



Five activities for Young STEM Leaders to lead in Technologies

by Angela Barclay

The Young STEM Leader Programme is an exciting opportunity for learners to take the lead in delivering activities, events or interactions to engage not only their peers, but also teachers and families too.

If you are looking for interesting ways to support Young STEM Leaders (YSLs) in Technologies you are in the right place! Here is a summary of five activities which have proven very effective and engaging, with links to resources where appropriate.

F1 In Schools

F1 In Schools is our main vehicle for YSLs, and with the introduction of the [Auto-Award](#) (meaning any young learner who competes in F1 in Schools can also have their work submitted to gain a Young STEM

Leader Award) the two elements go hand-in-hand. Although our F1 YSLs do not need to plan additional STEM activities, they always want to, particularly when it involves encouraging younger learners to become passionate about their topic. Teams have designed their own sessions from creating presentations to explain the fundamentals of aerodynamics, to workshops to make model cars, and delivered these to both small and large groups at the Angus annual STEM Event, "Mission Possible".

F1 in Schools have now released a new Primary project and the resources are excellent:

- [F1 in Schools Primary Class - F1 in Schools UK](#).

There are six units which YSLs can easily deliver aspects of, and there are also free worksheets that can be used for shorter or stand-alone activities. Some of these are also suitable for learners in S1.

If you are at the beginning of your Young STEM Leader journey and



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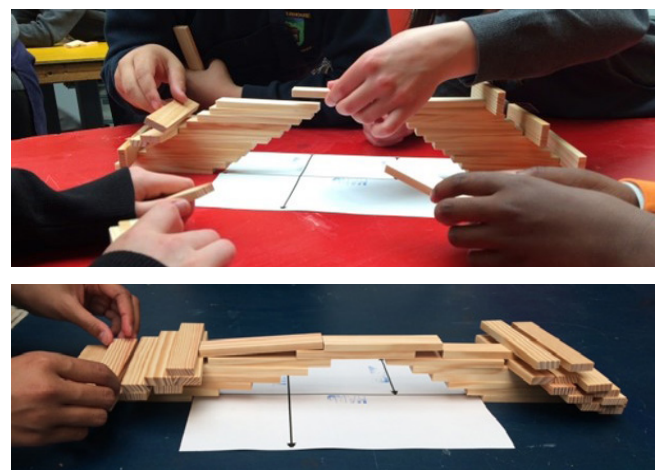
getting involved in F1 in Schools seems a bit overwhelming, don't panic. The following four recommendations are definitely within reach!

Kapla Bridge Building

This practical engineering activity is equally exciting and frustrating, as young people try to figure out what initially seems like an >>

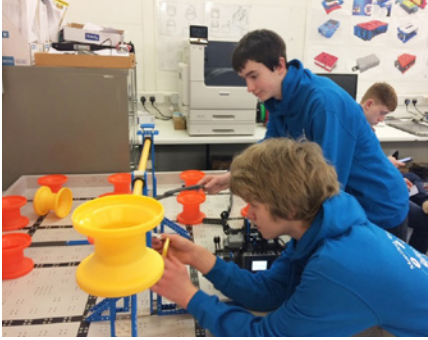


Young STEM Leaders taking part in F1 in Schools as part of their Young STEM Leader award.

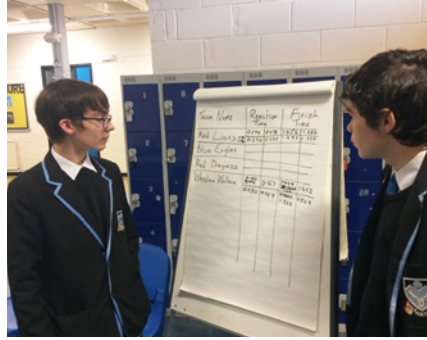


Kapla Bridge Building.

Wider STEM Engagement



YSLs leading robotics challenges.



impossible task. As well as learning about counterbalance, participants develop skills such as team working, communication, planning and resilience.

Audience

This activity works well with learners of all ages (staff loved it too), working in groups of 3-5, and our YSLs have enjoyed using it during transition.

Equipment

- Kapla Blocks (40 per group)
- A4 Paper (5 sheets per group)

Other blocks can be used providing your YSLs check the challenge is possible!

Planning

The YSLs set up the blocks in advance- an equal number to each group, and hand out the paper. They can prepare a short Powerpoint, or just talk the groups through the challenge.

Challenge

- 1) Design and build a bridge which spans the A4 paper widthways.
- 2) Design and build a bridge which spans the A4 paper lengthways.
- 3) Repeat the previous challenges using the minimal number of blocks.

This activity normally lasts around 50 minutes, but it could easily go on longer or for more than one session. The bridge building can be replaced with building the tallest tower, or something more creative!

Robotics

This robotics activity involves learning simple coding, working systematically and learning from mistakes.

Audience

This activity works well with primary and secondary aged learners, staff and families, working individually or in pairs. It has been used in classes, primary visits and at community events.

Equipment

- Lego Mindstorm, VEX Robot or similar (one will do, but the more the merrier!)
- Appropriate IT Equipment
- Timer
- Tape/Cardboard etc. to create the course
- Flip Chart or similar

Other Robots can be used providing your YSLs check the challenge they design is possible!



Examples of K-nex wind turbines.

Planning

The YSLs set up the Robot and design the task in advance. They can prepare a short Powerpoint, or just talk the groups through the challenge. YSLs can decide whether it's appropriate to expect participants to do any coding, or simply try to complete the task.

