



FUTURES 2022/23: WP3 Researchers in Schools Activity Report

1) WP3 objectives, purpose, deliverables, and plan

Objectives:

1. To engage school children and teachers in interactive conversation with researchers, either in schools or university premises.
2. To raise aspirations and curiosity for scientific research.
3. To demystify research process and research careers
4. To raise awareness of the impact of the UKRI's investment on the region's prosperity and advancement of scientific research.

Purpose of Researchers in Schools (WP3):

The WP aimed to co-ordinate a programme of works across the partnership that enabled researchers to go into primary schools, particularly those in KS1 and KS2, to help "Bridge the Divide" and aimed to share the research of the consortium with groups who would not typically be reached by our other events.

Deliverables:

In the original bid, we forecast to reach 2,800 pupils across the South-West consortium. The number of pupils to reach was revised in 2023 to 1,500 due to staff shortages and project changes within each University. By the end of delivery of WP3, we had reached 1,889 pupils across the South West, and 37 researchers had taken part.

We conducted monthly sub-group meetings from May 2022 until the end of May 2023. We developed a programme of digital and face-to-face resources, starting in September 2022. This report is the final WP deliverable.

WP Plan:

Task 1. Project Management

UoP employed a Researchers in Schools officer, who worked across the partnership to ensure that the ongoing programme of engagement was delivered across the Futures 22/23 project period. A Researchers in Schools Subgroup was set up with representation from each partner organisation, to share best practice, resources and to monitor progress against the set deliverables; the group met monthly.

Task 2. Development of Programmes and Content

Content from researchers was developed to align with the National Curriculum to support children to learn new skills and acquire new knowledge. A blended approach to delivery was taken to give flexible provision and help mitigate any ongoing or new COVID restrictions. Researchers engaged with the school children across key subject areas, including different types of science, developing a love of literature and how to apply Maths to a variety of everyday problems.

Task 3. Delivery

1. Online delivery used by multiple schools across the region covering key curriculum.
2. School visits, where researchers engaged directly with the children to enthuse and inspire.
3. Visits to University campuses where children saw and heard first-hand from researchers working in interesting and exciting areas.

2) Activity reports

UoP:

Did you Know?



UOP's programme ran from September 2022 through to July 2023, to engage young learners in real-world research activities. A series of face-to-face activities were initiated to encourage and inspire a love of learning. 8 Researchers developed a series of outreach activities that demonstrated their passion about their own particular area and their expertise and made that relevant to their respective audiences within KS1 (years 1 - 2) and KS2 (years 3 – 4). These included:

1. What do Plants need to Grow with Miss Chloe Betts
2. How Composers think and write Music with Dr Robert Taub
3. Codes and Coding (Mathematics) with Prof. David Burghes
4. Diversity: Variety is the spice of Life with Mrs Suparna Bagchi
5. What did Dinosaurs really look like with Dr Jodie Fisher
6. How do Baby marine animals grow in a changing World with Dr Oliver Tills
7. How can we reduce plastic pollution in our Oceans with Miss Eve Gadd
8. How do waves make Energy with Dr Emma Edwards

UOP made 17 visits across all areas of Plymouth and the surrounding PL postcode, reaching 642 pupils between the ages of 5 and 9 years old. Unfortunately, we were unable to capture these activities with photos within the classroom settings due to strict “no photography” rules to protect the identification of minors.

UoB:

MockCOP

This event took place on [28th March 2023 at the University of Bristol](#) and involved 48 students aged 15-18, from 8 local Bristol schools and colleges, accompanied by 6 teachers and supported by 18 Social Science researchers and Masters students. The event mimicked the 2022 Conference of the Parties to the United Nations Framework Convention on Climate Change, [COP27](#), which aims to achieve the goals of the [Paris Agreement](#).



