







# For Primary aged learners

### **STEM Storytime**

STEM Storytime is a programme of live online sessions delivered by STEM Ambassadors, each about a different topic. In each session a STEM Ambassador will deliver a book reading, followed by a short talk on the STEM links of the story based on their own experiences.

Each session will last 30 minutes during SAIS Week starting at 09.30 or 13.30. More information on the sessions and how to register will be available soon on our SAIS Week webpage or on our events page.

Register on our **SAIS Week form** to be contacted directly about these events when they're available.

# The future of technology is exciting - how could you be a part of it?

For learners aged 8-12 years old

In this session Becky Patel from the charity Tech She Can will discuss how advancements in technology are changing the future world of work. The students will then take a deep dive into the role of an ethical hacker with ethical hackers from PwC. This interactive session will also include tasks and activities for the students to complete.



For this session, the students will each need a piece of plain A4 paper and a pencil.

## For Secondary aged learners

#### **STEM Careers stories**

Interview with a STEM Ambassador – giving students the chance to ask the questions

We have lined up a host of STEM Ambassador who are ready to answer all the questions students ever wanted to know about their jobs, studies, and everything in between.

All our ambassadors will record a short presentation on their work and the studies and skills involved and then answer any questions sent in by students, recordings of the presentations and Q&A's will be available online at <a href="https://www.stemambassadors.scot">www.stemambassadors.scot</a> during STEM Ambassadors in Scotland Week.

We would love to hear from students across all the subjects and secondary school years about what you would like to know.

We have highlighted the subjects which might be particularly relevant for each ambassador, but questions are welcome from everyone.

Meet our ambassadors below, find out a little bit about them and then ask away by completing this simple form.

If you would like to know more about several ambassadors, please complete a separate form for each ambassador.

Ask your questions here

#### **Meet the Ambassadors**



#### Jenny Malyon - Engineering Project manager

Most suited to Physics, Chemistry Maths, English, & Technical Drawing students

My name is Jenny Malyon and I work as an Engineering Project Manager, in the power industry. I studied Highers in Maths, English, Physics, Chemistry and Geography, with Maths and Physics being the most relevant for my university course (BEng Electrical and Electronics Engineering) and future career, although English probably helped too! At university maths was a compulsory subject all the way through. Physics was a good starting point for a lot of the engineering subjects. Chemistry was useful for material science. I also studied Technical Drawing for a year at school and that helped with the engineering drawing at university.

After graduation, I started work as a trainee engineer, completing a formal 2 year graduate training course before going on to work as an instrumentation engineer, controls engineer, requisition engineer, people leader and now project manager. Most of my career so far has been involved with remote monitoring of power generation equipment, gas turbines, steam turbines and generators. The teams I work with design, install and commission the monitoring systems, trouble shoot any issues with the system, develop analytics that use the data brought back to central to predict and prevent failures in the monitored generating equipment and provide recommendations to our customers on how to resolve any issues that do come up.

**Ask your questions here** 



# Maryam Gharebaghi – Principal Process Engineer, Worley

Most suited to Chemistry and Maths students

My name is Maryam Gharebaghi. Born and bred in Tehran, Iran, I have studied internationally before settling down in Scotland as a process engineer in the oil and gas industry. I completed my chemical engineering degree at the University of Tehran, worked for few years as a graduate engineer in a consultant company.

Then I did a mechanical engineering master's degree at the Eastern Mediterranean University in Cyprus. I studied for my PhD at Leeds University before I moved to Aberdeen where I volunteered in a charity book shop prior to my decision to apply for jobs in the oil and gas sector.

I enjoy challenges that I know I can manage. There is always something to tackle in engineering, and I know that I can do it. Actually, the profession got more interesting for me, the more I knew about it. In my first job, I was still learning and got joy out of that. Now, as an experienced engineer, I feel that I am achieving a lot which is like pay-back for all the learning. Both men and women can be engineers because the job doesn't require any gender-specific attributes.

I have always loved chemistry but didn't want to be a chemist ... I also loved math but didn't want to be a mathematician ... So, decided to do a degree that encompasses all! Plus you can find job in many industries such as chemical, oil & gas, petrochemical, agriculture, mineral processing, advanced material, food industry, pharmaceutical and biotechnological.

