

Green Schools and Classrooms



STEM Ambassdor Guide



What are STEM Ambassadors?

STEM Ambassadors are volunteers of all ages working in a range of STEM related roles from apprentice engineers to geologists and nuclear physicists to zoologists. Not only do they have a lot of fun, but they get an opportunity to contribute to their local community and boost their skills and confidence.

STEM Ambassadors provide the link between the world of STEM, employers and the workforce of tomorrow. This guide shows how you can help inspire young people and safeguard Thailand's future STEM talent and skills.

STEM Ambassadors enthuse and inspire young people in STEM subjects, and open the doors to a world of opportunity that begins with STEM. Through actively engaging with students and supporting teachers in the classroom, STEM Ambassadors provide living, working examples of how young people can apply STEM subjects to carve out interesting, successful and rewarding careers. Coming from a broad range of sectors, STEM Ambassadors are engaging, enthusiastic, dedicated and committed, and can continually change young people's perceptions about STEM careers, and about the types of people who work in those roles.

STEM Ambassadors use their enthusiasm and commitment to encourage young people to enjoy STEM subjects. They open the doors to a world of opportunities and possibilities which come from pursuing STEM subjects and careers. STEM Ambassadors not only inspire young people, they also support teachers in the classroom by explaining current applications of STEM in industry or research. STEM Ambassadors contribute to their local community and at the same time boost their own professional skills, experience and confidence.

Who can become a STEM Ambassador?

From environmental scientists, chemists and civil engineers to architects, pharmacists and computer programmers, STEM Ambassadors can come from any industry or sector that uses STEM skills and knowledge. In short, anyone who uses STEM skills, enjoys volunteering, and wants to share their enjoyment and enthusiasm for their subject with young people can become a STEM Ambassador.

STEM Ambassadors include: Apprentices, Zoologists, Set designers, Climate change scientists, Engineers of all disciplines, Farmers, Designers, Geologists, Nuclear physicists, Architects, Physicists, Ice core chemistry technicians, Pharmacists and Energy Analysts.

STEM Ambassadors cross all ages and backgrounds, from apprentices to company directors, university students to professors, and junior government officers to heads of departments. STEM Ambassadors can range in age from 18 to 70 years of age.

All match the following criteria:

- are over 18
- have graduated from high school
- have a STEM background and/or role in STEM-based sector or higher education department
- are enthusiastic about STEM and their role

- have good communication skills
- want to volunteer
- are able to attend a one day (or two half day) training workshop, which also includes the completion of a pre-workshop task
- are able to commit 5 days per year to being a STEM Ambassador
- The most important qualities in STEM Ambassadors are that they are enthusiastic and positive role models for STEM subjects and associated careers

Why become a STEM Ambassador?

There are many reasons why people become STEM Ambassadors

- Engage and enthuse young people about STEM
- Give teachers a unique perspective on how the STEM curriculum can be demonstrated in the world of work
- Encourage young people to consider STEM careers and qualification
- Contribute to improved academic achievement in STEM subjects.
- Develop other employability skills in young people, including confidence, team-work, presentation and creativity
- If you are over the age of 18 with skills or interest in Science, Technology, Engineering and/or Mathematics you can become a STEM Ambassador



STEM Ambassadors report

- Enjoying a sense of achievement
- Facing a different challenge from everyday work
- Challenging stereotypes which young people have about STEM subjects and related careers
- Gaining a fresh perspective on day-to-day work when seen through the eyes of students
- Helping to make a difference in the local community
- Developing new skills and confidence

What impact will you have?

You'll be able to:

- Support teachers by demonstrating the practical application of the STEM curriculum in the world of work
- Encourage students to consider STEM qualifications and careers – 33% more students want a job in STEM after direct contact with a STEM Ambassador
- Contribute to improved progression in STEM subjects – 75% of pupils who've engaged with a STEM Ambassador say they are doing well in Science

- Develop confidence, team-work, presentation skills and creativity in young people – all essential for success in the workplace, whatever the field

STEM Ambassadors find that volunteering doesn't just give them a sense of achievement, but it also develops their own self-confidence and communication skills, improving their own motivation and job satisfaction.

What would you be able to do if you became a STEM Ambassador?

STEM Ambassadors get involved in a huge range of activities, which can all have an impact on young people's learning and enjoyment of STEM, including:

- giving careers talks or helping at STEM fairs
- providing technical advice or practical support to STEM projects in the classroom
- talking about cutting edge developments in STEM
- facilitating on STEM camps
- supporting projects in after-school STEM Clubs
- judging school STEM competitions
- speed networking with pupils, parents and teachers
- devising or delivering practical STEM experiments or demonstrations
- helping students with mock job interviews



How much or how little time and how many or how few activities you engage in is entirely up to you. You will initially probably want to support the activities introduced to you by the Inspiring Science team on the training, such as mentoring students working on STEM projects or carrying out a STEM placement at your university or place of work; giving a talk in a school; participating in a STEM careers activity in a school; running an activity or stand at a STEM fair or conference; acting as a judge of STEM projects; or writing an article about your work for the STEM e-magazine.

