



*I'm a Scientist & I'm an
Engineer*

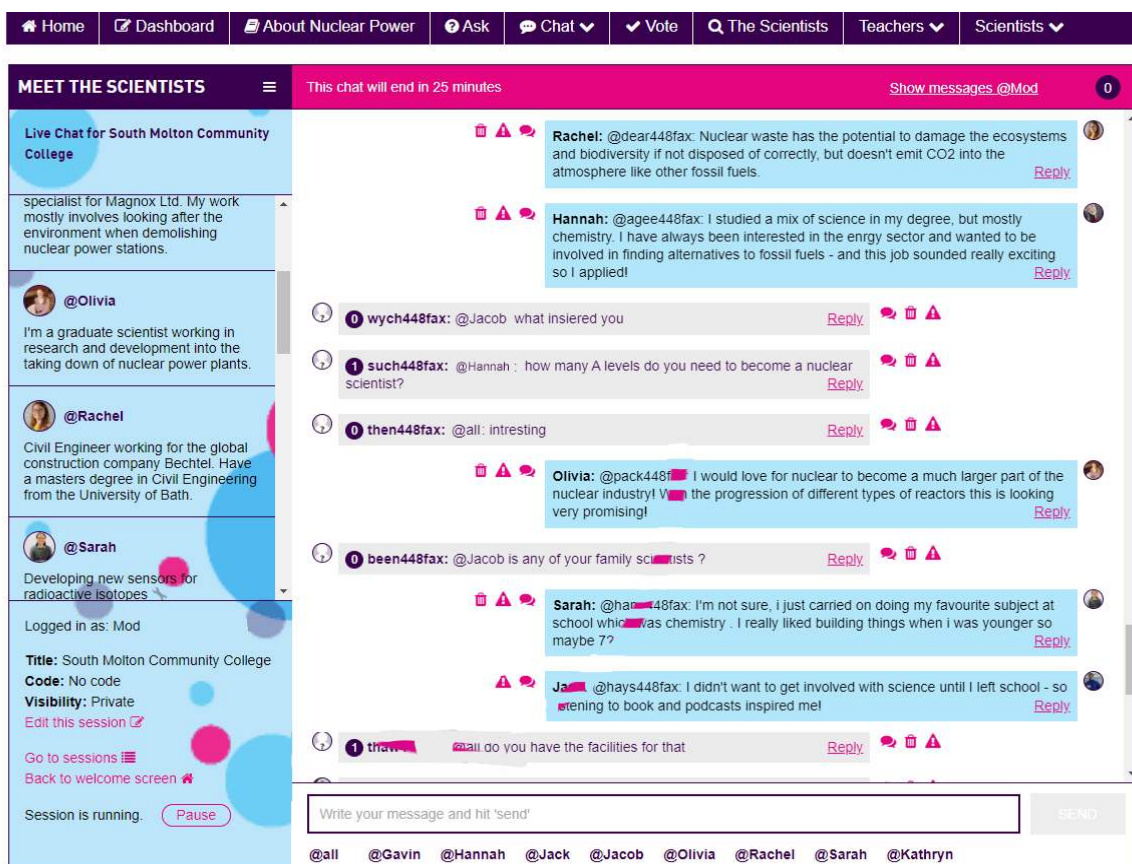
2021 Ireland Summary Report

December 2021

Gallomanor



Background



I'm a Scientist (IAS, imascientist.ie) and I'm an Engineer (IAE, imanengineer.ie), Get me out of here are student-led, public engagement projects. They provide students with authentic interactions with scientists, engineers, and other STEM professionals.

Scientists and Engineers create profiles on the website and engage with students online. This can be through real-time, text-based chats and answering students' posted follow-up questions. Students can ask questions about whatever they want and find interesting; careers, research as well as wider interests.

Students will connect with STEM professionals from diverse backgrounds, disciplines, and industries. They get to see them as ordinary people with hobbies and families. Students can learn about STEM careers and opportunities in higher education. All whilst seeing how what they learn in school relates to the world around them.

This report is a summary of IAS and IAE activities in 2021 funded by the Science Foundation Ireland (SFI, sfi.ie).

