

Adapting hands-on STEM public engagement in schools for online live interactions

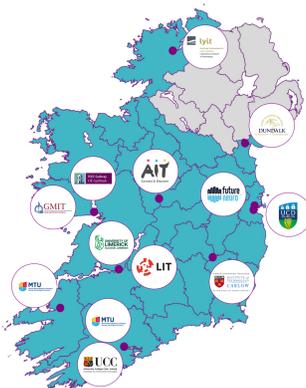
Muriel Grenon¹, Janic Schulte¹, Sarah Carroll¹, Amy Kerrigan¹, Bianca Simonassi-Paiva², Dr Mark Lynch², Dr Caroline Gilleran Stephens³, Dr Suzanne Linnane³, Dr Guiomar Garcia-Cabellós⁴, Dr Niall Burke⁵, Dr Tim Yeoman⁵, Mary Carr⁶, Dr Kellie Dean⁷, Dr Eoin Fleming⁷, Karen McGibney⁸, Dr Audrey O'Grady⁹, Dr Fiona O'Halloran¹⁰, Dr Maire Begley¹⁰, Dr Karen Finn¹¹, Dr Anthonia O'Donovan¹¹, Marie Walsh¹², Dr Siobhán Curtin¹², Ciara Courtney¹³

¹Biochemistry, School of Biological and Chemical Sciences, National University of Ireland Galway; ²to ¹³Regional team Co-ordinators (see affiliations below)

Follow Us! @cellexplorers www.cellexplorers.com

What is Cell EXPLORERS?

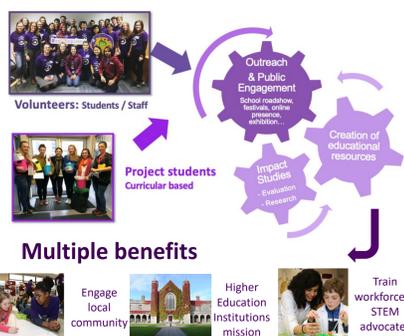
Our national network



Our objectives

- Promote modern biology, biomedical sciences and research
- Combat the stereotypical image of scientists
- Change perceptions on science and inform on scientific careers
- Contribute towards addressing the national shortfall of science graduates
- Train the next generation of science communications/educators

Our working model



Our ethos



Fantastic DNA in a Box : a science kit for teachers

Development, pilot & delivery of the FDIAB session



The classroom kit

The science kit contains the resources & materials for teachers need to run the session with their pupils



The online session with Cell Explorers

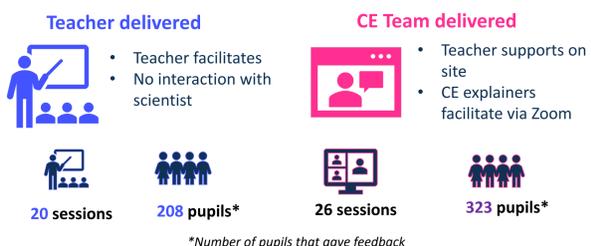
- 2 min Connecting the Zoom call
- 5 min Welcoming everyone
- 5 min Meeting the Cell EXPLORERS explainers
- 35 min The Fantastic DNA experiment
- 10 min Q&A with the CE explainers
- 3 min Thanking everyone & saying goodbye

Visit metrics 2020

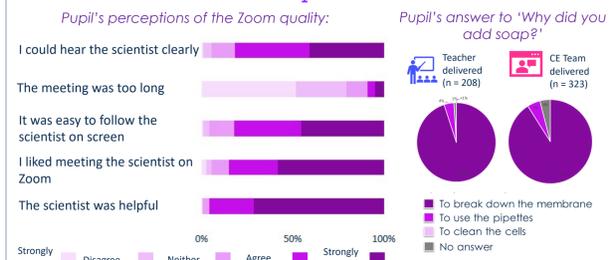


Evaluation highlights

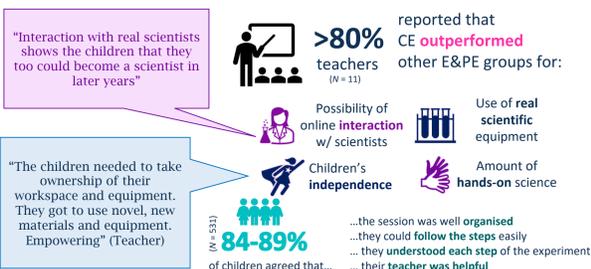
Sessions could be delivered by teachers only, or with CE explainers facilitating via Zoom