Students debate the issues at Mock COP

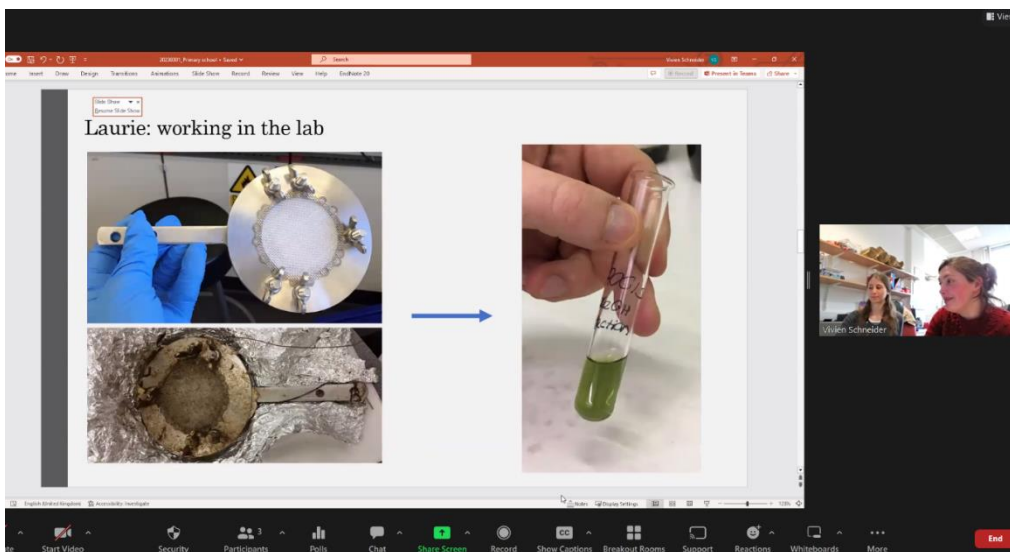
This mock COP engagement activity put the young people in the shoes of policy officials, researchers, and business representatives, as they strategically navigated their way through climate negotiations, representing different countries and global organisations. Using the COP27 themes to frame discussions, the small groups of students debated the issues and worked together to reach a consensus on ways to solve real-life global problems. The event gave students the opportunity to experience what an intergovernmental climate negotiation involves, to gain insight into real-world political decision-making and to engage with research, supported by three lead researchers and a number of post-graduate students. At the end of the day students also shared their own ideas for local climate action. The event was hosted by the [Cabot Institute for the Environment](#) and supported by [Praxis Research](#).

Discover and Discuss

With advice and guidance from [Curiosity Connections](#), and supported and coordinated by the University of Bristol, researchers from across the consortium working in STEM, Arts and Humanities developed activity resources for use in primary schools with disadvantaged intakes. The 8 activity topics were:

1. Cookie Archaeology
2. Crushing It: Be a Composites Engineer
3. Do vegetables really exist?
4. Geochemistry Gardening
5. Go with the flow
6. Let's Trap Some Light
7. The amazing surface properties of water and soapy solutions
8. Waste Warriors

Classes completed a practical activity in lesson time, then participated in an online session with the researcher/s who created it. The webchats lasted approximately 45 mins and allowed children to discuss the activity with the researcher; ask questions to boost their understanding of the subject; find out more about what it's like to be a researcher and to discover why and how they became one. 19 sessions took place, delivered by 18 different researchers, involving 947 Key Stage One & Two pupils and 23 teachers from 9 schools located across the South West of England in areas of deprivation.



Screenshot from Discover & Discuss online session with researchers

UoE:

Curiosity Pop-ups

The pop-ups took place in 4 secondary schools close to the UoE's Devon and Cornwall campuses in February 2023 with the aim to inspire and excite students about science with the focus on the EU mission areas. Topics included healthy oceans, smart cities, and cancer research. Researchers visited schools to deliver interactive 1-hour workshops. These workshops gave students a taste of what they could expect at the Pop-Up Curiosity Shop of Science and Culture in Exeter during 2023's Researchers Night and encouraged students and their families to visit.

