Classroom Olympics

Bring the Olympics into your classroom this summer

World-class CPD and resources from the National STEM Learning Centre and Network
Welcome to the third edition of STEM Learning magazine.

It’s been an exciting year for STEM – Tim Peake, a British ESA astronaut has flown to the International Space Station, gravitational waves in the fabric of space have been discovered, giving evidence for the collisions of black holes and the summer is set to be filled with even more highlights.

One event I’m looking forward to is the Rio de Janeiro Olympics in Brazil. Think of the million and one jobs that go into preparing for the Olympics and how many of them are STEM related: the sport scientists researching how to achieve peak performance; the engineers designing the innovative new stadiums, packed with swimming pools, running tracks and velodromes; the designers reducing every last millimetre of drag from the design of bikes, dinghies and helmets. Then there are the software designers creating websites, apps and booking systems for visitors attending the games; the technicians ensuring that all the sporting and broadcast equipment is working so we can see the action. Even the pilots and aero-nautical engineers creating and flying the planes that will bring athletes and visitors from across the world to the Games. With new technology and new discoveries being developed all the time, who knows what the Olympics of the future will look like, and which of your students will be involved?

As the world changes, one thing remains the same – the constant need for every country to inspire its young people in STEM so they have the skills to deal with an increasingly technological world and, for many of them, to become those advancing science, technology, engineering and mathematics for everyone’s benefit. As Gill Collinson mentions in her article on page 14, it’s predicted that over 14 million jobs will need to be filled between 2012 and 2022 in the STEM industries, so there is plenty of opportunity for all. So let’s embrace these exciting events, and use them to help more young people understand the possibilities that pursuing STEM subjects can open up for them.

YVONNE BAKER, CHIEF EXECUTIVE, NATIONAL STEM LEARNING CENTRE AND NETWORK
What does primary STEM look like?

by TANYA SHIELDS  
Professional Development Leader, National STEM Learning Centre and Network

The launch of the primary curriculum in 2013 saw an increased focus on providing children with an education that would enable them to contribute to the future prosperity of the country. If we are to truly offer a curriculum that enables children to successfully enter the skilled workforce we need to think carefully about how STEM education is fully integrated in our day-to-day teaching. STEM should not just be an acronym that is used to plan enrichment activities such as science weeks and challenge days.

STEM stands for science, technology, engineering and mathematics. Becoming a successful STEM educator does not mean changing everything you do. In most instances it’s a case of stepping back and recognising the work you already do. In the spring edition of our primary magazine, Rachel Jackson discussed the intrinsic link between mathematics and science by planning a coherent combination of mathematics and science lessons. Children not only have the opportunity to consolidate mathematical skills in science but they also improve their ability to draw scientific conclusions based on their findings. A good STEM curriculum should enable children to experience how science, technology, engineering and mathematics work together to improve the world in which we live.

While engineering might not be a subject commonly found in primary schools, there is no shortage of engineering skills being developed. Possibly some of the most creative engineering can be found in the early years foundation stage (EYFS) where children are encouraged to freely build structures, whether they be tall towers or imaginary space ships. The more formal teaching of engineering is embedded within the design technology curriculum where children are expected to design, make and evaluate.

The development of the new computing curriculum provides children and teachers with a wealth of creative and exciting new skills to explore. The introduction of coding to the curriculum has seen a boom in the number of children writing their own computer programmes. Back in December 2015 we saw a perfect example of how STEM subjects are intertwined. Astronaut Tim Peake’s launch to the international space station would not have been possible if it were not for STEM education. Not only is this a great news story but it’s also an excellent opportunity for children to see how their in-school education can be used in the real world. Tim took with him two Raspberry Pi computers and school children have been sending their code to the space station. One example is a reaction time test which Tim used to measure his changing abilities throughout his mission. Back on Earth, children can use the Stupendous Stepper activities from ‘In The Zone’ to find out if they can improve their reaction time through practice, or maybe even write their own code to measure their sporting achievements.

In short, STEM education doesn’t have to be complicated or time consuming. Simply make the time to ensure children knowingly use what they have learnt in one curriculum area and apply it to another curriculum area. Children will then begin to see how the STEM subjects are not single entities but subjects that rely on each other and when this knowledge is brought together amazing, life changing things can be achieved.

