

# STEM OUTREACH

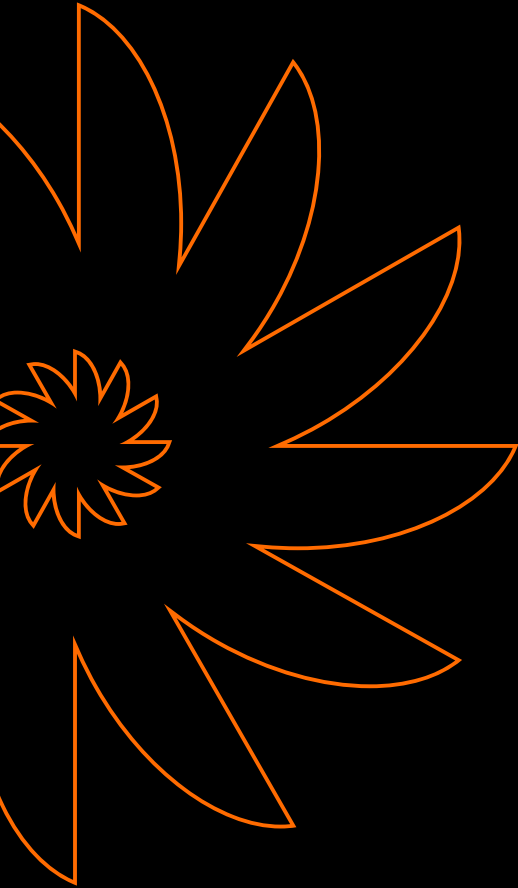
## ***Key Considerations & Recommended Steps***

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Prepared by

**STEMAZING**





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# Introduction



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Welcome and thank you for taking an interest in STEM outreach!

We need more diverse, visible STEM role models to inspire our next generation of innovators and problem-solvers. This is key to building a more inclusive STEM workforce. Only then will we create the innovative and inclusive solutions that are needed to tackle our global challenges.

You don't have to have a list of STEM qualifications or a STEM job title to be a STEM role model. You can be working in a role relating to STEM and still bring to life the excitement and importance of STEM to inspire young people.

This guide will take you through the process of STEM outreach step by step. It's packed full of STEMAZING guidance and tips so it's an ideal resource for new STEM role models looking to build strong foundations or more experienced STEM role-models who want to level-up!

Together we will make a difference.

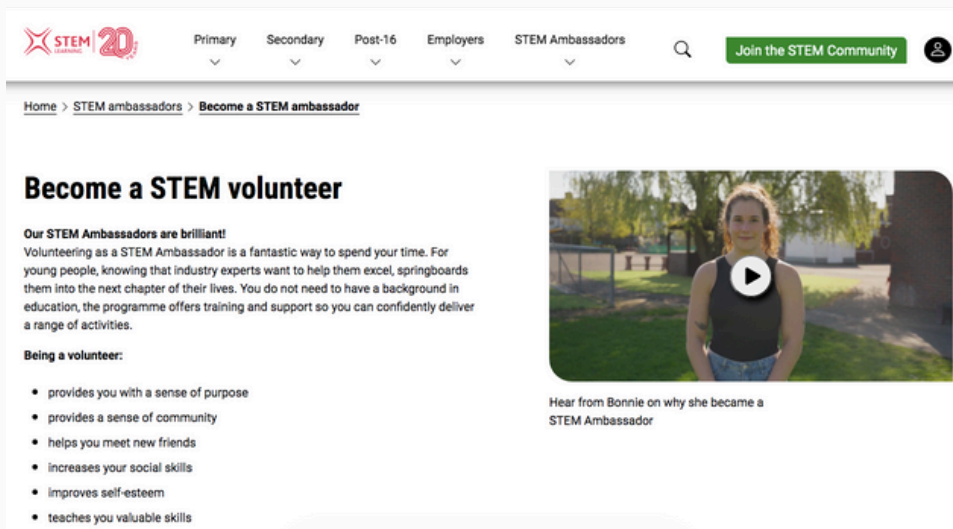
Be Curious. Be Creative. Be Courageous. Be STEMAZING!

# Before You Get Started

Speak with your line manager/organisation and let them know you are interested in doing STEM outreach. They may already have some projects you can support, available materials or be able to offer volunteer days for your engagement.

Register with [STEM Learning](#) if you are based in the UK. This is a fantastic place to begin your STEM engagement as they will provide you with some basic training and a Disclosure and Barring Service (DBS) or Protecting Vulnerable Groups (PVG) certificate as well as a platform for engaging schools and more than a few ideas for STEM activities.

