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How we opened a museum at our school

Encouraging children to
become eager to build,
research, write and analyse



Welcome

Get in touch...

We would welcome your feedback on our magazine: feedback@stem.org.uk



Welcome to the fourth edition of STEM Learning magazine.

There is always something exciting about the beginning of the new academic year. As the leaves begin to turn and the nights start to draw in, autumn brings with it a fresh start, full of new challenges and opportunities. This September we're pleased to announce that we are making it even easier for you, as teachers and others who are crucial to inspiring the next generation in science, technology, engineering and mathematics (STEM), by bringing together even more STEM support in one place for the very first time.

As well as continuing to offer high-impact, career long, subject-specific support to teachers and others across the UK through the National STEM Learning Centre and Network, we are now supporting you and your students through access to STEM Ambassadors and STEM Clubs. The STEM Ambassador network is a true national treasure, which brings thousands of people working in STEM fields, (scientists, engineers, zoologists, architects, set designers, nuclear physicists and more), all of whom are passionate about supporting you and your students in STEM. STEM Clubs provide excellent opportunities to build students' skills, confidence and excitement around STEM through practical activities. Evidence shows both programmes can help build young people's employability skills as well as STEM understanding and enthusiasm, and open their eyes to a whole range of possibilities, including careers.

You may have heard about Science Minister Jo Johnson naming the new, state-of-the-art polar research ship, named after world-renowned naturalist Sir David Attenborough. We are delighted to be working with BEIS and others in supporting educational activity around this exciting project through the Polar Explorer Programme. There will be lots of activities you and your students can get involved in during the run up to the RRS Sir David Attenborough's launch in 2019, so watch this space!

We're thrilled to be bringing you all these exciting new opportunities to inspire your students/pupils to study and perhaps go on to work in STEM-related fields. Who knows? Perhaps the next Tim Peake, Dr Helen Sharman, Sir David Attenborough or Dr Alice Roberts could be sitting in one of your classes this term...

Yvonne Baker

YVONNE BAKER, CHIEF EXECUTIVE, NATIONAL STEM LEARNING CENTRE AND NETWORK

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STEM Learning Ltd operates the National STEM Learning Centre and Network; providing support locally, through Science Learning Partnerships across England, and partners in Scotland, Wales and Northern Ireland; alongside a range of other projects including STEM Ambassadors, supporting STEM education.

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One size does not fit all:

How bespoke CPD could help your school

Do you ever attend CPD and think to yourself: "This does not seem relevant to me at all!" It can sometimes feel like the modules are not tailored to suit individual teacher's and school's needs.

However Poppleton Road Primary School in York have been undertaking bespoke training, designed just for them – will it make a difference?

We were very lucky to obtain an ENTHUSE bursary to pay for some CPD in design and technology for all our teaching staff. We had two sessions run by experts focusing on the design process and mechanisms. We felt that staff expertise in design and technology needed to be updated and refreshed. The training we received from Helen and Karen was excellent.

"Karen delivered fantastic CPD about the design process and different methods of design for use with different ages in KS1 and KS2. She focused on design and technology having a purpose within lessons to develop prototypes using different materials. We were also lucky enough

to have CPD from Helen regarding mechanisms as we felt this was an area we needed refreshing. Helen brought several types of pulleys, levers, cogs and other types of mechanics. We looked at how to incorporate using mechanics into other parts of the curriculum, such as a castle with a pulley drawbridge.

"We are using the skills taught to launch a design and technology project across the school, culminating in a 'Dragons' Den' style presentation." - Katy Kelly, teacher at Poppleton Road Primary School.

Impact reports show that within primary education, bespoke training has further fostered confidence, particularly in relation to assessing and tracking progress made by pupils. The bespoke options are vast – so next time you are considering booking some CPD for your school, why not try out bespoke CPD?

■ www.stem.org.uk/bespoke-cpd

■ www.stem.org.uk/mp/cx4w3

Shine the light on STEM this Diwali

by **KAREN BRUNYEE** Primary Professional Development Lead, National STEM Learning Centre and Network

The festival of lights, Diwali, begins on the 30 October. Three religions celebrate this five-day holiday, which incorporates New Year – Hindus, Sikhs and Jains, with over a billion followers across the globe. Diwali at its core celebrates the triumph of good over evil, light over darkness, and the word 'Diwali' translates in a number of languages to 'row of lights'. Why not incorporate STEM subjects into the study of Diwali and get your class experiencing this beautiful festival in a practical way.

SCIENCE

Light is of course an easy way to introduce the science of Diwali. There are so many fantastic experiments you can do with your class – looking at diya oil lamps and how the light travels away from the flame; repurposing old CDs to make bases for diya lamps so you can discuss reflections from shiny surfaces. Why not, whilst studying electricity, design a circuit that will light an electrical diya lamp or even a string of them. Get your pupils designing parallel circuits to light up multiple diyas and see if they can solve the problem if one lamp blows.

DESIGN AND TECHNOLOGY

Diyas, the small lamps that are displayed in homes, can be designed and created in the classroom. Try getting your pupils to design one that will be safe even if knocked over. Many families celebrate the New Year by wearing new, colourful clothes. Challenge children to design a new outfit for a member of the family. You will have plenty of scope for embedding your food technology as many foods are eaten to celebrate the holiday, allowing the children to perform taste tests.

COMPUTING

Coding is a huge part of the new computing curriculum. Why not get your class using Logo to code a simple rangoli pattern; the repeat command will come in handy and they will need to learn some basic shape construction. There are also great online games where they can plan and coordinate firework displays.



Seeds in space

by **GILL COLLINS** Senior Laboratory Technician, National STEM Learning Centre and Network

At last, the news we had been anticipating for weeks had reached us: the rocket seeds had returned safely to Earth after spending seven months on the International Space Station (ISS) with astronaut Tim Peake and were now in the hands of the Royal Horticultural Society being prepared for distributing to more than 8,000 schools in the UK.



Having a keen interest in plants and all things green I volunteered to carry out the experiment. I collected empty milk bottles to make the labels, bought compost and made sure I had sufficient modular seed trays. I was well equipped for the experiment, as we are fortunate to have a greenhouse on the roof of our building in York.

There were two packets of seeds in the folder – one red and one blue. One of the packets had travelled to the ISS with Tim Peake, but no one involved in the experiment knew which one!

I carefully planted one seed per module, noticing odd numbers in each packet therefore I only planted 91. I found this stage quite tricky as rocket seeds are very small, and felt a twinge of sympathy and admiration for the teachers conducting this task with excited children (possibly with sweaty palms!) in the school environment.

The seeds grew really well and I entered my results into the online national database and am now looking forward to finding out which seeds were sent to space. Tim Peake will be revealing the identity of the seeds in a specially recorded video. My personal prediction is that it was the blue packet!

■ **Tim Peake Primary Project resources:** www.stem.org.uk/mp/lxpta

SEE THE LIGHT WITH THE HELP OF THESE RESOURCES AND CPD : >

- www.stem.org.uk/mp/diwali
- www.stem.org.uk/mp/audience/primary

NEW TO LEADING PRIMARY MATHEMATICS
■ www.stem.org.uk/my004

MAKING POWERFUL CONNECTIONS BETWEEN LITERACY AND SCIENCE
■ www.stem.org.uk/rp114

Assessment in primary science: why, what and how?

by **JANE TURNER** > Director Primary Science Quality Mark, University of Hertfordshire
@PSQMTurner



Over 500 schools a year gain a Primary Science Quality Mark award, through a rigorous process of self-evaluation. This awareness of excellent practice from across the UK is invaluable to my role as Director Primary Science Quality Mark and as an independent science curriculum expert for the DfE Standards and Testing Agency, where I have recently co-led the interim teacher assessment and its exemplification.