The launch of the primary curriculum in 2013 saw an increased focus on providing children with an education that would enable them to contribute to the future prosperity of the country. If we are to truly offer a curriculum that enables children to successfully enter the skilled workforce we need to think carefully about how STEM education is fully integrated in our day-to-day teaching. STEM should not just be an acronym that is used to plan enrichment activities such as science weeks and challenge days.

STEM stands for science, technology, engineering and mathematics. Becoming a successful STEM educator does not mean changing everything you do. In most instances it’s a case of stepping back and recognising the work you already do. In the spring edition of our primary magazine, Rachel Jackson discussed the intrinsic link between mathematics and science by planning a coherent combination of mathematics and science lessons. Children not only have the opportunity to consolidate mathematical skills in science but they also improve their ability to draw scientific conclusions based on their findings. A good STEM curriculum should enable children to experience how science, technology, engineering and mathematics work together to improve the world in which we live.

While engineering might not be a subject commonly found in primary schools, there is no shortage of engineering skills being developed. Possibly some of the most creative engineering can be found in the early years foundation stage (EYFS) where children are encouraged to freely build structures, whether they be tall towers or imaginary space ships. The more formal teaching of engineering is embedded within the design technology curriculum where children are expected to design, make and evaluate.

The development of the new computing curriculum provides children and teachers with a wealth of creative and exciting new skills to explore. The introduction of coding to the curriculum has seen a boom in the number of children writing their own computer programmes. Back in December 2015 we saw a perfect example of how STEM subjects are intertwined. Astronaut Tim Peake’s launch to the international space station would not have been possible if it were not for STEM education. Not only is this a great news story but it’s also an excellent opportunity for children to see how their in-school education can be used in the real world. Tim took with him two Raspberry Pi computers and school children have been sending their code to the space station. One example is a reaction time test which Tim used to measure his changing abilities throughout his mission. Back on Earth, children can use the Stupendous Stepper activities from ‘In The Zone’ to find out if they can improve their reaction time through practice, or maybe even write their own code to measure their sporting achievements.

In short, STEM education doesn’t have to be complicated or time consuming. Simply make the time to ensure children knowingly use what they have learnt in one curriculum area and apply it to another curriculum area. Children will then begin to see how the STEM subjects are not single entities but subjects that rely on each other and when this knowledge is brought together amazing, life changing things can be achieved.

The launch of the primary curriculum in 2013 saw an increased focus on providing children with an education that would enable them to contribute to the future prosperity of the country. If we are to truly offer a curriculum that enables children to successfully enter the skilled workforce we need to think carefully about how STEM education is fully integrated in our day-to-day teaching. STEM should not just be an acronym that is used to plan enrichment activities such as science weeks and challenge days.

STEM stands for science, technology, engineering and mathematics. Becoming a successful STEM educator does not mean changing everything you do. In most instances it’s a case of stepping back and recognising the work you already do. In the spring edition of our primary magazine, Rachel Jackson discussed the intrinsic link between mathematics and science by planning a coherent combination of mathematics and science lessons. Children not only have the opportunity to consolidate mathematical skills in science but they also improve their ability to draw scientific conclusions based on their findings. A good STEM curriculum should enable children to experience how science, technology, engineering and mathematics work together to improve the world in which we live.

While engineering might not be a subject commonly found in primary schools, there is no shortage of engineering skills being developed. Possibly some of the most creative engineering can be found in the early years foundation stage (EYFS) where children are encouraged to freely build structures, whether they be tall towers or imaginary space ships. The more formal teaching of engineering is embedded within the design technology curriculum where children are expected to design, make and evaluate.

The development of the new computing curriculum provides children and teachers with a wealth of creative and exciting new skills to explore. The introduction of coding to the curriculum has seen a boom in the number of children writing their own computer programmes. Back in December 2015 we saw a perfect example of how STEM subjects are intertwined. Astronaut Tim Peake’s launch to the international space station would not have been possible if it were not for STEM education. Not only is this a great news story but it’s also an excellent opportunity for children to see how their in-school education can be used in the real world. Tim took with him two Raspberry Pi computers and school children have been sending their code to the space station. One example is a reaction time test which Tim used to measure his changing abilities throughout his mission. Back on Earth, children can use the Stupendous Stepper activities from ‘In The Zone’ to find out if they can improve their reaction time through practice, or maybe even write their own code to measure their sporting achievements.