From Professors to Early Career Researchers, PhD and MA students, 8 UoE researchers took part in visiting the schools to deliver 1-hour workshops and talk about their work in playful, interactive sessions. The topics ranged from Geography, Conservation, and Environmental Studies to History, Mathematics, and Data Sciences. The contributing workshops were:

1. Never Had it So Good? The politics of affluence, 1951-64
2. Smart Cities
3. Southern Ocean and Antarctic Coast
4. Plastics on the Cornish Coast
5. Coral Reefs in the Maldives
6. Plastic Pollution
7. Computer Science- Applications and Ethics
8. Plastic Pollution

The project's aim was to inspire and excite students about science within a workshop space that allowed them to express their curiosity and discover pathways into becoming researchers. The project reached 731 secondary and sixth form students. These workshops were also designed to give students (and their parents) a taste of what they could expect at the Pop-Up Curiosity Shop of Science and Culture in Falmouth in 2023.

3) Evaluation

Overall feedback from all concerned – teachers, students and researchers indicate that the content and formats worked well for those facilitating and participating in the WP3 activities. Foremost was the learning benefit that school students gained from participation and the opportunity to talk to and work with researchers developing solutions to real-world problems based in institutions in their locality.

Challenges

A variety of challenges were mentioned but tended to be event or activity specific rather than anything more widely applicable. For example, in one case some of the technical set up wasn't ready, in another it was because the online session was considered too long. For one there was too much talking and not enough hands-on activity, while another reported not having sufficient time for discussion.

More general teacher-suggested improvements or considerations included:

- Ensure the research element behind the activity is both put into a wider, real world, context and explained to students.
- Maintain a good balance between discussion and practical application.
- Provide sufficient equipment so students didn't have to wait their turn so long.
- Test the technical set-up before the activity starts.

Outcomes

The observed learning outcomes can be viewed in the table below:

Learning outcome	Number of observations where noted
Discovered something new	30
Been surprised	26
Been inspired	17
Discussed something about university research	14
Changed their mind	8
Made a suggestion	2

Observers noted three ways in which students appeared to engage with the activity that contributed towards their enjoyment and learning. The following are observations as directly quoted within the reports.

- **Benefit of two-way interaction with researcher:**

Children seemed highly interested in talking with the researcher and were excited to tell her about the findings of the activity and how they were feeling about what they had done.

The children loved the 3 different activities on offer and were eager to get around the tables to try all the activities out. The pupils were keen to impart their knowledge and repeat the information Eve had given in her presentation.

- **Thoughtful questioning:**

Students engaged with the talk via thoughtful questions. Most enjoyment appeared during the practical session where they could make things as well as speaking to one another and Prof Willis directly.

The children were curious and very interested in the mini wave tank in particular. Lots of questions directed to Lee about what the tank does and what an engineer do.

Engaging with the activity or task:

All still taking scenarios seriously and thinking about their aims and main concerns.

Students very engaged with voting. Cheers for votes that went their countries' way and boos for those that didn't.

Students enjoyed problem solving activity- looking at research into plastic alternatives.

The benefits for students included:

- Enjoyment
- New knowledge
- Meeting and speaking to real scientists / researchers.
- Seeing the practical applications of research.
- Engaging in ways to do science at a level not possible in school.
- Building skills including negotiation, communication, and oracy.
- Changing attitudes and understanding.

The benefits for teachers:

- Provided direct contact with real scientists for pupils rather than via the teacher.
- Provided content that can be used in class or at school.
- Building on what is being taught in class.
- Giving new teaching ideas and free classroom resources.
- Seeing their pupils learn in a different environment.
- Conducting activities not possible at school.

The benefits for researchers:

- Overall, very positive experiences with the events being run well and the students highly engaged with the activities.
- Having a positive impact on their research through honing public engagement skills and having a good all round “experience”
- It was felt there was value in finding common ground with young people.
- The students’ questions encouraged researchers to think about what they are doing within a wider context.
- Potential to develop further interactions with the school to share ideas and show students what researchers can do.