There is a good, shared understanding of why we assess in science. Ofsted and the Commission on Assessment Without Levels have both issued clear guidance: day-to-day formative assessment is essential for teachers to respond to and extend learning; in-school summative assessment is required to monitor children's achievement and progress over time; national summative assessment is used by the government to hold schools to account.

How to assess becomes more challenging. The Nuffield report for Teacher Assessment in Primary Science proposed that teachers should use formative assessment as part of their everyday practice to help pupils achieve the learning that is set out in the school's curriculum for science. In practice this means that when planning science lessons teachers need to ask themselves the following questions:

- 1 What do I want the children to learn about this concept or to be able to do?
- 2 How can I find out what they already know about it and what skills they already have?
- 3 What do I need to do to help them develop their understanding and skills?
- 4 How will I, and they, know they have developed their understanding and skills?

Good formative assessment means that teachers and children have clear evidence of their learning. When a child states "I used to think that...", but now I know that...", and can explain why or how they know, their teacher has clear evidence that learning has taken place. This evidence of learning enables teachers to make summative assessment judgements against the national curriculum. These are judgements of whether the child has achieved the learning that the teacher planned for, not a judgement of what level they have achieved. This does not require an end of unit test, nor for teachers to record every formative judgement, but it does require them to ensure that there are opportunities for children to represent or express their understanding, in what they do, say, write or draw.

End of key stage summative reporting of science teacher assessment data is statutory for 2016. The DfE has published interim Teacher Assessment Frameworks for KS1 and 2 which summarise the concepts and skills in the national curriculum in sets of statements beginning 'The pupil can'. At the end of each key stage teachers need to report whether children are working at the expected standard for all the statements in the framework, but don't need to report individually against each statement. Year 2 and Year 6 teachers should not test children against these statements, but use the assessment judgements that were made when the topic or skill was last taught, based on a range of evidence, to compile this summative data.

There is help and guidance available. The DfE has published collections of children's work to exemplify working at the expected standard for all of the statements within the KS1 framework and some of the statements in the KS2 framework.

The exemplifications include real work from children in different contexts, reflecting the variety of ways they express and represent understanding and skills in science. Each piece of work should be looked at alongside the commentaries that explain the learning context and the reasons why it meets the statement. The examples are useful documents to support formative assessment, helping teachers to plan

for learning and evaluate achievement when the topics and skills are taught. They provide a good starting point for moderation between teachers to ensure that assessment judgements are consistent. Many local authorities and science networks are compiling their own exemplification collections to use alongside the DfE versions.

“ There is help and guidance available. The DfE has published collections of children's work to exemplify working at the expected standard for all of the statements within the KS1 framework and some of the statements in the KS2 framework. ”

And what is the reporting for? Schools' teacher assessment data in science made against the Teacher Assessment Framework is not used for formal accountability, but will be available for scrutiny at individual school level and to monitor attainment in science more generally. If a school is selected to be part of the biannual sample testing in science the results are not reported at school level.

If your school understands and uses assessment formatively to help learning, and summatively to report on learning, then you can be confident that you have answered the important questions about assessment in primary science.

WHAT QUALITY MARKS ARE AVAILABLE FOR SCHOOLS >

PRIMARY SCIENCE QUALITY MARK
■ www.stem.org.uk/psqm

SPACE EDUCATION QUALITY MARK
■ www.stem.org.uk/seqm

LIST OF CURRICULUM ASSESSMENTS TO SUPPORT YOU:
■ www.stem.org.uk/curriculum-assessments

FANTASTIC CPD TO HELP WITH ASSESSMENT >

ASSESSMENT AND PROGRESSION IN PRIMARY SCIENCE:
■ www.stem.org.uk/rp102

DEVELOPING THE EXPERIENCED SCIENCE SUBJECT LEADERS:
■ www.stem.org.uk/ny003

ExoMars: bringing Mars exploration to the classroom

by **RACHEL JACKSON** Primary Specialist, National STEM Learning Centre and Network
@JacksonR141

Is there life on Mars? Children always ask this when we talk about space. Soon the European Space Agency (ESA) might be able to give us all the answer: their new ExoMars programme, due to arrive in October, plans to search for evidence of life on Mars.

The mission plans to use sensors to search for gases such as methane, which could indicate life in the Martian atmosphere. In 2020, a rover will drill down two metres under the surface of the planet to search for evidence of life underground. So there couldn't be a better time to explore the red planet in your own classroom!

EXPLORE MARS FROM YOUR CLASSROOM

THINK LIKE A SCIENTIST



Discuss the characteristics of living things and ask the children how we could look for evidence of these life processes on Earth. For example: we could observe evidence of movement on Earth – but how could this be done when exploring a distant planet? What about other evidence of life, such as gases? The ExoMars orbiter will try to detect methane, a gas produced by the degradation of living things.

WORK SCIENTIFICALLY



Most likely any life found on Mars will be microscopic, so ask children to test samples of 'Martian soil' for the presence of microorganisms and investigate the conditions affecting their growth. They can also compare and test the samples identifying properties that indicate characteristics of 'Martian soil'. These activities from the resource 'Is there anyone out there?' are perfect for the ExoMars mission.

BECOME A SPACE ENGINEER



Research the landscape of Mars and create your model of it in class. Think about where would be best to land, then design a rover to move across this landscape. Rovers could be programmed to avoid obstacles. Sensors can be used to detect different colours to represent different rocks on the planet.

These activities provide opportunities for working scientifically, robotics, data logging and engineering, as well as hopefully inspiring some space scientists and engineers of the future.

RESOURCES DESIGNED TO SUPPORT YOUR TEACHING >

IS THERE ANYONE OUT THERE:
■ www.stem.org.uk/mp/rxxhr

AURORA - EUROPE'S JOURNEY TO MARS:
■ www.stem.org.uk/mp/cx5ymf

EXPLORE OUR SPACE CPD AND SEE WHERE IT COULD TAKE YOU >

SPACE AND ASTRONOMY - A CONTEXT TO TEACH PRIMARY STEM:
■ www.stem.org.uk/ny017

BRING MARS EXPLORATION INTO THE PRIMARY CLASSROOM:
■ www.stem.org.uk/cy010

Feel the force: a demonstration of the effect of using a pulley

by **JANE WINTER** Professional Development Leader at CIEC (York University),
National STEM Learning Centre and Network, Schools Advisory Teacher
@janewinter115

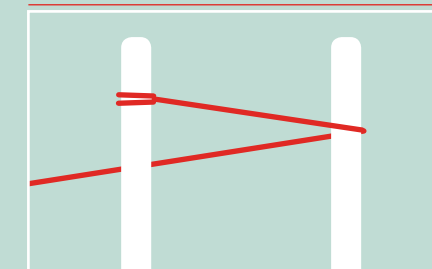


Levers, pulleys and gears are a relatively new edition to the primary science curriculum. To help children to understand simple machines we need to let them experience their effects.

I've used an effective pulleys demonstration in class and here's all you need to do it with your pupils:

- two stout sticks such as broom handles or lengths of PVC pipe
- a length of rope
- three volunteers

STEP ONE



Ask two of your volunteers to stand opposite each other holding the sticks parallel to the ground and to each other, about 60cm apart.

