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THE UNIVERSITY of EDINBURGH

Remote^3: Public Engagement over 1 km underground – and beyond

REMOTE^3

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UK Research & Innovation
Science and Technology Facilities Council

CHEP2024, Krakow, Poland, 21 Oct 2024

Who am I?

Work in UKRI/STFC's Public Engagement (PE) department as a Senior PE Officer

PE Co-ordinator with UKRI/STFC's Boulby Underground Laboratory, part of the Particle Physics Department

Core Team member for Remote^3

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Agenda

1 Context

2 Remote^3 project

Overview, Aims, Development

3 Challenges and Benefits

4 Further Plans

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Image © STFC Alan Ford

Introduction to STFC and UKRI

The Science and Technology Facilities Council (STFC), part of UK Research and Innovation (UKRI), works with the UK government to deliver, support and invest in fundamental research in astronomy, physics, computational science and space science.

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STFC Public Engagement and Outreach

STFC has a strategic objective to use their stories, community and facilities to engaging the next generation

STFC's facilities give us a unique opportunity to inspire the next generation with their remarkable scale, ambition, and achievement

Wonder Initiative: Science *is* for them!




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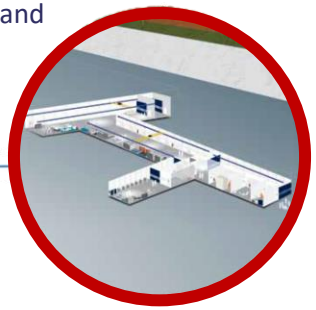
Daresbury Laboratory
Warrington, Cheshire

UK Astronomy Technology Centre
Edinburgh, Scotland

Boulby Underground Laboratory
Cleveland



Polaris House
Swindon, Wiltshire

Rutherford Appleton Laboratory
Didcot, Oxfordshire

Chilbolton Observatory
Stockbridge, Hampshire

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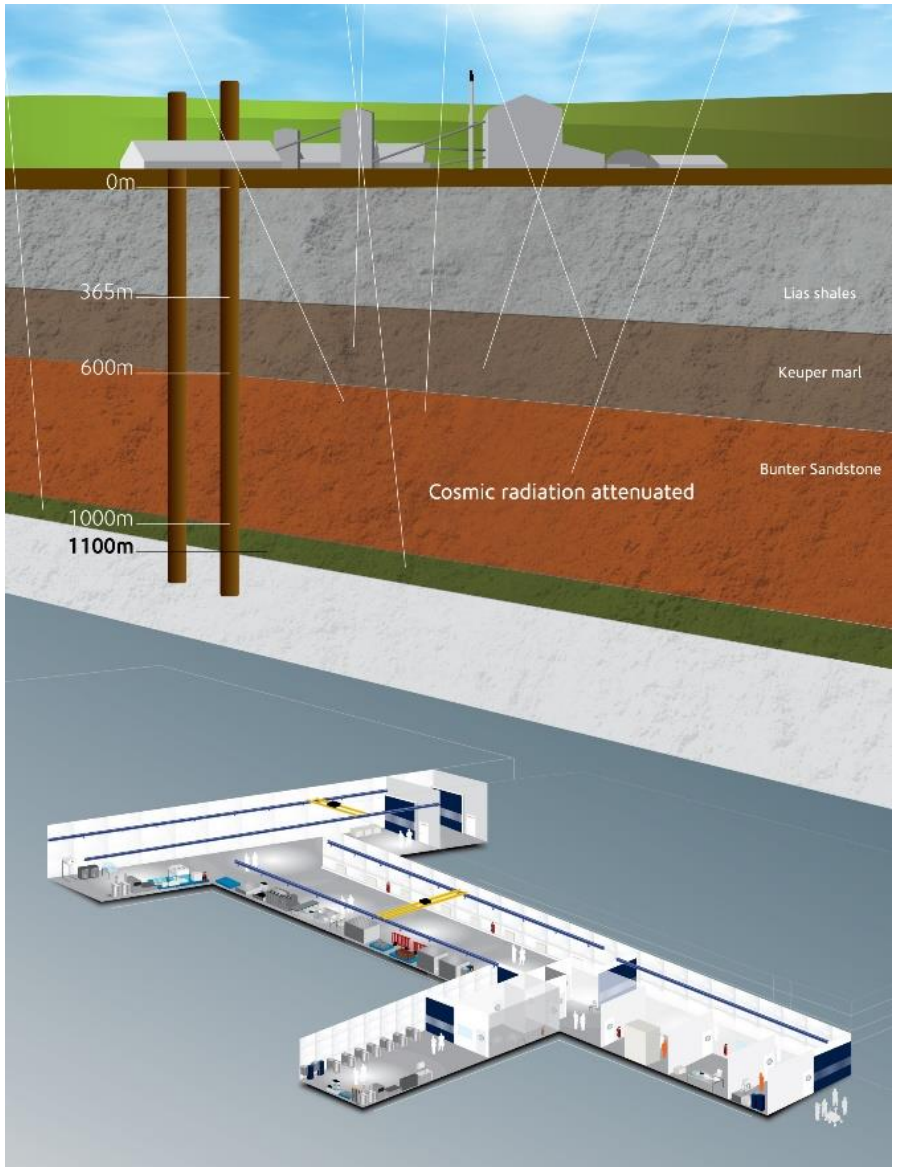

Boulby Underground Laboratory

- 1.1km underground in a working polyhalite and rock salt mine operated by ICL-UK

- Science at Boulby ranges from low background astro-particle physics to studies of geology/geophysics, climate, the environment, planetary exploration technology development, life in extreme environments on Earth and beyond.

