Cell EXPLORERS

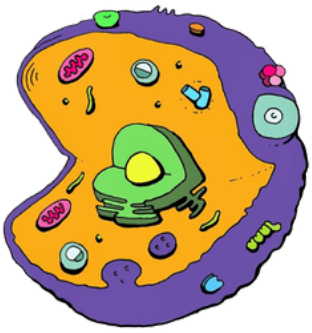
ACTIVITY REPORT
VISUAL SUMMARY
2021

TABLE OF CONTENTS

This report is using logos & higher education institutions' names used in 2021

AIMS & OBJECTIVES

Cell EXPLORERS is an Education & Public Engagement programme which primarily aims to **inspire, inform and involve** the general public in modern molecular biology, whilst facilitating authentic interactions with real scientists.



The programme uses a **dual benefit** model, where young people are given the opportunity to engage in hands-on science experiments, whilst guided by trained and enthusiastic science explainers - our Cell EXPLORERS volunteers.

PROVIDE YOUNG PEOPLE THE OPPORTUNITY TO ENGAGE IN HANDS-ON SCIENCE

Young people have the opportunity to individually complete an authentic science experiment - extracting DNA from bananas. This positive experience can contribute towards improving young peoples' attitudes towards science, and help to build their confidence in science

FACILITATE INTERACTIONS WITH REAL SCIENTISTS

Many young people with low science-related aspirations hold stereotypical assumptions about scientists, or what kind of people can become scientists. Meeting real scientists, and being able to interact with them in a positive setting, can contribute towards addressing these misconceptions and increase the chance of young people seeing themselves as someone who can also do science.

TRAIN THE NEXT GENERATION OF SCIENTISTS

Public engagement in science is become an increasingly important, and expected, priority for scientists. Being part of the Cell EXPLORERS programme provides volunteers with the training in science communication, public engagement and best practices in interacting with children.

HOW WE DO THINGS

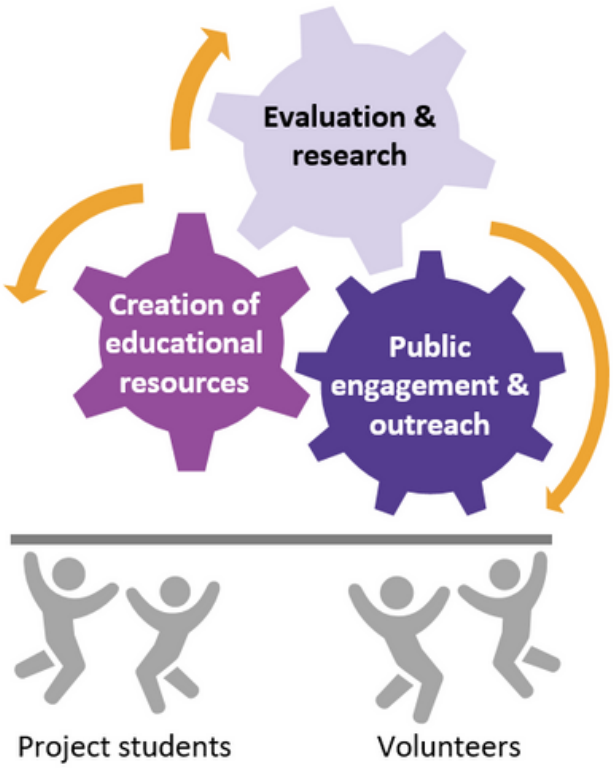
OUR ETHOS

Our ethos is drawn from a mixture of **Social Constructivist** pedagogies, **Humanistic philosophies**, social justice model the **Science Capital Teaching Approach**, and best practices in public engagement in science.

We believe that **science is for everyone**, and our ethos helps us to achieve that in an equitable manner, informed by research.

The Cell EXPLORERS way of doing things has been informed by **nearly 10 years of doing hands-on engagement** in science with young people.

