



I'm an Astronaut, Get me out of here

Final Report

October 2015 – November 2016

The screenshot shows the 'I'm an Astronaut' website interface. At the top, there's a navigation bar with the 'I'm an Astronaut' logo, a 'Principia' logo, and a 'Meet the Astro Support Team' section featuring five team members: RocketRici, Jenn (labeled WINNER!), Floris, Elie, and Col Op. To the right, there's a 'Touchdown Zone' dropdown, a 'Go!' button, and a 'Log in' link. Below the navigation bar, there are buttons for 'Ask?', 'Chat', and 'Vote X'. The main content area displays five user profiles:

- Richard Moss**: Astronaut Trainer. Latest Question: "Is it possible for the new planet that was discovered outside of Pluto's orbit to be part of a space ripple that could..."
- Jenn Wadsworth**: Labeled 'WINNER!'. Latest Question: "Why does earth have a..."
- Floris Van Den Berg**: Research doctor on Antarctica for the European Space Agency (ESA). Status: "Hot chocolat anyone? Windchill is..."
- Elie Allouis**: Mission And Robotics Systems Engineer working on Future Planetary robotics mission concepts. Latest Question: "Has the ISS ever had a near miss it a collision with large space debris..."
- Columbus Operations**: Latest Question: "If you've ever seen Apollo 13, and remember all the people on the ground, talking into headsets, staring at telemetry, and fixing problems... Well, that's our job!"

principia
mission



1. Executive Summary

- Four I'm an Astronaut Zones were run between October 2015 and June 2016, and a final live chat was held in November 2016.
- Engaged over **2,000 students from across the UK** with real people helping to make human space missions possible (Section 3).
- 26 different people from across space industry and science, **16 directly related to the ISS and the Principia mission**, were able to engage with school students as part of the Astro support Team. This included members of the ISS flight control team successfully working together on the site to provide students with a direct link to the mission as it happened. (Section 3).
- **Students asked the Team 1,628 questions** about astronauts, the International Space Station the particular work and research of each Team member, and how to become involved in the space industry (Section 4).
- The **event improved students' attitudes towards science**, especially among those students who were less interested in science jobs before taking part (+0.8 score increase on average in response to survey questions, Section 6).
- **100% of the teachers who responded to a survey were satisfied with their experience of the event**, with the majority (93%) saying they were "Very Satisfied" – *The whole school have been involved...It has created a real buzz here* (Section 6).
- **Members of the Astro Support Team said they wanted to do more public engagement after taking part, and 100% agreed they had gained a better understanding of how students see their work.** They were satisfied with the experience and felt that the online engagement an effective way to engage with students – *This was more one to one and an amazing opportunity for the students to connect to experts. It was really fun. Some questions I'd never have thought of before!* (Section 6).
- **Students from 7 schools talked directly with Tim Peake and four members of the Astro Support team in a Live Chat in Debrief Zone on the 4th November 2016** (Section 7).
- £500 was awarded to ESA research doctor Beth Healey after she was voted the overall winner of the event by students. **This prize will be used by Beth to support her public engagement, extending the impact of the project.**
- More than **23,000 unique visitors and over 200,000 page views of the I'm an Astronaut site** over the course of the project.

2. Introduction

I'm an Astronaut, Get me out of here! (IAA)

I'm an Astronaut, Get me out of here (imanastronaut.uk) is an online event where students get to meet and interact with the Astro Support Team: flight controllers, researchers, instructors, engineers working on human spaceflight missions, like Principia. It's an X-Factor style competition between the Astro Support Team, where students are the judges. By taking part, students learn more about the wide range of people involved in human space missions, and let the Team know their opinions about space travel.



The event consisted of four rounds called Zones (Training, Launch, Orbit and Touchdown) spread across the Principia mission from October 2015 to June 2016, and a final zone (Debrief) which included Tim Peake and took place in November 2016.

In the first four rounds the Astro Support Team connected with school students in three ways on the site. Students used the ASK section to send in questions, they had text-based live CHATs with the Team, and then students VOTEd for their favourite Team member to win £500 prize to be spent on more space science communication.

In November's Debrief Zone, winners from the first four rounds of the I'm an Astronaut competition and nominated schools and students took part in a live chat with European Space Agency (ESA) Astronaut Tim Peake.