- Remote location is a challenge for taking visitors!

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Boulby Underground Laboratory

What is Remote^3?

- Teams of school students (primary and secondary) are challenged to design, build and program Lego Mindstorms® robots, working with Scientists, Engineers, and Computer Programmer mentors.

- The completed robots are taken to the Mars Yard at the Boulby Mine, over a kilometre underground and challenged with tasks across a simulated Martian landscape, from navigation and searches to rock collection and return for analysis.

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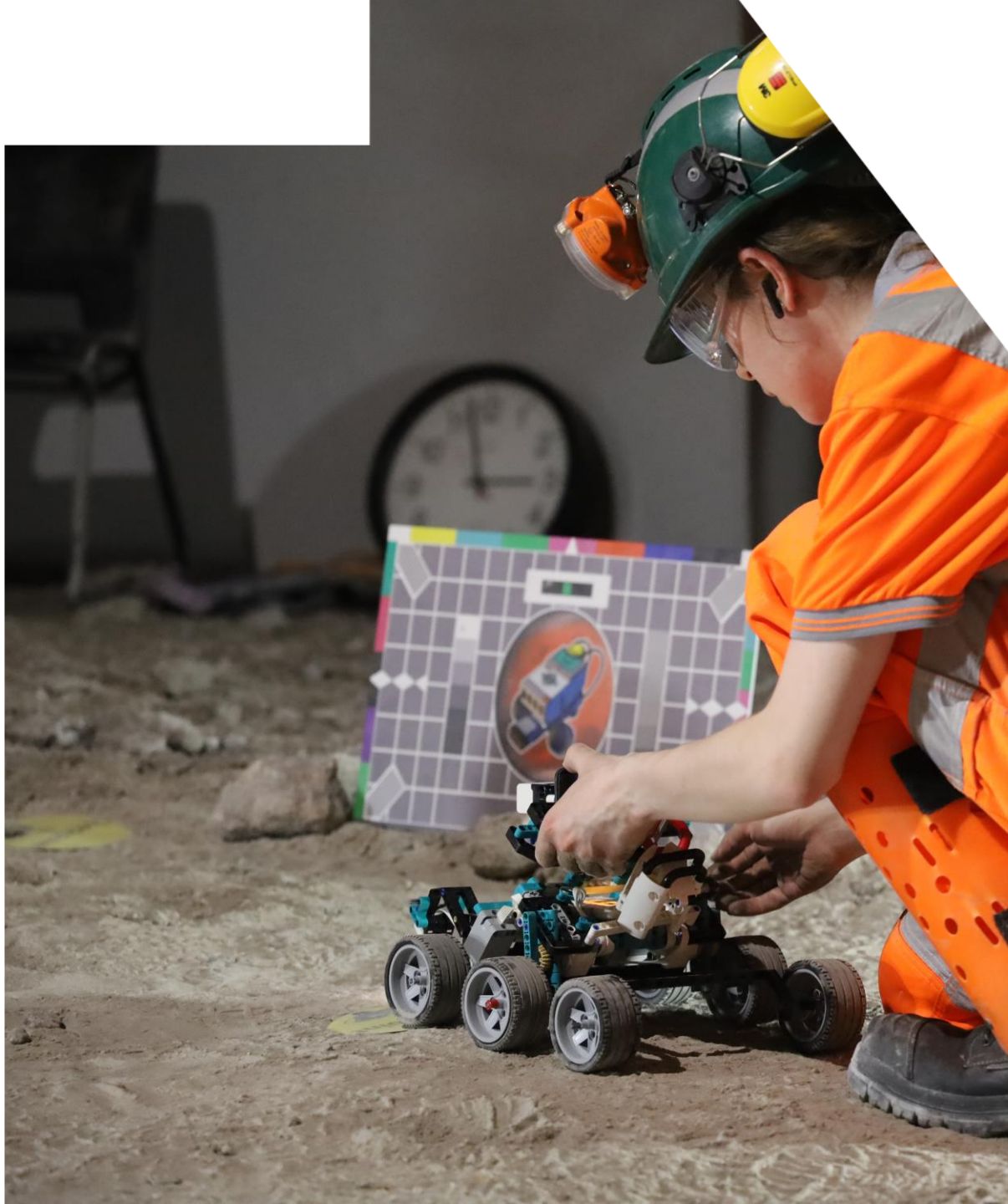
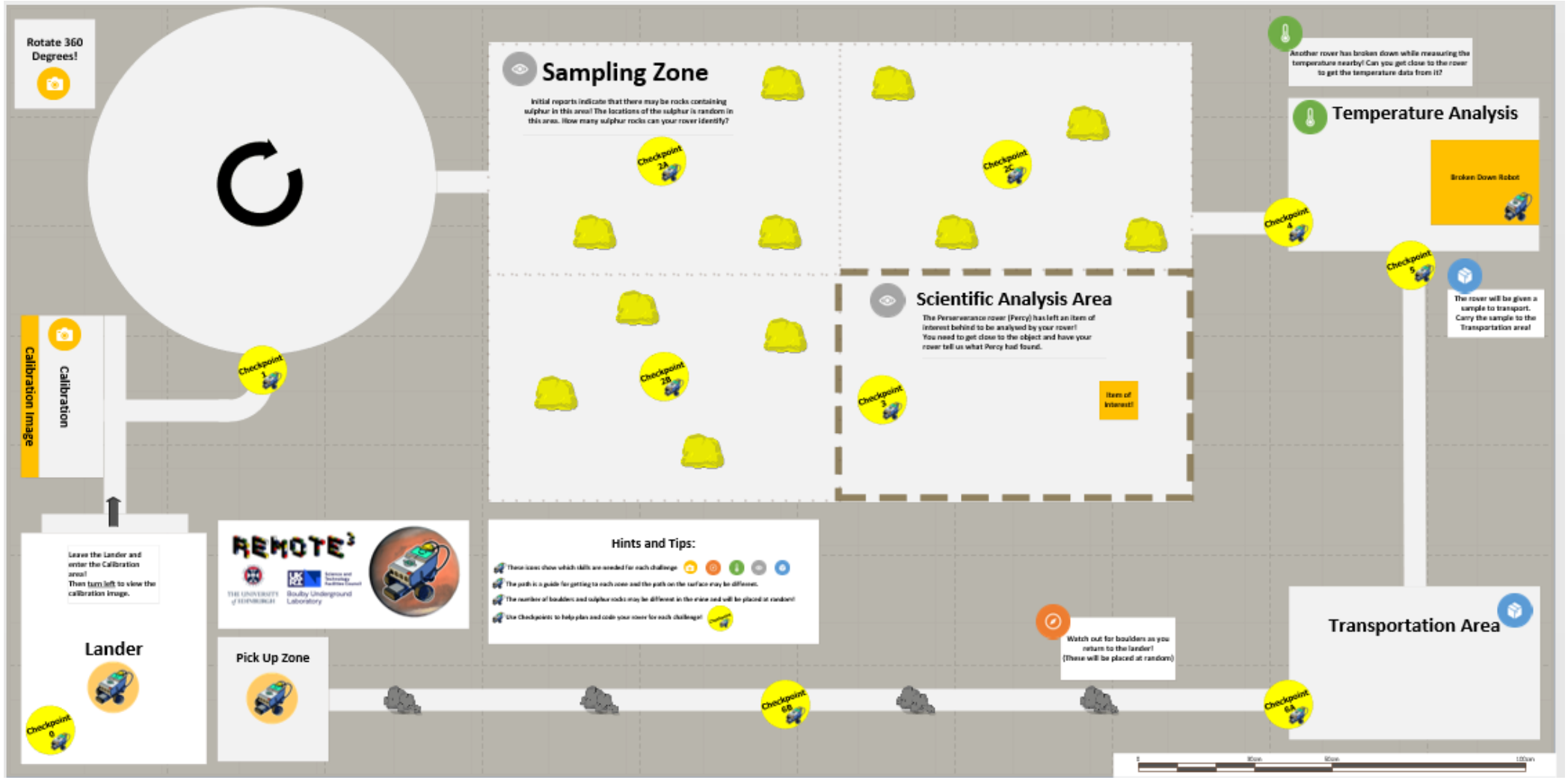