In future you may wish to vary your role. Some STEM Ambassadors prefer to respond to specific requests from teachers; others choose to contact their local schools with ideas for how they may help; and others get involved with after-school STEM Clubs; so you can choose any volunteering opportunity near to where you work or live, facilitated by the Inspiring Science team and schools and regional STEM Centres. From helping at careers fairs or providing technical support in the classroom to supporting hands-on practical activities in a STEM Club and judging school STEM competitions, the possibilities for positive impact are endless. All we ask is that you commit to a minimum of five days a year – every moment of which we know will make a difference.

The Inspiring Science team and Regional STEM Centres will keep you up to date with the wide range of opportunities and requests that we receive from teachers and schools. You can choose to volunteer for any of the activities in the regular emails and updates, or you can come up with your own ideas.

All we ask is that you commit to a minimum of five days a year – every moment of which we know will make a difference. Many volunteers are able to do a lot more and often get involved in a number of STEM events and initiatives. We appreciate and value every contribution that is made.

How do you become a STEM Ambassador?

If you are over the age of 18 and have skills or interest in any STEM subject all you have to do is to contact the Inspiring Science team (inspiring_science@hotmail.com) or regional STEM Centre.

Then, you'll need to attend a one day (or two half-day) induction and training workshop run by the Inspiring Science Team, or Regional stem Centre. The induction and training workshop will explain the types of activity you can get involved with and how you can stay informed about opportunities. You'll also receive lots of tips and advice on working with schools and young people, and be able to plan activities with the trainers.

Support for STEM Ambassadors

All STEM Ambassadors receive a one-day induction and training workshop focussing on working in the classroom and with young people. The Inspiring Science team and Regional STEM Centres will make sure that you get all will the help and support you need.

We want our STEM Ambassadors to become confident and enthusiastic volunteers who enjoy making the most of their involvement with the Inspiring Science project and STEM Ambassador programme. To this end, we invite and listen to your feedback.

We will provide additional training, helpful toolkits, examples of good practice, and case studies – all with the aim of supporting you in the invaluable work you will do for young people. Newsletters containing volunteering opportunities and news in your area will all be part of the package. Finally, talk to your employer or university and ask for their support, too.

Frequently Asked Questions

I'm retired. Can I still volunteer as a STEM Ambassador?

Yes, there is no upper age limit for being a STEM Ambassador. Enthusiasm is the main quality we look for!

What kind of STEM Ambassador activities are on offer?

There are a wide variety of activities that STEM Ambassadors can get involved in, as outlined in the guide. You will be introduced in detail to these on your training workshop. The Inspiring Science team and your Regional STEM Centre will send regular updates to you.

Can I apply for a specific activity?

The range of STEM activities you can get involved in is extremely broad, and the Inspiring Science team and your Regional STEM Centre will circulate regular updates about events. It is completely up to you what you choose to get involved with; our only requirement is that all Ambassadors take part in a minimum of five days activity per year. Equally, you are very welcome to pursue your own school links or take part in activities through your company and/or institution under the banner of the STEM Ambassadors programme. In which case please keep us informed of such activities you are involved in.

How much planning and preparation will I have to do for an activity?

This depends entirely on which activity you decide to support. There are a huge number of ways in which Ambassadors can support schools: judging competitions; providing e-mentor careers support; giving "day-in-the-life-of" talks; explaining research techniques; advising on CV writing, interview technique or work skills; supporting clubs etc. If you are giving a talk about your work, most schools will ask you to prepare a simple presentation including any pictures or visual aids you might have, if you are going to mentor an STEM project you may wish to read about the activity in advance and think about how you could relate what you do to the work the students are undertaking. It is up to you as the Ambassador to make plans about the visit in advance with the responsible teacher once the Inspiring Science team or Regional STEM Centre has put you in touch with the teacher and school.

Can I apply to volunteer at a specific school?

Yes. We aim to meet the needs of all schools in Thailand, so the activities we support reflect what schools happen to be looking for at a particular time (support for a class of high-achievers in maths, mentors for a STEM project etc). You are welcome to work with a particular school in an ongoing way, but if this is through your own/your organisation's contacts please let us know.

Will I have the right skills to contribute?

The primary quality which all STEM Ambassadors have is enthusiasm for STEM and enthusing young people about these subjects. You do not need to have any particular qualification and we welcome people with a wide variety of skills and professional backgrounds.

I have no experience of working in schools. Can I still take part?

Yes. A large number of new Ambassadors have not worked with young people before joining the programme. The induction and training workshop aims to make you feel confident about visiting a school for the first time, and includes some classroom-based scenario activities and role-play exercises. If you do feel particularly nervous about visiting a school on your own, we will arrange for you to attend an event with a more confident or experienced Ambassador.