OUR WORKING MODEL



Multiple benefits

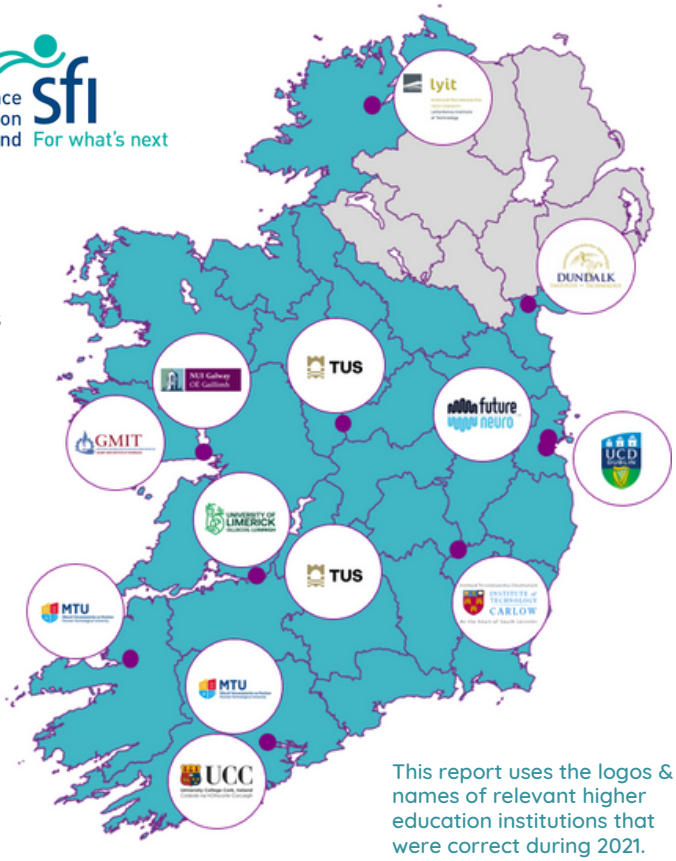
Engage local communities
- Raise interest & awareness in STEM
- Contribute towards science capital

Align with HEI missions
- Teaching
- Research
- Staff development
- Community engagement

Train STEM advocates
- Gain transferable skills
- Develop graduate attributes
- Personal development

NATIONAL NETWORK

Science Foundation Ireland For what's next



13 national teams

The Cell EXPLORERS programme is delivered by a national network comprising 13 teams based in 11 institutions across Ireland. The network is funded by Science Foundation Ireland under its Discover programme.

Partner team in South Africa

The first international partner team is run by Dr. Doras Sibanda in the University of Kwatzulu-Natal in Durban, South Africa. The team piloted their first visit in 2019. This collaboration is supported by NUI Galway.

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

This report uses the logos & names of relevant higher education institutions that were correct during 2021.

An internationally-recognised programme

Cell EXPLORERS is part of Scientix, the community for science education in Europe and member of the European Science Education Association (EUSEA).

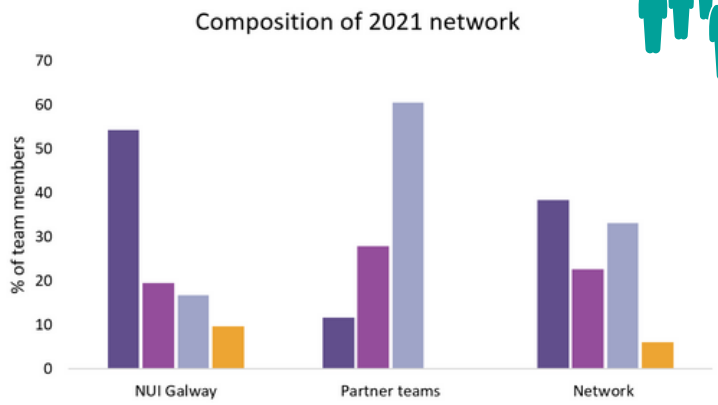
SCIENTIX The community for science education in Europe

EUSEA European Science Engagement Association

EXPANSION, REACH & FUNDING HISTORY

NETWORK ACTIVITY 2021

Team composition



115 team members

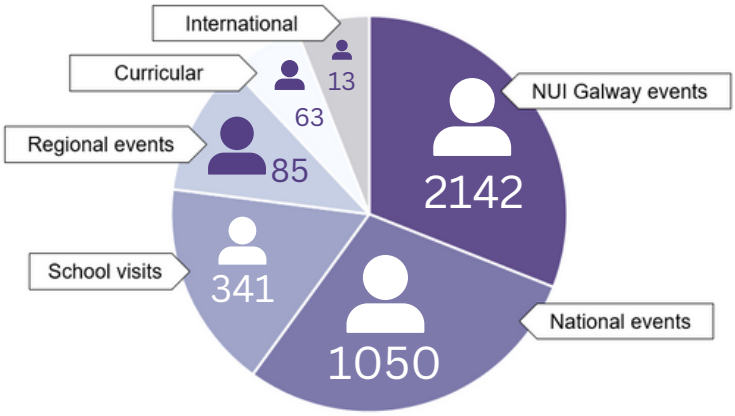
- Undergraduate students
- Postgraduate students
- Staff (e.g. postdocs, technical staff, lecturers)
- Collaborators