Challenge Map



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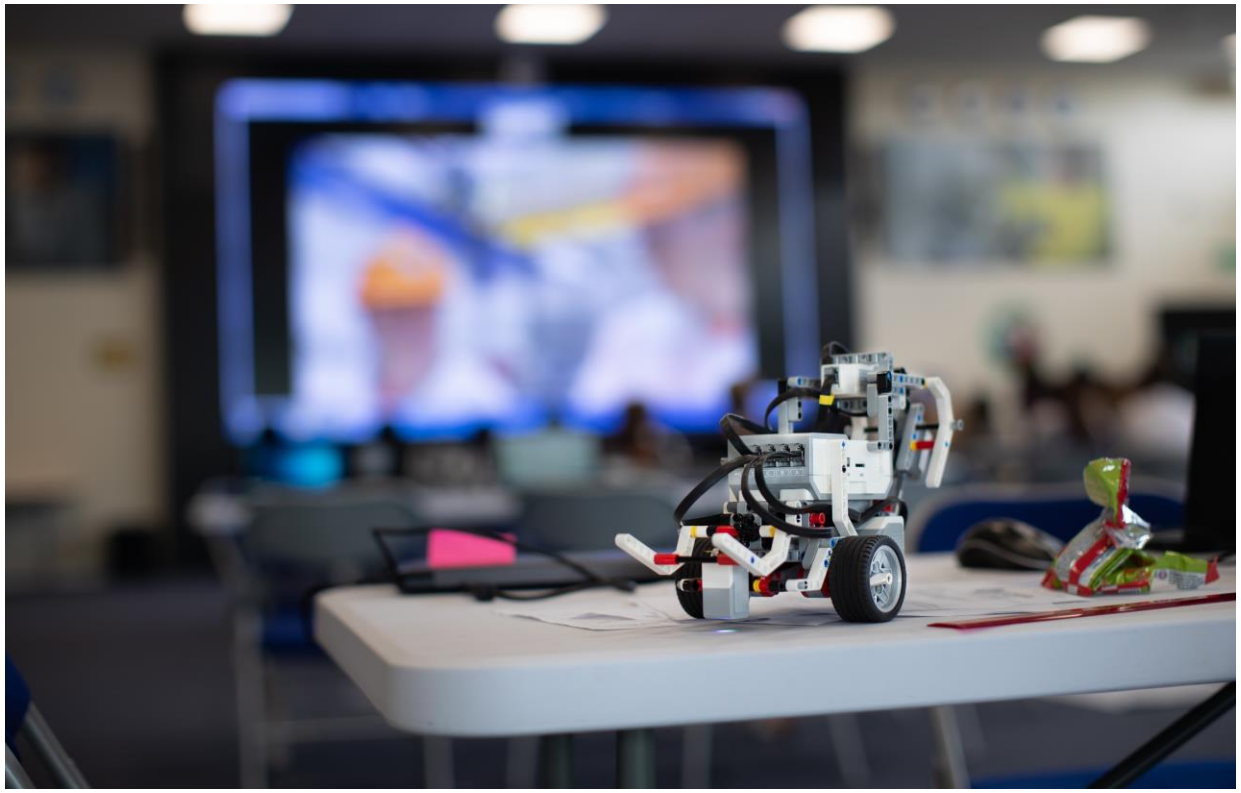
2019 Pilot



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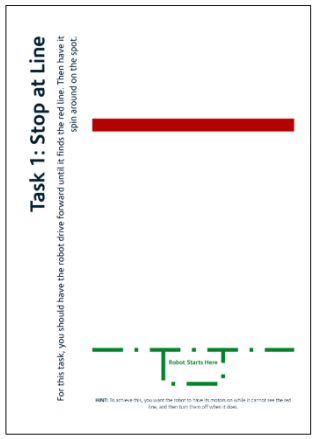
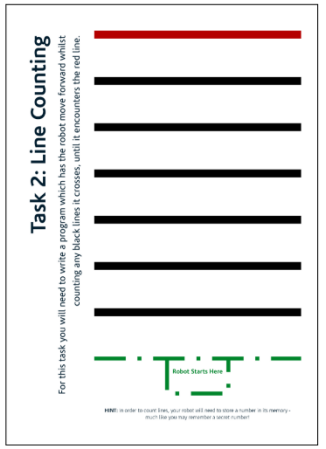


Above is the task map for this activity.



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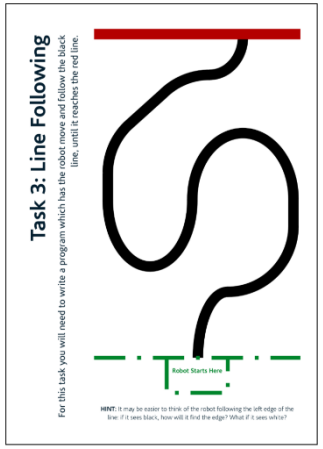


