University of Nottingham
Nanoscale and Microscale Research Centre

Under the Microscope

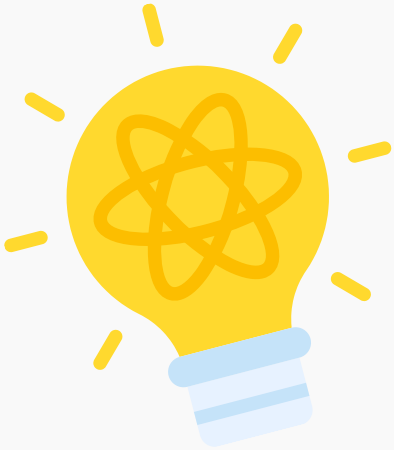
LIVE

Resource & Information Pack

SEMT
The Society of Electron Microscope Technology

Hi! From a microscopic mealworm!

Contents



Welcome Message

Dear Teachers,

Thanks for expressing interest in '**Under the Microscope LIVE!**' We are super excited to share the fascinating technique of electron microscopy with young people across Nottinghamshire and beyond!

Our fantastic team of microscopists continually generate images of the microscopic world that wow and impress. It's our hope that if we can share these wonders with school children - it'll help spark scientific curiosity and inspire the next generation of scientists and engineers!

The University of Nottingham's 'Under the Microscope LIVE' Team

Introduction to Under the Microscope LIVE

Welcome to your **Under the Microscope LIVE** resource pack, we can't wait to start our sessions with you and introduce you to the world of microscopy!

Under the Microscope LIVE is a project run by the **Nanoscale and Microscale Research Centre (nmRC)** at the **University of Nottingham**.

www.nottingham.ac.uk/nmrc

It is enabled by the generous sponsorship and support of the **Society of Electron Microscope Technology (SEMT)** and **Royal Microscopical Society (RMS)**

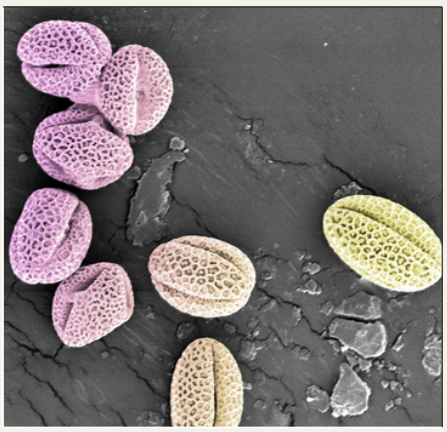
https://www.semtuk.org/

The main aim of **Under the Microscope Live** is to inspire future scientists by giving them a snapshot of the microscale world that is rarely afford to school age children. *What do materials look like on this scale? Why is this important?*

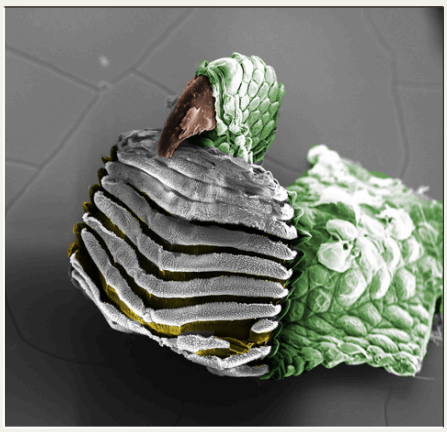
We also wish to highlight the importance of microscopists, showcasing a career that does not necessarily require a degree but is crucial to a huge range of industries.

Electron microscopy is not broadly available to younger audiences, but can show how the structures of objects can look vastly different compared to what we see by eye - and explain why a material behaves as it does!

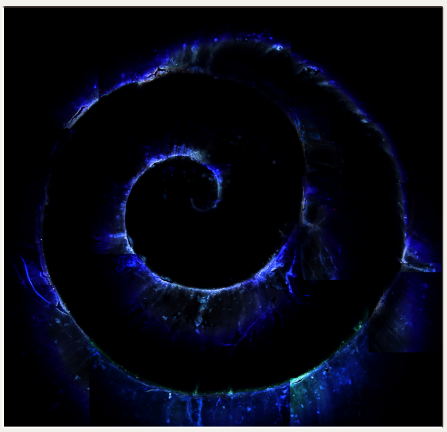
Since materials science can be defined as the study of the composition and structure of substances, **'Under the Microscope LIVE'** develops a natural curiosity to learn more about the world around us.