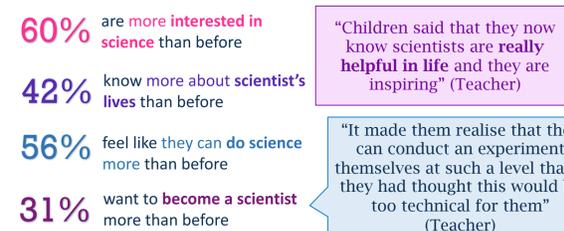
Facilitating via Zoom does not negatively impact the experience



The session remains a high quality EPE activity



Participating in the session positively contributed towards pupils' science capital:



How to engage despite COVID-19?

Social distancing prevented in-person visits!



In March 2020, the COVID-19 pandemic and social distancing requirements meant that we could not deliver any more in-person events.

We needed an online solution to provide a similar positive authentic science experience!

How to keep the high level of engagement of the Fantastic DNA session?

- 1 hour classroom intervention for 10–14yold
- Each pupil individually extracts DNA from a banana
- Small group learning – 6 pupils guided by 1 scientist explainer
- For many, it is the first time that they will meet and engage with a real scientist!



Future work

- Maximise impact on young peoples' science capital by employing the Science Capital Teaching Approach in a revised session
- Revised our volunteer training tools to help implement the new session
- Train the national network to implement new session for November 2021
- Resume in-person visits again in 2022?



Keep both in-person and online delivery formats due to flexibility and possibility to schools too far away to visit in person

Our tips to engage online!

Hoping to deliver hands-on activities online or create your own science kit? Here are some tips!

- Go above a 'Zoom webinar' format: get the public to take part in activities, preferably hands-on science (send a kit that participants can use).
- Send instructions to participants in advance of the online sessions so that everyone know what is involved!
- if designing activities for schools, work with teachers. Pilot your activities and ask for critical feedback. The first version is never the final one.
- Train your facilitators in the new format, do not assume that they will easily shift from in-person to online facilitation. Plan for the theory to be studied offline, and meet up live to practice hands-on elements together.
- Send materials & instructions guides to teachers & empower them to run the activities in the classroom, even without you.
- Consider the sustainability of your kit – can some/all be used again?
- Consider teaming up with people who have online expertise you do not have (e.g. expert in running online chats)

Acknowledgements

The Cell Explorers Network: Our network is made up of 13 teams based in Irish higher education institutions. Each team is led by volunteer coordinator(s) who manage their local team of scientist volunteers to deliver the 'Fantastic DNA' session in their respective communities. The network is coordinated by the NUI Galway team, which also evaluates and researches the impact of the network's activity.

Funders: Science Foundation Ireland is funding our national network through Discover strategic partnership Awards. All our regional teams are supported locally by their institutions. The NUIGalway team is supported by Biochemistry, the school of Biological and Chemical sciences, the College of Science & Engineering and the Galway university Foundation.

Cell EXPLORERS Team Affiliations: ¹Biochemistry, School of Biological & Chemical Sciences, National University of Ireland Galway, ²Material Research Institute, Athlone Institute of Technology, ³School of Health and Science, Dundalk Institute of Technology, ⁴Faculty of Science, Institute of Technology Carlow, ⁵Department of Biological and Pharmaceutical Science, Munster Technological University Kerry, ⁶Department of Science, Letterkenny Institute of Technology, ⁷School of Biochemistry and Cell Biology, University College Cork, ⁸National Virus Reference Laboratory, University College Dublin, ⁹Department of Biological Sciences, University of Limerick, ¹⁰Department of Biological Sciences, Munster Technological University Cork, ¹¹Department of Biopharmaceutical & Medical Science, Galway Mayo Institute of Technology, ¹²Department of Applied Science, Limerick Institute of Technology, ¹³FutureNeuro, SFI Research Centre for Neurological Diseases.

Acknowledgements: We thank past and present team coordinators for their hard work and commitment, all students and researchers volunteering with Cell EXPLORERS teams in all institutions and the team of volunteers who has helped with evaluation data entry and analysis for FDIAB 2020. We thank all school teachers for delivering the Fantastic DNA in a Box session in their classrooms and all school children for their enthusiasm and engagement.