Principia Mission Education and Outreach Scheme

The UK Space Agency [Education, Skills and Outreach Strategy](#) supports the aims of the UK Space Agency (set out in the UK Civil Space Strategy) by encouraging the use of space as an inspiring context for learning as well as by addressing the skills needs of the space sector and by raising awareness of the UK's space programme.



A programme of education and outreach activities was set up to support Tim's Principia mission to help deliver these objectives. This programme is a national celebration for everyone in the UK to engage with, inspiring greater interest and understanding of STEM in general and UK space matters in general.

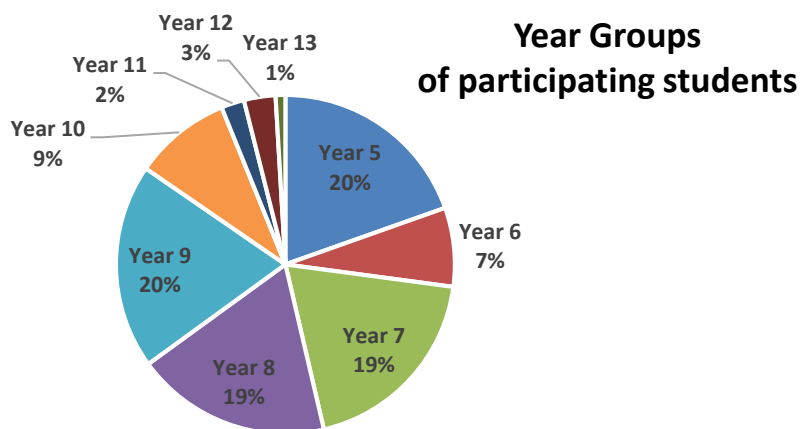
The programme is wide ranging and already encompasses activities across a range of topics including food, coding, plant growth and fitness – in each case trying to present STEM topics in new and inspiring ways. Full details of all of the existing Principia education projects and links to the education resources for each one can be found at www.principia.org.uk.

3. Participation

Schools

85 schools took part in the four main zones of I'm an Astronaut. They were located across the UK (blue markers on map to the right), from Baltasound in the Shetlands to Fowey River Academy in Cornwall. In the final live chat with Tim in the final round, Debrief Zone there were students present from 7 schools.

In total, 2,004 student log ins were used by students. When first logging in, the students tell us about themselves, which provides information about the audience of the event. Of those who filled in these personal details (863), 42% were girls, 49% were boys and 9% were a group of students. The proportions of the ages of the students are indicated below, with the largest represented year groups being Years 5,7,8,9.



Astro Support Team

26 different people, including Tim Peake, answered questions from students as part of the Astro Support Team. The Team for each round consisted of at least five people representing a variety of different disciplines related to human spaceflight missions. They ranged from space scientists based in the UK to astronaut instructors at ESTEC in Netherlands to on duty ISS flight controllers in Germany to ESA research doctors at Concordia Base in Antarctica.

Across the zones, 44% of participants were female and 61% had a direct link to the Principia mission. For example, Richard Moss had trained Tim for part of his mission, and flight directors like Simon Challis were in daily contact with him.

In each of the first four zones, there were four rounds of voting with one Astro Support Team member evicted in each. Students can cast one vote in every round. The person with the most votes in each zone went through to the final live chat with Tim, and the winner with highest proportion of votes overall was awarded £500 to use for engaging the public.

Zone Winners



Beth Healey — ESA Research MD for spaceflight analogue Concordia Antarctica



I'm a British medical doctor conducting research in Antarctica for the European Space Agency on spaceflight analogue Concordia. Here, the conditions are similar to those experienced by astronauts, like Tim, on the Principia Mission in space. We hope our findings will further increase our understanding of the physiology and psychology of Astronauts in future long duration spaceflight missions.



Julia Attias — PhD Student at King's College London



I am researching the Gravity-Loading Countermeasure Skinsuit, which aims to re-create gravity through the body, in an attempt to help keep astronauts' bodies protected from losing muscle and bone. Andreas Mogensen tested it on the International Space Station in September 2015 it may be that the skinsuit is involved in missions which may involve Tim in the future



Jenn Wadsworth — PhD Student, University of Edinburgh



I'm an Astrobiologist working on microbes that are currently on the International Space Station, looking at how they can survive in space!



Charlie Laing — Scientist, German Space Agency (DLR), Cologne



Using artificial gravity to make a human mission to Mars possible is the main goal and focus of my research.