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Summary

- **We ran 3 Zones in 2021**
 - Kilogram, Magnesium and Sustainability
- **Students interacted directly with scientists and engineers in 62 live chat sessions:**
 - 1,045 students from 28 schools took part in those live chats.
 - 79% of participating Irish schools were DEIS schools and/or in SFI target counties.
- **78 scientists and engineers took part:**
 - 48 scientists
 - 30 engineers
 - The wide range of experts' backgrounds gave students insight into different careers, fields, and routes into STEM
- **Taking part in IAS supports students' science capital:**
 - IAS maps well onto the Science Capital Teaching Approach, supporting four science capital dimensions:
 - *science literacy, seeing science as relevant to everyday life, knowledge about the transferability of science/science qualifications, and especially, knowing people in science-related jobs.*

"A great experience for children in that it's a super platform for them to ask questions to engineers which are then answered within a short time frame. Also every child's question is relevant, there is no judgement in relation to simplicity/complexity of the question asked."

- **Teacher feedback**

Objectives, outputs, outcomes

Objectives	Outcomes
Run 1 <i>I'm an Engineer</i> Ireland Zone: 1 to 26 March 2021 alongside Engineers Week 2021	Ran 1 zone: Kilogram
Run 2 <i>I'm a Scientist</i> Ireland Zone: 8 November to 3 December 2021 alongside Science Week 2021	Ran 2 zones: Magnesium (non-themed, general science Zone) and Sustainability
60 scientists and engineers take part in <i>I'm a Scientist</i> and <i>I'm an Engineer</i>	48 scientists and 30 engineers took part.
3,000 students from 60 schools take part in <i>I'm a Scientist</i> and <i>I'm an Engineer</i>	1,045 students from 28 schools took part.
At least 80% of students actively engage with scientists/engineers by asking them questions, chatting with them or voting for their favourite	86% of students actively engaged with scientists and engineers.
50 family members of students view and engage with zones during family chats	Open live chats were not busy across all zones with only one student taking part in an evening chat.
80,000 people view imascientist.ie and 8,000 view imanengineer.ie in 2021	In 2021 imascientist.ie was viewed 70,347 times by 52,036 users. Imanengineer.ie was viewed 27,682 by 19,015 users.

Objective

Outcome

For students:

- See STEM as more personally relevant
- Feel their opinions and views on STEM have been listened to and valued
- Break down stereotypes, see that scientists are normal people they can relate to
- See wide range of cutting edge STEM happening in Ireland
- Get a better understanding of how science is done in the real world

Planned paper surveys were carried out in November 2021 for the IASIE Zones.

The evaluation showed that IAS activities map well onto the Science Capital Teaching Approach and supports four of its dimensions:

- Science Literacy (Dimension 1)
- Seeing science as relevant to their everyday lives (Dimension 2)
- Knowing about the transferability of science (Dimension 3)
- Knowing people in science-related jobs (Dimension 7)

42% of conversations in live chats between students and scientists/engineers was related to careers and education.

47% (IAS) and 62% (IAE) of questions asked by students were about careers and education.

For scientists and engineers:

- Improve communication skills
- Get insight into how their jobs and role in society is perceived by students
- Increase their enthusiasm and confidence in communicating with public audiences
- (In IAS Academy) gain understanding of what goes into effective public engagement

"Because you didn't start with an explicit presentation, students could ask out front what most interested them instead of waiting for you to get over the part which you think interested them" - Engineer feedback, March 2021

- 87% of scientists/engineers reported that the activity increased their skills in communicating with lay audiences.
- 75% report an increased interest in taking part in future public engagement events.

Participants and activity

Summary of activity

I'm an Engineer Zones

March 2021

[Kilogram Zone](#)

I'm a Scientist Zones

November 2021

[Magnesium Zone](#)

[Sustainability Zone](#)

Key activity figures	Total	Kilogram Zone	Magnesium & Sustainability Zone
Researchers	78	30	48
Schools	28	9	22
Students logged in	1,045	238	807
Active students ¹	86%	84%	87%
Live chats	62	20	42
Lines of live chat	14,863	3,812	11,051
'Ask' questions asked	532	177	355
'Ask' questions approved ²	370	108	262
'Ask' answers given	798	321	477
Votes	536	90	446

¹ Students actively engaged through asking a question, taking part in a live chat, casting a vote, or posting a comment.