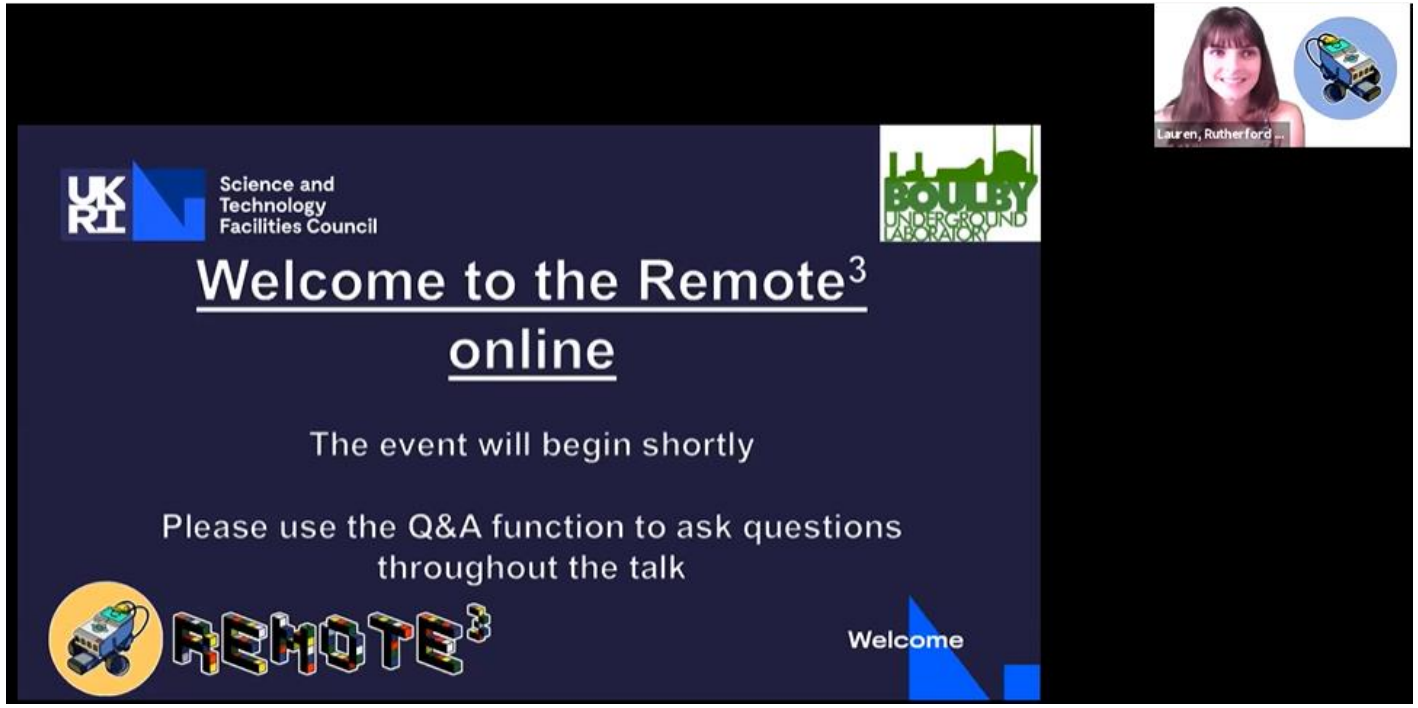
Above is the task map for this activity.

Remote^3 or Remote^4?

- Initial Teacher workshop and project launch went ahead in Feb 2020 with 10 schools in remote locations of Scotland

- Lockdown began March 2020 and the programme had to be paused

- Challenges taken to online format and shared weekly with the public at home



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Remote^3 Aims

We want participants to:

- build skills
- build confidence
- build relationships

- build Lego

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Challenges

- Teacher confidence
- Issues with resources (Mindstorms are expensive)
  - Easy to address in the short term but long term is tricky
- Time issue
  - Co-ordinating multiple intervention sessions across schools is a big investment of time and shouldn’t be underestimated

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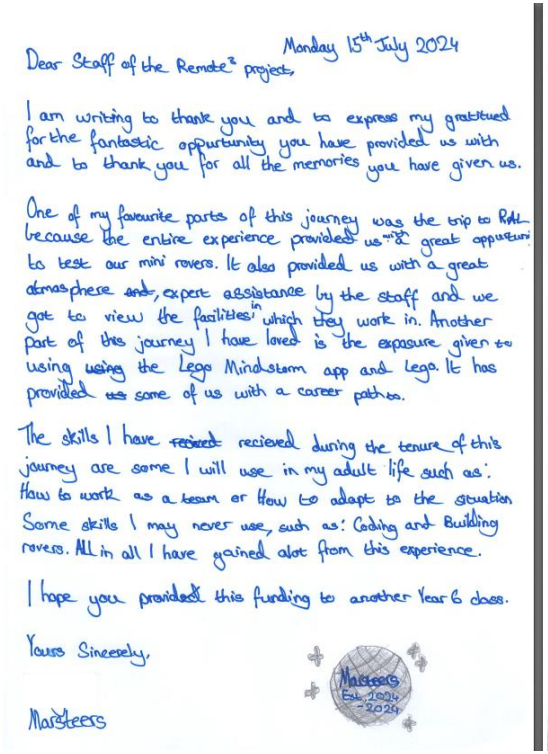
Benefits

- Multi-intervention interactions are extremely positive

- Important for aspirations to identify with science and engineering and the people that do it



Monday 15th July 2024

Dear Staff of the Remote³ projects,

I am writing to thank you and to express my gratitude for the fantastic opportunity you have provided us with and to thank you for all the memories you have given us.

