

Engineering skills and partnership programmes

Fife Case Study— Formula Goblin Kit Car

This case study will be of interest to primary schools who wish to develop a range of STEM skills and attributes through a strong focus on engineering tasks.

Rationale

The aim of the Goblin programme is to develop STEM skills through a series of contextualised, problem-rich, collaborative tasks.

The programme

Pupils were supported by an engineering partner to manufacture and assemble a Formula Goblin Car from a commercially produced kit via Greenpower Educational Trust.

Across Fife, 24 schools took part in the ten week programme which culminated in a race day at Cowdenbeath Race Wall with awards for racing, teamwork and portfolios.

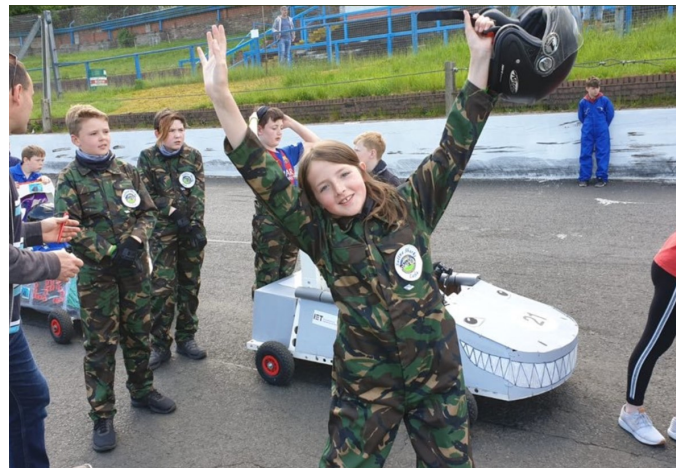
Initially, many schools used after school or lunchtime clubs to target specific pupils. Now however, most schools have whole classes involved in a range of roles. The build process was as follows:

- Unpacking kit and familiarisation with the contents
- Training in safe use of tools
- Constructing the core chassis
- Adding electrics and checking alignment
- Design, manufacture and fit of exterior bodywork
- Scrutineering.

Impact

The pupils reported enhanced collaboration and problem-solving skills in addition to technical engineering skills.

Practitioners reported the programme was effective in terms of engaging pupils and in skills development.



What does it cost?

The Goblin G2 costs £1300.00 + VAT and includes all parts required to complete the build of a fully functioning electric racing car.

The kit is suitable for groups of six to 10 children per car. It comprises all required mechanical and electrical parts. The body work is designed and built by the children. Many schools opted to use recycled materials to gain extra points in adjudication.

Schools could fund this through support from local business sponsorship, PEF, SAC or Parent Council fundraising. Some schools built their car in conjunction with Police Scotland as part of a community project.



Notably, teachers working within the Pupil Support Service reported that their team members showed such an interest and engagement that the staff were actively seeking additional engineering activities beyond the race based programme.

Although all of the team members have struggled in a mainstream setting, every pupil enjoyed a sense of community and camaraderie. The atmosphere was entirely positive throughout the day.

Many of the youngsters had their first ever shared experience of success in learning. This programme has been identified by police officers as “transformational” and “potentially life changing” for those seeking positive destinations.



What equipment is needed

Each team needs to have a full helmet and a boiler suit for each member and a trickle battery charger.

Basic hand tools are needed:

- A selection of screwdrivers, and Allen keys
- Assorted metric spanners (8mm, 10mm, 13mm, 17 mm and 19mm)
- Pliers and a small hammer
- Electric tape, cable ties, electrical insulating tape

More information at:

<https://www.greenpower.co.uk/product/238>

The project developed STEM skills in a real-life context and built important industry and school cluster partnerships. A third of the schools have had sustained support from local business partners, with all reporting a keen desire for this collaborative programme to continue.