² Excludes duplicated questions

Zone reports

Zone reports summarise activity data, show examples of good engagement, and preliminary feedback.

These are published following each event and are available online:

- IAE Zone reports: <https://imanengineer.ie/category/zone-reports/>
- IAS Zone reports: <https://about.imascientist.ie/category/zone-reports/>

Participating schools

1,045 students from 35 different schools logged in over the three Zones in 2021. 7 schools took part in more than one Zone.

86% of students actively engaged by contributing to live chats, asking a question, posting a comment, or casting a vote.

The map (right) shows the locations of participating schools across the Republic of Ireland.



Underserved and DEIS schools

We work to prioritise schools in geographically underserved areas and widening participation schools (DEIS schools).³

79% of participating schools were underserved or widening participation schools.



Schools in SFI target counties
50%



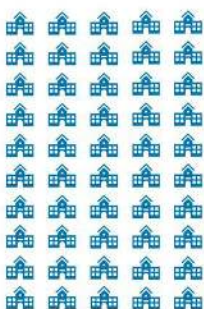
Widening participation schools in target counties
4%



Widening participation schools in other locations
25%



Non widening participation or underserved schools
21%



54% of participating schools were in SFI target counties, 32% Dublin and 18% other. 29% of participating schools were widening participation schools.

³ Widening participation schools are ones identified by the Delivery Equality of Opportunity in Schools Action Plan for Education Institutions. Underserved schools are schools from the SFI target counties list. Read more here <https://about.imascientist.ie/under-served-and-wp/>

Participating scientists & engineers

In total, 78 scientists and engineers took part in the Zones in 2021.

48 scientists and 30 engineers from institutions and universities across the Republic of Ireland took part. They represented a wide range of areas within science and engineering, giving students a greater insight into potential careers.

The map (right) shows the locations of members of the RSC that participated.



The list below shows the universities, research centres, institutes and organisations represented, with the number of scientists and engineers at each⁴.

Universities and Institutes of Technology	
<ul style="list-style-type: none"> ● NUI Galway (5 people) ● Dublin City University (5 people) ● University of Limerick (5 people) ● University College Dublin (12 people) ● University College Cork (11 people) ● Trinity College Dublin (2 people) ● Royal College of Surgeons in Ireland (3 people) 	<ul style="list-style-type: none"> ● Ryan Institute (1 person) ● Munster Technological University (1 person) ● Cork Institute of Technology (2 people) ● Institute of Technology, Tralee (1 person) ● Waterford Institute of Technology (2 people)
SFI Research Centres	
<ul style="list-style-type: none"> ● Confirm (2 people) ● Insight (4 people) ● i-Form (1 person) ● VistaMilk (2 people) ● CONNECT (1 person) 	<ul style="list-style-type: none"> ● Cúram - Centre for Research in Medical Devices (1 person) ● APC Microbiome Institute (3 people) ● FutureNeuro (1 person) ● BIOrbic (1 person)
Research Institutes	Companies
<ul style="list-style-type: none"> ● Tyndall National Institute (10 people) ● National Institute of Standards and Technology (NIST) (1 person) 	<ul style="list-style-type: none"> ● Exyte (1 person) ● Alpha Wireless (1 person) ● Medtronic (2 people)
Government/Public Sector	
<ul style="list-style-type: none"> ● Clare County Council (1 person) ● Irish Centre for High-End Computing (ICHEC) (1 person) ● Teagasc (8 people) 	

⁴ Some scientists and engineers represented multiple organisations/institutes

Conversations in *I'm a Scientist* live chats

Student: Why did you want to be a scientist?

Scientist: *I always liked physics and maths and problem solving so science was a good option*

Student: Can you become better at problem solving if you practice?

Scientist: *Yes, looking at different problems gives you a broader and better perspective while also allowing you to learn from different experiences*

Student: How is it possible that there is electricity in the brain?

Scientist: *Electricity is really just the moving of electrons from one place to another. Our brain cells use a complex system of channels and gates to move ions' which are either positively charged or negatively charged across their cell membranes.*

This is why we say the brain uses electricity.