We also recommend planning your engagement before you contact schools. This will help set expectations for content, duration, level/age group, required resources and number of sessions. You can always make adjustments based on the schools/classes needs after you've initiated contact. Be sure to include diversity in your content you are sharing either as a diverse role model yourself, with the support of others or referencing diversity in your content. You can't be what you can't see!



# Selecting Schools

- Start local! A quick phone call to your local school via the school office is a great way to: find out if the school would be interested in your offer. It's helpful to confirm the school email address and ask the name STEM Coordinator/Lead to address your initial email to follow up.
- You may also want to consider contacting youth groups and uniformed organisations (Boys/Girls Brigade, Cadets, Guides & Scouts) to explore other STEM engagement opportunities outside business hours.
- Utilise tools like [STEM Learning](#) to share your offer with schools and look for local events you can support.
- Consider proximity to your home or workplace and any connections to schools through family and friends.
- Ask if your organisation has any existing relationships with schools that you can build on.
- Consider if there are any criteria that you are looking for in your engagement such as age groups, a high percentage of Free School Meals (FSM) or young people with SEND (Special Education Needs and Disabilities) or ASN (Additional Support Needs).
- You can use the Indices of Deprivation for your country (links on [page 18](#)) to identify areas of deprivation in which to target your search for schools.
- Many schools and youth organisations also have social media accounts. This can be a great way to see the kinds of activities they have run in the past and as well as make initial contact.
- You may need to contact a few schools before finding the right one for your planned activity and availability.



# Initial Email Checklist

Be sure to include the following in your initial email:

- Your name, job title and organisation
- Availability for further discussion or the engagement itself

Brief outline of the engagement you would like to deliver including:

- What you would like to cover (inc expected key learning point(s))
- Duration
- Number of sessions
- Any materials required and who would provide them
- Intended audience (age and/or year groups)\*
- State that you can make adjustments to the session to help meet the needs of all participants (SEND/ASN)
- Ask about any safeguarding requirements that the school has

\*Note that classes can have up to 34 pupils and in very large schools there may be up to 6 classes per year group!

# Engagement Planning: Format

We recommend building your engagement around a practical element in your session where the learners do an activity. It can also be a good idea to share an outline of the session with the school or the STEMAZING team and request feedback so that it can be tailored to the school's requirements or further developed. If you would like to create your own activity, we would recommend considering the following:

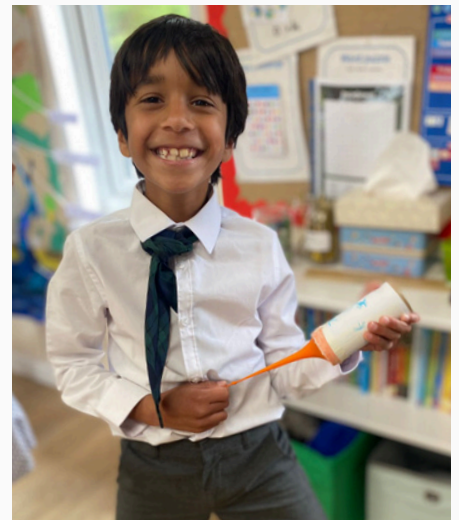
- Consider if your engagement will be in person or online. Could be delivered in either format?
- Can you make it a series of sessions? Repeated engagement has been found to have a much greater impact on young people than a single interaction. After-school STEM clubs are a great way to engage a mixed group of students multiple times.
- 30 minutes to 1 hour is an appropriate duration for an engagement. We've found a 40 minute session is the good length for the classroom and would typically have the following format:

Time	Activity
5 minutes	Introduction to you
5 minutes	Introduction to the key learning point.
20 minutes	Active task. Take care as sometimes a make or a build can take much longer than expected!
5 minutes	Recap of key learning point.
5 minutes	Q&A to test their understanding / retention of new knowledge and invite further questions about you or the key learning point.
Optional	Participant evaluation.

# Engagement Planning: Content

Check out our [STEMAZING Inspiration](#) ideas for simple activities that can be delivered to primary school aged children. There are also loads of great resources online to help you with content, e.g. [STEM Learning](#), [Tomorrow's Engineers](#), [This is Engineering](#), [Institute of Physics](#), [Energising Futures](#).