In short, STEM education doesn’t have to be complicated or time consuming. Simply make the time to ensure children knowingly use what they have learnt in one curriculum area and apply it to another curriculum area. Children will then begin to see how the STEM subjects are not single entities but subjects that rely on each other and when this knowledge is brought together amazing, life changing things can be achieved.
Taking the next step in coding

A great workshop can be inspiring.
But what happens when you get back to your own classroom? Do the new ideas and knowledge get to see the light of day? Two teachers tell us what they’ve got up to after finishing computing CPD in York.

by RUTH in Suffolk
Primary Mathematics Leader

Following my Scratch training, I was able to teach the Year 5 and Year 6 children to write their own Scratch programs and games using a wide range of commands, including sound and animation and so on.

Enjoyment and motivation definitely improved with many of the children downloading and using it at home and choosing Scratch as their chosen vehicle for producing their homework. One of my Year 5 boys wrote a program to show how to sort decimal numbers rather than making a leaflet or a poster as others did. It was great to see pupils applying their skills to other aspects of their schooling.

As mathematics leader, I was keen to develop some Scratch programs that I could use to demonstrate some of the solutions to maths problems and use Scratch as a means to practice skills and revise learning in maths. I used the freely available Mathematical challenges for able pupils for Key Stages 1 and 2 as a start. The children enjoyed seeing how these problems could be modelled through Scratch and the challenge to solve the problems in the first place improved my Scratch skills hugely.

My aim after attending the course was to become more confident myself in order to be able to support the learning for my pupils and to be able to assist colleagues too. After a number of weeks, I led some INSET in school and was able to support colleagues with Scratch plans and lessons in Years 3 and 4. Staff could also see how maths lessons could be used to support learning.

by ROB in Darlington
Key Stage 2 Teacher

Last February I attended training on the teaching of the new computing curriculum. It was a brilliant two days which inspired me to develop a coding ethos in the school.

I could see that the curriculum we were following took on much more work process and presentations. A picture which most stuck in my mind was a list of the different topics we had to make to get the children accessing the new computing curriculum.

It was simple as well – that was the best part – using online scratch software to meet the requirements of most of the new curriculum. By opening up the curriculum to computer coding you would be committing the children to access a whole new world of possibilities. I learnt a new term – debugging. The best thing is this does not involve the removal of creepy crawlies from children’s heads either!

So where are we now? Well, we have a brand new computing curriculum that centres around Scratch. This includes all year groups and not just Key Stages 2. The best bit is the children. They’re buzzing about being given the chance to code and they’re all becoming better programmers than I ever was.

Are we there yet? ‘No’ in a word. The pressure on the primary curriculum from literacy and numeracy means that teachers are only getting into the computer suite once a week at the moment, but it is a start and I do feel that we are giving the children all year groups the chance to develop these skills so that they can become the programmers of the future.

Could the Singapore Bar Model hold the key?

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

Laura had $240. She spent 5/8 of it. How much money did she have left?

When asked this question 78% of children in Singapore answered correctly, whilst only 25% of children in the United States did.

This question, highlighted on a course, intrigued me as solving worded problems proves to be a stumbling block for many children. So how does teaching differ in Singapore to produce this result?

As we went on to discover, this visual representation may hold the key…

In Singapore children are taught to use the Singapore Bar Model to represent a worded problem before performing the calculation. The example given would show two bars, the first representing 240 dollars and a second smaller bar representing 5/8th of this. This representation supports children in seeing that the answer must be less than 240 dollars and gives a visual representation of the calculation hidden within the words.

With this method being taught consistently in schools in Singapore and with a higher percentage of children able to answer worded problems successfully, I wonder if this could be part of the solution for teaching this tricky area. It is interesting to note that in a 2011 Ofsted report on good practice in primary mathematics an example of using the Singapore Bar Method is highlighted as an example of using a visual representation to aid conceptual understanding. Currently Maths Hubs across the country are working with primary schools using adapted versions of textbooks currently used in Singapore exploring the Concrete-Pictorial-Abstract way of teaching mathematics including the bar model.

When speaking with teachers and listening to experts in this field, it does appear to provide children with a visual representation of the calculation, so they can understand what needs to be done. Even though the calculation they perform may not always be carried out correctly, they are given the tools to unravel the often confusing worded problem and find the mathematics underneath.