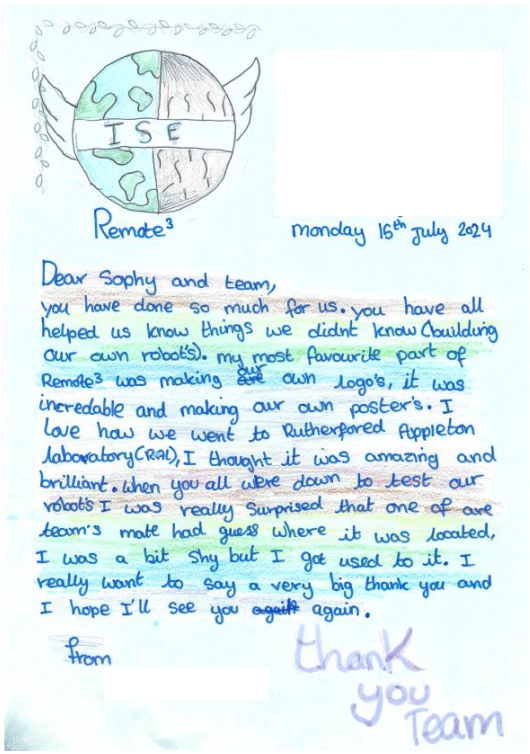
One of my favourite parts of this journey was the trip to RAL because the entire experience provided us with a great opportunity to test our mini rovers. It also provided us with a great atmosphere and, expert assistance by the staff and we got to view the facilities in which they work in. Another part of this journey I have loved is the exposure given to using using the Lego Mindstorm app and Lego. It has provided us some of us with a career path to.

The skills I have ~~recieved~~ recieved during the tenure of this journey are some I will use in my adult life such as: How to work as a team or How to adapt to the situation. Some skills I may never use, such as: Coding and Building rovers. All in all I have gained alot from this experience.

I hope you provided this funding to another Year 6 class.

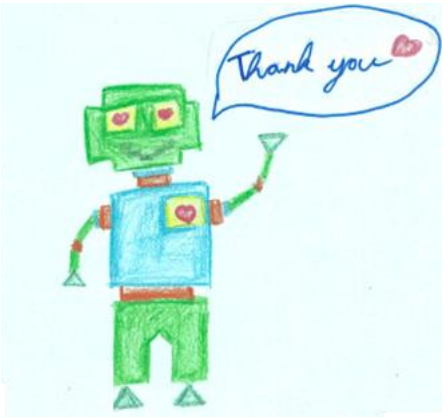
Yours Sincerely,

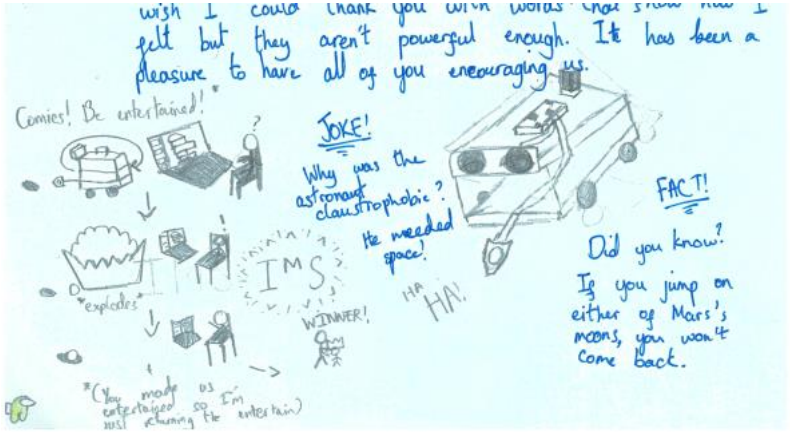
Marsteers



We want students to:

- build skills
- build confidence
- build relationships





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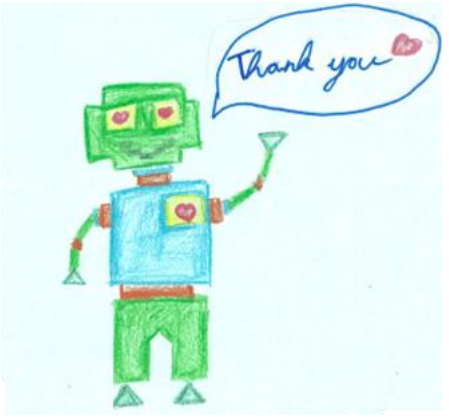
Benefits

- Build skills
  - “A skill I learnt was how to work together to improve the rover”
  - “My knowledge of coding and design have increased significantly and I am very grateful”

- Build confidence
  - “I was a bit shy but I got used to it”
  - “My parents were really proud of me and my robot”
  - “Don’t give up and keep trying because one day you will make it”



- Build relationships
  “I loved working with all your colleagues but in my opinion, Will was my favourite but you’re all fantastic”

