The Institute for Research in Schools

2020—2021

Impact report

IRIS

Contents

Impact report
2020_2021

The Institute for
Research in Schools

IRIS

WHY DO WE CHAMPION RESEARCH IN SCHOOLS?

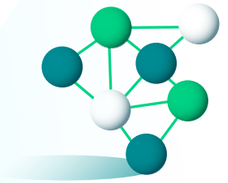
Because students, teachers and our own experience say research...

Fosters
CRITICAL THINKING

ALLOWS STUDENTS TO
Experience
STEM

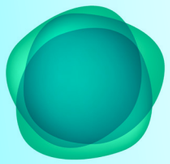
Reveals
STRENGTHS

Sparks
A PASSION FOR SCIENCE



TEACHES
Teamwork

Enhances
COMMUNICATIONS



ENCOURAGES
Wonder

BUILDS
Self-confidence

Builds
RESEARCH SKILLS

WHAT STUDENTS SAY ABOUT THE IRIS EXPERIENCE...

"THIS EXPERIENCE WILL REMAIN *unforgettable for me* AS I'VE LEARNT SO MANY NEW SKILLS AND I'VE ALSO BEEN ABLE TO HELP SCIENTISTS"

Genome Decoders | Lavanya Year 12

Lampton School

"I ENJOYED BEING ABLE TO WORK WITH OTHERS *to achieve something substantial* AND IT WAS ENJOYABLE TO CREATE A RESEARCH POSTER TO ADVANCE MY SCIENTIFIC WORK FURTHER"

Cosmic Mining | Billy Year 12

Bohunt Sixth Form

"USING THE PORTABLE SCANNING ELECTRON MICROSCOPE HAS GIVEN US *opportunities for learning new skills* AND TO GAIN EXPERIENCE FOR UNIVERSITY"