The curriculum contains a much greater focus on problem solving and reasoning, at both primary and secondary level, so could the bar model could help provide a standard approach for worded problems and developing reasoning skills?

EXPLORE OUR COMPUTING CPD AND SEE WHERE IT COULD TAKE YOU)

LEADING THE NEW PRIMARY COMPUTING CURRICULUM
■ www.stem.org.uk/cy004

ASSESSMENT IN PRIMARY COMPUTING
■ www.stem.org.uk/cy092

CODING USING SCRATCH AND JIJOI
■ www.stem.org.uk/cy368

■ OPINION

FIND OUT MORE ABOUT THE BAR MODEL)

Inspirational ideas and more:
■ www.stem.org.uk/ck4e4f

We will be discussing the Bar Model at this year’s Primary mathematics conference in June:
■ www.stem.org.uk/my007
The best Early Years activities not only engage children, but engage their families too. The trick is to find age appropriate science experiences that also grab the attention of adults and get them talking, not only to their children, but to each other. Often though it is not what we do but the way that we do it that has the biggest impact.

Planting and growing sunflowers for example is perfect. The seeds are easily manipulated by small hands, germination is generally reliable and the resulting plants are dramatic. There are plenty of opportunities for children to measure, record and observe over time and to find out what a plant needs to grow. However, if children take their young plants home, the momentum is frequently lost and most of the plants are destined to remain in their small pots until they die a premature and stunted death. It doesn’t need to be like this. One year, I let families know that the sunflowers were to be ‘homework’ for the rest of the term. Every few days the children would bring home measuring kits and the day after measuring their sunflowers, adults were asked to come in with their child to support them to fill in a full scale graph of their sunflower. Families inevitably began to compare notes as they noticed that some plants were considerably taller than others. People who were not usually interested in gardening suddenly became very interested. Larger pots were bought, grandparents were consulted, and fertilizer was applied.

Even with high levels of engagement, it is still possible that the impact can be wasted; there is a danger that families do not realise that they are engaged in science, as some see science as a remote and difficult subject. It’s important to show that science is interesting and relevant if children are to realise that it could be a worthwhile subject to pursue when they are older.

I found that the class pages of the school website were a useful way to share information. To ensure that people regularly logged on I found that it was necessary to upload photographs and information regularly. Parents got used to reading, not only about what their child had been doing in school, but why and how they had been doing it, and how they could continue to support their learning at home.

Over time families came to realise that when I countered their requests for homework sheets with a suggestion that they might like to do some cooking, gardening or something else with their child, I was not fobbing them off. Moreover, they understood how they could get the most out of the experience because they had a better understanding of why they were doing it. They also began to change their views about science.

It’s important to show that science is interesting and relevant if children are to realise that it could be a worthwhile subject to pursue when they are older.
Food for thought

by STEPHANIE SINCLAIR
Senior Project Manager for The Crunch, Wellcome Trust
@wellcometrust

TIM BENTON
Champion of UK Global Food Security Programme, Professor, University of Leeds

The future of food is one of the greatest challenges on our plate. Did you know, for example, that about 11 tonnes of water are required to produce a kilogramme of steak? And even more surprisingly, 70% of the water used to grow our food is used overseas.

A green bean, perhaps grown in Morocco or Kenya, may require a bucket of water to produce. If we buy a packet of beans from overseas, leave them in the fridge until they’ve gone slimy and throw them away, it’s the equivalent of importing a bathtub of water from a drought-prone country and tipping it down the drain. What we eat and drink affects our health and our planet in astonishing ways.

The Wellcome Trust’s new project, The Crunch, has been set up to explore these very issues. With free events happening all over the UK, teachers, parents and students are being challenged to examine their relationships with food, our planet, and keeping ourselves healthy.

The Crunch’s website, thecrunch.wellcome.ac.uk, is used overseas.

Find out how you can engage with the Wellcome Trust’s new project at thecrunch.wellcome.ac.uk

Teachers, parents and students are being challenged to examine their relationships with food.

• how can we help crops to grow in difficult places?
• what will happen to the food we eat, and the food chains we are part of, if the climate changes?