Beth Healey was voted the overall winner by students based on the proportion of votes received. She plans to use the £500 prize money to reach schools around the country with resources about doing science in Antarctica. [Read Beth's Thank you message here.](#)

4. Activity in the zones

We ran four two week long zones alongside different stages of the Principia mission:

- Training Zone in October 2015
- Launch Zone in December 2015, coinciding with Tim Peake's journey to the ISS
- Orbit Zone in March 2016
- Touchdown Zone in June 2016, coinciding with Tim's return to Earth.

The final Debrief Zone, consisting of the live chat with Tim and school, student and Astro Support Team winners was held on the 4th November 2016.

IAA Figures: Total figures for the four regular zones, the averages of these zones, and historic averages in I'm a Scientist zones since 2012 for comparison

Key Figures for	IAA TOTALS	IAA ZONES AVERAGE	HISTORIC IAS AVERAGE
Students logged in	2,004	501	364
% of students active in ASK, CHAT or VOTE	-	85%	85%
Questions asked	4,521	1,130	704
Questions approved	1,628	407	303
Answers given	2,584	646	554
Comments	484	121	79
Votes	1,574	394	288
Live chats	85	21	15
Lines of live chat	31,353	7,838	5,049
Average lines of live chat per chat	1,475	369	329
Schools	86	22	10
Answers given per approved question	-	1.6	1.3

The zones in IAA were above a typical I'm a Scientist UK zone across almost all measures of engagement, pointing towards the enthusiasm that both students and Astro Support Team had for the event and the subject. The zones had both busy live chats and high numbers of questions and answers in ASK.

PAGE VIEWS OVER THE TWO WEEKS	IAA TOTALS	IAA ZONE AVERAGE	IAS JUNE '16 ZONES AVERAGE
Total zone	125,171	31,292	21,638
ASK page	10,251	2,562	1,582
CHAT page	13,846	3,461	2,737
VOTE page	7,343	1,836	1,369

Of note are the high number of questions approved, the above average number of answers written per question by the Astro Support Team, and the well above average lines of live chat. The consistently above average number of page views during the zones bears out how busy and engaged the zones were.

5. Questions and live chats



Live Chats

These word clouds above reveal some popular words used in live chats across the four competitive zones, and reveal how focused discussion was on the theme of human space travel. Many words, aside from the ever popular “space”, appear across all the zones: “astronaut”, “planet”, “ISS”, “gravity”, “food”, “water”.

Others relate to specific work done by members of the Astro Support Team, for instance “plants” relates to the work of Anne Visscher of Kew Gardens, “bacteria” relates to Delma Childer’s astrobiology research aboard the ISS and “robots” occurs in the zone where Elie Allouis of Airbus was taking part and talking about setting up Tim’s remote robotics experiment, METERON

Interestingly, the popularity of the term “Tim” in the Launch Zone and Touchdown Zone seems to mirror the high visibility of Tim Peake in the media at those important times of his mission.



“Space” in relation to other common words used in live chats.

Example questions from the ASK sections of IAA zones
Click to see answers

“How did Tim get picked to go on the ISS and what are his qualities?”

“Are there more male or female scientists working with space?”

“What is it like when you have the 3 months in darkness? is it scary?”

“Have you ever fixed the ISS and what was the problem??”

“What do you do to make space launch safer?”

“How does FRED stop back pains?”

“What is your opinion on using astronautical technology in weapons?”

“I read about the robotic arm you are working towards so what exactly will it be used for also how expensive was it to make?”

“Is there anything you think people wouldn't expect about your job?”

“What happens to the space industry now we've left the EU? Can we still be a member of the ESA?”

“What's your opinion on the Mars One expedition?”

“In class I'm making a space ship how many people would be on the space ship?”

“How long does the process of communicating with Tim Peake take?”

“Is there a chance of there being a second ISS?”

Hi, I was wondering if you could shed some light on global warming and climate change in Antarctica?

“Who has the most important job on Tim Peake's Team, apart from Tim himself?”