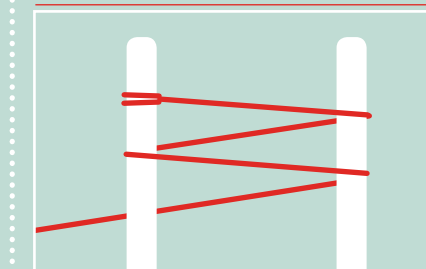
STEP TWO

Arrange the rope as shown, inside the volunteers' hands. Explain to them that whatever happens they must not let the sticks get closer together.

STEP THREE

Now ask your third volunteer to hold the free end of the rope. Their job is to pull the two sticks together. Because they are pulling against the combined strength of two people they should be unable to move the sticks at all.

STEP FOUR



Now loop the rope a second time around the handles as shown.

STEP FIVE

Ask them to again try to pull the broom handles together. This time the mechanical advantage should mean that they will be able to do this easily. To show that to move the sticks 60cm they will actually have to pull the rope 120cm ask your volunteer to keep hold of the same part of the rope so that they have to move at the same time as the sticks.

STEP SIX

If they are still unable to pull the sticks together an extra loop can be added. Now pulling them together will be easier still, but the third volunteer will have to walk even further to pull them the same distance. This is exactly how a pulley works.

This demonstration works really well if there is a mismatch in the strength of the two volunteers holding the sticks and the one pulling the rope; asking adults to hold the sticks together, or pitching two Year 6 children against a much younger one would also be fun.

GET A LIFT WITH YOUR CPD >



THIS RESOURCE DEMONSTRATES POPULAR MECHANICS:
BECOMING A DESIGNER OF MACHINES
■ www.stem.org.uk/rx34t5

HELP CHILDREN TO SEARCH OUTSIDE THE CLASSROOM FOR INSPIRATION: SUPERMARKET SCIENCE
■ www.stem.org.uk/rp125

Driving science education in primary schools

by Cheryl Cawkwell > Year 6 Teacher/Science and Computing Subject Leader, Oasis Academy Henderson Avenue

Children's engagement and curiosity in science is enhanced if you have staff who are inquisitive and curious themselves. In my opinion a school's most valuable resource is its well-qualified, enthusiastic and inquisitive teachers who can drive excellent science education in primary schools. So we must engage our staff!

The initial question I asked myself as a new science subject leader back in 2010 was 'How do I engage and enthuse our children?' Science is no longer a subject tested by SATs and, as a result, the perceived importance of teaching science in school has declined over the subsequent years. Working in an academy where raising the standards of reading, writing and mathematics were the main priority, I found myself in a difficult situation. I remember thrusting the 'Maintaining Curiosity' document under the head teacher's nose and to my surprise, she read and digested its findings with great interest. Around the same time an email landed in my inbox inviting applicants to apply for the 'New and aspiring primary science specialist' pilot. I really needed to do this for my own CPD and improve my own subject knowledge. I was successful! Spending the next two years developing myself as a subject leader with the help and support of the National STEM Learning Centre in York gave me the confidence and determination to lead change in science in our academy.

I needed to get my staff on board this science train. They were the key drivers in my vision. How many times are we told teaching needs to be hands on and interactive? Passive learning was a definite no-no. Yet how many times have you sat in an inset thinking about the pile of marking you have to return to and you clearly haven't listened to anything that has been said? What a waste! I had to change my approach. I needed to make my insets memorable to get my science message across. I needed my staff to walk away thinking "Yeah, I want to do that!"

I introduced 'wow' science to our staff in inset, where they completed investigations like they would if they were in the classroom. The staffroom became a hive of activity and I just stood back and watched the staff engage, enquire and genuinely enjoy their science experience. 'Wow' science allowed staff the freedom to be creative and develop children's

“ I had to change my approach. I needed to make my insets memorable to get my science message across. I needed my staff to walk away thinking “Yeah, I want to do that!” ”

enquiry in a fun and exciting way. The staff were asked to deliver a science investigation each week from then on. It only had to be 10 to 20 minutes a week, so I wasn't asking too much of them. They didn't need to complete a detailed plan either, which was a definite hit and we stocked our resource cupboard full so the buying of resources wasn't an issue either. This was a turning point for science in our academy. Our staff relished these opportunities to have fun in science and the enthusiasm for science soon

grew. Staff and children alike couldn't wait to share their investigations with me and often accosted me down the corridors. Children began to question, predict and test theories of their own. They began to lead their own learning. They loved their science experience!

Fortunately, the introduction of the new curriculum came at a great time for us. Staff and children were now on board with science due to the 'wow' science and children were having a greater experience of science in school. Staff took to the new curriculum really well.

So where are we at today? Well, children and staff are now engaged and becoming ever more curious about science. We have just been awarded the silver Primary Science Quality Mark and science has a very important status in our curriculum.

OPEN THEIR MINDS WITH THESE GREAT CPD ACTIVITIES >

GET YOUR COPY OF THE MAINTAINING CURIOSITY DOCUMENTS:

■ www.stem.org.uk/maintaining-curiosity

IF YOU'RE QUICK YOU MIGHT STILL BE ABLE TO ATTEND THE NEW AND ASPIRING PRIMARY SCIENCE SPECIALIST CPD:

■ www.stem.org.uk/ny010

SUPPORT YOUR TEAM WITH OUR DEVELOPING THE ROLE OF THE SCIENCE SUBJECT LEADER CPD:

■ www.stem.org.uk/rp101

How we opened a museum at our school

by **ZOE GIANNOULIS** Science Leader, Year 5 and 6 Phase Manager, Prior Weston Primary School and Children's Centre

In the run-up to Science Week I was faced with a dilemma. Children could tell me where we see science in action, that nurses, doctors and engineers use science in their work, yet they still saw science as something 'mad' and explosion heavy.

After a lot of thought, a plan came together: we would open our own museum. The museum would encompass all areas of the curriculum; science would lead the way and children would become experts.