There are some fantastic activities to get your class involved with. They could learn about digestion, including why certain foods are so good for us to eat; design menus for an astronaut, gladiator and superhero; how chickens are related to human health; grow plants hydroponically; debate the merits of genetically modified food; and discuss what our food will look like in the future.

This year all UK schools and colleges will receive free schools kits, packed with all these activities and more, to help teachers and learners examine our relationship with food, our planet, and keeping ourselves healthy.

Find out how you can engage with The Crunch at thecrunch.wellcome.ac.uk

The Aspires report produced by Kings College, London looked at young people’s science and career aspirations.

The five year study provided a series of messages for policy and practice. Here are a selection:

• efforts to broaden students’ aspirations, particularly in relation to STEM, need to begin at primary school. The current focus of most activities and interventions — at secondary school — is likely to be too little, too late
• breaking the pervasive perception that ‘studying science = becoming a scientist’
• embed STEM careers awareness in science lessons

The ‘Look to the future: the future needs STEM’ is a careers resource written to highlight some of the STEM career opportunities available so that pupils, teachers and school communities in primary schools can discuss and explore from an earlier age the breadth of jobs opportunities available. I have used this resource in many schools in my role as a space ambassador for ESERO-UK and every time I use it I wish someone had talked to me at an earlier age about careers.

The activity which teachers say they particularly enjoy delivering from the booklet is the activity where each pair of children is given a set of skills and qualities cards. These include words like hardworking, caring, reliable, determined, trustworthy etc. The children are asked to sort into skills and qualities and then identify which ones would describe the two people in the job profiles provided. These include astronaut Tim Peake and Katherine Jackson (Engineer).

The Aspires research showed that it is not a lack of interest in science that is causing a low uptake of STEM careers but instead a lack of awareness as to where science can lead. Using resources such as Look to the Future within lessons can help to broaden perspectives at this crucial age.
Bring the Olympics into your classroom

by TANYA SHIELDS
Professional Development Leader, National STEM Learning Centre and Network

How time flies! It’s been four years since the London Olympics and this summer sees the opening of the Olympic Games in Rio de Janeiro. The Olympics will be taking place in Brazil, from 5 to 21 of August, and the Paralympics will be taking place from 7 to 18 September.

We’ve come up with some great ideas to link up with the Olympics in your lessons. Each one of the activities we’ve suggested could be done in isolation, but why not link your science, computing, design and technology, engineering, and mathematics lessons in the build up to Brazil, and challenge your students to become ‘Olympic STEM champions’?

SCIENCE

Turn your classroom into a sports science laboratory this summer. There are so many great experiments you can get your pupils to do – testing their classmates’ reaction times, how exercise affects the heart and other organs, thinking about athletes’ diet. The list is endless! One challenge for Team GB will be the Brazilian climate.

Why not get the class investigating the amount of UV reactive beads to investigate the amount of UV light that hits their playground or sports field at different times of day? What time of day would be best to hold a race to avoid high UV? Could they investigate which sun cream the athletes should wear to protect their skin?

DESIGN AND TECHNOLOGY

Try getting your students to investigate the design of footwear for different sports which athletes need grippy shoes and which need slippery shoes? Using a Newton meter and a variety of sports shoes children can find out which shoes create the most friction when pulled across the floor.

How could you make them lighter, grip better, or keep athletes feet cool in hot South America? Challenge them to design a special shoe that will enable athletes to jump higher or run faster.

COMPUTING

Get your class coding this summer term – if you have access to a Nintendo Wii, why not bring it in and use their sports game to introduce some of the classic Olympic sports? Once they’ve got inspired by the game, challenge them to design their own Olympic game using Scratch. Over several lessons they can begin creating the game, debug the code and finally present their game to the class.

MATHEMATICS

The Olympics offer some great opportunities for data handling activities with an exciting context. From measuring lengths of arms and legs and seeing how these affect athletes’ success at various sports, to timing their classmates’ lap times and creating averages. If you’ve been doing Olympics challenges in all your lessons you could ask your class to analyse how well the class does across the whole range of activities and work out who is the ‘Olympics STEM champion’!

ENGINEERING

There’s so much you could do to link the Olympics and engineering – looking at exciting designs for the stadiums, examining the perfect running track or what materials would work best as different pieces of sporting equipment. But a great angle could be the Paralympics. Taking place in September, these Games will show case the application of science and engineering working together to build prosthetic limbs. Why not challenge your students to work in teams to design a prosthetic limb for a range of Olympic sports?