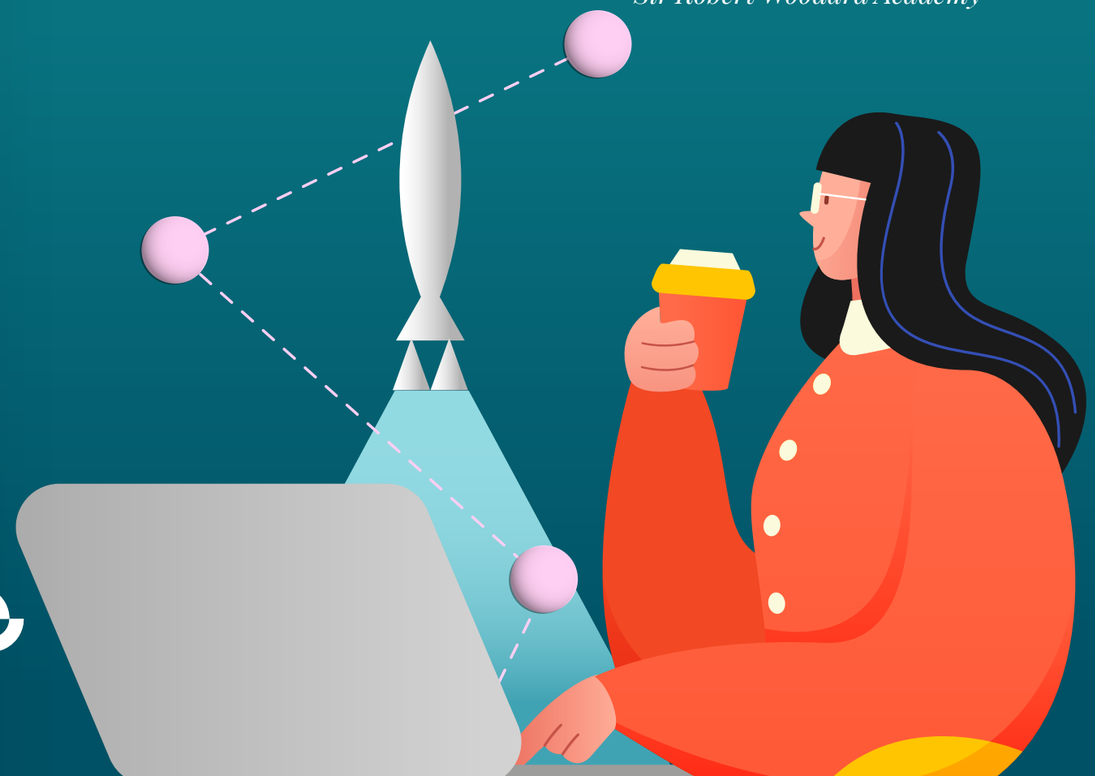
Original Research | Charlotte Year 12

Liverpool Life Sciences UTC

"IT IS MAKING ME *rethink my career plans* BECAUSE I NOW WANT TO HAVE SOME FOCUS ON HOW DNA CAN BE USED IN HEALTHCARE"

DNA Origami | Kieran Year 12

Sir Robert Woodard Academy



WHAT TEACHERS SAY ABOUT THE IRIS EXPERIENCE...

IT HAS
engaged students
WITH A RANGE OF INTERESTS FROM ENGINEERING TO MEDICINE
to learn more
ABOUT THE WORLD OF MATERIAL SCIENCE

DNA Origami | John Dyer

Liverpool Life Sciences UTC

THEY HAVE
learnt new skills
THAT MOST STUDENTS WOULD NOT ENCOUNTER UNTIL LATER ON IN UNIVERSITY AND HAVE SHOWN
an incredible work ethic

Cosmic Mining | Luke Fuller

Bohunt Sixth Form

AS WELL AS INSPIRING OUR STUDENTS, MY COLLEAGUES AND I FEEL ENTHUSED BY BEING PART OF IRIS. IT IS A REAL JOY TO SEE THE
spark of creativity, curiosity and confidence
THAT LIVE SCIENCE CAN IGNITE

Original Research | Jackie Flaherty

Chipping Campden School

THE PUPILS WORKED IN THEIR OWN TIME TO DEVELOP AND CODE AN ALGORITHM TO IDENTIFY PENGUIN COLONIES FROM THE SATELLITE IMAGERY.
To be acknowledged in a peer reviewed paper was a great boost to the group
AND SHOWED THAT IT IS POSSIBLE TO PERFORM MEANINGFUL REAL SCIENCE IN SCHOOLS

Original Research | Dr Andrew McDonald

Stirling High School

DIRECTOR'S LETTER

Dr Jo Foster
Director

At IRIS, 2020 has been a year of renewal. A year of re-thinking how we engage with schools and, crucially, how we facilitate the participation of schools who might have little previous experience of research.

We were fortunate that we had already started this work. The success of our Research in Schools - At Home project, which we ran at the start of lockdown in 2020, showed us that students already had the appetite to carry out research independently; we just needed to tap into it.

In a year where many organisations have seen a reduction in school engagement, we have seen significant and sustained engagement with our projects. At the end of June 2021, IRIS had 99 research projects running in UK schools with 840 students taking part. This included students' work to help scientists develop treatment for a neglected tropical disease and a concerted research effort to support astronomers finding targets for the James Webb Telescope, launching in October. Read more on page 11.

We have been delighted to secure new, and build on existing, partnerships. Our relationship with Professor Alan Barr's team at the University of Oxford continues, with a new project based around data from the CERN ATLAS detector piloting soon.

We secured funding from Henry Royce Institute for DNA Origami (see page 11). We developed this new project in partnership with Dr Andrew Lee and his team from the Bragg Centre for Materials Research. We received positive feedback from all the students and teachers who took part in the pilot, so we look forward to launching it to more schools in Autumn 2021.

Due to COVID-19, we held our annual conference virtually. A huge success, we had 1,000 visits to the event and 160 students shared their research with their peers and academics through prerecorded talks and online posters. While feedback was overwhelmingly positive, it was clear from the evaluation that both students and staff were keen to get back to 'face-to-face' conferences as soon as possible.

In the past year , we have made significant improvements to the way we communicate to schools and colleges and other stakeholders with a new website and resources. Traffic to our website has increased five-fold since September 2020, and our new resources have been well received by schools.

Operationally, the organisation has strengthened significantly, allowing more consistent and targeted support for schools that need it. We have bolstered our evaluation programme, adding external assessment of our impact. A team of researchers at UCL will continue their work in September 2021 .