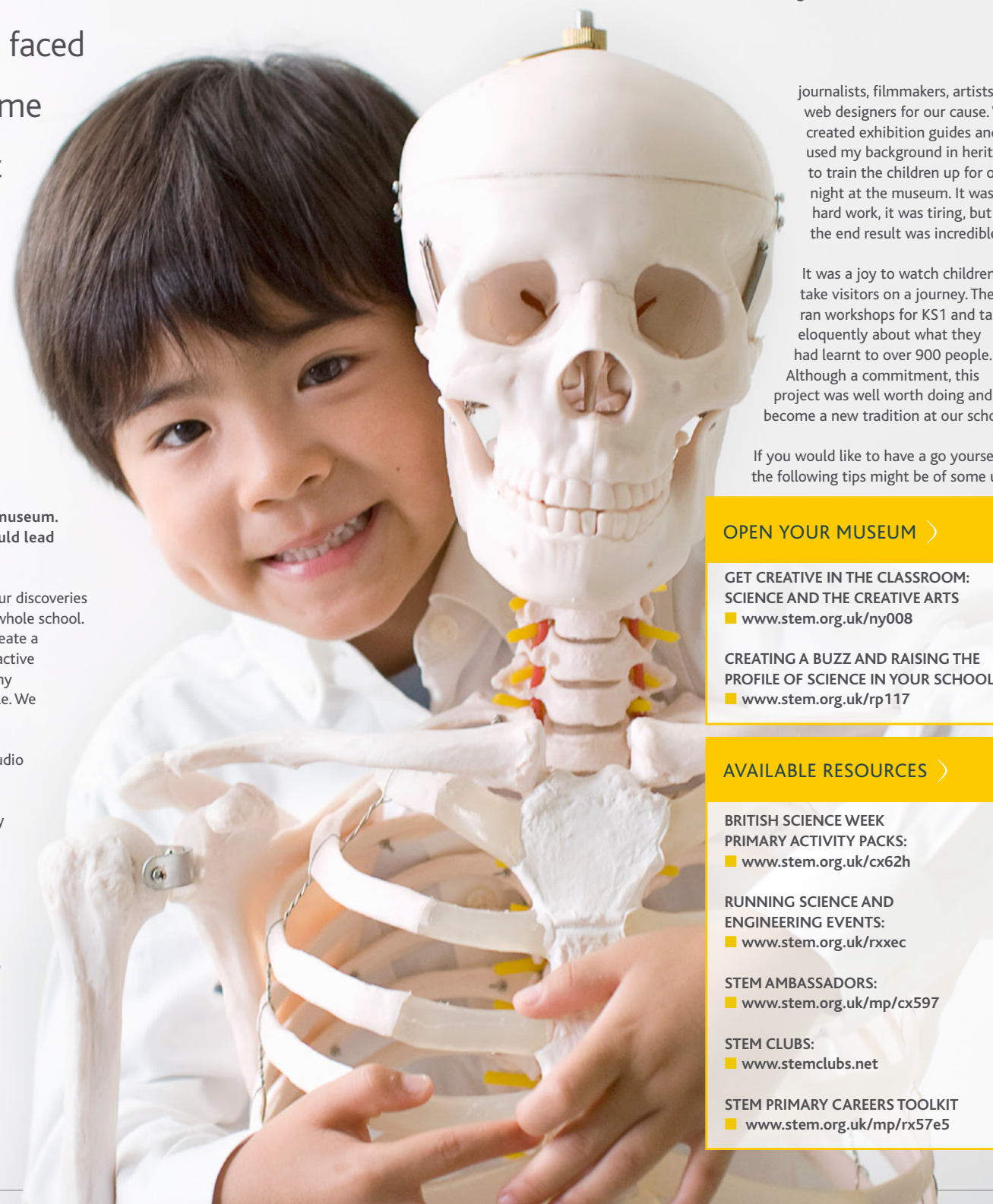
We contacted the Museum of London, who are located five minutes away, and spoke to their archaeology department. Eager to help us, we soon had forensic osteologists, archaeologists and chemists coming into classrooms. Children handled skeletons and learnt to spot the causes of death – they used their research skills to link the bones to historical periods and find evidence in the streets surrounding us that could support their ideas.

We went mudlarking, scavenging for interesting objects on the riverbank of the Thames, with Museum of London Archaeology (MOLA) archaeologists, and used our knowledge of materials and tides to identify artefacts. Suddenly the streets that we had walked down a thousand times were alive with voices from every era, discoveries and events that had been dormant up until this point. Children followed in the footsteps of Brunel, Snow and Bazalgette. They could explain the structural integrity of The Globe Theatre and how the drainage systems worked in Elizabethan buildings. They became eager to build, research, write and analyse.

Now we needed to take our discoveries and share them with the whole school. The goal was simple: to create a welcoming, rich and interactive space that reached as many different people as possible. We began to think big.

The children created an audio guide, using a recorded interview with the osteologist. We tentatively entered the world of app development and created 'Thamestastic!' which included the children's research. This was downloaded all over the world, including in the US, Africa and Hong Kong.

We started a Twitter feed and harangued MOLA and the scientists we had met to follow and retweet us; we plundered our parent base and drafted any



journalists, filmmakers, artists and web designers for our cause. We created exhibition guides and I used my background in heritage to train the children up for our night at the museum. It was hard work, it was tiring, but the end result was incredible.

It was a joy to watch children take visitors on a journey. They ran workshops for KS1 and talked eloquently about what they had learnt to over 900 people. Although a commitment, this project was well worth doing and has become a new tradition at our school.

If you would like to have a go yourself, the following tips might be of some use.

OPEN YOUR MUSEUM

GET CREATIVE IN THE CLASSROOM: SCIENCE AND THE CREATIVE ARTS
www.stem.org.uk/ny008

CREATING A BUZZ AND RAISING THE PROFILE OF SCIENCE IN YOUR SCHOOL
www.stem.org.uk/rp117

AVAILABLE RESOURCES

BRITISH SCIENCE WEEK PRIMARY ACTIVITY PACKS:
www.stem.org.uk/cx62h

RUNNING SCIENCE AND ENGINEERING EVENTS:
www.stem.org.uk/rxxec

STEM AMBASSADORS:
www.stem.org.uk/mp/cx597

STEM CLUBS:
www.stemclubs.net

STEM PRIMARY CAREERS TOOLKIT
www.stem.org.uk/mp/rx57e5

END POINT



Have an end point in mind from the very beginning and share this with the children – knowing they are responsible for the content and running of such an event is a big motivator, especially if people from 'real life' are involved. Proving they can successfully run a prestigious event does wonders for their self-esteem.

UTILISE WHAT YOU'VE GOT



Think about your area, from gardeners to museums, there will always be an organisation that would love to do a project in your school. Are you in an historically rich area? Natural area? Sometimes just being cheeky enough to email and ask for a favour is all you need to do – secondary schools are great for this and are often happy to run lab sessions for Years 5 and 6.

The same motto could be used for the actual set-up of the museum – we were lucky to borrow some display cases from the Museum of London, but we also used gymnastic apparatus covered in blackout curtains, table tennis boards backed in sugar paper and school lunch tables as the structural body of our space.

BE BRAVE



Don't be afraid to develop an app or audio guide. There are great sites such as SoundCloud and Twitter, which can help you reach a wider audience, and Google Apps are easy to use for the uninitiated. Being able to reach out of their local community really motivated the children.

DOCUMENT EVERYTHING



Keep a record of everything – it is a great evaluation tool to look at photographs and videos of the experience; it also brings home to the children just what a feat they have accomplished!

SHOUT ABOUT YOUR ACHIEVEMENTS

We were so thrilled to have such a fantastic response to our project and I hope by sharing our success it will inspire you to try a project like this in your school! So Tweet, blog and show other schools what you've been up to.

ARE YOU PLANNING AN EXCITING PROJECT LIKE THIS IN YOUR SCHOOL? We'd love to hear about it. Tweet us using @STEMLearningUK and share your ideas and successes

Keeping children safe online

by **STEVE DALE AND PAUL SCOTT**
@Stevedale @Pederosa

Curriculum Innovation Consultants,
Curriculum Innovation Service

The online world is increasingly inhabited by children. Ofcom's recent study, 'Children and Parents: Media Use and Attitudes' (2015), reports that 8 to 11 year olds spend up to 11 hours a week online, with one in seven of all 3 to 4s and half of 5 to 15s playing games online.



Smartphone ownership is 24% for 8 to 11s. This means that children have easy access to a wide variety of online content (including social media) that could lead to the access and creation of inappropriate sexual content (including sexting), online bullying, grooming and extremism. 17% of 9 to 16 year olds in the UK say they have seen sexual images online or offline within the past 12 months, according to 'Net Children Go Mobile', a 2014 international report on children's online behaviour.

Parents often say that they have little or limited knowledge about the technologies, sites and apps that their children use. Educating parents and the local community with regard to online safety is essential to ensuring our children remain safe at all times when using connected technologies.

Most school systems ensure children have access to appropriate online content through the use of suitably configured filters and firewalls but this is often not the case in most homes or when children are using 3/4G data-enabled devices such as mobile phones and some tablets.