Events delivered & people reached

3,795

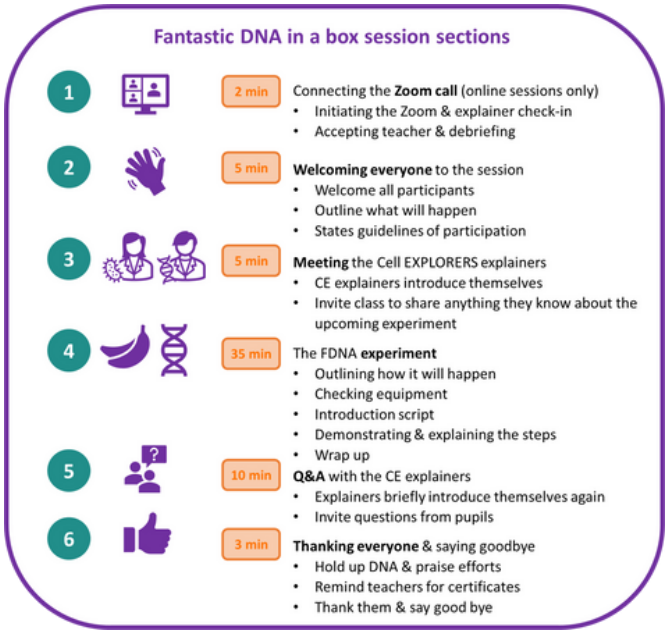
MEMBERS OF THE PUBLIC REACHED DIRECTLY

91% of events were Online



Revision of our practice to maximize impact

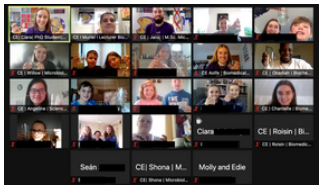
Revision of Fantastic DNA in a Box session to align to Science Capital Teaching Approach



Creation of new online training tools for volunteers

Fantastic DNA in a Box

Answering questions & introducing yourself

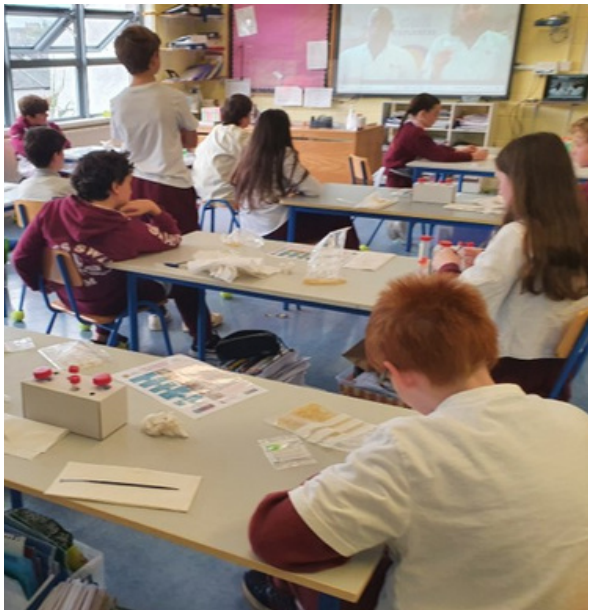


Fantastic DNA at Home

FANTASTIC DNA IN A BOX 2021 OVERVIEW

Fantastic DNA in a Box is an online adaption of the programme's established activity on living things, cells and DNA. Enabled by a **classroom science kit** delivered in advance, pupils still have the opportunity to complete a **hands-on experiment** and extract DNA from a banana, whilst **using real science equipment and materials**.

Teachers have the option to **deliver the session independently**, guided by **specifically-tailored resources.** Alternatively, to give young people the **opportunity to interact with a scientist**, teachers can **connect online to Cell EXPLORERS explainers via an online video-call**, who will then guide pupils through the experiment step-by-step.