- Be clear on the message you want to share. This will help steer the rest of your planning and delivery.
- As a visiting person in industry, you will also be assisting the class in meeting Gatsby or career education benchmarks but you could also try to link your content with the STEM curriculum (links on [page 18](#)) making your presence even more valuable.
- Use what you know. Simplifying a STEM concept that you work with regularly, making it appropriate for the age groups you want to engage, is a great place to start. Asking a thought provoking question or having a practical demonstration is a great way to introduce a concept
- Tell a story and link with real life applications. How does the topic or STEM concept make a difference in people's lives or help the planet?
- Use terms and language that your audience will understand.
- Build your session around practical demonstrations and active tasks keep the audience engaged. Get the learners doing as much as possible!
- Breakdown big tasks into smaller steps and demonstrate as you go.
- Consider the capability of your audience and make sure the task is accessible to all learners.





# Engagement Planning: Content

- Include a risk assessment for any activities. (Simple or Detailed)
- What resources will you need and who will provide them? Consider the materials that schools are likely to have to hand. Will your organisation be able to provide resources or is there a budget you can access to obtain materials? How will you transport materials for classes of up to 34 pupils plus spares?
- Engage your audience with questions so it's more of a learning conversation than a lecture.
- Slides are a useful tool to give your session structure but avoid relying on them too heavily as talking without interaction for an extended period may lose your audience's attention. Don't have too much (if any) text on your slides as this can be a distraction for many learners, stick to images and diagrams.
- Video clips can sometimes explain a concept succinctly but school firewalls can often block links to video clips.
- To get feedback on your session you could create a participant evaluation, a simple hands up survey can work well. STEM Learning has guidance of feedback and evaluation activities that you can run with a class.
- To promote further discussion at home, you could create a completion certificate. This could be for individuals or the whole class and digital or hard copy.



Please share an outline of the session with the school or the STEMAZING team and request feedback so that it can be tailored to the school's requirements or further developed.

# Engagement Planning Checklist

## Delivery

- In-person
- Virtual
- Either

## Number of sessions

- Single
- Multiple \_\_\_

## Session length

- 30-40 minutes
- 40-50 minutes
- 50-60 minutes

## Introduction

- Share your story
- Show a diverse and inclusive workplace
- Celebrate what makes you unique

## Content

- Clear message
- Linked to real life
- Linked to curriculum
- Helps people or the planet
- Uses accessible and inclusive language
- Built around practical demonstrations and/or suitable hands-on activities
- Chunk and demonstrate active tasks
- Consider adaptations for learners with SEND/ASN
- Draft risk assessment for activities
- Uses simple, cost effective, easily accessible and/or transportable resources
- Engages the audience with questions
- Share outline with school for feedback

## Optional Extras:

- Slides with relevant images and diagrams to clarify key points
- Participant evaluation
- Completion certificate

# Inclusive Practice

- When introducing yourself and your role, present an inclusive and diverse workplace. You could show an image depicting a diverse workforce if available.
- Celebrate your uniqueness. If you have lived experience of disability or additional support needs we would encourage you to share this with the class. You can't be what you can't see!
- Use inclusive language and avoid gendered terms.
- Discuss SEND (Special Education Needs and Disabilities) /ASN (Additional Support Needs) or prior learning with the school and adjust your session as necessary.
- Understand that the mood and energy of some learners changes. Learners with SEND/ASN may disengage and re-engage at any point. This is not a reflection on the content of the session or your presentation style so it should not be taken personally. Every student learns at their own pace and has their own way of learning.
- Consider using dyslexia friendly fonts on a pale yellow background to make any text on your slides easier to read.
- Larger fonts benefit young people with dyslexia and visual impairments.
- You may wish to include a break. Many learners can only focus for short spaces of time and benefit from planned opportunities to rest or move. Breaks also allow you to gather your thoughts and make any adjustments to the next elements now that the students are in the room and you can see their engagement levels and capabilities.



- Including a visual timeline on slides can help all students understand what is expected of them and show them what is happening next. If you can't do this visually, you can do this audibly by saying what the current focus is and what will happen next.

# Inclusive Practice

- Allow ample time to shift from a making activity to a quiet listening activity. Letting pupils know that they have one minute left on the current section will help them get ready to move on.
- Some students may benefit from materials being pre-prepared ahead of time. Consider what the aims of your activities are: is spending time cutting out a shape really a key part of the activity?
- Allow extra time for tasks. Often this is most beneficial for tasks that require fine motor skills.
- Think, Pair, Share - If students are reluctant to raise their hands to answer a question it can be useful to have them take time to think about the question then discuss possible answers with a partner or their table group first. This also gives you the opportunity to listen in and contribute to some conversations before asking the class to share their thoughts. This works especially well with questions with multiple correct answers for instance: Can you name a renewable energy source?
- Share in their success! Recognise that success looks different for everyone and share and celebrate any progress in learning, understanding or skills that take place during the session.