The PSHE Association, together with the Child Exploitation and Online Protection Centre (CEOP), have identified 11 key areas to successfully support online safety in schools and show that interventions are most likely to be effective if parents and the wider community are engaged,

interactive and skills-based teaching strategies are used, and that the school effectively monitors and evaluates its own online safety provision.

Several useful sites available for parents are the Childnet parental control website, Internet Matters.org and Common Sense Media. These sites explain how to make children's devices safe, provide information on social media sites and give verdicts by educators and parents on games, apps and films that the children may be watching and using. Training teachers to deliver the important messages and expected behaviours is key to the success of keeping pupils safe online and CEOP runs courses to train ambassadors and also 'Think You Know' trainers.

Clearly, it is important to have a whole school approach to eSafeguarding, where all the contributing factors can be monitored and evaluated. We strongly recommend schools use the free 360 Degree Safe online safety audit tool from the South West Grid for Learning which allows a school to assess, develop and monitor its whole school eSafeguarding provision and quickly identify strengths and areas of development.

This tool helps schools ensure that they have an appropriate curriculum in place meeting the needs of the computing curriculum including online safety and online bullying. It also identifies the

necessary policy, process and practice to ensure all technology systems are used safely and securely, and that there are robust systems in place to monitor, record and respond appropriately to any eSafeguarding incidents.

Safeguarding, including eSafeguarding, is the most important role of an educator and just like we teach pupils from an early age to be cautious in the real world we also need them to be aware of the potential dangers when online and using connected technologies.

USE THESE RESOURCES AND ACTIVITIES IN YOUR CLASSROOM >

360 DEGREE SAFE TOOL
■ www.360safe.org.uk

USING DATA LOGGERS AND DIGITAL TECHNOLOGY IN PRIMARY SCIENCE
■ www.stem.org.uk/ny011

HOW TO USE DIGITAL TECHNOLOGIES TO SUPPORT SCIENCE
■ www.stem.org.uk/rp115

Awe and wonder

Making science exciting for early years children

by **LUCY HUDSON**
@HunsleyPrimary

Head Teacher,
Hunsley Primary



I recently found myself with a new challenge: as head teacher of a brand new primary free school specialising in mathematics and science, this is not an unusual position to be in, and one I am usually quite adept at embracing. But this time, I really had to think – our Friday assembly was coming up fast, and was focused on science. Could we make science exciting for our early years pupils?

During the week, our nursery nurse set up the large water tray experiment in the continuous provision area, and it proved to be very popular with the children's prediction and the results chart filled up with predictions like 'rolling pin – sinks', 'water bottle – floats', 'boat – sinks' (bit controversial, that one) in blotched ink, well-splashed by eager five year olds.

We fully embrace the 'characteristics of effective learning' – they are very much akin to 'working scientifically' approaches: playing and exploring; active learning; creating and thinking critically. Children should develop essential curiosity and concentration, enjoy the reward of persistence, make links and develop new strategies. Such is the intrinsic value of investigative learning that it pervades our whole curriculum from Foundation to Year 6 and beyond into our secondary school. This is crucial if the Foundation Stage is to be just that: a 'foundation for lifelong learning'.

Friday arrived. I positioned the visualiser and big screen, ready for our assembly, to show our Reception class one little boy's take on 'sinking and floating': an apple bobbing in a beaker of water, now enlarged to impressive proportions at the front of the room for all to see.

As the children filed in, giving the desired gasp of awe and wonder at the sight of the magnified floating apple, huge on the screen, a member of the team said: "And why does it float, children?" A cartoon question mark had suddenly appeared above all our heads. Many eager faces looked back, and a number of risk-taking hands shot up – where to start? Their answers were at once imaginative, profound, funny, improbable, challenging and intelligent; they really made me think. I became highly aware of the physicist sitting at the back of the room, our initial teacher trainee, volunteering each Friday to support our STEM curriculum. He gave a wry smile – we would be extending this experiment into next week.

WE CAN SUPPORT YOUR STEM LESSONS >

MATHEMATICS FOR THE EARLY YEARS:
■ www.stem.org.uk/my008

PUTTING SCIENCE AT THE HEART OF EARLY YEARS:
■ www.stem.org.uk/rp120

HERE ARE SOME FUN RESOURCES TO INSPIRE YOU:

SCIENCE FROM WATER PLAY
■ www.stem.org.uk/rxwx3

EVERYDAY MATERIALS
■ www.stem.org.uk/rxuau

What can a STEM Ambassador do for you?

By broadening your students' learning in STEM, you can inspire them to consider new avenues and set new goals for themselves. Exposure to STEM Ambassadors has been proven to positively impact problem solving abilities, communication and social skills as well as teamwork, resilience and confidence.

STEM Ambassadors can help build the skills needed in the world of work, as well as demonstrating the range of opportunities that open up through studying science, technology, engineering and mathematics. STEM Ambassadors can work with you in many ways. Here's what teachers, pupils and employers who have worked with STEM Ambassadors have to say.



A STEM Ambassador can open your students' minds to the excitement of science, technology, engineering and mathematics and the life changing opportunities that a career in the STEM industries can bring. STEM Ambassadors are enthusiastic and knowledgeable role models, who can help support you and your students across STEM subjects. Even better, their support is completely free.

BRINGING FIRST-HAND EXPERIENCE OF CAREERS IN STEM:

"The pupils get to see the STEM Ambassador's flight path... hearing a real person's experiences, it's much more powerful."

CREATING INNOVATIVE STEM PROJECTS:

"The excitement they add to the project... it gives more credibility to what you are doing"

DELIVERING PRACTICAL DEMONSTRATIONS AND EXPERIMENTS:

*"You can see STEM in action. You don't have to visualise it, you can actually make it and see how it's done."
"No matter what I've been looking for there has been someone to fit the bill."*

From architects to zoologists; engineers to set designers; and farmers to nuclear physicists – STEM Ambassadors are a source of inspiration for your students.

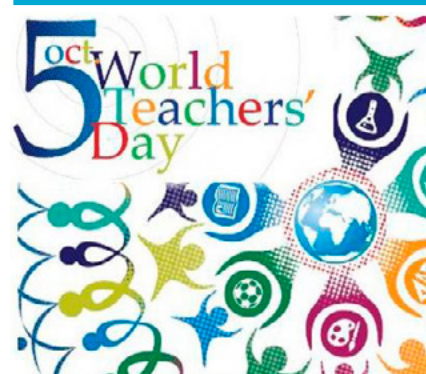
Find a STEM Ambassador to inspire your students today:
www.stem.org.uk/stem-ambassadors



CALENDAR

Our top picks for you to put in the calendar..

OCTOBER 2016



WORLD TEACHERS' DAY 5 OCTOBER 2016

Did you know that World Teachers' Day will be taking place on 5 October? This is a perfect opportunity to celebrate the amazing work that you and your colleagues do every day!

■ www.stem.org.uk/teacher-day

NOVEMBER 2016



ROLLS-ROYCE SCIENCE PRIZE NOVEMBER 2016

The Rolls-Royce Science Prize helps teachers to implement science teaching ideas in their schools and colleges. In November this year, the winners of the 2015/16 Rolls-Royce Science Prize awards will be announced.

Open to all schools and colleges in the UK, you can apply for the 2016/17 award.

■ **Find out more:**
www.stem.org.uk/rolls-royce-science-prize

NOVEMBER 2016



PRINCIPIA SCHOOLS' CONFERENCES 2 AND 5 NOVEMBER 2016

Taking place in November, pupils have the opportunity to present their work to leading space experts and, if his schedule allows, Tim Peake himself.