Examples of good engagement

Students were active in the comments in ASK, responding to answers and showing they appreciated answers or wanted more information:

Student: *Would it be possible to live on mars with oxygen, food and water?*

Richard, astronaut trainer: *Yes. The other key element is radiation. You need to be protected from that too. We aim to put people on Mars as soon as possible...*

Student: *What would you do if you were in the same situation as they guy from the Martian?*

Jenn, astrobiologist: *I'd definitely be listening to disco music too:P*

Elie, engineer: *Establish what you have, think about what you need and how to get there...! It was quite well put together in the movie, like the growing of vegetable, scavenging different bits together and finding a way to communicate with Earth...and it is applicable to everything you do...*

Student: *Good question!!! I would probably have a panic attack i am such a drama queen*

All the members of the Astro Support Team engaged well in the live chats, many of which were busy with lots of excited students. The flight directors offered unique insights into what working on a space mission is like, for example, here Simon shared his personal feelings about his work:

Student: *What's your favourite moment in your job?*

Simon, flight director: *There are so many cool stories about fixing equipment or helping the crew... what I love is to come away from work knowing that we made something work or we completed a new experiment and the funny thing is when you are in the supermarket or a cafe no one around you knows what you just did and you just smile to yourself.*

The Team members took the opportunity to answer light-hearted questions from students in ASK and demonstrate their personalities.

Student: *Did Alan Shephard get a hole in one in 1971? I can't seem to find his score online.*

Jon, astronaut instructor: *He did, but he was disqualified afterwards for not signing his scorecard – something about not being able to hold a pencil whilst wearing space suit gloves...*

Sergio, flight director: *There were so many holes up there, everyone would've been able to get a hole in one!*

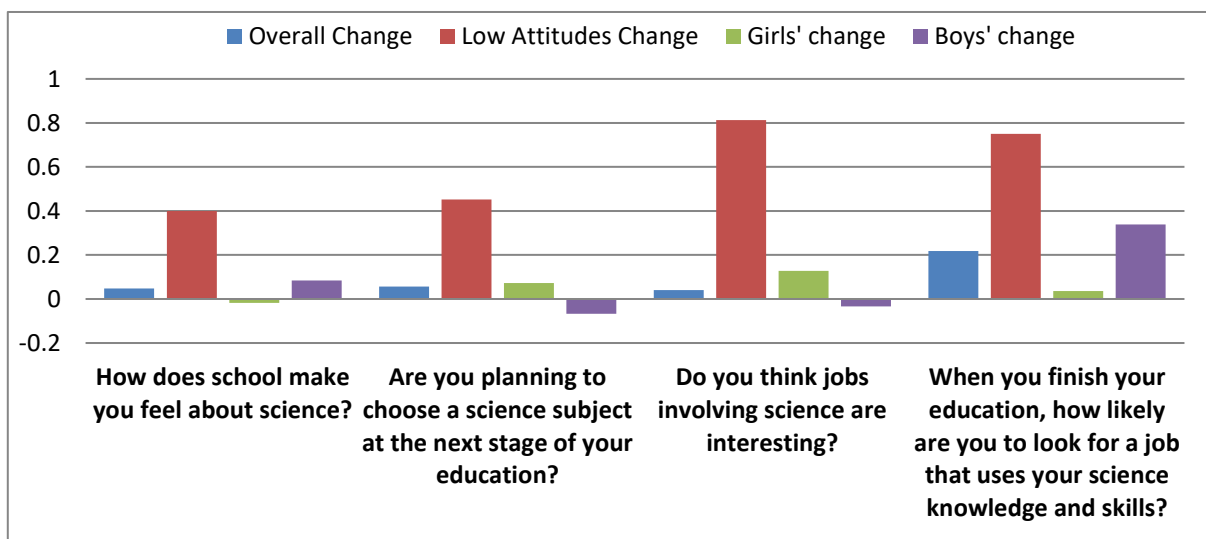
6. Impact

Students

It was very interesting and I had a lot of my questions answered, it was cool to be talking to real live researchers and they gave me a lot of advice on how to get into a space related career. – Student

When students first log in to the site they are asked a set of attitudinal questions about their views on science and careers in science. Later, after they've interacted with the site, they are asked to complete a second survey asking the same questions. Their responses are assigned scores from -2 to +2 to allow us to gauge how their attitudes might have changed over the course of the event.

The sample size of students completing both surveys is limited (n=125), so we cannot draw definitive conclusions. However, the results are especially encouraging for those students' who initially scored low (from 0 to -2, red bar in the chart below) and saw the biggest positive change in attitudes after taking part.