There is a wealth of resources and ideas out there to enrich your STEM curriculum and introduce children to the forthcoming games. You can also link this theme to literacy, art, drama, physical education - even the school lunches. We hope we’ve got you inspired – and if you decide to bring the Olympics into your classroom, don’t forget to Tweet us some pictures!

#STEMolympics16

GO FOR GOLD:
Activities in this article are inspired from our fantastic collection of online resources – you can browse over 10,000 free resources here:
www.stem.org.uk/mp/resources

12 Primary STEM Learning magazine
Primary STEM Learning magazine 13
Currently around 39% of companies that currently recruit employees with STEM skills are reporting difficulties in recruiting staff with STEM qualifications. This figure is set to rise due to the expansion of STEM industries and as the existing ageing STEM skilled workforce retire in the next few years.

There’s no question about it, studying STEM subjects helps young people to develop a wide range of skills. Some skills are specifically STEM-based, such as mathematical reasoning and data collection, whilst others, such as communication, team working and curiosity, are more generic but still crucial for everyday life.

We all know that providing effective careers information, advice and guidance to all young people has a positive impact on their social identity and sense of self, their choices, opportunities, economic and social understanding and skills. Here’s where you come in… one in five young people name teachers as the most important source of careers information, with the other two being parents (including carers) and friends. It is vital that primary teachers recognise and feel confident in making children aware of the skills needed to support them in future careers and of career options open to them and how they link to the things they are learning in school. Teachers need to be aware of the advances in industrial sectors and cutting edge research, and can apply this knowledge in their teaching practice.

The number of job opportunities across the UK over the next decade is huge. The United Kingdom Commission for Employment and Skills (UKCES), predicts that over 14 million jobs will need to be filled between 2012 and 2022. Most of the ‘hard to fill’ vacancies will be for people with strong STEM knowledge and skills.

Having read this far, it is clear you think this is important. You recognise that you can play a leading role in helping to improve children’s aspirations and you want to engage young people in fulfilling their STEM potential. Providing STEM careers information, which is embedded in the curriculum, makes STEM learning contextual and will support children to see how their learning can lead to STEM careers.

At the end of the day, no one expects you as a teacher, to be a careers expert. However, you are in a position to enthuse your classes about learning science, mathematics, computing, design and technology and engineering. You can stimulate their aspirations by weaving careers throughout the curriculum. Careers awareness is a powerful concept – positioned at the heart of education we can together inspire the next generation, to help us all realise the scientific breakthroughs of the future.
Our top picks for you to put in the calendar...

**WORLD TURTLE DAY**

23 MAY

Put it in your diaries, World Turtle Day takes place annually on 23 May. This resource from the Arkive collection is packed full of games and engaging materials to teach your pupils about the life cycle of turtles and the dangers they face on a daily basis.

- www.stem.org.uk/rx325k

**JUNE 2016**

**JUNE 2016**

**JUNE 2016**

**JUNE 2016**

**JUNE 2016**

**JUNE 2016**

**WORLD ENVIRONMENT DAY**

5 JUNE

Celebrate the biggest day for positive environmental action. Inspire your pupils with environment-related activities and resources, all based around the Earth and our carbon footprint.

- Find out more: www.unep.org/wwed

**FREE ONLINE CPD, DIFFERENTIATING FOR LEARNING**

20 JUNE

Transform your classroom by differentiating lessons to benefit students’ learning. Led by Dylan William and Christine Harrison, this CPD provides the opportunity to learn from two leading STEM education experts.

- Register your interest: www.stem.org.uk/mp/online-cpd

**OLYMPIC GAMES 2016**

5-21 AUGUST

As the Olympic Games approach, why not use these Olympic Games-related activities to help engage and inspire pupils? Covering science, technology, engineering, and mathematics, these resources can be used in individual lessons or as part of a cross-curricular Olympic theme.

- www.stem.org.uk/tx5rz

**2016 summer conferences**

Want to improve your skills over the summer? Come along to one of our subject specific conferences held at the National STEM Learning Centre in York. With everything from developing your coding knowledge to teaching the more difficult aspects of the mathematics curriculum, we have something for everyone. Plus get your creative juices flowing in our inspiring Centre and check out the physical resources we have available in our library.