If you would like any support adjusting a session for SEND/ASN pupils please reach out to the STEMAZING Spark team.



# Inclusion Checklist

In your introduction:

- Show a diverse and inclusive workplace
- Celebrate what makes you unique
- Use inclusive language and avoid gendered terms
- Discuss SEND/ASN requirements with the school

Possible adaptations:

- Dyslexia friendly fonts on a pale yellow background
- Larger fonts
- Add a break
- Visual timeline on slides
- Pre-prepare materials
- More time to complete tasks
- Think, Pair, Share

Contact STEMAZING Spark if you would like further support.

# Before The Session Checklist

- Confirm the time and date with the school
- Confirm volunteering time with line manager/employer
  - Request any additional information you would like from the school such as:
    - Number of participants
    - Number/Percentage of participants who are female
    - Number/Percentage of participants with Free School Meals (FSM)
    - Number/Percentage of participants with SEND/ASN
    - Number/Percentage of participants from ethnic minorities
- Provide DBS/PVG certificate number to the school
- Check safeguarding policies and procedures for the school and any organisation you are representing
- Check school policy on taking photos. Consider carefully how this relates to safeguarding and privacy policies. STEMAZING strongly recommends that the teacher takes photos then forward them to you after the session
- Make any adjustments to engagement based on feedback from the school
- Provide a risk assessment
- Practice! Ideally to a group that includes young people

## In person

- Check commute times for the time of day you will be travelling
- Confirm arrival time
- Check use of car park and local road restrictions
- Send slides/presentation and check visitor use of USBs and laptops
- Prepare and pack resources
- Pack personal items: water bottle and nut-free snack (lunch if required)\*

## Virtual

- Identify a suitable space for you to call from
- Have a test video call with slides if they are being used
- Confirm the required resources (plus spares incase of mishaps) have arrived before the session

\*Note that most schools are nut-free due to some young people having severe allergies.

# On The Day Top Tips

- Breathe - a few long breaths in a quiet spot can help calm any nerves.
- Hydrate - particularly if presenting isn't usually part of your role.
- Smile - even if you don't feel like it. It will help you relax and make you appear welcoming to your audience.
- Have fun with it - if you're having fun with it, chances are the kids will be having fun too!
- Embrace the mistakes - it's live delivery and something is bound to happen that isn't quite according to plan. Acknowledge it, laugh it off if you can and move on. We're all human!
- Try to hear from as many different pupils as possible - if you ask a question and it's the same hand that's been up for the last two questions give some clues, help others find the answer and hopefully you'll have a few more pupils ready to share their thoughts.
- Wrong answers - Young people may give an answer that we think is incorrect or not what we were looking for. Don't just dismiss them as young people will lose confidence in speaking out - find a way to find a positive in their answer by saying something like "I understand the thinking that's gone into that" or "I think you may be thinking of this...". If you can guide them to the answer if possible or invite them to 'phone a friend' so that they can participate in finding the solution. This sets the tone for the rest of the session and will hopefully encourage more young people to speak up.
- Expect the unexpected - children and young people make the most interesting connections when learning! Hear them out and try to link or guide back to the topic to keep on track.
- More than anything, relax and be yourself, enjoy the experience. Young people are wonderful at giving you a new perspective on a topic you think you know well!



# On The Day Guidance

## In Person

- Arrive in good time
- Bring all materials and equipment required including a few spares in case of damages or mishaps.
- Turn your phone to silent mode or off.
- Bring a copy of your DBS/PBG certificate and photographic ID.
- Know your car registration number as this is often required when completing visitor sign in.
- Bring a USB with your slides if allowed.
- Always take a water bottle and a nut-free snack and consider break and lunch arrangements for longer sessions.
- If the school has allowed you to take photos, ask the teacher if there are any pupils in the class without photo permissions.

## Virtual

- Allow enough time in your work day to set up and prepare as well as wind down afterwards.
- Remove all distractions and turn your phone to silent mode.
- Have a second device or phone as a back-up in case of technical difficulties.
- If the school has allowed you to take photos, ask the teacher if there are any pupils in the class without photo permissions. This means that you will not be allowed to take screenshots or screenprints if anyone in the class does not have these permissions.