Conversations in *I'm an Engineer* live chats

Student: What are your favourite things to eat when you are working very hard?

Scientist: *definitely junk food - pizza, red bull, polo mints, sugar, very bad habit!*

Student: same with me! We have a lot in common. I'm gonna vote for you :)

Scientist: *thank you so much! Eat your vegetables!*

Student: I do! I really like carrots

Student: Would you have any advice to girls that want to go into engineering or any part of STEM? It seems like a very intimidating sector to go into

Engineer: *Dare to go. There is actually nothing scary when you are there :)*

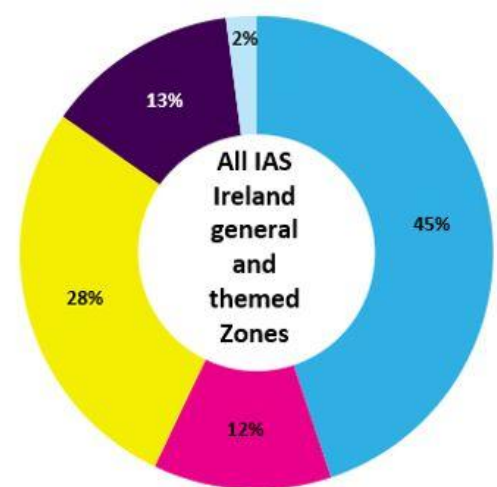
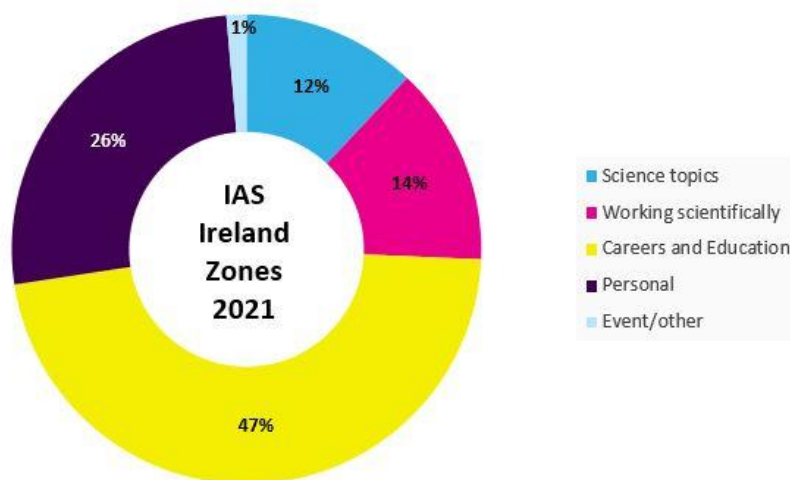
Engineer: *Believe in yourself! The boys/men are not any better than you and you have just as much right to be there as everyone else :D*

Follow-up questions

Questions submitted by students are coded according to their theme. The charts below shows the proportion of questions in each theme.

Topics of questions asked in Irish Zones were consistent with other IAS and IAE themed and general Zones. The **majority** of questions were about **scientific topics** and **careers and education**.

Follow-up questions in IAS Zones



Follow-up questions for scientists

Questions can range from detailed subject-related questions to ones that support science capital by making science more relatable to everyday life.

Can you tell if areas are at risk of having an earthquake or tsunami by studying tectonic plates?

— Student question

At some point in your life did having dyslexia put you off from pursuing to be a scientist?

— Student question

I love science and I really want to pursue it but I am terrible at maths. Is that important?