Blossom Pollen

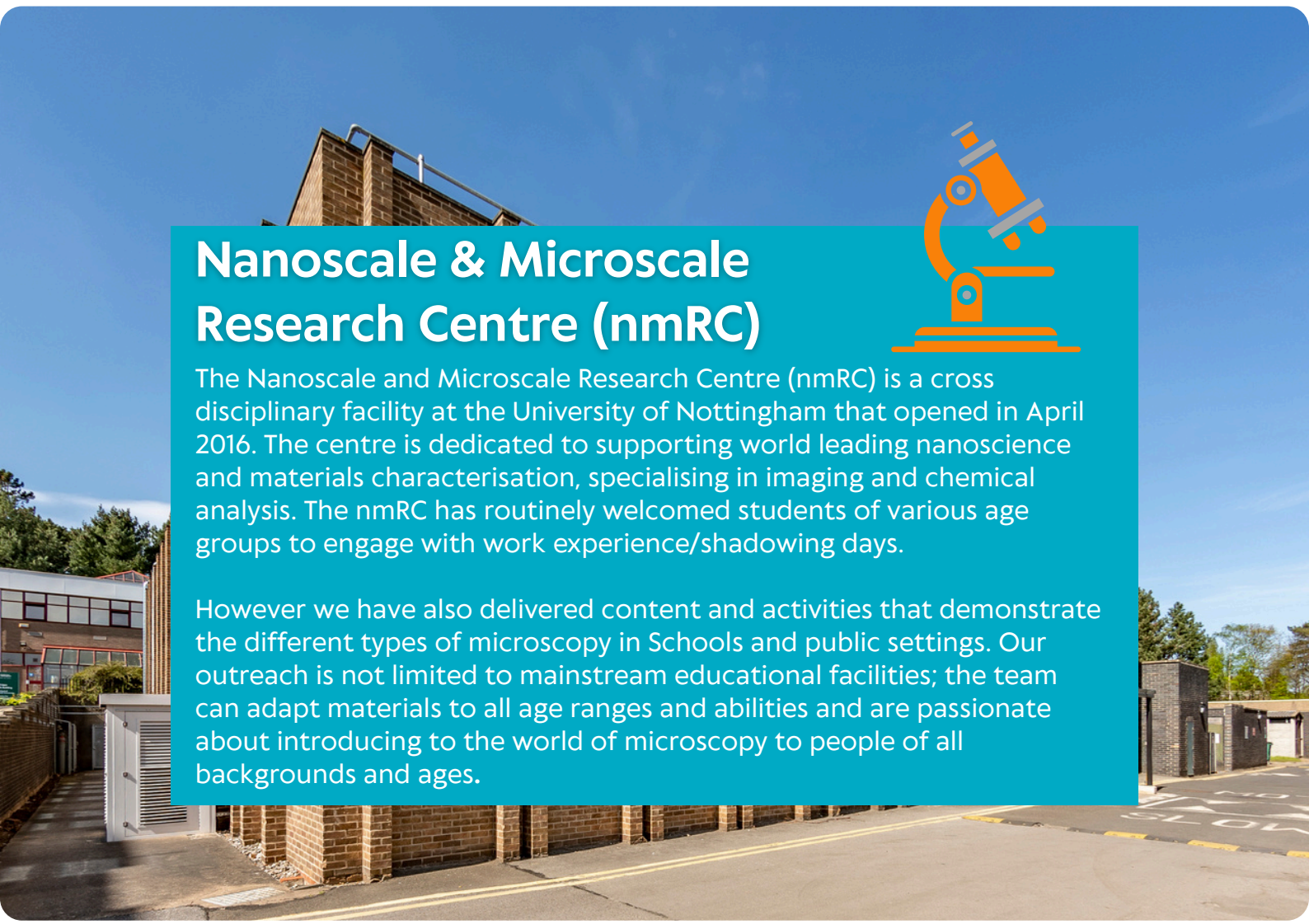


Lizard Scales



Snail Shell

Examples of Under the Microscope Submissions



Nanoscale & Microscale Research Centre (nmRC)

The Nanoscale and Microscale Research Centre (nmRC) is a cross disciplinary facility at the University of Nottingham that opened in April 2016. The centre is dedicated to supporting world leading nanoscience and materials characterisation, specialising in imaging and chemical analysis. The nmRC has routinely welcomed students of various age groups to engage with work experience/shadowing days.