What support is available to me?

Following your training the Inspiring Science team and the Regional STEM Centre t will provide you with support and guidance during your time as an Ambassador, e.g. activity worksheets, organising contact with a particular school you would like to work with etc.

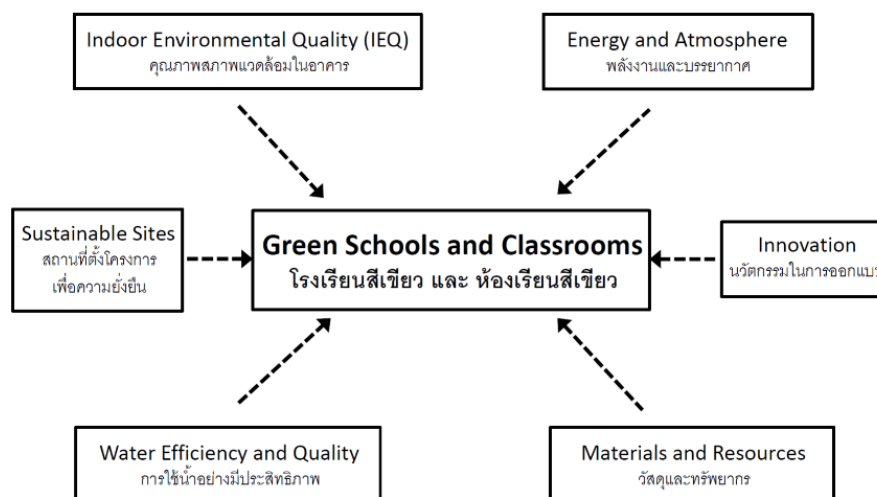


Case studies

The following case studies are from the Thailand's experience of implementing a STEM Ambassadors programme.

Case study 1: What does a Green Building Designer do?

Introducing Dr. Boonjong Buranawanachoke: one of the few people in the world to be a certified green building expert (LEED). The students at SateeSetthabutrBumpen School were excited to learn of an occupation named “Green Building Designer,” thus achieving their teacher Mr. Kandanai Visuthsiri’s first aim of opening up the world of STEM to his students. Mr. Kandanai and Dr. Boonjong planned a two period STEM Ambassador experience for the students called “Green Schools and Classrooms”. After introducing himself and breaking the ice with students, Dr. Boonjong talked about green building basics, and also obtaining his green building expert certificate.



The Ambassador exhibited excellent communication skills, and developed good rapport with the students, who responded enthusiastically when he introduced them to green buildings both around the world and locally in Thailand, and also when he discussed the idea of a green school. The talk was followed by a group activity in which groups discussed how they could modify their school into a green school. Not only was this issue relevant and close to home, but also encouraged students to approach an idea scientifically. It resulted in a large number of suggestions; groups of students competed with each other and scored 3 points per idea that could be applied to their school, and an additional point if the idea could be applied to all schools. The students’ presentations were full of fun, encouraging them to be more confident about expressing their ideas. They were inspired by Dr Boonjong, who summarised and commented on their ideas before answering questions. This active STEM Ambassador experience encouraged the students to follow up their ideas for making their school green. The STEM Ambassador really opened up a new perspective on STEM for the students, and served as a great example of how to achieve the goals for such an experience.

Case study 2: Shale gas - An unconventional source of energy

Samsenwittayalai Schoolorganised a STEM Ambassador activity with Dr. Sudeshna Basu from University College London, UK, for students from Grade 10 and 11. Dr. Basu shared with the students her research experience on shale gas while working both at a university and for a private company. Her interactive talk introduced the idea that shale gas is a natural gas, highlighting how it is formed and where it can be found, and also underlining that it is still an unconventional source of energy with the potential for development. Dr. Basu also introduced the idea that at present we rely on energy from conventionally extracted petroleum, natural gas, and coal, which are limited resources. However, within the last4-5 years, new technology has been developed that for the first time enables access to shale gas resources across the world.

Following her talk, the students were involved in hands-on workshop activities that included:

- looking at electron microscope photomicrographs,where they observed contrasting grain sizes, cementation and matrices. They learned that shale gas is present as free gas in pores and as absorbed gas in a matrix; free gas is more efficiently extractable and cemented shales have lower pore spaces and therefore lower free gas content.
- looking at borehole pictures, and discussing how shale gas boreholes are different from general boreholes.
- discussing the environmental impact and management of shale gas extraction.
- observing and identifying that shale gas is a part of a continuum of unconventional gas reserves, from tight gas sands (all free gas), gas shales (mixed free and absorbed gases) to coal bed methane (all absorbed gas).

Students were excited by and interested in the activities. They asked lots of questions, enthusiastically discussed and shared their ideas. They were really motivated by the experience, recognising how the development of new technology has made shale gas available. The STEM Ambassador experience inspired the students, with many expressing an interest in studying geology or courses relating to the petrochemical industry in future.



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