#### Ask your questions here



#### Jordan Moir – Senior Biomedical Scientist, NHS Scottish National Blood Transfusion Service

Most suited to English, Maths, Chemistry and Biology students

I am Jordan Moir, I currently work with the NHS Scottish National Blood Transfusion Service (SNBTS). I have worked with SNBTS for over 6 years and have newly been promoted to my current role as a Senior Biomedical Scientist. I enjoy my role and as a Biomedical Scientist (BMS) I work within the Manufacturing and Dispatch labs to process and prepare blood donated from volunteer blood donors. Once processing is complete then it is ready for distribution to patients who require a blood transfusion within hospitals across Scotland.

I studied many subjects at school including; English, Chemistry, Maths, Biology, Music, Computing, French and History. Some of the subjects which prove useful in my day-to-day role are English for the completion of reports, training, filling in forms. Maths for working out statistics and formulas, Chemistry and

Biology are also both useful in providing an understanding about blood and its function, reviewing test results and data analysis.

I was successful in gaining a place at Glasgow Caledonian University, to study a BSc (Honours) in Applied Biomedical Science on a 4-year degree course which was accredited by the Institute of Biomedical Science and included a 16-week placement within a lab. The accreditation is a requirement for a BMS to work in the NHS and to be state registered with the Health and Care Professions Council (HCPC).

#### <u>Ask your questions here</u>



# Ashleigh Kitchiner - Senior Marine Mammal Consultant at APEM Ltd

Most suited to Biology, Chemistry and Physics students

Ashleigh is a Senior Marine Mammal Consultant and works with many organisations to assess the risk to marine mammals, create monitoring survey plans, mitigation protocols and much more. Her main areas of expertise are marine mammal ecology and identification, policy and legislation, surveying methods, and genetic analysis.

When she's not busy with her nose buried in a marine mammal ecology textbook or outside with her binoculars, she sits on three committee boards, is a STEM Ambassador, a Girl Guide volunteer and enjoys macramé (easier than knitting), and candle making.

<u>Ask your questions here</u>



#### **Anne Okafor - Construction Planner**

Most suited to Maths, Computing, Technology, Engineering students

Anne is a Construction Planner. She comes from a background in hospitality and retail management and is a recent entrant (6 years) to the Construction Industry.

Anne has worked with young and new professionals in built environment disciplines, since 2015, to support them upon entering the industry and acting as a signpost to personal and professional development opportunities.

Anne didn't enjoy maths whilst in education but has since discovered how to overcome her own anxiety around maths and works to help others do the same.

At school Anne's favourite subjects were the technical subjects as she always wanted to make things and understand how things were put together. I enjoyed the satisfaction of developing something from drawings and components to a complete project.

Recently, her focus is towards talking to children at younger age groups through STEM engagements and workshops in Primary Schools and Libraries. She is a Girlguiding Leader for a Brownies group.

She also hosts her own podcast, The Everyday Determinator.

#### **Ask your questions here**



# Felicity Carlysle-Davies - Teaching Associate Forensic Science at the University of Strathclyde

Most suited to Biology, Chemistry and General Science Students

I am currently working at the University of Strathclyde where I teach Forensic Science to Postgrad and Undergrad students. My job has a lot of variety, some days I am taking students through laboratory exercises, others I am giving lectures and developing new assignments.

I get to work closely with Forensic Science Providers to ensure that what we are teaching at the University links with the skills and knowledge needed to become a forensic scientist. So how did I get here? I did my undergrad down in England studying Biochemistry because I liked both biology and chemistry and couldn't really pick between them for a degree topic! I then came up to Glasgow to do my MSc in Forensic Science where I specialised in Forensic Chemistry and got to spend three months working at the Forensic Explosives Laboratory. This inspired me to go on and do my PhD which was looking at explosives detection.