However we have also delivered content and activities that demonstrate the different types of microscopy in Schools and public settings. Our outreach is not limited to mainstream educational facilities; the team can adapt materials to all age ranges and abilities and are passionate about introducing to the world of microscopy to people of all backgrounds and ages.

Society of Electron Microscope Technology (SEMT)

The Society of Electron Microscope Technology (SEMT) was founded in 19070 as a forum for the exchange of ideas on techniques and applications in microscopy.

It has expanded to become one of the foremost user groups in the UK, addressing all aspects of microscopy from instrument design and specimen preparation to digital image acquisition.

SEMT The Society of Electron Microscope Technology

Fizzy cola bottle!

How it all started

2023

The nmRC launched it's 'Under the Microscope' public engagement programme in March 2023. We asked members of the public to submit ideas for items to image by scanning electron microscopy (SEM). We were not disappointed! We imaged suggestions from a porcupine quill to shortbread biscuits. Scan the QR code above to see a video review of year 1!

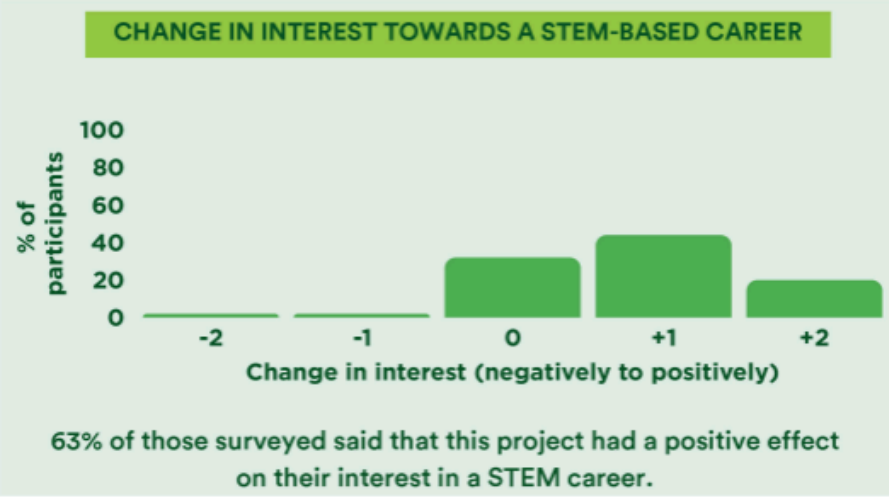
2024

In February 2024 we took part in the Nottingham Festival of Science and Curiosity, which allowed us to engage with local children and introduce them to the fascinating world of microscopy. Students were surprised to see what fizzy cola bottles and a pair of crocs looked like under a microscope! Motivated by this event, we applied to the Royal Society of Chemistry (RSC) for funding to develop a school's outreach project....

How it all started cont.

2025

Thankfully we were successful! And in 2025 we launched ‘Under the Microscope LIVE’. This involved running sessions in 12 schools across 3 counties, including state, private and specialist SEND providers. We were able to demonstrate appreciable improvements in student attitudes towards STEM based careers and and a high satsifaction score.



2026

The RSC outreach funding for 2025 was complete.... however the journey is far from over! Having presented our work to the Royal Microscopical Society (RMS) one of their special interest groups, the Society of Electron Microscope Technology has kindly offered to sponsor another 2 years of Under the Microscope Live activity.....

How does it work?

Through an innovative hybrid in-person and live streaming format, students will have the opportunity to explore microscopic structures and objects of their choosing, engaging them in hands-on scientific inquiry and sparking curiosity about the structure and composition of the unseen world around them.

The Sessions

The project prioritises student involvement by asking for suggestions of objects to be imaged in advance of the LIVE session (via a video call) ensuring that the LIVE content is then relevant and captivating for the participants.

There will be 3 sessions (2 interactive, 1 presentation) in total

1

An online discussion with the class explaining the concept and asking for sample suggestions.

