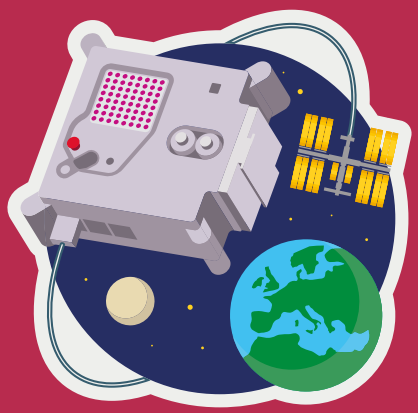

Astro Pi Mission Space Lab 2022/23

Impact report

March 2024

Raspberry Pi Foundation Impact Report

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Introduction

Through the European Astro Pi Challenge, we inspire young people to get involved in computing through the unique experience of writing code that runs on Raspberry Pi computers aboard the International Space Station (ISS). The European Astro Pi challenge, an ESA (European Space Agency) Education project run in collaboration with the Raspberry Pi Foundation, is open to young people up to age 19 in ESA member and partner countries. Each year, there are two challenges: Mission Zero and Mission Space Lab.

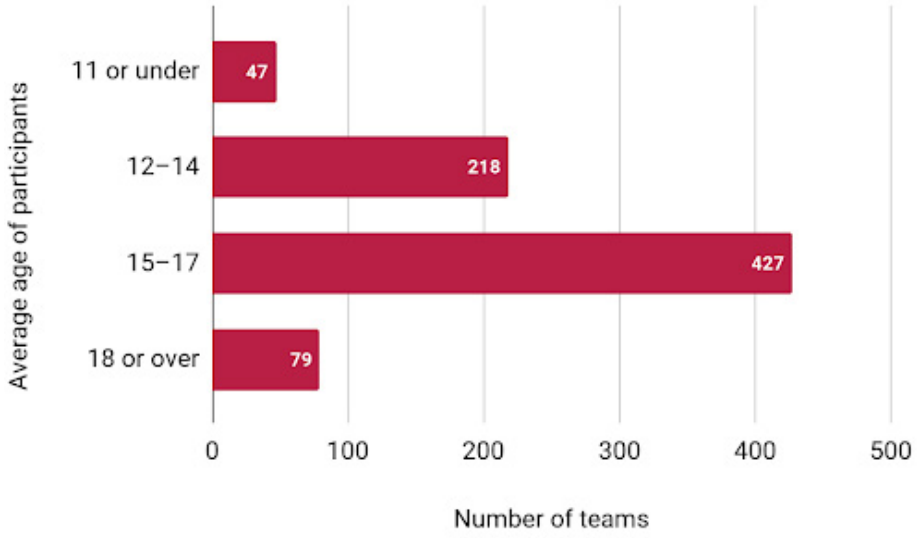
In Mission Space Lab, teams of young people work together to create computer programs for scientific experiments on the International Space Station. We test their programs to make sure they work and do not contain any functionality that might adversely affect the ISS or its networks. The most original and well-designed programs are selected to be deployed on the ISS, i.e. they receive **'flight status'**. These programs then run on the two Astro Pi computers on the ISS: space-adapted Raspberry Pis with cameras and a range of environmental sensors.

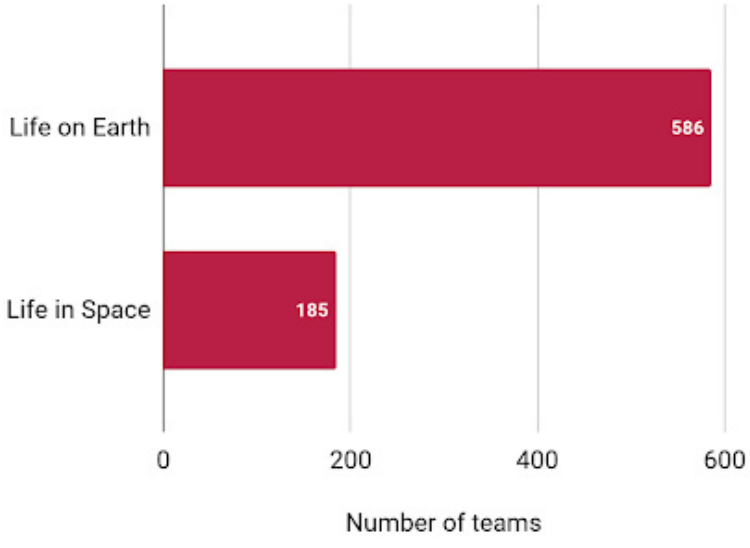
Experiment highlights from Mission Space Lab 2022/23 are available in **this blog**. This report provides further insights about the participants and the impact the 2022/23 challenge had on them. It is based on participation data and on surveys completed by team mentors (**not the young people themselves**) before and after the challenge.