## Promote discussion at home

- Towards the end of the session, ask the class how they could continue what they have started in the classroom at home.
- If learners have built or crafted an item, encourage them to show their parents / carers what they have made and how it works.
- Present or ask teachers to email home completion certificates if available.
- Engage with the school's social media pages. Be sure to check out STEMAZING's [Safeguarding](#) and [Privacy](#) policies before sharing any images online!



# After The Session

## Evaluation

With any engagement it is important to consider what went well and what could have gone better. Personal reflection is amazing but if you can also gain feedback from the school and young people then this will help you develop even more as a visible role model. A short survey or quick chat is a great way to get feedback from a school and while in a class you could get feedback from learners by asking a few simple questions. They could raise hands or show thumbs to answer quantitative questions and provide short comments for qualitative feedback. [STEM Learning](#) has guidance of feedback and evaluation activities that you can run with a class.

## Impact

- Record your hours with STEM Learning
- If available, we would be grateful if you could log the following information with the STEMAZING team to include on our Impact Report:
  - School
  - Role Model(s)
  - Activity/Activities
  - Number of participants
  - Number/Percentage of participants who are Female
  - Number/Percentage of participants with Free School Meals (FSM)
  - Number/Percentage of participants with SEND/ASN
  - Number/Percentage of participants from Ethnic Minorities
- Celebrate your successful engagement with the STEMAZING community, your colleagues and on social media. Be sure to check out our STEMAZING's [Safeguarding](#) and [Privacy](#) policies before sharing any images of young people online!

# Frequently Asked Questions

## **What if a young person asks a question I don't know the answer to?**

- It's okay to say "I don't know... yet!" This shows that even as adults we don't hold all the answers and learning is a lifelong process that doesn't stop as soon as you've left school and got a job. You could share your thinking/best guess based on what you know but state that you'll check and get back to them. You could even encourage the young person to do their own research and you can later compare your results!
- It may be helpful to consider the kinds of questions young people might ask about the topic and how you could answer them before the session. "How much do you earn?" is a very common question.

## **What do I do if a teacher hasn't responded to my email?**

Teaching is a demanding role with various periods of high activity throughout the academic year which can make it difficult to respond promptly, especially during teaching hours.

- Send a second email as a polite reminder.
- If there is no response, send a third email but this time include the main school office email. It may be the case that the teacher is absent and organisation for the event was not handed over in the transfer of duties, the office staff may be able to redirect your email to the correct person.
- Following that, a quick call to the school office to check on the teacher and leave a message will usually work.
- It's not often that communication with a school completely breaks down but it can happen. Send a final email stating that you appreciate the demands of teaching and how busy the school calendar can be, however you can't proceed with the engagement without further communication. You can also encourage them to reach out to you when there is a more appropriate time to run the event.

## **What if something comes up and I can't make it?**

STEM outreach is a professional commitment and should be treated as such but we appreciate that life can be unpredictable at times. Reach out to the school to apologise, giving as much notice as possible, and try to offer an alternative arrangement such as a virtual rather than in person session or an alternative date and time.