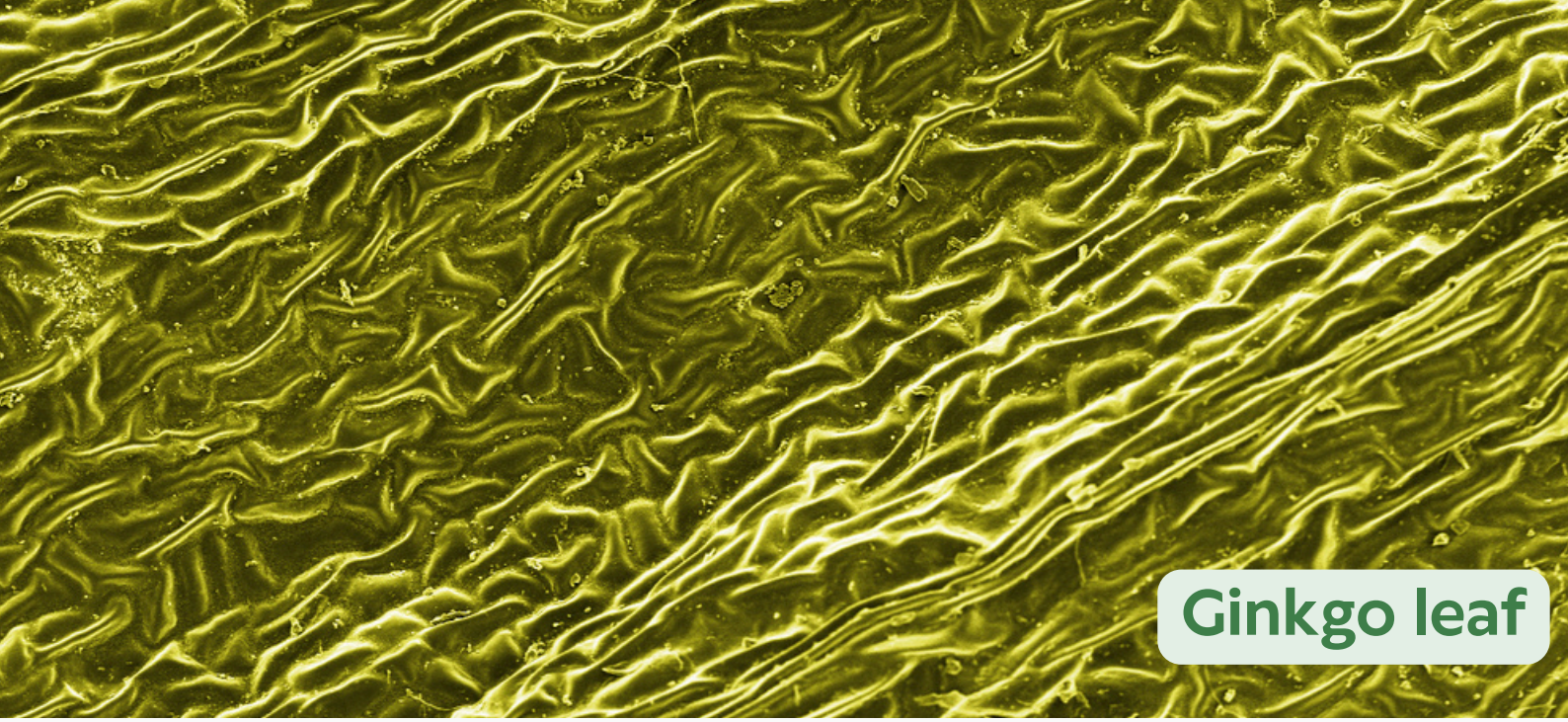
2

Live electron microscopy in the classroom.

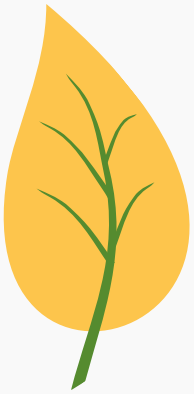
3

An image that was taken during the session will be turned into a canvas, and presented to the class.

Each session will utilise 1-2 members of staff operating the microscope via our bespoke audio-visual setup, whilst an additional 1-2 staff members will be at the school with a microscopy toolkit, explaining how electron microscopy works.



Which objects can be selected?



There are 3 basic rules of picking a suitable object for electron microscopy:

1. **Only solid objects (as the analysis takes place in a vacuum)**
2. **Must be obtainable**
3. **Cannot be alive ..... you would be surprised at some of the previous suggestions!**

The Team

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