Delivery of online visits 2021

NUI Galway

LyIT

68 Schools

Future Neuro

MTU Cork

97 Boxes Delivered*

DkIT

MTU Kerry

97 Classes*

GMIT

NVRL UCD

54 Zoom Sessions

IT Carlow

UL

2652 Children reached

IMPACT OF FDIAB ON YOUNG PEOPLE

Teachers & pupils appreciate the hands-on experience the FDIAB kit provides

What pupils like best:

N = 708 pupils

I used real lab equipment	20.4%
I did the experiment myself	18.3%
I learnt something new that we don't talk about at school	18.3%
I learnt the kind of job I could do if I were to study science	18.3%
I got to bring the DNA home	12.9%
Other	11.8%

It makes you feel **more independent** and proud of the result

I felt like a **real scientist**

We don't normally **do experiments** at school

It is really cool to use things **that scientists use**

What teachers like best:

N= 23 teachers

1st — The opportunity for each child to **do an experiment** (13/23)

2nd — The positive experience of **successfully** completing an experiment (7/13)

3rd — The introduction to **new science equipment** and **terms** (8/13)

Meeting a real scientist can address misconceptions held by some pupils

What some pupils thought about scientists **before**:

What they thought about the **CE scientists:**

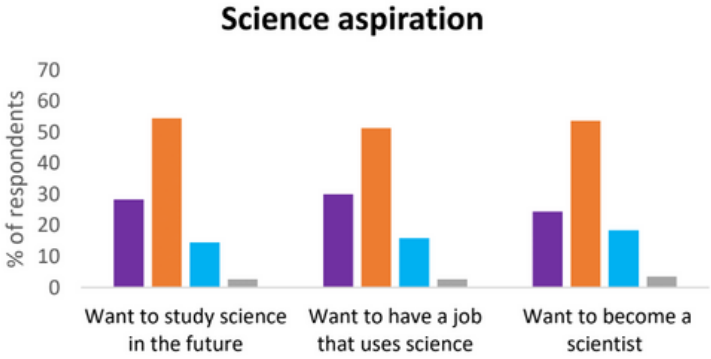
N= 59 pupils whose prior descriptors of scientists did not match the CE scientists

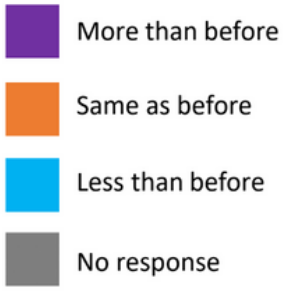
... he was clever but he **wasn't odd** or nerdy

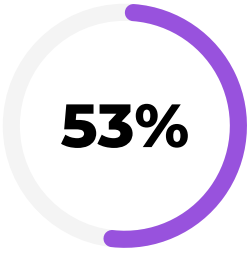
the scientist was **not crazy**. He was organized, not nerdy.

Fantastic DNA in a Box positively contributes towards pupils' science capital

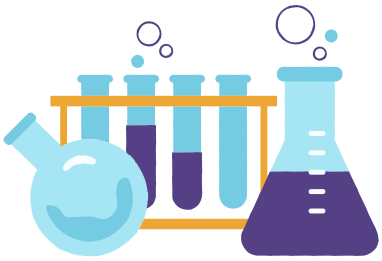
The feedback questionnaire asks pupils (N = 721) how they feel about nine different statements related to their science-related attitudes after participating in the Fantastic DNA in a Box.

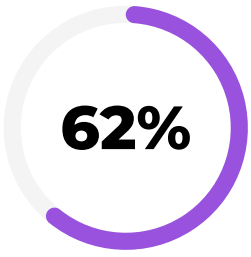






of pupils feel like they can 'do science' more than before





of pupils 'want to do experiments' more than before

Teachers report that doing the experiment raises awareness of science careers

*"It helped them to see a career in **real science** and experience a **real experiment**. It helped them understand scientific terms"*

[Teacher feedback questionnaire]

RESEARCH HIGHLIGHTS

Embedded in the Cell EXPLORERS programme is an Informal Science Education research group, based in NUI Galway. The research scope of the group includes young people's science-related views and attitudes, best practices in education and public engagement, and investigating the impact of informal science education activities.

FINAL YEAR UNDERGRADUATE PROJECTS

Each year, final year undergraduate students at NUI Galway can choose to do their project with the CE informal science education research group.

