



Life Through a Lens

On the Road 2012

***Life Through a Lens – On The Road*, is a workshop touring schools, aiming to engage school children in:**

- **The process of scientific discovery**
- **Using microscopes**
- **Understanding cells**
- **How researchers today are building on the work of scientists that came before them.**



Pupils at Towerbank Primary School perform the onion cell staining experiment.

In 2011, encouraged by the Wellcome Trust's 75th anniversary, we ran the 'Life Through a Lens' workshops for schools, based at the Royal Botanic Gardens in Edinburgh. In 2012, we wanted to widen our reach and take the project out to schools that could not easily travel. The Royal Microscopical Society's Vice President's Fund helped us to achieve this, in conjunction with funding from the Wellcome Trust Centre for Cell Biology.

For this roadshow, we developed a new experiment where children take a swab from their mouths, stain it on a microscope slide and see their own cells. We also aimed for two visits to be combined with the arrival of an RMS Microscope Activity Kit. Enabling us to train the teachers a little on the microscopes and allowing the school to carry on learning once our visit had ended.

What happens in a workshop?

Our workshop has a strong performance theme, using people dressing and acting the roles of historical scientists such as Robert Hooke.

Hands-on activities for pupils include:

- Using a microscope to view everyday things in



Towerbank pupils dress as historical scientists and get very enthusiastic about science methodology: if you have a theory, you must.... PROVE IT!

close up, such as fabric, poppy seeds, peacock feathers, bee stings, and stinging nettles in the manner of Robert Hooke.

- Using a microscope to examine a drop of pond water in the manner of Anthony van Leeuwenhoek.
- Preparing a sample to view via microscope, using raw onion and mouth swabs to reveal visible cells and nuclei in the manner of Robert Brown and Theodore Schwann.



Senior pupils from Liberton High School helping to present Life Through a Lens to primary school pupils visiting the school.





A busy classroom, everyone engaged.

- That there is a microbial world, invisible to the naked eye which affects everything around us.
- How microscopy has changed our understanding of biology over the centuries – and continues to do so.
- A sense of wonder at how looking at anything closely can reveal layers of unseen, unimagined complexity and give insights into how things work.
- That all living things are built of cells.

Working in primary schools in Dalkeith and Portobello

We started in primary schools that do not have good local access to science. Our first visit was to Kings Park Primary School in Dalkeith. We loaded up a huge van with 16 quality microscopes, equipment, costumes and six willing volunteers. We stayed for two days, running two workshops each day and seeing 103 children.

This was our first time on the road, and we were very pleasantly surprised by how well everything worked. It actually worked better than our Botany residency – we found the children more relaxed in their own school environment. We also found we could run this workshop successfully, in all its complexity with children as young as seven years old. This was really was a surprise, teaching cell

- Staining a sample of the cells in their mouth to view via a microscope, in the manner of Theodore Schwann.

What will people gain by attending our workshop?

School children, teachers and helpers who visit for a full session should afterwards understand:

- The historical nature of science and value of scientific method.
- That simple science experiments and use of the microscope can help us answer fundamental questions.



The president of the Royal Society circa 1660 (played by Iona Beange)



Orkney pupil getting to grips with the dissecting microscope



Teachers at Dounby Primary School, Orkney trying out the RMS Microscope Activity Kit.

theory to a seven-year-old seemed ambitious on paper, but in reality, the children just soaked the information up when we presented it to them in the right way.

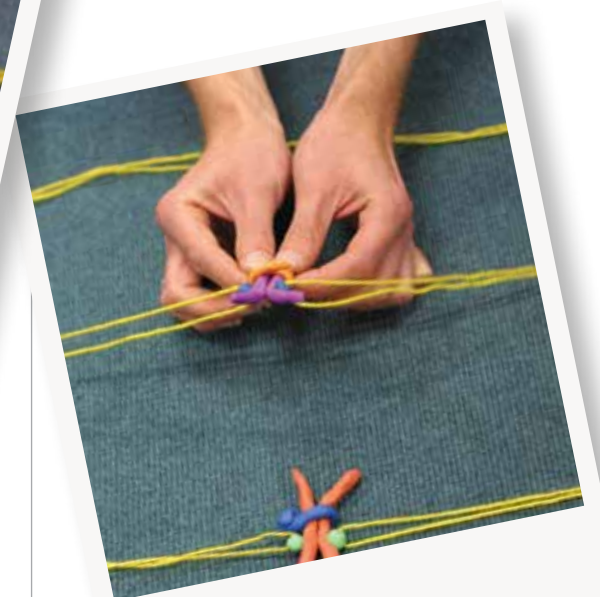
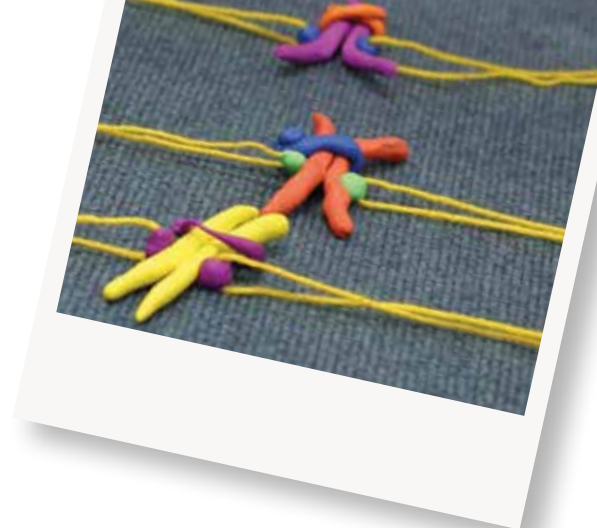
Next was a two day visit to Towerbank Primary School in Portobello, Edinburgh. This is a very big school with many classes, so we decided to shorten each workshop to try and fit three into each day. Again, the volunteers and children adapted well, we missed having the extra time to have fun, but we did manage six big workshops in two days working with 125 children: a great achievement.