# Acronym Guide

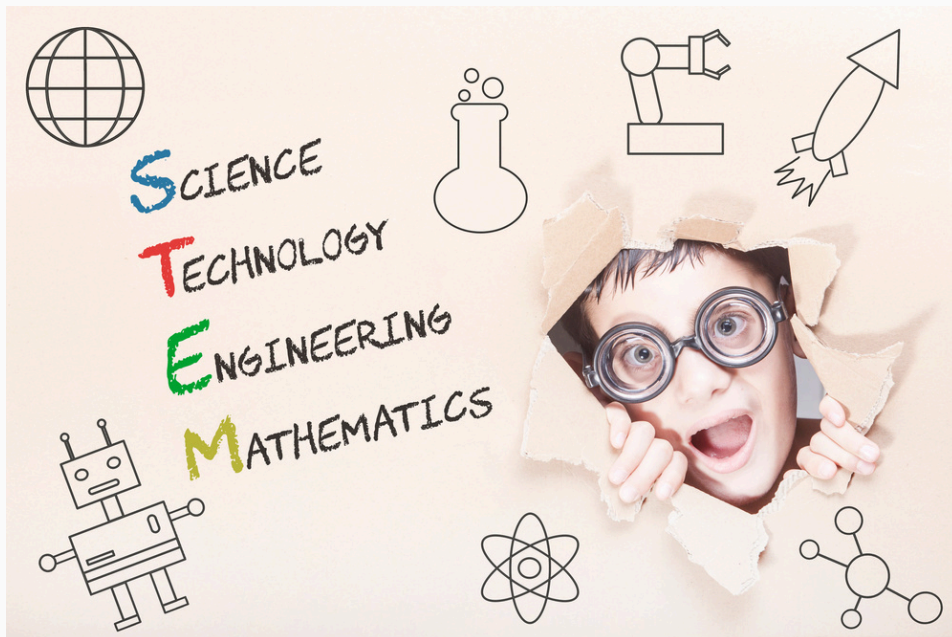
ASN - Additional Support Needs

DBS - Disclosure and Barring Service

FSM - Free School Meals

PVG - Protecting Vulnerable Groups

SEND - Special Education Needs and Disabilities



# Helpful Links

## **Indices of Deprivation**

[Indices of Deprivation \(England\)](#)

[Northern Ireland Multiple Deprivation Measure](#)

[Scottish Index of Multiple Deprivation map](#)

[Welsh Index of Multiple Deprivation](#)

## **Science Curriculum**

[Curriculum for Excellence Science Experiences and Outcomes \(Scotland\)](#)

[Progression Framework Science and Technology \(Northern Ireland\)](#)

[Science in the National Curriculum for Wales](#)

[Science programmes of study: key stages 1 and 2 \(England\)](#)

## **Career Education Benchmarks**

[A Strategy for Careers Education and Guidance \(Northern Ireland\)](#)

[Careers Wales: Realising CWRE in the Curriculum for Wales \(Primary\)](#)

[Careers Wales: Realising CWRE in the Curriculum for Wales \(Secondary\)](#)

[Developing the Young Workforce Career Education Standard \(Scotland\)](#)

[Gastby Benchmarks \(England\)](#)

## **Activity Ideas**

[Energising Futures](#)

[Institute of Physics](#)

[STEM Learning](#)

[STEMAZING Inspiration](#)

[This is Engineering](#)

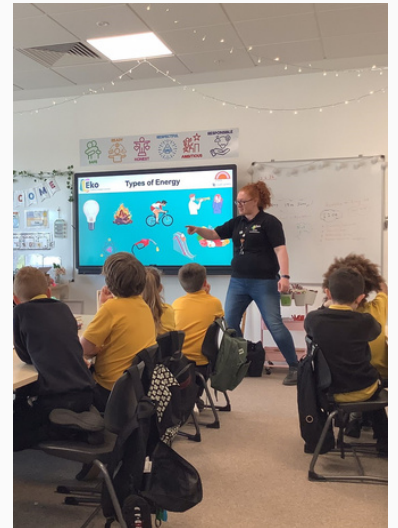
[Tomorrow's Engineers](#)

# Approved by Teachers

STEMAZING is fortunate to be able to call upon the expertise and experience of the two fantastic former teachers in our team to provide insight for our Role Models and put together this helpful guide.

Michelle is our Scotland STEM Lead and former Primary School teacher with a passion for teaching Primary science. She is delighted to be able to share practical tips to help sessions run as smoothly as possible and ensure all learners get the most from an engagement. Michelle also volunteers with the Scouts as Beaver Section Leader, providing engaging learning opportunities in an informal setting which has given her a wealth of experience of leading learning with fun and meaningful play.

Additionally, she is part of a working group focused on expanding STEMAZING's offering to Special Education Needs and Disabilities (SEND) and Additional Support Needs (ASN) Schools and has successfully supported delivery of workshops to young people with complex learning and support needs.



Susan is our Administration Manager and a highly skilled and experienced educator with a strong background in both information technology and Primary and Secondary School support. For over a decade, Susan served as an ICT Teacher and Head of ICT in a secondary school, where she successfully fostered students' technological literacy and nurtured their passion for digital learning.

Following this, Susan transitioned to a Primary school support role, where she played a pivotal role in leading sessions and providing invaluable guidance to young learners. Her expertise in both technology and education allowed her to create engaging and effective learning experiences for her students.

# With Special Thanks

This guide would not be what it is today without the fantastic support of our STEMAZING Role Models reviewing drafts, making edits, and offering suggestions for content. Many thanks to you all!

- Angela Campbell
- Lisa-Jayne Cook
- Jessica McCafferty
- Sam Middleton
- Dr Lisa Mullan

# Contact Us

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