— Student question

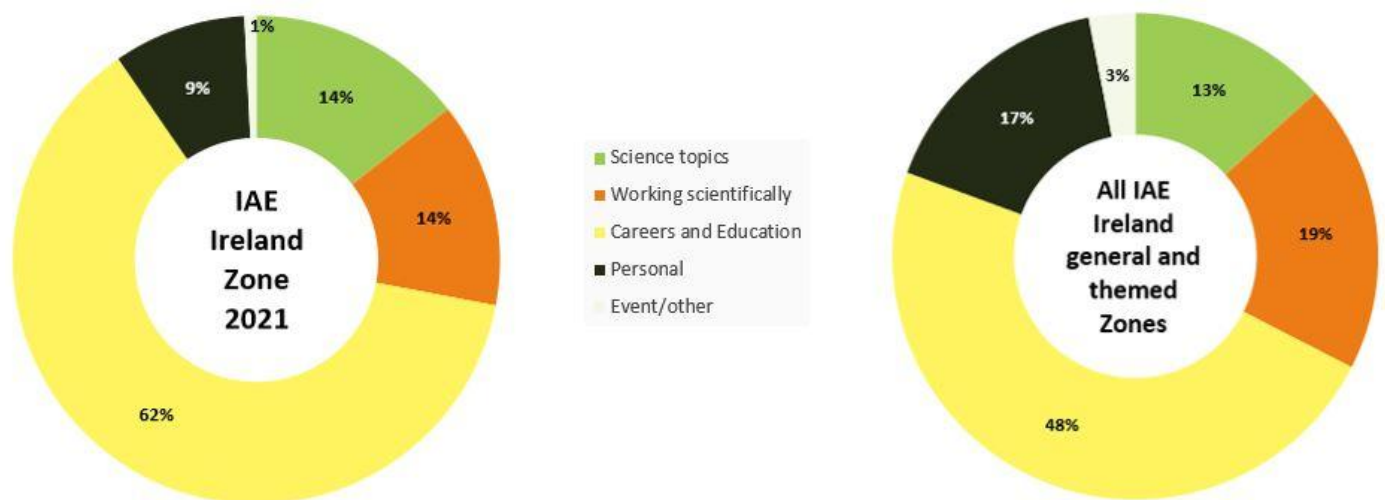
Did you always want to be a scientist?

— Student question

Is a vegetarian diet more healthy than a diet that contains meat?

— Student question

Follow-up questions in IAE Zones



Follow-up questions for engineers

Questions can range from detailed subject-related questions to ones that support science capital by making science more relatable to everyday life.

How is an AI built (such as Siri or Alexa) to know how to do stuff like turn your lights green? (if you connect it to your home)

— Student question

How fast can spaceships go in space?

— Student question

What is an algorithm?

— Student question

Since you started working as an engineer what's been your biggest challenge?

— Student question

How far in advance in technology do you think we would be in around 50 years?

— Student question

Conversations around careers and education

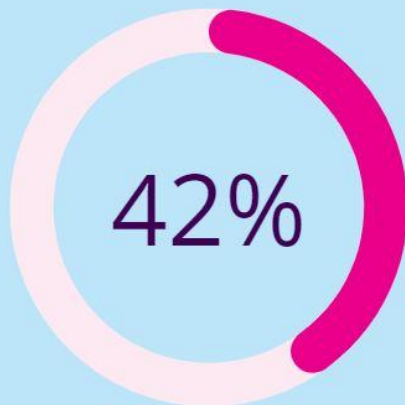
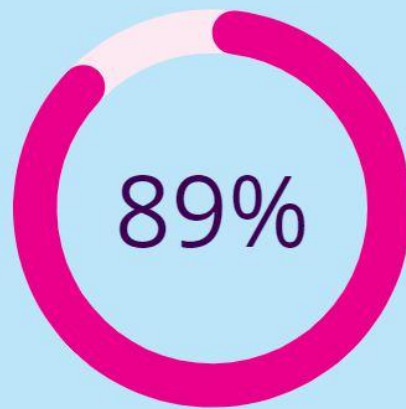
We carried out an analysis to estimate the proportion of conversation that related to careers and

education.

Using words from Career and Education coded questions and words used within live chat sessions we created a list of words⁵. Using this we determined the proportion of conversations relating to careers and education.

Only conversations between students and scientists were counted.

The majority of all live chats contained conversations about careers and education.



Just under half of all conversations contained words relating to careers and education.

⁵ [78 words](#) related to careers and education and included: *doctor, scientist, engineer, diploma, leaving cert, etc.*

Impact

Supporting Science Capital

I'm a Scientist, Supporting Science Capital

In November 2021 Jen DeWitt, PhD, an independent research and evaluation consultant, and member of the core team developing and applying the concept of science capital, conducted an evaluation of IAS to see how the experience might support students' science capital in Ireland.