11
students

Analysed 700+ FDIAB feedback forms
Amy Kerrigan, Grace McNamara, Nicole Campbell, Victoria Morley, Caitriona Ryan

Created & evaluated 2 animated videos on COVID-19 testing and vaccines
Andrew Collins, Emma Cheasty

Analysed 200+ Draw-A-Scientist-Test drawings
Alexandra Mereuta, Jonathan Kelly

Created & evaluated resources for the CE Escape Room
Roisin Guidera, Daria McGlynn

Presented at the 2021 European Science Engagement Association & Science and You conferences

Recruited new PhD student, Shannon Stubbs, working on the implementation of the SCTA in a structured Q&A. Funded by NUI Galway Hardiman Student ship

Published a paper in Irish Educational Studies
Carroll & Grenon (2021) 'Practice makes progress: an evaluation of an online scientist–student chat activity in improving scientists' perceived communication skills'.

EVENT HIGHLIGHTS

DELIVERY OF FANTASTIC DNA AT NEW EVENTS

Fantastic DNA! At Home

1 hour remote science workshop enabled by a science kit posted to families in advance. Participants are guided through an online video call in a step-by-step experiment to extract DNA from bananas.

86% would like to do more science together

89% have a better understanding of who scientists are

"My son loved the live experiment. The live experience ***kept him engaged the whole way*** *through. It was* ***far more engaging than watching*** *and following a pre recorded video. He enjoyed* ***seeing the other kids taking part****, being* ***involved in the poll*** *and* ***asking questions****."*

(Mother of 7 years old)

107 Families hosted

120 Kits delivered

7 Online sessions

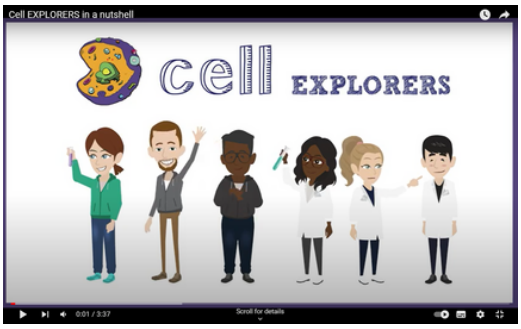
320 People engaged

UNIVERSITY OF LIMERICK BIG DNA DAY

CE UL facilitated a Fantastic DNA in a Box session with **200 pupils** at Monaleen N.S. - all at the same time!

CREATION OF NEW VIDEOS

Big Bang Science Communications created us 3 amazing videos to complement our activities. Watch 'Cell EXPLORERS in a Nutshell' on YouTube here!



NATIONAL NETWORK MEETING 2021

We hosted the national network meeting online on MS Teams. We caught up, shared network updates and exchanged best practice. Overall, we congratulated ourselves to successfully adapting to being online!

SECONDARY SCHOOL PILOT OF CE ESCAPE ROOM

The Cell EXPLORERS Escape Room, designed in collaboration with Dr Ran Peleg, with funding from Science Foundation Irelarn, was piloted with 25 2nd year students with Coláiste Éinde in Galway city and their teacher Sarah Buckley. Everyone successfully escaped!

ACKNOWLEDGEMENTS

The Cell EXPLORERS programme, network and dissemination of hands-on science engagement activities would not be possible without the passion, commitment and support from many different sources.
We would like to take this opportunity to sincerely thank everyone involved in making 2021 a success and showcasing the idea that science is for everyone. This includes our funders, supportors, network partner coordinators, teams and institutions, volunteers, and participating schools, teachers, pupils, youth groups, young people and their families! Thank you!

Funded by Science Foundation Ireland under its Discover programme

Cell EXPLORERS network coordinators and teams:

Muriel Grenon, Sarah Carroll, Janic Schulte (NUI Galway and national coordination team), Caroline Gilleran-Stephens and Suzanne Linanne (Dundalk IT), Ciara Courtney (Future Neuro), Anthonia O'Donovan and Karen Finn (GMIT), Guío Garcia-Cabellos (IT Carlow), Mary Carr (Letterkenny IT), Fiona O'Halloran and Máire Begley (MTU Cork), Niall Burke (MTU Kerry), Bianca Simonassi-Paiva and Mark Lynch (TUS MidLands), Marie Walsh and Siobhain Curtin (TUS MidWest), Eoin Fleming and Kellie Dean (UCC), Karen McGibney (UCD-NVRL), Audrey O'Grady (UL).

Contact Us

Cell EXPLORERS
University of Galway coordination team
School of Biological and Chemical Sciences,
College of Science & Engineering
University of Galway. Galway city, H91 TK33

www.cellexplorers.com
cellexplorers@nuigalway.ie.
@cellexplorers

Visual summary report prepared by Sarah Carroll

This report uses the logos & names of relevant higher education institutions that were correct during 2021