Could High School pupils run this workshop?

I like to see how far I can stretch things, so when we came to work with a Liberton High School in Edinburgh, I wondered if the more talented senior pupils might be able to present the workshop themselves to younger children.

We worked with a group of 15 senior pupils aged 16 - 17 years old, training them to present this workshop to the primary school pupils who were visiting the school for a week. They learnt how to present science, use microscopes, memorise their lines and act: quite a challenge for all of us, as it turned out! In the end, the senior pupils did excellently and surpassed expectations.

With this format, each visiting primary school pupil got many opportunities to speak informally with the senior pupils. This enabled them to ask questions about what life would be like when they moved up to 'big school' and more importantly what the science lessons would be like. It also gave the senior pupils a chance to experience what it is like trying to teach a class of pupils who are either too nervous to talk, or are too excited to listen! Working as a team with the 15 Liberton senior pupils, we ran the workshop six times over three days, seeing 100 children.



Taking the roadshow to the Orkney Islands

Finally, we took the workshop into the remotest areas of Scotland, arranging to work with two Orkney primary schools as part of The Orkney Science Festival. We loaded up the van with people and equipment, drove over 300 miles and caught a ferry across the Pentland Firth. The ferry rode capably over the highest seas we had ever seen, whilst my excitable volunteers danced a ceilidh on the lurching deck.



Stefan Galander from the Marston Lab demonstrating chromosome cohesion and segregation to Papdale Primary School pupils.

Our first visit was to Dounby Community School. We got a very warm welcome, with the head teacher giving us lots of help. We settled in and took two classes through the workshop and a group of teachers through some training on the RMS Microscope Activity Kit. One of our volunteers, Lewis Hou, even found time to run an extra workshop that combined neuroscience and his playing of the fiddle. We were bowled over with their enthusiasm – what a positive school and community! We left behind a full set of RMS microscopes for teachers and pupils to use over the next 4 months.

Next we visited Papdale Primary School in Kirkwall, one of the biggest primary schools in Scotland and certainly one of the friendliest we have visited. The walls were covered in the most impressive art and the staff could not do enough to help us. Again, we left behind a set of RMS microscopes and an





The team at Orkney Science Festival Ceilidh. From left to right: Sarah Keer-Keer, Kathleen Pullen, Lewis Hou, James Dyson, Stefan Galander, Christopher Jennings, Iona Beange

enthusiastic group of children and staff. We found Orkney primary schools some of the best to work with in the UK!

Finally, we ran an open day in Kirkwall for the general public, talking to over 150 people and showing them how to operate microscopes and conduct simple experiments.

Exhausted, we packed up the van and headed slowly home to Edinburgh. The roadshow is complete for now, but we will start it up again in 2013 in collaboration with the Royal Botanic Gardens where we will take a similar show to the regional gardens in Dawyk, Benmore and Logan. Many thanks to the Royal Microscopical Society for helping to fund this year of the *Life Through a Lens* roadshow.



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2012 Winners of the Vice President's Fund

The Vice Presidents have decided to support the following two worthy projects this year:

Darwin's Unseen Specimens and Artefacts

This project will be a photographic record, history and philosophy of Charles Darwin's microscope slides and discoveries and their effects on scientific and world culture.

The research will centre around not only images hidden within scientific slides but also the relevance of their history, science and public awareness, and why these meticulously prepared samples go unobserved for such long periods.

Micrometres, Models and Mysticism: Creative Interpretations of the Microworld

A 12 month project, liaising with artists who will produce works that are quite different to the micrographs from which they are derived, to allow their wider appreciation to a non-scientific audience.

Atomic Force Microscopy (AFM) images will be obtained from hair and DNA samples, artists will then be given the micrographs and after a short briefing/consultation period, will be left to produce artworks from the images. The idea is to offer something beyond a 2D or 3D model of the micrographs.

Congratulations to both recipients. Further information and reports on these projects will be in **in focus** and on the RMS website later in the year.

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