Teachers

Teachers were asked what they thought about the event in online post-event surveys. 100% of the 56 teachers who responded were satisfied with their experience of the event, with the majority 93% saying they were "Very Satisfied". Written feedback from teachers indicated they had found the event enjoyable for worthwhile for their students and themselves, and supports the view that students with potentially low interest in science found the event engaging

I really enjoyed the experience and the variety of people during the touchdown stage allowed the children to find out about a wide range of areas – Teacher

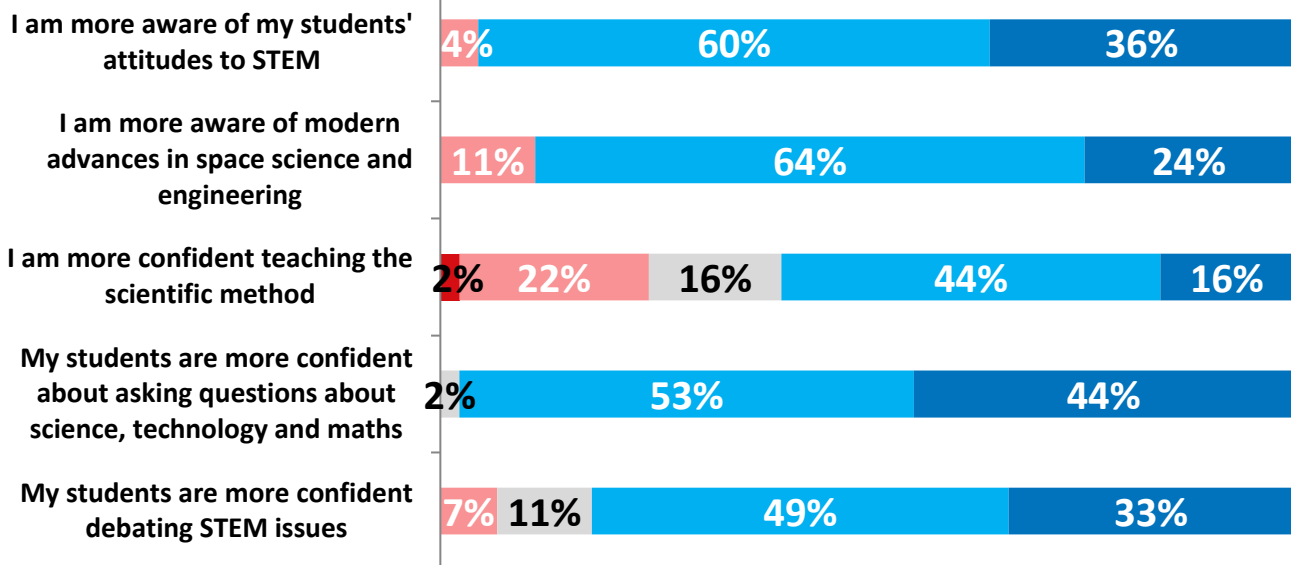
We wanted to have our lower ability sets (who also have some behaviour problems) taking part and it has been fantastic for their engagement and they enjoyed it hugely – Teacher

A strong majority of teachers agreed with a range of positive outcomes from taking part. In particular, 96% felt more aware of their students' attitudes to towards STEM, and 98% saw their children were more confident asking questions about science, technology and maths in their lessons.