When I finished my PhD I stepped out of the lab to work in knowledge transfer, which is basically trying to get people to come together to share knowledge and work with each other. I was co-ordinator of the Forensic Science Special Interest Group for three years before making the decision that I wanted a job that was more hands on and taking up a teaching role at the University of Strathclyde where I have been ever since training the next generation of Forensic Scientists.

#### Ask your questions here



#### Lorna Bennet - Mechanical Engineer at Offshore Renewable Energy Catapult

Most suited to Maths, Physics, Chemistry, Biology and Art (Lorna graduated from Glasgow School of Art) students

Lorna works to improve the operations and maintenance of offshore renewable energy assets. This involves liaising with academic researchers, SMEs, technology developers, manufacturers and operators to develop new technologies, procedures and research. Lorna has always had a passion for building things and solving problems, having helped her dad with maintenance around the house from a young age.

This contributed to her decision to study for a BEng Honours in Product Design Engineering at the University of Glasgow and Glasgow School of Art. Lorna discovered engineering as a career choice when it was almost too late to apply for university, so she is passionate about engaging young people in STEM learning at an earlier stage.

As a STEM Ambassador since 2010, she has dedicated a significant amount of time to STEM engagement programmes, so that others do not miss out on the opportunities offered by engineering. In March 2018 she was awarded a Royal Academy of Engineering Ingenious Award to set up a pilot STEM engagement strategy with four local primary schools in Glasgow.

She has since recruited 18 new STEM Ambassadors to run the programme and developed a series of renewable energy and sustainability-related lesson plans.

#### Ask your questions here



# Anthony McCluskey - Wild Spaces Project Officer with Butterfly Conservation

Most suited to Biology, Chemistry, Business Studies and Marketing

I work with a charity called Butterfly Conservation, and we have a mission to help save butterflies and moths and improve the environment. My job involves working with community groups to plant trees and wildflowers that will help butterflies and moths by providing food for their caterpillars. I also train volunteers to identify and record the different species of butterflies so we can see how their numbers are doing.

I went to school in Northern Ireland, so our school system had GCSEs and A-levels. The most important of these for me in my job was Biology. Chemistry is also useful too, as lots of university degrees on biology require you to have an A-level in Chemistry too. I also found great use for subjects like Business Studies - for example I studied marketing in business studies, and it helps when I come to advertise my public events.

Ask your questions here

#### PRACTITIONER ACTIVITY CARDS

SAIS Week is the perfect opportunity to place a request for a STEM Ambassador to work with your class or school. It's simple to get started, if you haven't already got an account you need to register on the STEM Learning website then you can add an activity. We have created a guide to help you write an activity which you can find <a href="here">here</a>. We've also provided some sample text you can simply copy and paste into the new activity form and just fill in the blanks.

To tie in with our theme of Storytelling here's some specific ideas of what you could request:

- Ask a STEM Ambassador to deliver a talk or activity linked to a story you're reading in class.
- Request a STEM Ambassador to deliver a talk on their area of expertise then set a writing prompt or activity for the learners to complete

While learners are not able to place a request for a STEM Ambassador on the database themselves, you could task them with writing the request for you to post. We've included a template of the information needed to help you do this.

#### **View template**

#### **Activity**

Title

Deliver [ACTIVITY] at [SCHOOL NAME] in [LOCATION]

Deliver a coding workshop at Primary School in Glasgow

We are looking for a STEM Ambassador to deliver [ACTIVITY] to our pupils. The session should be around [INSERT TIME] in length. This will take place in our school [ADD ANY INFO NEEDED TO ATTEND THE SCHOOL] and take place [INSERT IDEAL DATES & TIMES]. Our pupils have been learning about [SUBJECT] in class and would like to hear from someone first-hand. Some things we'd like a STEM Ambassador to demonstrate include [INSERT LIST]

Add information about your pupils, age, interests, and knowledge so far Include any specific aims you want to achieve: e.g. 'we would like our pupils to have an understanding of civil engineering.' Include anything else the STEM Ambassador might need to know before volunteering.

# SCIENCE COLOURING BOOK ACTIVITY AND COMPETITION



Inspire your future scientists with the SULSA colouring-in book packed full of exciting jobs! Created by SULSA to highlight the range of careers available in STEM and raise awareness of the diversity of people that can do these jobs.