■ www.principia.org.uk/schools-conference

JANUARY 2017

ASE ANNUAL CONFERENCE 2017 4-7 JANUARY 2017

What better way to start 2017 than by discovering new teaching ideas and resources that you can use in your lessons?

■ **Visit today:** www.ase.org.uk/conferences/annual-conference/

BETT SHOW 2017 25-28 JANUARY 2017

This is your annual opportunity to experiment with the latest technology, hear from inspirational figures and network with other people.

■ **Visit today:** www.bettshow.com

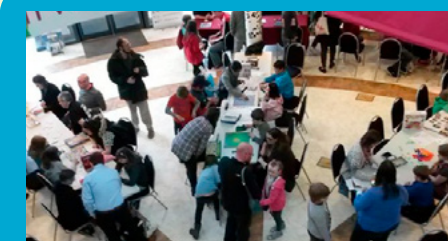
SOCIAL MEDIA

Let's take a peek at what people have been tweeting:

@STEMLearningUK
Followers: 20K



■ **@jogstem** @STEMLearningUK we had great fun using our ESERO grant to make gym equipment for ISS



■ **OsteveJLyon** Still loads of people having fun playing games at the STEM centre in York @STEMLearningUK #maths

■ **@astro_timpeake** @GM_Science @STEMLearningUK Never stop learning, #STEM careers are what keeps humans advancing and creating better ways of living



■ **@yvonne baker** Outside No.10 - honor to meet @astro_timpeake and update him on the impact of our TP work with primary @STEMLearningUK

■ **@sciencejo** A privilege to see the National STEM Learning Centre and to experience the Centre's commitment to sharing best practice with teachers.

Follow us @STEMLearningUK and let us know what STEM related things you're up to!

High quality professional development that has impact

You can access our CPD nationally, locally and online. Our ENTHUSE Award bursary funded residential courses are run at the National STEM Learning Centre in York and our network of school-based Science Learning Partnerships (SLPs) provide support locally across England. SLPs combine local expertise and knowledge with national standard provision to provide you with a range of courses and support to suit needs. Nationally and locally we can also tailor our CPD to meet the individual needs of your department, school or network through our bespoke provision.

To find your local SLP go to www.stem.org.uk/science-learning-partnerships

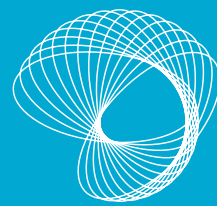
Bursary support for all state funded schools and colleges

ENTHUSE Awards

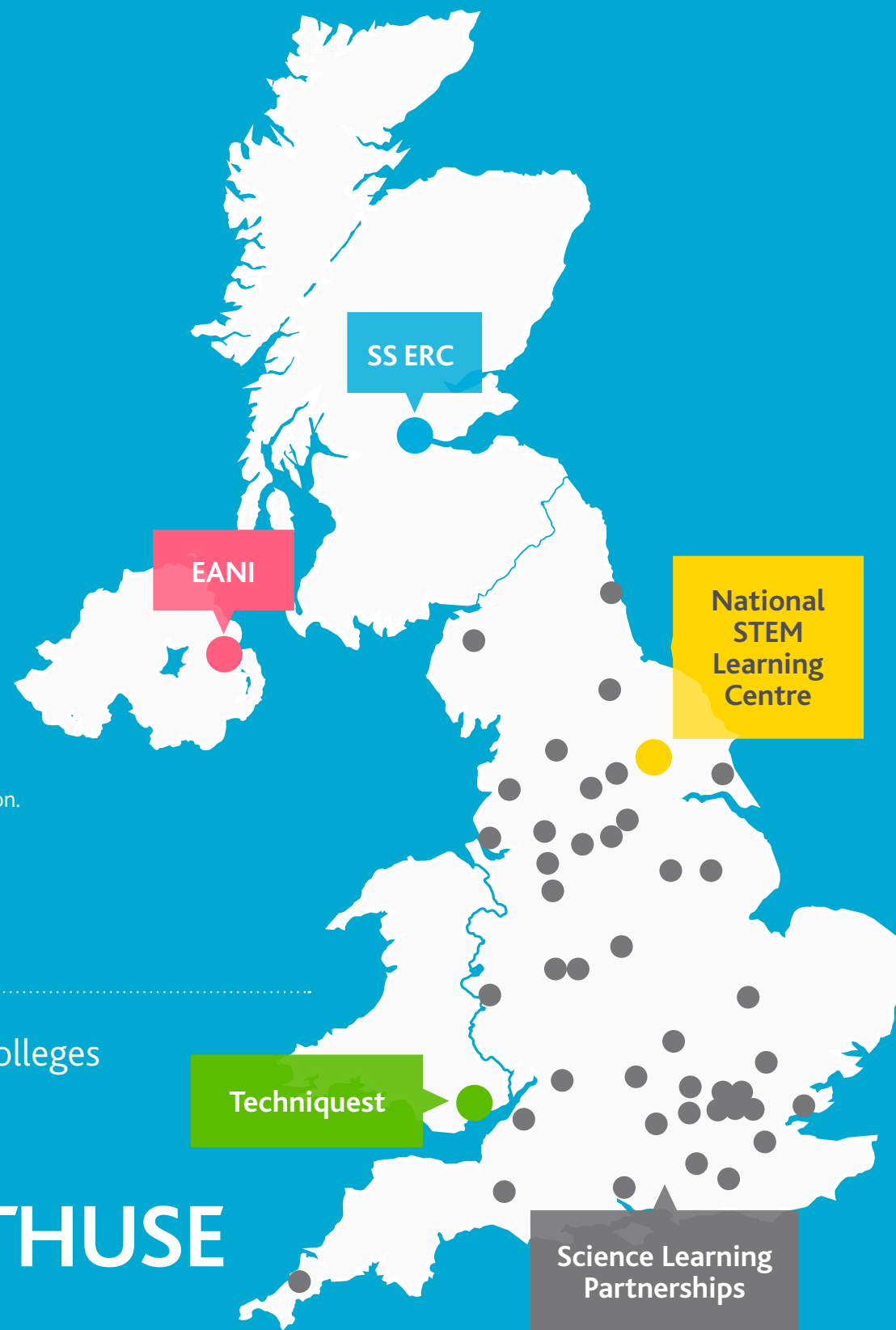
ENTHUSE Awards contribute towards the costs of attending world-class professional development provided by the National STEM Learning Centre.

ENTHUSE Awards are provided by Project ENTHUSE which is a unique partnership of government, charities and employers that have come together to bring about inspired STEM teaching through the professional development of teachers, technicians and support staff across the UK.

www.stem.org.uk/project-enthuse



ENTHUSE
AWARD



We have chosen a selection of key themes and activities for you:

SUPPORTING NEW ENTRANTS TO THE PROFESSION

| | |
|---------------------------------------------------------------|---------|
| ■ Working scientifically in the new curriculum | Page 22 |
| ■ Strengthening subject understanding in... .. | Page 22 |
| ■ Massive Open Online Courses..... | Page 22 |
| ■ Mathematics for the early years..... | Page 20 |
| ■ New to leading primary mathematics..... | Page 20 |
| ■ How to use digital technologies to support science | Page 21 |
| ■ Primary Conference | Page 22 |
| ■ Using iPads and other tablet devices in the classroom | Page 20 |

SUPPORTING ESTABLISHED PRIMARY TEACHERS

| | |
|--------------------------------------------------------------|---------|
| ■ Assessment without levels | Page 21 |
| ■ Subject specialism courses | Page 22 |
| ■ Linking the core subjects..... | Page 21 |
| ■ Working scientifically in the new curriculum | Page 22 |
| ■ Enriching primary science..... | Page 22 |
| ■ Developing mastery in primary mathematics..... | Page 20 |
| ■ Space and astronomy - a context to teach primary STEM..... | Page 21 |
| ■ Teaching primary science outdoors..... | Page 21 |

SUPPORTING SUBJECT LEADERS

| | |
|--------------------------------------------------------------|---------|
| ■ Primary science subject leaders' network..... | Page 22 |
| ■ Assessment without levels | Page 21 |
| ■ Developing the role of the science subject leader | Page 21 |
| ■ Extending thinking and talking in primary science | Page 20 |
| ■ Developing the experienced science subject leader | Page 20 |
| ■ New to leading primary mathematics..... | Page 20 |
| ■ Putting science at the heart of Early Years | Page 22 |
| ■ Leading an effective design and technology curriculum..... | Page 20 |

All fees and award values are valid for state funded schools and are correct at the time of print (August 2016). See www.stem.org.uk for fee paying for schools and the latest information.

