Bringing Science back into the Curriculum

The Microscope Activity Kits from the Royal Microscopical Society have now reached a new milestone of over 40,000 children across the UK and are doing an incredible job of inspiring the next generation of microscopists from an early age as well as building teachers' confidence in teaching science in Primary Schools.

With recent reports of Primary Schools being encouraged to focus on English and Maths to achieve the desired marks in the Key Stage tests, science is at risk of becoming less prominent in the timetable and teachers are less able to find time to prepare a range different and engaging science lessons.

Students in Yorkshire take a closer look at bugs

Looking at the intricate details of leaves in London

In 2010, this gave Dr Susan Anderson, from the University of Nottingham and Honorary Secretary for Education and Outreach at the Royal Microscopical Society, a fantastic idea. She wanted to provide equipment and resources for Primary Schools to borrow free of charge, to help promote science through the use of microscopes in the classroom, while encouraging and supporting teachers. The newly formed RMS Education and Outreach Committee began testing a range of microscopes to find the most suitable for use in primary schools, as well as developing activities with input from teachers to ensure curriculum targets were met whilst being fun and engaging yet not too difficult to source equipment and write notes and worksheets.

In April 2011, the Microscope Activity Kits were launched with 10 fully-stocked Kits going out each term with the view to obtain valuable feedback from the schools to further develop the scheme. The Kits were received better than the RMS could have expected and they were fully booked within a matter of weeks solely down to word of mouth.

A student in Reading examines one of her finds from the school garden

By 2013, with a new box, camera and set of microscopes – the Kits were ready for an expansion and the RMS began sending out 50 Kits a term rather than 10. Four years on, the Microscope Activity Kits have now been used by over 40,000 children in over 450 Primary Schools across the UK – figures to be incredibly proud of!

So what's in a Microscope Activity Kit?

Each Kit contains 8 microscopes that are lightweight and easy both to use and maintain, along with 6 activities that are ready-to-go. The activities include the equipment and samples as well as worksheets that can be photocopied for children to use and teacher's notes including guides on how to run the activity and suggestions of how each activity matches a requirement on the National Curriculum for England. The Kits also include an eyepiece camera which can be attached to any of the microscopes and using a USB cable, can display the image onto a computer or an interactive whiteboard - key to those children who respond best to visual learning.

The contents of an RMS Microscope Activity Kit

Why are the Kits so Popular?

The main reason the kits are so popular is that they come complete and ready to use straight from the box. All activities are supported with microscopes, worksheets, samples and specimen. At the same time, the kits are flexible enough to allow teachers to get creative and develop their own activities which are then shared with participating schools. The only thing the RMS request in return is the completion of a short feedback form to ensure the Kits remain an essential learning resource. Teachers are also encouraged to create their own lesson plan to use with the Kits either in the classroom or at an afterschool club, which can then be shared with other teachers via the RMS website. Teachers and parents are always astounded to hear that the loan of a Microscope Activity Kit is completely free! The RMS cover the costs and organisation of the delivery and collection, allowing teachers to make the most of the resource whilst it is in the school.

The Microscope Activity Kits don't always stay in UK classrooms, in addition to the 50 Kits being sent out around the UK each term, there 5 Kits that are being used to cover the Republic of Ireland by our sister projects – Under the Microscope from the University of Galway and Science Live, a joint initiative lead by researchers at Trinity College Dublin. Despite only running since January 2015, they have already attracted the attention of the local media and have generated interest in the scheme across the Republic of Ireland. The project differs slightly from the UK Kits as they send scientists into schools on the first day with the Kits to run activities for both the children and teachers to increase their confidence with the equipment, before leaving it there for the rest of the term.

There are also 5 Kits that live at the Primary Science Teaching Trust that are used to build teacher's confidence in using microscopes and also joining the RMS in the quest to engage children in all aspects of the curriculum using microscopes in the classroom!

The microscopes in use at a primary school in Bristol

What do the Schools Think?

Each term, the RMS receives brilliant feedback from the schools. Every piece of feedback is used to develop and improve the Kits for future loans

The microscopes added a new dynamic to our science lessons which really helped to engage and motivate the children to make close and careful observations. Thank you – Westgate Primary School, Morecombe

Thank you very much indeed - this was a wonderful opportunity. The resource is superb. I was delighted that so many children were given the opportunity to use the experience and develop skills. – Winterbourne Earls Primary School, Salisbury

It's been an awesome kit to have in the school. They would come in full of enthusiasm for 'Microscope Monday' excited and constantly asking what will we be looking at under the microscopes this week. They were really disappointed when I told them that they were being returned. Yet they still constantly talk about our head teacher the biscuit thief that we caught using super sleuth detective skills. - Shirwell Community Primary School

We would have loved to have had them for longer and then more classes would have used them – St Hilda's Primary School, Hertfordshire