You can download the whole colouring-in book or individual pages **here**.

#### **Activity**

Ask learners to choose the page with the job that that interests them the most and give them some time to colour it in.

Ask learners to research more information about the job and find out what it involves. This could include:

- Who does it
- What they do
- How they do the job
- What a typical day looks like for them
- What subjects you need to study for it

Learners should then write something to show what they have learnt. This could be a story, poem, blog post, diary entry, or anything else they think would be a good way of communicating their learning.

#### Competition

or the learners to be in with a chance of winning a prize, you can submit their work – their coloured-in picture and the written work – via email. <u>Download and complete the form</u> and email it along with your entries to **stemambassadors@sserc.scot**.

The competition is open to any primary-aged learners, and the winner will be drawn randomly from the submitted entries. By submitting the work, you agree to it being shared with SULSA and that it may appear on the SULSA, STEM Ambassadors in Scotland, and SSERC websites and social media accounts. There is no limit on submissions from schools, but teachers should only submit one entry per learner. All entries must be submitted by 10 February 2023.



STEM Ambassadors in Scotland Week is a great opportunity for Young STEM Leaders (YSLs) to plan some engaging activities, events or interactions in their centre with the support of STEM Ambassadors.

The STEM Storytime and STEM Careers Stories sessions could allow YSLs to meet inspirational role models in STEM and kickstart ideas for their own activities. STEM Ambassador Spotlights can allow YSLs to explore the skills and qualities necessary for different careers in STEM, and there are lots of physical and online resources available to borrow and use.

Engaging with STEM Ambassadors in Scotland Week links to many elements of the YSLP Framework:



- Engaging with STEM Ambassadors can support exploring opportunities in STEM
- Challenging stereotypes, misconceptions and outdated views in STEM can be supported by Ambassadors



- Join one of the online sessions to connect with inspirational role models in STEM
- Work with your Tutor Assessor to place a STEM Ambassador request on the database, or explore STEM Ambassador Offers.



- Plan your own STEM Storytime session with younger learners in your centre or another centre
- Link your activity plans to a story



- Find out how STEM Ambassadors show leadership skills, qualities or behaviours in their careers
- Deliver storytelling sessions in your centre
- For the Science Colouring Book activity (on Page 15), consider how you might lead this to other learners in your centre. For more instructions click here.

As well as engaging with and planning events during the week, Young STEM Leaders can use the Resources on page 20 when planning their own activities, events or interactions at any time of year.



Monday 16th January 16.00 - 17.00 (online)

Our monthly networking and sharing event for Tutor Assessors is an excellent opportunity to hear examples of how Young STEM Leaders have linked their activities, events or interactions to storytelling in centres across Scotland.





In 2018, the Tech She Can Charter was founded, with 18 organisations agreeing to collaborate and work together to increase the ratio of women working in technology roles. Three years later, Tech She Can became an independent charity in order to extend its reach and impact. The charity now brings together the collective experience and expertise of over 240 member organisations, providing initiatives and pathways into technology careers across the key moments in girls' and women's lives. This includes an early education programme, **Tech We Can**, career insights days, apprenticeships and a **relatable role model campaign**. You can read more about Tech She Can's impact during its first year as a charity in its **2022 Impact Report**.

#### **Tech We Can educational resources**

Educating and inspiring the next generation of technologists is a core objective for Tech She Can, through its Tech We Can programme of free learning materials, which can be used by teachers or parents.

The Tech We Can resources focus on children's hobbies and interests and demonstrate how these could lead into a potential future career in technology. These resources are delivered to children as young as five years old in order to challenge gender stereotypes as soon as possible.

The Tech We Can resources include:



#### **Animated lessons**

These short animations, featuring characters Katie and Tex, are designed to encourage young children to be inquisitive about the technology they encounter and use on a daily basis - giving them a simplified understanding of how it works and that people design and create this technology.