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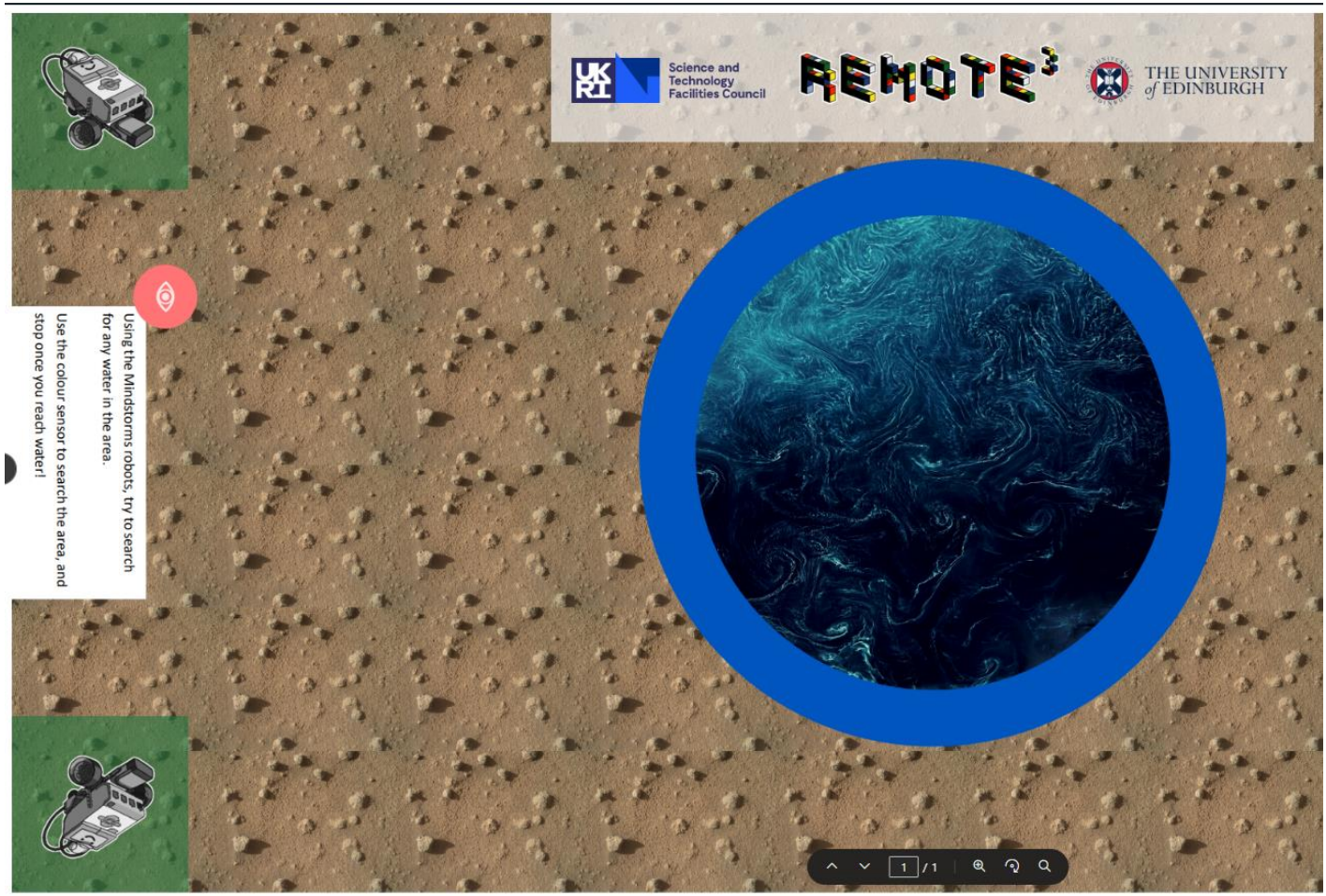
Further plans

The project will continue for another year, with a new cohort of primary and secondary school students across the country with even stronger highlights of curriculum links

Remote^3 has previously flourished in a wide variety of different environments and through multiple mediums, which continue to evolve building on lessons learnt each year