As the ambitions and impact of IRIS have expanded, so has our team. Since September 2020, we have welcomed a Deputy Director, two new Regional Schools Engagement Leads and a Development Manager. We have also seen the retirement of our Director of Operations, Steve Greenwood. We thank him for his commitment to IRIS and his contribution to its success and wish him well in his new adventures.

We would like to extend a formal thank you to our Trustees, who have supported IRIS through this year. A sincere thank you also to the Battcock Charitable Trust, without which the work of IRIS would not be possible.

OUR AMBITIONS FOR THE NEXT GENERATION

If we in the UK are to achieve our ambition to become a 'science superpower', we must begin to develop the next generation of researchers.

The STEM Research and Innovation in Schools Framework sets out our plan to ensure every secondary student has the opportunity to experience research while in school

Our schools and colleges are full of untapped potential but far too often, students are put off from pursuing a career in STEM. We must find a way to plug that 'leaky pipeline' of STEM talent.

IRIS strives to bring the excitement and possibility of STEM to all students, at all levels, by:

- providing school students with opportunities to participate in cutting edge STEM research
- supporting schools to develop a culture of research and innovation
- evidencing the impact on students of participating in research

In September 2021, we will launch the STEM Research and Innovation in Schools Framework. This framework brings together the expertise of organisations including the Royal Society, STEM Learning and the British Science Association, all whom successfully engage with schools to improve students' experience of authentic research and real science. The Framework will provide a roadmap to empower school leaders and teachers to create a culture of research which enables students from all backgrounds to routinely take part in increasingly higher-level research as their schooling progresses.

This year, we have refined our vision and mission to reflect our ambitions to change the culture in UK education so that authentic research and innovation is part of every young person's school experience. What we do is now driven by our moral imperative to capture talent and break down barriers that impact the participation of underrepresented young people in STEM. Over the next 10 years, we aim to become a beacon of expertise and good practice in how research in schools and collaboration across the STEM community can benefit all.

Students from St John Fisher Catholic Voluntary Academy pipetting DNA as part of DNA Origami

OUR IMPACT

During the 2020-2021 academic year...

840
students carried out
99 research projects

295
students took part in an Original Research project

7
This year IRIS ran 7 university linked research projects

81%
of students felt that their projects had contributed to scientific research

3 OUT OF 5
have improved their awareness of future career opportunities through IRIS projects

3 OUT OF 4
students said it deepened their understanding of science

81%
During lockdown, 81% of students said IRIS projects made them excited about science

At the IRIS Virtual conference...

160
students presented at our conference

1085
visits to our virtual conference

93%
enjoyed hearing about what other students had done

12
Over 3 days 12 academics networked with students about their research

95%
of students rated presenting at the conference a great experience

85%
enjoyed finding out what a research conference was like

98%
of students said the conference was good or excellent

224 students and 77 teachers took part in our evaluation in 2020-2021

OUR SUPPORTERS

We wish to thank all our funders, partners and contributors in aiding our continued success

Battcock Charitable Trust

Bragg Centre for Materials Research, University of Leeds

Carbon Footprint

CERN

Centre for Polar Observation and Modelling

European Bioinformatics Institute

Henry Royce Institute

Institute of Experimental and Applied Physics, Czech Technical University

Open University

Queen's University Belfast

The Royal Commission for the Exhibition of 1851

Science Museum Group

Science Technology and Facilities Council

STEM Learning

University College London

UKRI MRC Integrative Epidemiology Unit

University of Bristol

University of Cambridge

University of Oxford

We the Curious

Weil

Wellcome Sanger Institute

Wellcome Trust

UK Space Agency

PROJECT HIGHLIGHTS

Young researchers have shone this academic year. Here are some of their discoveries:

To find out more:
https://researchinschools.org/projects

Delving deeper into the Earth's biosphere.

Using satellite data, students helped scientists evidence the dramatic environmental changes in Antarctica.

Stirling High School students helped the British Antarctic Survey scientists discover a new colony of emperor penguins.