DESIGN AND TECHNOLOGY

INTENSIVE SUBJECT-SPECIFIC CPD

Accommodation and meals included

LEADING AN EFFECTIVE DESIGN AND TECHNOLOGY CURRICULUM

Develop your own subject knowledge and identify the role subject leaders play in developing a whole school approach to teaching design and technology.

- Your school receives: £700 ENTHUSE Award
- Activity fee: £600 (ex VAT)
- 9 Feb 2017 4 days
- www.stem.org.uk/ty011

USING IPADS AND OTHER TABLET DEVICES IN THE CLASSROOM

Learn how teaching with iPads and other tablet devices in your classroom can improve pupil engagement and motivation.

- Your school receives: £600 ENTHUSE Award
- Activity fee: £600 (ex VAT)
- 2 Feb 2017 2 days
- www.stem.org.uk/ty700

"I found implementing D&T in the national curriculum most useful as it has helped to develop my knowledge of D&T curriculum. I feel that I now have a greater understanding of what the national curriculum requirements are in school and what I can do to ensure that this requirements are being met across the school. I also found that the information on planning (long, medium and short) term very helpful."

- Leading an effective design and technology curriculum, 2016 participant

MATHEMATICS

INTENSIVE SUBJECT-SPECIFIC CPD

Accommodation and meals included

DEVELOPING MASTERY IN PRIMARY MATHEMATICS

Gain an understanding of what mastery is and how it can be used to challenge pupils and investigate strategies and resources that promote a deeper understanding in mathematics.

- Your school receives: £700 ENTHUSE Award
- Activity fee: £600 (ex VAT)
- 2 Mar 2017 2 days
- www.stem.org.uk/my002

MATHEMATICS FOR THE EARLY YEARS

Explore how children learn within mathematics and develop mastery in numbers.

- Your school receives: £700 ENTHUSE Award
- Activity fee: £500 (ex VAT)
- 15 Mar 2017 2 days
- www.stem.org.uk/my008

NEW TO LEADING PRIMARY MATHEMATICS

Explore the mastery approach to mathematics, develop your skills, knowledge and change the way the subject is taught in your school.

- Your school receives: £1,050 ENTHUSE Award
- Activity fee: £750 (ex VAT)
- 2 Feb 2017 3 days
- www.stem.org.uk/my004

"All sessions were extremely useful and I will take away a lot of practical ideas and strategies to use in the classroom."

- Developing Mastery in Primary Mathematics, 2016 participant

"I have learned many strategies and ideas from today that I can take back to school, implement and share with colleagues."

- Developing Mastery in Primary Mathematics, 2016 participant

SCIENCE

INTENSIVE SUBJECT-SPECIFIC CPD

Accommodation and meals included

DEVELOPING SCIENCE IN THE EARLY YEARS FOUNDATION STAGE

Aimed at science subject leaders and early years practitioners, this very practical CPD activity will help identify and demonstrate good teaching and learning.

- Your school receives: £1,400 ENTHUSE Award
- Activity fee: £1,000 (ex VAT)
- 10 Jan 2017 4 days
- www.stem.org.uk/ny012

DEVELOPING SUBJECT KNOWLEDGE THROUGH PRACTICAL ENQUIRY

Teaching primary science can be daunting, we will support your needs and increase your confidence. Improve your subject knowledge with practical enquiry-led activities.

- Your school receives: £1,050 ENTHUSE Award
- Activity fee: £750 (ex VAT)
- 27 Mar 2017 3 days
- www.stem.org.uk/ny040

DEVELOPING THE EXPERIENCED SCIENCE SUBJECT LEADER

Explore best practice and interact with research at local, national and international levels.

- Your school receives: £3,150 ENTHUSE Award
- Activity fee: £2,250 (ex VAT)
- 23 Jan 2017 11 days
- www.stem.org.uk/ny003

EXTENDING THINKING AND TALKING IN PRIMARY SCIENCE

Increase your confidence in teaching science and develop methods to stimulate curiosity, discussion and thinking in the primary classroom.

- Your school receives: £1,400 ENTHUSE Award
- Activity fee: £1,000 (ex VAT)
- 19 Jan 2017 4 days
- www.stem.org.uk/ny001

SCIENCE AND THE CREATIVE ARTS

Encourage creative approaches to curriculum planning and discover innovative methods of communicating through science.

- Your school receives: £1,400 ENTHUSE Award
- Activity fee: £1,000 (ex VAT)
- 28 Feb 2017 4 days
- www.stem.org.uk/ny008

SPACE AND ASTRONOMY - A CONTEXT TO TEACH PRIMARY STEM

Using inspirational elements of space and astronomy, you will engage in activities to extend pupils' knowledge.

- Your school receives: £700 ENTHUSE Award
- Activity fee: £500 (ex VAT)
- 13 Mar 2017 2 days
- www.stem.org.uk/ny017

TEACHING PRIMARY SCIENCE OUTDOORS

Teach science activities in the great outdoor environment and bring the fun back into teaching. Explore ideas to excite your children that will encourage learning.

- Your school receives: £1,400 ENTHUSE Award
- Activity fee: £1,000 (ex VAT)
- 5 Apr 2017 4 days
- www.stem.org.uk/ny009

USING DATA LOGGERS AND DIGITAL TECHNOLOGY IN PRIMARY SCIENCE

Explore how data loggers and other forms of digital technology can support learning in science.

- Your school receives: £700 ENTHUSE Award
- Activity fee: £500 (ex VAT)
- 20 Mar 2017 2 days
- www.stem.org.uk/ny011

ASSESSMENT AND PROGRESSION IN PRIMARY SCIENCE

Evidence shows that effective assessment for learning leads to raised attainment. Identify how you can integrate and embed assessment practices into your science teaching.

- Various dates and venues online
- www.stem.org.uk/rp102

CREATING A BUZZ AND RAISING THE PROFILE OF SCIENCE IN YOUR SCHOOL

You will leave full of practical ideas to enrich primary science in your school. You will be inspired to enthuse your pupils about the thrill of scientific ideas and enquiry.

- Various dates and venues online
- www.stem.org.uk/rp117

DEVELOPING THE ROLE OF THE SCIENCE SUBJECT LEADER

Explore a range of strategies to audit and lead science in your school, understand your role more fully and be able to identify and promote effective primary science.

- Various dates and venues online
- www.stem.org.uk/rp101

ENGAGING SCIENCE IN KEY STAGE 1

Try out ideas for practical science that can be used with young children to develop a range of scientific skills and explore opportunities to promote children's social skills.

