5 activities for Young STEM Leaders to lead in the science classroom

by Pete Colquhoun

The Young STEM Leader Programme is a great opportunity for learners to take the lead in delivering activities, events or interactions that provide engaging experiences for their peers.

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If you are looking for some tried-and-tested activities for Young STEM Leaders (YSLs) to lead in the classroom then look no further. Here is a summary of five engaging, enjoyable STEM activities that your YSLs can deliver to complete their STEM leadership hours. I use these resources on a yearly basis as part of our in-house S1 STEM curriculum and our Senior YSLs have had great success in taking on the role of the teacher and leading these activities themselves.

Many of the activities have been sourced from well-known STEM resource websites and then adapted slightly to fit with our own needs.

Lighthouse building

This is an engineering activity which challenges learners to build a working lighthouse using basic equipment found in any classroom (sticky tape, paper, card, straws, foil) and science department (batteries, bulbs, and holders, leads). It works best in groups of 3-5 learners and, as well to teaching engineering principles, the activity develops skills in teamworking, problem solving, forward planning and budgeting. The YSLs can begin by discussing the role of an engineer and the skills involved. Following on from this, the rules of the challenge are explained:

- The lighthouse must stand unassisted with the lightbulb on
- The height is measured from the base of the lighthouse to the lightbulb.
- Only materials included in the list can be used for the structure.

The groups can then plan, design and build their lighthouse using a limited fictional budget. It is recommended that around 2 hours is allocated to carrying out this activity from start to finish.

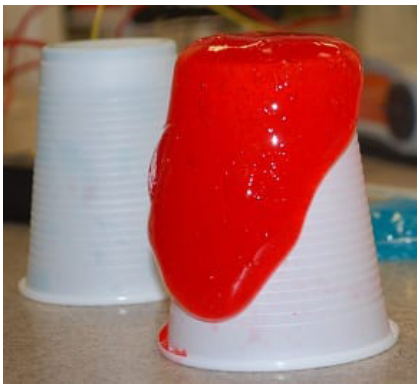
TOP TIP
If possible, ask 2 YSLs to deliver this activity together. Managing the "materials shop" and supporting groups of learners can be quite tricky if they are on their own.

Halloween slime

This science activity is great fun, easy to do, very messy and provides an opportunity for learners to learn the underlying science about why the slime glows in the dark. Only a few ingredients are required to make the slime – PVA glue, water, baking soda, borax solution and glow powder (easily sourced online).

This can be completed quite quickly so a nice follow-up activity if you want to fill a lesson is to use water, food colouring and corn flour to make a non-Newtonian fluid.

The recipes for both can be easily found online [1], [2].



Slime safety

- YSLs and participants should wash their hands after handling slime.
- Slime should not be taken home.
- A few people with sensitive skin my be irritated by the slime – if this is likely, they should wear gloves. >>

Additionally, for glow-in-the-dark slime:

- Only use glow-in-the-dark powder from a known school supplier such as Mindsets [5].
- If the glow-in-the-dark-slime only glows in the presence of UV light, then:
  - use only UVA light;
  - do not look directly at the light source;
  - avoid irradiating the skin;
  - consult SSERC's guidance on optical radiation [6].

No school should have any glow-in the-dark material that is radioactive. If you think you have any, please contact SSERC immediately.

Christmas coding decorations

This festive activity teaches learners to code without a computer, learn about the binary alphabet and create a decoration for their Christmas tree [3].

By first introducing the concept of how computers use a series of 1s and 0s to read letters of the alphabet, the resulting Christmas decoration provides a neat way of visualising this code in the form of coloured pattern. The only supplies your YSLs need to carry out this activity are coloured pony beads and pipe cleaners (you can easily get a supply of these online or at a craft store) and a copy of the binary alphabet sheet.

I'm a Scientist Get Me Out of Here Debate Kits

These free Science Debate Kits [4] are excellent for encouraging learners to engage with major scientific issues, discuss and debate the limitations of science, and consider any ethical issues which can arise from topics that are can otherwise be difficult to introduce in the classroom.

Each kit provides debate cards which provide opinions of fictional characters on a particular topic such as vaccinations, climate change, IVF, self-driving cars and many more. These role-play cards provide the learners with a range of views on the issue at hand and help them to form opinions, discuss different sides of the issue and compare differing points of view.

The user guides are very straightforward, the activity requires very little in the way of resources and each debate can be completed within a lesson. Your YSLs will need to do a bit of reading on the subject matter beforehand but this is provided as part of the resource pack.

I particularly enjoy this activity as it implements literacy and debating skills which are lesson common in science lessons.

TOP TIP
Learners can very quickly become enthusiastic and passionate about debating their views. This can be wonderful to observe but be prepared to step in if things get a little too heated!

Improving gender balance

Produced by Skills Development Scotland, the Institute of Physics (IOP) and Education Scotland, these are a great set of individual lesson resources designed to challenge common stereotypes that exist within STEM. Following the activities, learners should:

- Have a better understanding of the concept of gender stereotyping.
- Be able to give examples of how stereotypes may affect behaviour and attitude.
- Recognise that images in the media are often manipulated.
- Describe themselves in terms of personality traits and interests, rather than appearance.
- Explain the concept of unconscious bias.
- Give examples of how unconscious bias may affect our judgements.

The activity guides are very easy to follow and, in my experience, both the YSLs and lower school learners really benefit from discussing the important issues addressed in these activities.

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References

[1] https://littlebinsforlittlehands.com/make-glow-in-the-dark-slime-no-black-light/
[2] https://www.sserc.org.uk/subject-areas/chemistry/chemistry-resources/polymer-slime/
[3] https://littlebinsforlittlehands.com/christmas-coding-activity-stem-ornament-binary-alphabet/
[4] https://debate.imascientist.org.uk/what-is-a-debate-kit/
[5] https://mindsetsonline.co.uk/
[6] https://www.sserc.org.uk/health-safety/physics-health-safety/optical-radiation/ (login required)

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