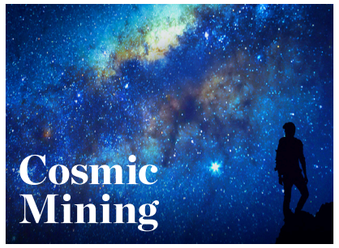
Annotating genetic material. 50 schools took part in this research effort to improve the health of their peers in distant countries. With their contribution of 20,000 annotations, Welcome Sanger are nearer the completion of the annotation of the protein-coding-gene-set. The project was shortlisted for the 2021 Falling Walls Science Breakthroughs of the Year Science Engagement prize.

In the true spirit of discovery, students continue to chart a new course by conducting their own original research project.

Year 9 students from Liverpool Life Sciences UTC began research to find out if mealworms can digest plastic waste. They hope their work will one day provide a solution to one of humanity's greatest environmental challenges.

Collaborating for change. UK students continued to work with their school to quantify its carbon footprint and develop a plan to decrease its environmental impact.

A new wave of students joined from Ladies' College Guernsey progressing the school's carbon reduction plan. They influenced every school on the island to set targets to decrease their footprint too. Government officials are using the students' research to inform its own pledge to become carbon neutral.



Exploring the stars. Budding astronomers developed skills in the advanced field of spectral analysis. Their work could help scientists find targets for the James Webb Telescope, launching in October.

Bohunt School sixth formers analysed data from the Spitzer Space Telescope, identifying 14 planetary nebula – shells of luminous gas emitted by dying stars – by identifying the tell-tale turning point in the spectra.

Reconsidering the potential of DNA. DNA Origami introduces young people to the emerging field of nanotechnology. Students learn to fold DNA with the help of computer aided design to create new and unusual shapes.

Secondary students from five schools piloted the project this year, becoming the youngest people to construct artificial structures using DNA.

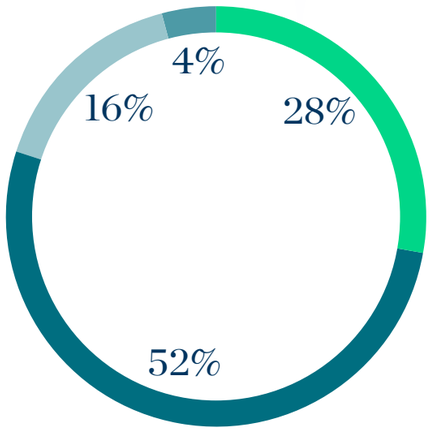
FINANCES

Overall expenditure has decreased due to the Covid pandemic

Accounts

	2020/21	2019/20	2018/19
Income Grants, Donations & Interest	**£504,000**	£851,000	£560,000
Expenditure on Charitable Activities	**£531,000**	£606,000	£589,000
Net Funds at 31st March	**£376,000**	£403,000	£158,000

How we spend our funds



In comparison with last year, overall expenditure has decreased. This reduction was largely due to the Covid-19 pandemic which resulted in the cancellation of our annual conferences and a dramatic reduction in staff travel. Despite the pandemic, IRIS continued to adopt a lean approach to working to optimise staff time and skills and ensure expenditure was directed to working with schools.

Our team was well prepared when all IRIS activity moved entirely online, due to being remote based with home-office setups. The team were also experienced in utilising cloud-based and online technologies to carry out the duties of the charity. As a result, IRIS spending on office and overheads was significantly less than the previous year. In addition, the updated project structures and resources were made available on the new IRIS website in September 2020. This enabled teachers to access materials more easily thereby allowing IRIS staff to focus their time on supporting schools and less on administration.

As IRIS has grown, the need for additional front-line staff increased. Therefore, our school support costs now include the costs for two new Regional Schools Engagement Leads who joined IRIS in January 2021 – one to cover the Scotland and Northern Ireland region and to lead on original research; the other to cover the North of England region. We have also appointed a part-time Development Manager to support the charity's aim to diversify its funding.

Impact report
2020_2021

The Institute for
Research in Schools

IRIS

The Institute for
Research in Schools

www.researchinschools.org

Twitter@ResearchInSch
Facebook@ResearchInSch

The Institute for
Research in Schools

www.researchinschools.org
info@researchinschools.org