To what extent do you agree with the following outcomes from taking part? -

Teachers

Strongly disagree Disagree Don't know Agree Strongly Agree



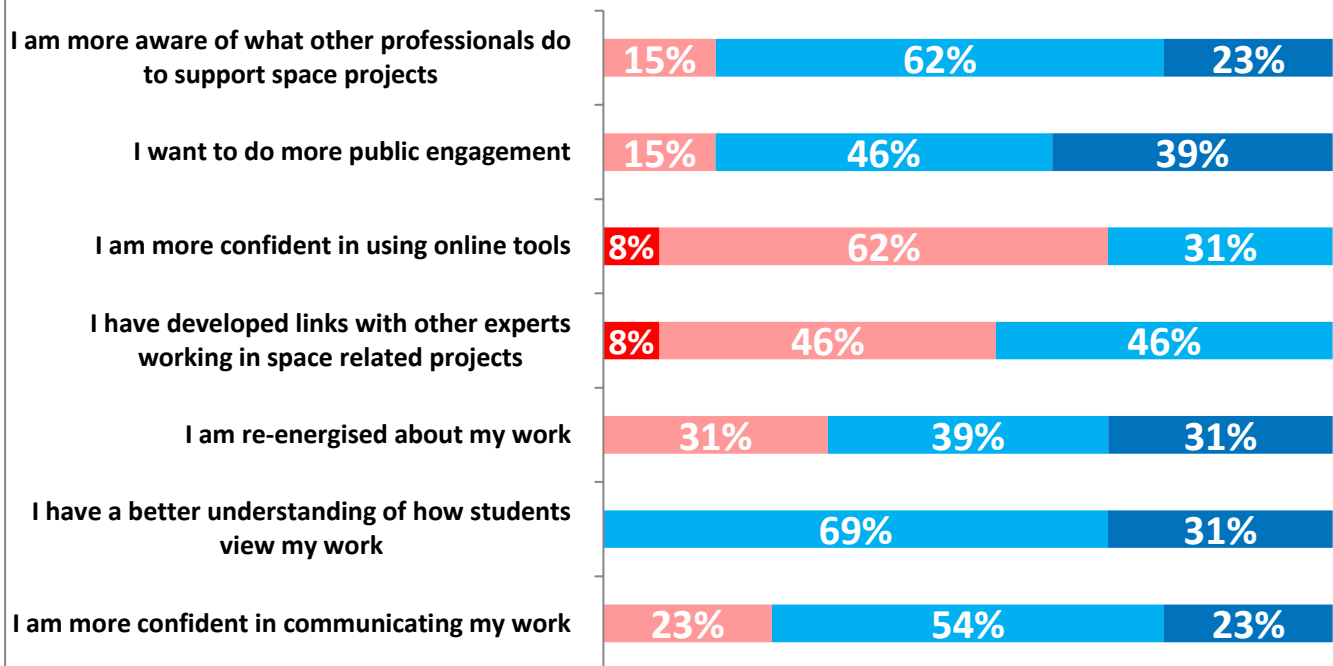
Astro Support Team

The Astro Support Team were also asked for their feedback in an online survey after the event. 93% of the respondents to the survey said they enjoyed taking part and would take part again if given the opportunity. 85% said they wanted to do more public engagement after taking part, 77% felt they were more confident communicating their work, and 100% had gained a better understanding of how students view their work.

To what extent do you agree with the following outcomes from taking part? -

Astro Support Team

Strongly disagree Disagree Agree Strongly agree



Overall, 92% of the Team were satisfied with the experience and felt they were able to use the site to engage and communicate effectively with students. These outcomes are echoed in what the Astro Support said about the experience themselves:

"I found it to be much more interactive than classroom visits.

The text based platform was fantastic. It could be picked up when there was time and the ability to edit and give more thought to answers was excellent. Other engagement I've done was usually speaking to students or running classes - this was more one to one and an amazing opportunity for the students to connect to experts. It was really fun. Some questions I'd never have thought of before!

In this way, I would be able to do much more outreach. I was surprised at how well the info got through, considering it was done via computer screens" – **Team member**

Improving the event

Both the Astro Support Team and teachers provided feedback on what would improve the event.

Live Chat The Team said they would like ways to manage fast-paced live chat sessions, and teachers wanted to see the transcript of what had happened in the chat:

It would be useful as a teacher to see a list of which of my pupils had asked questions and if possible what answers they got, it would be nice to be able to look back at the chat once it is over. – **Teacher**

This feedback was used to implement new features in a redeveloped live chat system over the summer, including the ability for the Team to highlight questions asked directly to them, and downloadable chat transcripts for teachers. The new chat facility was then used successfully for the final live chat with Tim Peake. Feedback about the new chat was very positive from both teachers and the Astro Support Team.

ASK section There was also feedback from a Team member who felt they couldn't sometimes tell whether or not their answers in ASK were appreciated by students. Although there is a 'Like' system in place on the site we will look at ways of getting students to engage more with it or finding another way for Team members to get more feedback on their answers in this section of the site.

Evaluation We also want to change some of the questions we ask during evaluation to get more useful results. For instance, the outcome *I am more confident using online tools* should be ranked on a scale indicating change in confidence to allow for when people's online confidence is already strong. Currently, the only option for these people is to disagree with the statement, which is ambiguous.