Impacts

15 out of 27 teachers reported doing something further in class as a result of participation on FUTURES, along with connecting it to school clubs and the school ethos more widely. Quotes directly from teachers included:

Students will complete an assessment next week, which will be on the topic covered in the talk (it has also been taught in class).

We continued looking at coding through braille and morse code. Pupils already learn Roman Numerals so further links were made to this.

Enhanced own scientific enquiries in classroom.

We will be taking forward ideas from the session into our project work in geography this half term where we will be researching different countries.

This will be integrated into our lesson in Geography.

Discussions with students of wider implications of climate agreements and how school policies could improve.

Students reported a high degree of interest in potentially becoming a researcher in the future, although the proportion believing they would be good at it was somewhat lower than those who thought it would be interesting. 26% of responding students thought being a researcher would be very interesting and 20% felt they would be a good researcher. See tables below:

Do you think working as a researcher would be interesting?

Very Interesting	Quite Interesting	Not Sure	Not Very Interesting	Not At All Interesting
26%	38%	29%	4%	3%

Do you think you could be a good researcher?

Yes Definitely	Maybe	Not Sure	Definitely Not	Yes Definitely
20%	38%	38%	4%	20%

Teachers: Do you think the activity raised your student's awareness of careers in research?

	Number of responses
Yes, a lot	14
Yes, a little	16
No, not at all	3

Teachers felt the understanding of what kind of activities a researcher does during their research was achieved through two primary means:

- The interaction between students and researchers.
- Gaining an understanding of what kinds of activities a researcher does during their research.

Students were able to see what researchers do, discover how research impacts daily lives, and learn about a “day in the life” of a researcher.

Quoting directly from the teachers themselves: -

Katharine talked about how they became a researcher. Link between research and future cities.

Emily (the researcher) spoke passionately about their work and how they became a researcher.

By showing them real life researchers and linking to the research projects.

Sharing of anecdotes and answering student’s questions about what it is like being a researcher.

Could talk during and after about careers in science. Nice to have female role models. The leader of the session talked about her research at the University and made reference to her thesis on diversity.

Students were exposed to methods of research and introduced to the idea of discovering new findings.

By just demonstrating how historians actually work, what a professional historian does.

Built their knowledge of careers in science.

Their eyes were opened to the possibilities of doing something they love as their job.

Links to topics we're covering in class and upcoming work on Smart Cities. A chance for students to see how research and studying impacts real life situations.

They found it interesting to see how maths and science worked together and the types of things they are used for in real life.

Showing opportunities working in research can bring e.g. travel.

Becoming aware of research as an option in their future lives and what it's like to work at a university.

The effectiveness of the overall work package in achieving its objectives can be evidenced in the following three main ways:

1. Discovering how research impacts our daily lives through a class activity with a researcher

- Students took part in activities that connected the research to their lives and real-life situations, with researchers making clear links between theory and practice, such as:
 - Learning about future Smart Cities.
 - Creating real-life scenarios such as a mock COP that helps students gain a better understanding of policy issues and how research impacts on these.

2. Understand what kinds of activities a researcher does during their research

- Teachers reported their students achieved this by having the opportunity to meet and talk to researchers and being able to see what researchers do.
- Learning about research first-hand via direct contact with real scientists rather than via the teacher.

3. Learn how to become a researcher

- Students reported a high degree of interest in potentially becoming a researcher in the future. 26% thought being a researcher would be very interesting.
- 20% felt they would definitely be a good researcher.
- Nearly all teachers (30 out of 33) said that to some extent participation in FUTURES raised their student's awareness of a career in research.

4) Work Package 3 Summary

The delivery of Work Package 3 was extremely successful, despite various operational challenges over the period. It achieved its objectives, exceeding the target number of students involved and providing participants with unique and valuable research-related experiences. Students and teachers across the South West of England met researchers in person, connecting them to real research happening nearby, and inspiring the researchers of the future.