Next steps

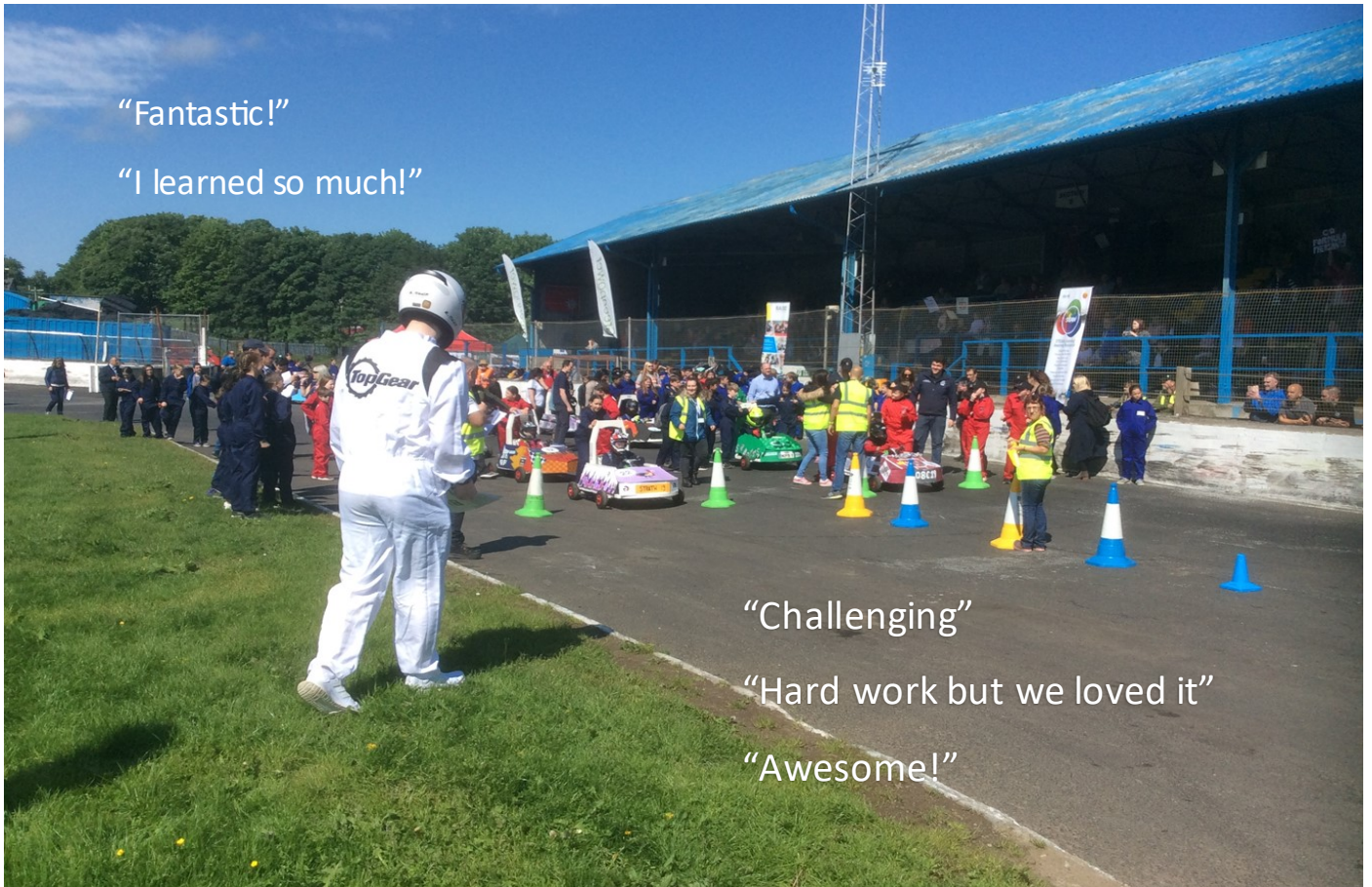
More than 30 schools are signed up for the Goblin Car Race in academic year 2020/21, with the majority using it as an opportunity to support transition for P7 pupils.

Resources and planning guides have been developed to show links to the CfE experiences and outcomes and the Careers Education Standard. In partnership with BRAG Enterprises, there are CLPL sessions being delivered on electrics, construction and the scrutineering process. These sessions are always very well attended and highly valued. Feedback is entirely positive.

Partnerships are being established with engineers throughout Fife. This is being supported by the Developing the Young Workforce Business Engagement Officer.

STEM Ambassadors from across Scotland have been invaluable as supporters and mentors for youngsters and teachers who lack engineering skills and/or experience. Their contribution cannot be underestimated and we encourage companies to explore using the school engagement aspect as part evidence towards securing Chartered Engineer status for employees. Other companies use it as part of their Graduate Apprenticeship offerings.





“Fantastic!”

“I learned so much!”

“Challenging”

“Hard work but we loved it”

“Awesome!”



“ The scrutineering was tough but we did it!”

“You learn as you go along. It’s great.”

“ This is for girls and boys, it’s for everyone.”

This case study has been prepared by Karen Doherty. The views contained in this document are those of the author and do not necessarily represent those of RAiSE, Education Scotland, and/or The Wood Foundation.