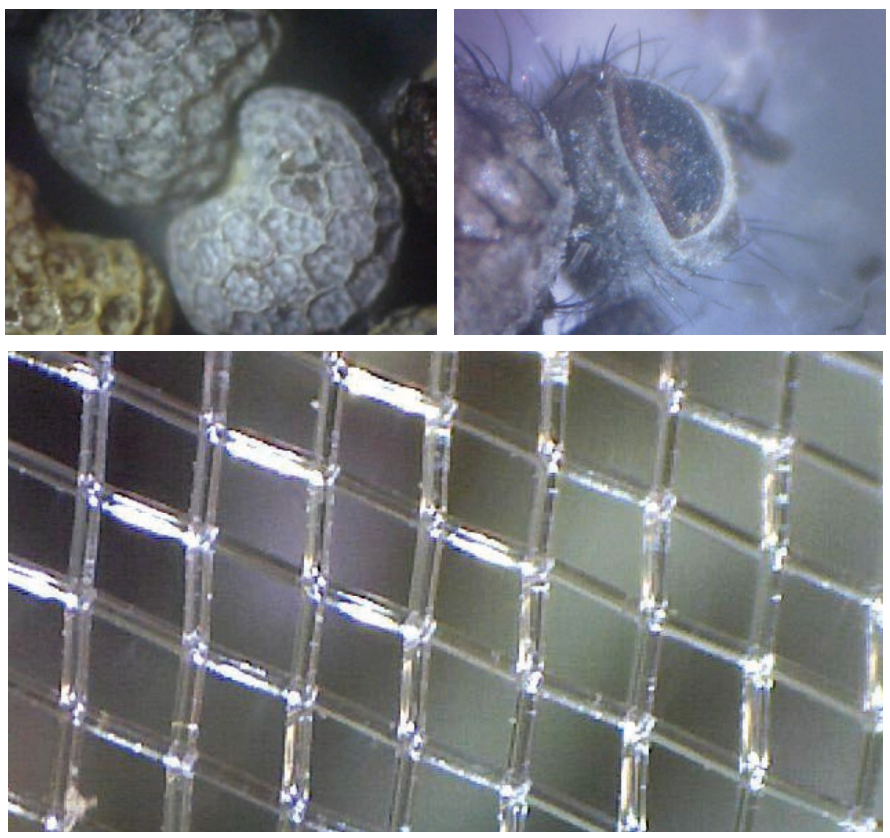
The Microscope Activity Kit Scheme is funded purely through the Royal Microscopical Society, coming from monetary donations and through donated microscopes that are serviced and refurbished by volunteers and sold on to amateur microscopists.

Future plans for the Kits is to expand the scheme from 50 to 100 Kits nationwide to solve the issue of waiting lists that currently exist, with the next Kits currently available in January 2017.

To celebrate the milestone of reaching over 40,000 children and to promote the scheme to a much wider audience, the RMS commissioned a video, available to watch at www.rms.org.uk/microscopeactivitykit

What about Outside of the Classroom?

The RMS also take the Microscope Activity Kits to a number of Outreach events to bring unique activities into the programme and allow even more children the chance to use a microscope. From Oxford to Inverness, the Kits have been to a number of Science Festivals as well as the



A variety of everyday objects captured using the camera included in the RMS Microscope Activity Kit

Children at the Micrographia Anniversary Event in London

recent Outreach day where the RMS collaborated with the Worshipful Company of Scientific Instrument Makers to celebrate the 350th anniversary of Robert Hooke's Micrographia.

On this day, over 300 children aged 7-14 flocked to Glaziers Hall in London to enjoy a day full of microscope-related activities!

Children were able to view everyday samples such as pollen and garden bugs through a table top SEM, experiencing something usually reserved for sixth form or university students. This activity was led by GCSE pupils from St Paul's School in London, giving them the opportunity to engage with the younger students. After their eyes had adjusted to seeing everyday objects in a completely different way, the next activity was a quiz, with a number of household objects photographed through a microscope for students to try and identify. The 'slimy' appearance of a mushroom caused a chorus of "Ewww", whilst a wasp's sting astounded all.

Next was a forensic, CSI-style activity taken directly from the Microscope Activity Kit (Activity 6) where children were given clues through which they had to deduce who had stolen the jelly babies from the jelly baby factory – the most heinous of crimes! The activity itself allows for the most dedicated of children to be rewarded by being the top detective and solving the mystery and children were animated throughout and worked both as a team, comparing their results with their table, as well as individually, determined to prove that they could solve the crime without any help from friends or teachers. The room was buzzing with excitement all day!

Finally, demonstrating that microscopes don't have to just be for science, children drew their own pictures of what they could see down the microscope, just like Robert Hooke did 350 years ago. With the help of Professor Rob Kesseler and students from the University of the Arts, London, some brilliant drawings were created and the best were awarded with their own microscope to take home. The concentration shown by all the students astounded some of the accompanying teachers as even the usually disruptive students were completely enthralled by the activity. The afternoon's prize giving was conducted by the Lord Mayor of London, Sir Alan Yarrow, who also took great pleasure in trying out each of the activities for himself!

Activity 6 encourages teamwork, discussion and analytical thinking

To find out more about the Microscope Activity Kits and to book one for your school, please visit www.rms.org.uk/microscopeactivitykit

or for Irish readers, sister project Under the Microscope can be found at http://www.su.nuigalway.ie/under-the-mic

You can also find them on facebook and twitter:

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