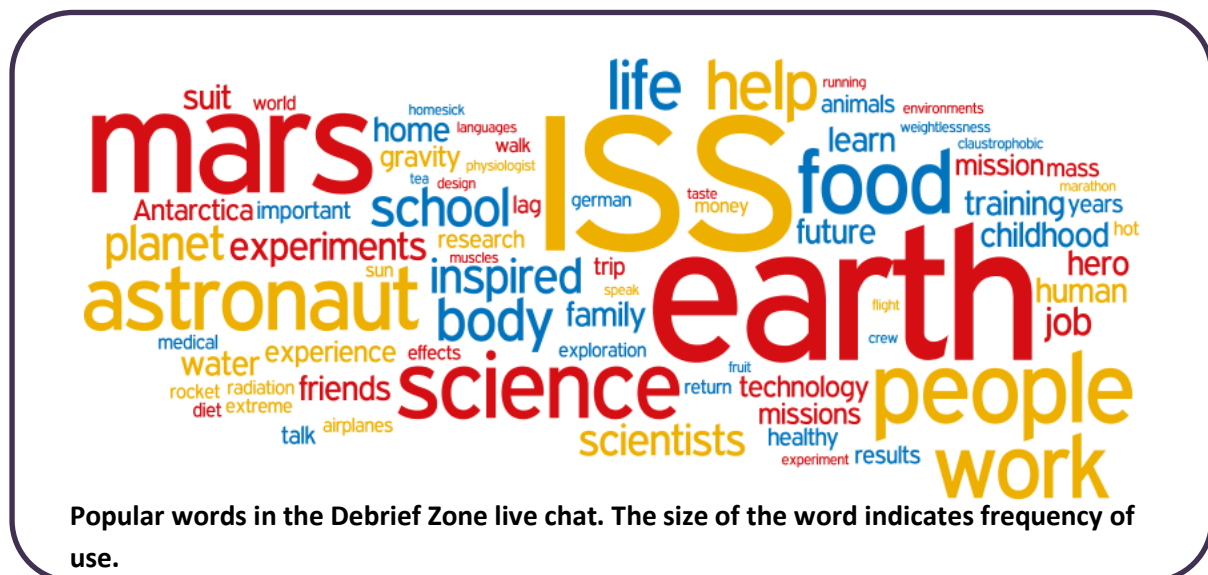
Promotion We were extremely successful at reaching our schools audience but it was harder to attract a wider public audience for the final live chat with Tim Peake. We want to develop our marketing strategy to include widening out to the public when it is appropriate to do so. To extend the reach of the event, working closer with funding organisations with existing audiences will be key to achieve this goal.

7. Final Live Chat



The final live chat with Tim Peake included the school and student winners and Astro support Team Zone winners and took place between 9:30 and 10:15am on Friday 4th November.

The 18 students involved came well prepared with questions for both Tim and the Team, and grasped the new chat system quickly. It was a very lively and fast paced chat and there were a total of 879 messages, of which 207 were direct answers from the Team to students.



The chat covered a wide range of topics including life on board the ISS, why spending money on space is justified, the effects of low gravity on astronaut's health, the qualifications needed to be astronaut and scientists, potential voyages to Mars, the film choices of the Team, and how to take a gorilla suit into orbit.

Excerpts from the Debrief Zone Live Chat

Student: @all How does weightlessness affect an astronaut's body once they go into space?

Tim: I lost bone mass and had to work hard to keep muscle mass

Beth: Lots of ways, one is that all the fluid in your body floats around too! This is why astronauts look a bit fatter around their faces when they are in space!

Student: why do astronauts bones and muscles get weak in space?

Charlie: When we are on Earth our bodies have to work against gravity. Although it is not difficult this loading helps keep muscles and bones strong. When we take away the forces body no gravity the longer has to work against it so the bone and muscles adapt

Student: Julia how can you have a healthy diet when you only have a certain amount of food to eat in space?

Julia: Great question. The nutritional intake of astronauts is extremely carefully worked out. They make sure that they get everything they need, and take into account all the activity they will be doing to make sure they have enough.

Student: @all what's the most accurate space movie?

Tim: I loved Interstellar for their ambitious attempt to explain gravitational Time dilation and what happens beyond the event horizon of a black hole!

Read the chat transcript here: imanastronaut.uk/2017/02/final-live-chat-highlights or read the edited highlights blog: [27 Things we learnt in Debrief Zone](#).

8. Future Perspective

There is a clear opportunity to build on the high quality online engagement between students and the Astro Support Team in the I'm an Astronaut project. There is huge demand from teachers — more than 300 applied for the 100 places in the event — and the space industry is growing right across Europe, with different European astronauts living on the ISS each year.

We want to continue collaborating with the UK Space Agency and keep developing our newly established relationships with ESA. We will explore how we can use the inspirational nature of space science and technology in more online events like I'm an Astronaut to improve the aspirations of school students across Europe