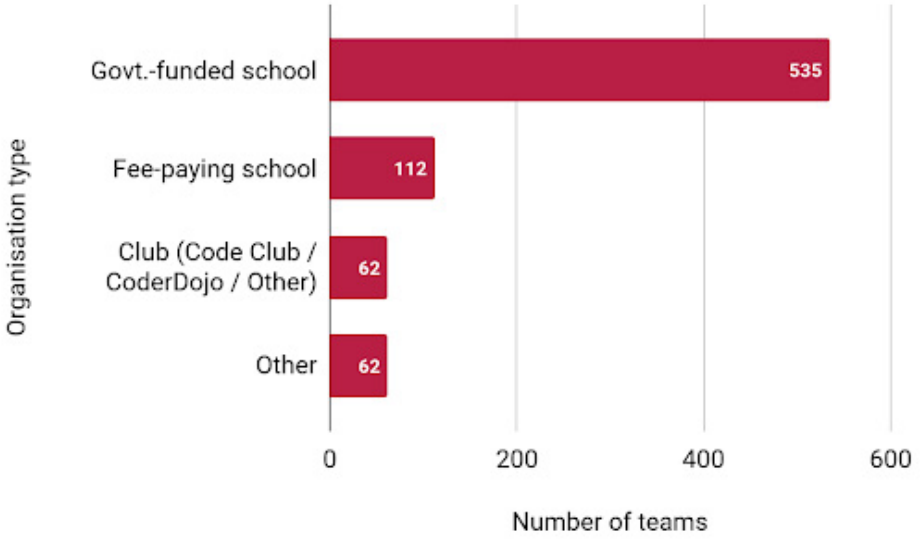
Who took part?

In total, 771 teams took part in Mission Space Lab, of which 295 (38%) achieved flight status.

Over half (55%) of the participating teams had an average age of 15–17, and 69% were from government-funded schools. Three out of every four teams (76%) chose to design Life on Earth experiments, meaning their programs investigated the Earth's surface. The other teams (24%) chose to design Life in Space experiments, i.e. their programs investigated conditions aboard the ISS.



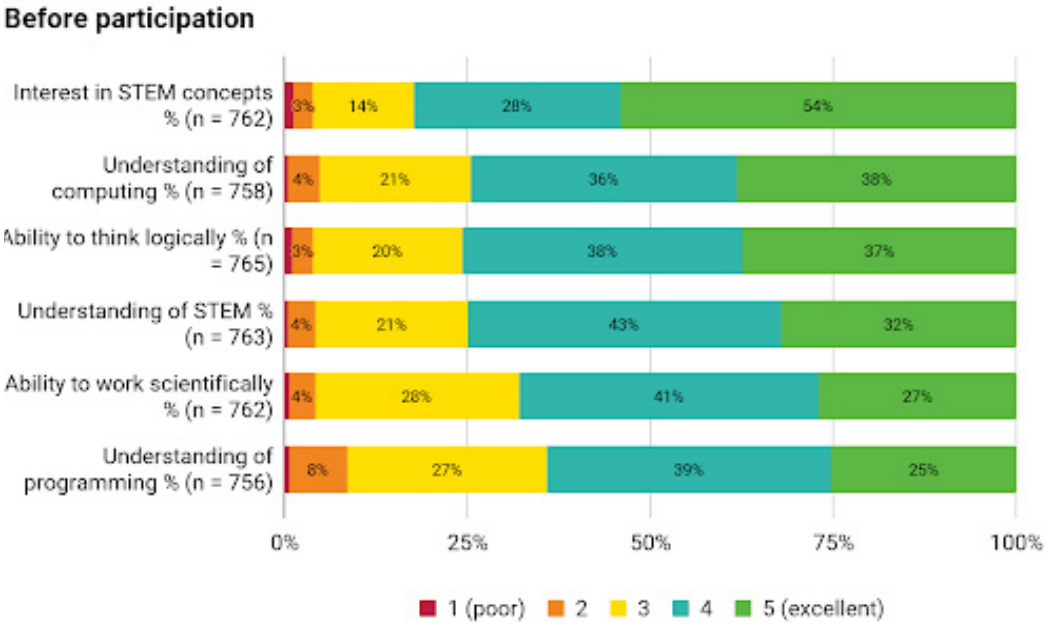



Organisation type
Govt.-funded school
535
Fee-paying school
112
Club (Code Club / CoderDojo / Other)
62
Other
62
0
200
400
600
Number of teams

Abilities, understanding, and interest before participation

Mentors reported high levels of interest, understanding, and ability in STEM and computing for their teams prior to taking part in Mission Space Lab.

There was, however, a significant minority who reported lower levels: for example, in 36 percent of mentor responses, understanding of programming was rated as a 3 out of 5 or lower.