The research comprised teacher interviews, student surveys and analysis of content generated on the IAS site including transcripts of live chats and questions asked by students.

The evidence produced by this research demonstrates that the experience of IAS maps onto elements of the Science Capital Teaching Approach. In turn, this supports science capital-related outcomes of participating in IAS.

The research discussed in the following section applies to the IAS project as a whole.

Read the full report (PDF):

<https://imascientist.ie/wp-content/uploads/2022/02/IAS-Ireland-Science-Capital-focus-ed-evaluation.pdf>

Background: Science capital

Science capital⁶ is a set of resources that helps individuals engage and identify with science. Young people with higher levels of science capital are more likely to see science as 'for me' and to choose to study science subjects at a higher level.

The Science Capital Teaching Approach (Godec, King, & Archer, 2017)⁷ aims to enhance young people's engagement with science, supporting them in seeing science as relevant to their lives and 'for me'.

The foundation of this approach involves broadening what counts in the science classroom: creating a learning environment where all students feel able to offer

⁶ ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/science-capital-research

⁷ discovery.ucl.ac.uk/id/eprint/10080166/

contributions from their own experiences and interests. The approach also consists of three main pillars:

1. **Personalising and localising:** Going beyond contextualising, to connect to the actual experiences, understandings, attitudes and interests of young people.
2. **Eliciting-valuing-linking:** Inviting students to share knowledge, attitudes and experiences; recognising these as having value; and connecting this back to the science.
3. **Building the dimensions of science capital:** Considering the eight dimensions when developing activities, lessons or programmes.

Supporting science capital

The research found evidence that IAS provides support for four of the science capital ‘dimensions’:

- **Science literacy** (Dimension 1)
- **Seeing science as relevant to everyday life** (Dimension 2)
- **Knowledge about the transferability of science/science qualifications** (Dimension 3)
- **Knowing people in science-related jobs** (Dimension 7)

Science literacy (Dimension 1)

By providing the opportunity to ask about science content, taking part in IAS contributes to science literacy.

Seeing science as relevant to everyday life (Dimension 2)

Because students can ask questions of interest to them personally, taking part in IAS can enhance science-related attitudes and values, helping students to see science as relevant to their everyday lives.

Knowledge about the transferability of science (skills, knowledge, qualifications) (Dimension 3)

When students ask about qualifications, participation may improve their knowledge of the range of jobs that science can lead to.

Knowing people in science-related jobs (Dimension 7)

Most importantly, however, IAS provides an opportunity to get to know scientists — about the paths they took to their current work, about a range of aspects of their work (e.g. travel, teamwork) and about their lives outside of work. Students may even discover that scientists are not all ‘super geniuses’ — that they are normal individuals, albeit with interesting jobs.

In sum, IAS is personally relevant to students and their lives, elicits and values students’ questions and experiences, and provides support for building dimensions of science capital. Together, its various elements create an environment in which students are able to contribute from their own interests and experiences.

Consequently, through participating in IAS, students can come to see science as personally relevant to them and to appreciate that scientists are ‘normal people’. Moreover, ultimately it is the participating students who are in control — it is their votes that determine the winner.

This environment, we believe, reinforces that the arena of *I’m a Scientist* is one in which it is students’ valued and valuable opinions that count the most. Together, then, the elements of IAS can support students’ science capital, meaning IAS has an important role in helping young people see that science just might be ‘for me’ which, in turn, can contribute to nurturing science aspirations.

Challenges

Covid-19

The higher number of COVID-19 cases in March 2021 increased uncertainty and pressure in schools. A survey completed by teachers who didn't take part, provided further information. Teachers reported that restrictions limited the access to IT equipment. Additionally, time available was restricted due to having to catch up on core curriculum work.

Similarly in November 2021, Covid-19 cases were at an all time high in Irish schools resulting in high student and teacher absences. This meant the Zones run in November were less busy than predicted.

In November we ran two I'm a Scientist zones. A general zone and the Sustainability Zone. We chose this zone based on the proximity of COP-26 and the importance of the topic. We were only able to recruit 16 researchers working in the field of sustainability to take part. This is lower than we expected.

Contact

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