Each animation focuses on a different area of technology and is accompanied by supporting information to help teachers and parents explain it in more detail to children. There's also an optional challenge for children to complete at home or in school



#### **On-demand lessons**

These fun and informative online lessons are aimed at children aged 8-14. In each pre-recorded online lesson, presenters Becky and Katie explore the role of technology in different areas – from sport, to food, outer space and the environment. Role models working in each area are featured in the lessons, which also include a creative challenge for children to complete. These lessons can be used in the classroom or at home, and are available on demand giving teachers, parents or students the flexibility to watch them when it suits them.



#### Lesson packs

These downloadable packs include everything a teacher or parent would need to deliver a Tech We Can lesson themselves, with no specialist knowledge needed. Covering 14 topics, each pack includes a presentation, detailed plan with curriculum links and any further printable resources that may be required.

Technology available in schools and in homes varies greatly, so Tech She Can has created different versions of the lesson packs to suit the technology available.



#### **Tech We Can Champions**

Tech She Can recently launched a volunteer programme to help reach more children across the UK - challenging their perceptions of tech subjects and what a future tech career might look like. Through a partnership with STEM Learning and our STEM Ambassador programme, the charity has trained individuals to deliver the Tech We Can lesson materials in classrooms, as well as bringing their real life experience from their own jobs. Since January 2022, Tech She Can has trained over 300 champions. If you're based in the UK, you can request a visit from one of them at <a href="https://www.techshecan.org/champions">www.techshecan.org/champions</a>.

#### **STEM LEARNING**

STEM Learning have thousands of resources available for you to access on many different topics, here are a few to help you participate in SAIS Week's storytelling theme:

## **For Primary Schools**

## SSERC's STEM by the Book

**CfE Early, First and Second Level Learners** 

A selection of STEM practical activities linked to a range of well-known (and not so familiar) children's books. Activities are designed to support reading, listening and talking.

With an emphasis on understanding, analysing, evaluating and investigating – the resource aims to engage learners with increasingly complex ideas, structures and specialist vocabulary for different purposes.

**Access resource** 

## Storytelling

5-11 year olds

This series of three lesson activities uses Scratch to create animations that tell a story and can link to studies in English.

**Access resource** 

## **Big Schools' Birdwatch Stories**

4-11 year olds

From the Royal Society for the Protection of Birds, this resource contains two bright and colourful story books which look at identification of birds and the different types of food eaten by different birds.

Access resource

## **Teaching Science Through Stories**

4-7 year olds

This resource contains two short stories aimed at introducing science ideas and vocabulary to young children. Written from the point of view of farmyard animals, they are designed to be read aloud in class and to promote discussion, before leading into science learning.

**Access resource** 

**Victorians** 

4-11 year olds

Through this challenge, learners will have the opportunity to explore and understand the everyday life of the Victorians. Identifying potential problems/areas of Victorian life where an invention could be useful and to use drawing, writing and speech to communicate their invention to an audience.

**Access resource** 

# **For Secondary Schools**

**Super Power Stories** 

14-18 year olds

This resource describes how engineers at Rolls Royce apply physics and chemistry in the development of their engines, including how materials behave in extreme conditions, aerodynamics, thermodynamics, the use of computer modelling to look at forces and energy transfers, and the use of maths in performance modelling.

Access resource

## All ages

#### **STEM Ambassador Spotlights**

A collection of STEM Ambassador case studies and profiles from a wide range of different careers and backgrounds. Suggested uses:

- Ask learners to browse them to learn more about different people and jobs.
- Have learners find a profile they're interested in and do further research into the job or area of STEM
- Find a profile and use it as a starting point for some creative writing, for example: a blog post, diary entry or story.

**Access resource** 

#### **STEM Ambassadors in Scotland Resource Hub**

Our Resource Hub has lots of digital and physical resources for you to access. Our physical STEM kits can be requested and borrowed for free and is a great way to include a STEM Ambassador in the classroom. When requesting a kit, let us know if you would like a STEM Ambassador and we can help you find one.

**Access resource** 

If you need any help or have any questions you can contact us at: **stemambassadors@sserc.scot** 

or visit our website for more information: www.stemambassadors.scot

Don't forget to complete our form to be kept up to date with the latest opportunities for STEM Ambassadors in Scotland Week.

Complete the form