- Various dates and venues online
- www.stem.org.uk/rp109

USING COMPUTING AND DATA LOGGING TO SUPPORT SCIENCE

Gain hands-on practical experience using digital technologies in science and be able to decide on the best use of the technology and integrate them into your science lessons.

- Various dates and venues online
- www.stem.org.uk/rp115

MAKING POWERFUL CONNECTIONS BETWEEN MATHEMATICS AND SCIENCE

Maximise your pupils' opportunities to develop their numeracy skills and improve attainment in science by planning lessons in which children effectively handle data.

- Various dates and venues online
- www.stem.org.uk/rp113

MAKING POWERFUL CONNECTIONS BETWEEN LITERACY AND SCIENCE

Explore the curriculum links between science and literacy and how to develop literacy skills to improve the quality of children's written explanations in science.

- Various dates and venues online
- www.stem.org.uk/rp114

PRIMARY CONFERENCE

Our primary conferences always provide outstanding learning opportunities linked to topical developments in primary science teaching, alongside plenty of time to talk and share ideas with other primary practitioners.

- Various dates and venues online
- www.stem.org.uk/rp124

PRIMARY SCIENCE SUBJECT LEADERS' NETWORK

These meetings are a chance for subject leaders to learn about the latest local and national initiatives in science and keep abreast of developments within the subject.

- Various dates and venues online
- www.stem.org.uk/rp121

PROMOTING THINKING AND TALKING IN PRIMARY SCIENCE

Consider the key elements of thinking, talking and communicating in science and develop these skills to create an effective learning environment.

- Various dates and venues online
- www.stem.org.uk/rp116

PUTTING SCIENCE AT THE HEART OF EARLY YEARS

Increase your confidence in using a range of approaches and assessment strategies to meet children's needs in Early Years.

- Various dates and venues online
- www.stem.org.uk/rp120

Bespoke CPD tailored to your needs

Our comprehensive range of support can be requested as a bespoke offer for your department, school or network. We can make the CPD more effective and tailored to the specific challenges and needs your school faces.

We have a proven track record of highly evaluated, impactful professional development and a wealth of experience in supporting teachers, technicians and support staff in all aspects of STEM education.

- www.stem.org.uk/ms/bespoke-cpd



SCIENCE continued

RAISING ATTAINMENT IN SCIENCE

Identify teaching and learning strategies that will move good lessons to outstanding lessons by focusing on the learning that happens in the classroom.

- Various dates and venues online
- www.stem.org.uk/rp103

STRENGTHENING SUBJECT UNDERSTANDING IN...

Focus on the big ideas in primary science, helping you make a difference to children's learning by identifying and challenging misconceptions.

- Various dates and venues online
- www.stem.org.uk/rp112

SUPERMARKET SCIENCE

This practical CPD will provide you with a bank of easy to use ideas that you can take away with you to enable your pupils to conduct experiments and have fun.

- Various dates and venues online
- www.stem.org.uk/rp125

USING YOUR OUTDOOR LEARNING ENVIRONMENT

Using the outside world, you can create exciting and inspiring investigations that will motivate and engage your pupils to learn.

- Various dates and venues online
- www.stem.org.uk/rp111

WHY CHILDREN NEED TO WORK SCIENTIFICALLY AND HOW THEY CAN

Learn to implement strategies for enquiry in order to improve children's outcomes through effective teaching of scientific enquiry.

- Various dates and venues online
- www.stem.org.uk/rp107

WORKING SCIENTIFICALLY IN THE PRIMARY CURRICULUM - PUPIL LED INVESTIGATIONS

Explore a range of techniques to draw out pupil ideas and develop strategies to incorporate these into your science lessons.

- Various dates and venues online
- www.stem.org.uk/rp108

ONLINE

Get to grips with one or all three of these free online cpd activities. We are offering high quality, online professional development delivered by world-leading experts.

DIFFERENTIATING FOR LEARNING

- 16 Jan 2017
- www.stem.org.uk/online-cpd

ASSESSMENT FOR LEARNING

- 27 Feb 2017
- www.stem.org.uk/online-cpd

BEHAVIOUR FOR LEARNING

- 24 Apr 2017
- www.stem.org.uk/online-cpd

"The course highlighted many important factors and the sessions were highly thought provoking. Furthermore, they have given me much to think about in terms of application to my own school and practice."

- Developing the experienced science subject leader, 2016 participant

principia mission

esa

UK esero

UK SPACE AGENCY

Tim Peake inspires

Have you and your pupils been inspired by Tim Peake's mission to the International Space Station (ISS)?

ESERO-UK has created a page dedicated to the educational resources linked in to Tim's mission and human spaceflight. These resources include:

- The magic of light - study light and colour using spectrometers and colour wheels.
- Explore the ISS with our great collection of resources looking at life aboard this flying laboratory

■ To explore the full range of free, STEM related resources visit:

www.stem.org.uk/esero/mp/tim-peake

• Rosetta primary resource book - seven activities themed around the mission, using interact games that will help to engage your class.

Primary Rolls-Royce Science Prize

The Rolls-Royce Science Prize supports teachers and technicians to implement mathematics and science teaching ideas into their schools. The awards programme culminates with a gala dinner celebration in November which is the highlight of many calendars.



Past winners have shown how excellence in mathematics and science teaching is recognised. They promote innovative and sustainable strategies for teaching science across the full spectrum, from special educational needs to high ability students.

One winner, who managed to speak to astronaut Tim Peake live on the International Space Station, was Rode Heath Primary School. Their aim was to inspire children to engage with STEM subjects through the exciting context of space, to awaken them to the possibilities that could be part of their future. The children were encouraged to design and make purposeful products

related to a life in space. This led to pupils who are motivated and want to come to school in the morning understanding more about STEM subjects and careers. They said: "We have nurtured a restless curiosity in our children, turning them into creators as opposed to users of technology".

Another recent winner developed a 'seed to supper' project with their pupils. At the Argyle Primary School they built links across the curriculum and all year groups, allowing children to gain an improved understanding of healthy eating, nutrition and improved community awareness of issues related to sustainability. Children made pizzas, had a

vegetable parade, looked at the water cycle, grew mushrooms and much more. This linked into year-round learning, the outdoor classroom and building children's scientific vocabulary.

- Find out more: www.stem.org.uk/mp/rolls-royce-science-prize

**Rolls-Royce
Science Prize**

What are you looking for?

PROFESSIONAL DEVELOPMENT

We offer high-impact professional development across the UK, and online, based on the latest developments in both pedagogy and STEM subjects. We can also tailor professional development to your school's specific needs with our bespoke CPD.

CAREERS EDUCATION

As well as a host of excellent resources on our website including the Careers Toolkit, we also run the STEM Insight programme to give you a unique experience in industry or university through inspiring placements.

INSPIRATION

We've got a host of ways to help you inspire your students: why not bring a STEM Ambassador into your school to talk about STEM subjects and careers, or start a STEM Club to build confidence and teamwork skills?

COMMUNITY

Share your ideas and challenges with teachers and technicians through our online groups and at our networking events. And join us on Twitter - we have over 20,000 like-minded educators following us.



National STEM Learning Centre and Network

RECOGNITION

Our recognition schemes and awards allow you, your department and school to showcase the impact you have on your students and colleagues.

RESOURCES

We have over 38,000 quality, STEM teaching resources, available online or at our centre. You can also browse teacher-made resources and submit your own.

STEM Learning operates the National STEM Learning Centre and Network, alongside other projects supporting STEM education

www.stem.org.uk