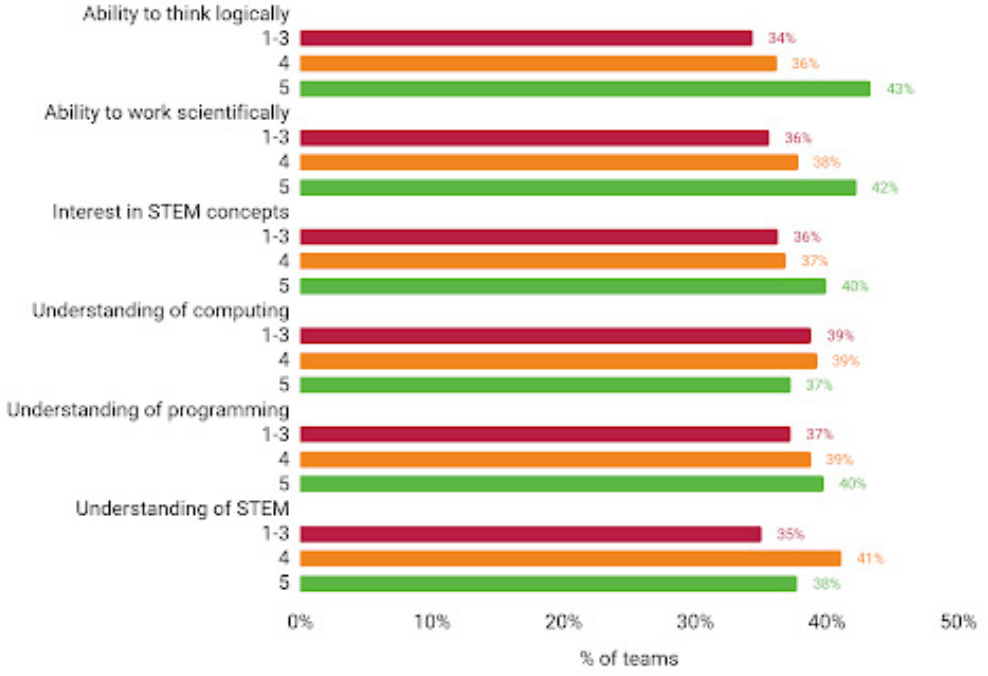
Who achieved flight status?

Overall, 38% of teams taking part in Mission Space Lab achieved flight status.

Teams whose interest, understanding, and abilities were rated more highly by their mentors were slightly more likely to progress.

High 'ability to think logically' or 'ability to work scientifically' were the strongest predictors of achieving flight status.

What percentage of teams achieved flight status, by mentors' rating before participation, (1=poor, 5=excellent)



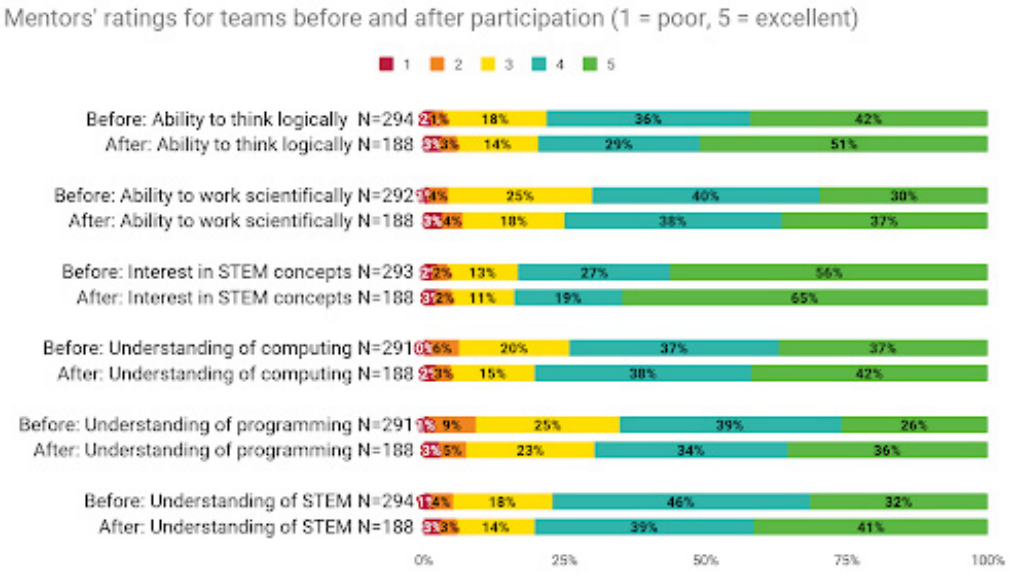
Interest, understanding, and abilities compared

For teams achieving flight status*, mentors' ratings of their teams' interest, understanding, and ability increased after taking part.

However, these increases were quite small (between 5 and 10 percentage point increase in mentors responding 'excellent'). This may in part reflect the high ratings given before taking part, which gave less room for improvement.

There were some variations between groups, for example:

- Teams with an average age of 15–17 had smaller reported increases
- School-based teams saw greater improvement, starting from a lower average rating than other teams
- Improvements in understanding of computing and programming were greater for teams that chose to design a 'Life in Space' experiment



* Mentors of teams not achieving flight status were not asked to complete a follow-up survey

Conclusions

In total, 771 teams took part in Mission Space Lab 2022/23. Of these, 295 achieved flight status, and these teams experienced small but consistent improvements in their interest, understanding, and abilities in STEM and computing.

Mission Space Lab mainly reached young people aged between 12 and 17 from government-funded schools, and prior to taking part, their mentors considered teams to already have high levels of interest, understanding, and ability in STEM and computing. This suggests that Mission Space Lab is seen as a good opportunity for young people who already have a fascination with STEM and computing to use and test their existing skills and knowledge.

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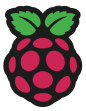

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