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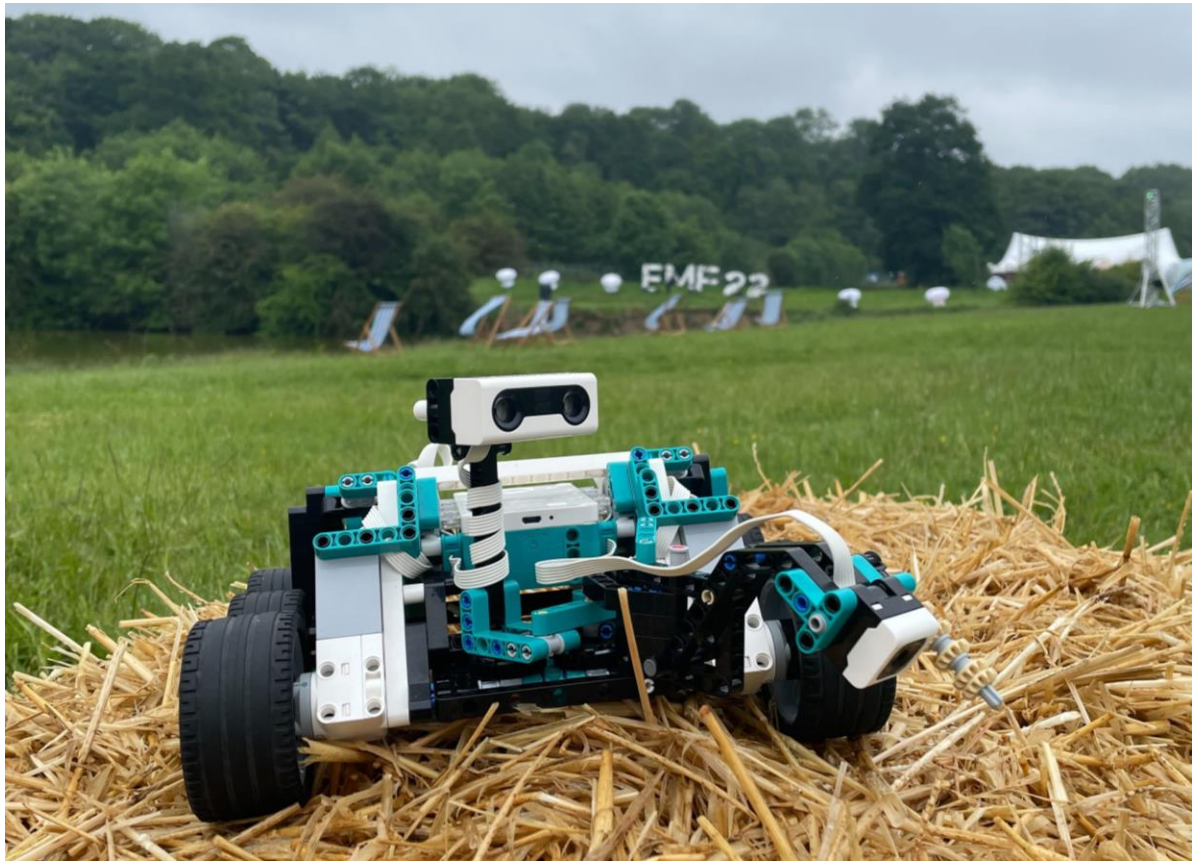
Further plans



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Further plans: the book!

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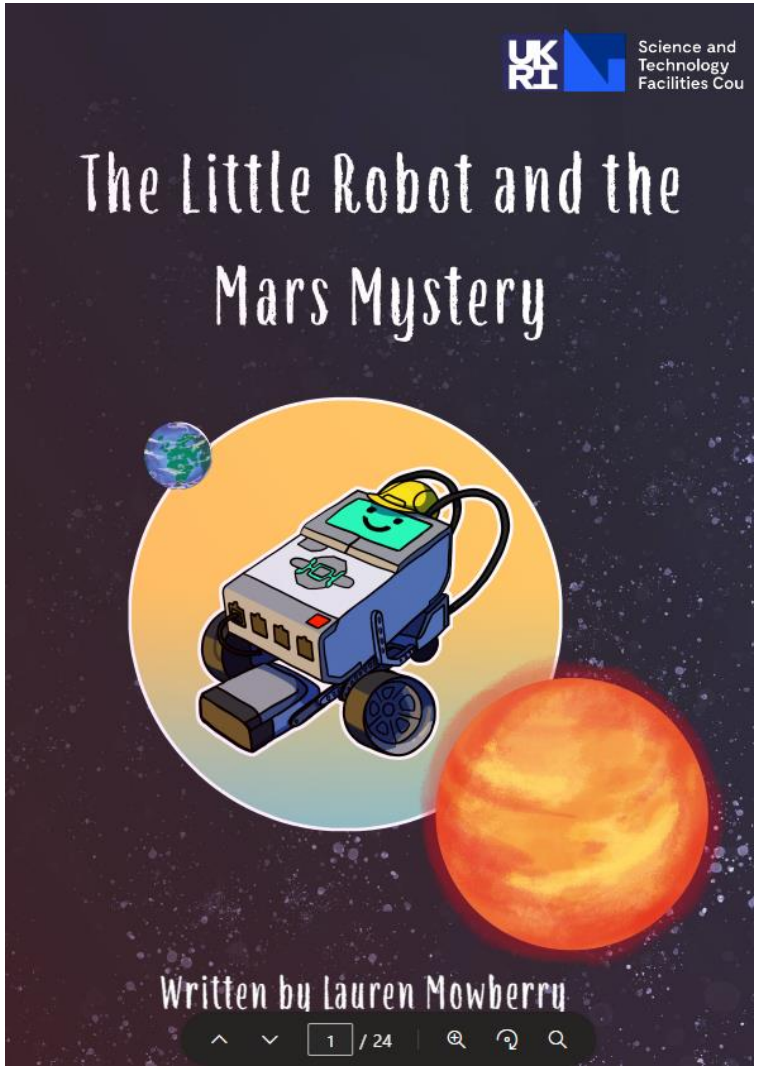

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Questions?

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Thank you

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