Challenge

- 1) Participants listen to instructions.
- 2) Participants take turns to control/ code the robot through a marked route in the shortest time while others spectate.
- 3) YSLs operate timer and keep track of the leaderboard on the flipchart.

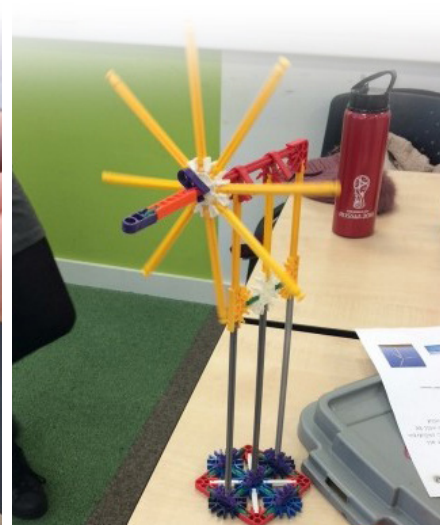
This activity lasts as long as you want, as it can become very competitive.

TOP TIP

This activity can be used to raise funds for charity by charging per turn - be prepared, you might have lots of repeat customers!

K'Nex wind-turbine design

This is another hands-on activity, which involves more planning and typically lasts around three 50 minute sessions, perfect for the extended leadership required in the Formal levels of YSLP. The learning input is around motion and structures, and participants also develop their planning, team working, communication, and resilience. >>



Wider STEM Engagement



Young STEM Leaders delivering a presentation.

Audience

This activity has been used during transition, and also with young people in S2, working in groups of 3-5.

Equipment

- K'Nex Kits (at least one between three teams, one between two teams is best)
- A4 Paper (4 sheets per group)
- A3 Paper (2 sheets per group)

Planning

YSLs should sort the K'Nex into the different pieces and divide them equally between the teams, and hand out the paper. Again, they can prepare a short PowerPoint, or just talk the groups through the theory about different types of motion and the challenge.

Challenge

- 1) Design a Wind Turbine individually on A4 paper- this should turn easily and be a minimum height.
- 2) Discuss and develop a team design on A3 paper, indicating which pieces you will use.
- 3) Negotiate with other teams if you wish to swap any pieces.
- 4) Build and test your Wind Turbine, using a fan or hairdryer.

This normally takes 3 x 50 minute lessons, and can be adapted to develop a Fairground Ride or a Bridge for variety.

TOP TIP

YSLs should be prepared to photograph final models to record them, so that groups can then dismantle and assist in reorganising all the pieces!

Cardboard chair design

This practical design activity is very collaborative and exciting. As well as learning about construction and ergonomics, participants develop skills such as team working, communication, planning and resilience.

Audience:

This activity has worked well with S3 learners, and can probably be adapted to suit most ages, working in groups of 3-4.



Cardboard chairs don't often last for very long!

Equipment

- Cardboard (minimum of two large boxes/sheets per group- we used PC and Monitor boxes after a school IT refresh, and food packaging from the dinner hall)
- Wide Sticky Tape
- A4 Paper (4 sheets per group)
- A3 Paper (1 sheet per group)

Other materials can also be used providing your YSLs check the challenge is possible!

Planning

The YSLs set up the materials in advance - an equal number to each group - and hand out the paper. They can prepare a short PowerPoint, or just talk the groups through the challenge.

Challenge

- 1) Individually design a chair from the given materials on A4 paper.
- 2) Collaborate and agree a team design on A3 paper, showing construction methods. (This can also be done using CAD)
- 3) Build a chair which supports the weight of one team member.
- 4) The chair must seat the user at least 300 mm from the ground.
- 5) The chair must be a good fit for the user's body.
- 6) Bonus points if the chair is aesthetically pleasing!

This activity normally lasts around three 50 minute sessions, and YSLs can adapt the specification to best suit the materials available.

TOP TIP

For a shorter, simpler activity, all materials can be replaced with balloons and string, and a time limit of 30 minutes. This is best done on a soft surface- possibly outdoors on grass, as the balloons do sometimes pop during testing!



Wider STEM Engagement

In addition to the activities described above, our YSLs have presented at parent's evenings and community events, judged junior learner competitions, and our Senior YSLs supported our Junior YSLs in setting up working groups to drive forward our school STEM agenda.

Young STEM Leaders delivering a presentation

I think that covers most of our YSLs leadership in Technologies, but I'm sure yours will come up with many more ideas of their own. If you would like to run anything by me, or if you would like some examples of YSLs in

DYW activities such as Barista or Nail Bar, please get in touch. I hope you find your involvement in the Young STEM Leader Award as rewarding as I have - good luck!

You can reach Angela by emailing Angela.Barclay@sserc.scot



Find out more...

To learn more about the Young STEM Leader programme and start delivering it in your school community or youth group, visit www.youngstemleader.scot, email us youngstemleader@sserc.scot or check out our [@YoungSTEMLeader](https://twitter.com/YoungSTEMLeader).

Nuffield Research Placements



SSERC's coordination of the Nuffield Research Placements Programme in Scotland is now well under way. We have begun matching learners with their placement supervisors and will be in touch with successful candidates soon to let them know where they've been placed.

The Evaluation of the 2021 Nuffield Research Placements Cycle report has now been released. Learners who took part in last year's cycle found the experience really valuable, with 98% finding that their experience had supported their higher education or job applications and 93% saying they would recommend it to other learners.



Find out more about the report [here.](#)

"I was a real researcher carrying out valuable research. I was able to do so many new things and widen my knowledge of topics I had previous knowledge of."

If you are a young person or teacher interested in placements, or an educational institute or employer looking to host a placement, please get in touch: nuffieldresearchplacements@sserc.scot