**USING STEM RESEARCH CONFERENCE: USING RESEARCH TO IMPROVE TEACHING AND LEARNING OF STEM SUBJECTS**

We’re giving you the opportunity to learn how to effectively use research to improve your lessons with evidence-based teaching. Featuring keynote speakers like expert Professor Shirley Simon, interactive workshops, discussions, and debates all based around academic papers and case studies provided by teacher participants. Don’t miss out on your chance to maximise your impact on the teaching of STEM subjects.

- 20 May 2016: 2 days
- www.stem.org.uk/mp/enthuse-celebration-awards

**ENTHUSE CELEBRATION AWARDS**

5 JULY

The ENTHUSE Celebration Awards are presented each year to recognise the impact that teachers, technicians and support staff have on their pupils, colleagues, schools, colleges and peers, as a result of ENTHUSE supported professional development.

Applications are now open to apply for the awards, the dinner and ceremony will be held on 5 July at the Wellcome Trust Building in London.

- Sign up now: www.stem.org.uk/mp/enthuse-celebration-awards

**PRIMARY SCIENCE CONFERENCE**

Inspire children and colleagues to enjoy science and develop a range of creative and cross-curricular approaches to primary science.

- 1 Jul 2016: 1 day
- www.stem.org.uk/ny007

**PRIMARIES MATHEMATICS CONFERENCE**

As an inspiring day of workshops with opportunities to discuss mathematics education with a broad range of colleagues.

- 30 Jun 2016: 1 day
- www.stem.org.uk/my007

**COMPUTING CONFERENCE WITH CAS REGIONAL CENTRE FOR YORKSHIRE AND HUMBER**

Featuring sessions from leaders in computing education and CAS Master Teachers, this conference is an ideal opportunity to learn about computing at all phases of education and to share ideas.

- 29 Jun 2016: 1 day
- www.stem.org.uk/ry007

**USING STEM RESEARCH CONFERENCE: USING RESEARCH TO IMPROVE TEACHING AND LEARNING OF STEM SUBJECTS**

We’re giving you the opportunity to learn how to effectively use research to improve your lessons with evidence-based teaching. Featuring keynote speakers like expert Professor Shirley Simon, interactive workshops, discussions, and debates all based around academic papers and case studies provided by teacher participants. Don’t miss out on your chance to maximise your impact on the teaching of STEM subjects.

- 20 May 2016: 2 days
- www.stem.org.uk/mp/enthuse-celebration-awards

**ENTHUSE CELEBRATION AWARDS**

5 JULY

The ENTHUSE Celebration Awards are presented each year to recognise the impact that teachers, technicians and support staff have on their pupils, colleagues, schools, colleges and peers, as a result of ENTHUSE supported professional development.

Applications are now open to apply for the awards, the dinner and ceremony will be held on 5 July at the Wellcome Trust Building in London.

- Sign up now: www.stem.org.uk/mp/enthuse-celebration-awards

**PRIMARY SCIENCE CONFERENCE**

Inspire children and colleagues to enjoy science and develop a range of creative and cross-curricular approaches to primary science.

- 1 Jul 2016: 1 day
- www.stem.org.uk/ny007

**PRIMARIES MATHEMATICS CONFERENCE**

As an inspiring day of workshops with opportunities to discuss mathematics education with a broad range of colleagues.

- 30 Jun 2016: 1 day
- www.stem.org.uk/my007

**COMPUTING CONFERENCE WITH CAS REGIONAL CENTRE FOR YORKSHIRE AND HUMBER**

Featuring sessions from leaders in computing education and CAS Master Teachers, this conference is an ideal opportunity to learn about computing at all phases of education and to share ideas.

- 29 Jun 2016: 1 day
- www.stem.org.uk/ry007

**ENTHUSE CELEBRATION AWARDS**

5 JULY

The ENTHUSE Celebration Awards are presented each year to recognise the impact that teachers, technicians and support staff have on their pupils, colleagues, schools, colleges and peers, as a result of ENTHUSE supported professional development.

Applications are now open to apply for the awards, the dinner and ceremony will be held on 5 July at the Wellcome Trust Building in London.

- Sign up now: www.stem.org.uk/mp/enthuse-celebration-awards

**PRIMARY SCIENCE CONFERENCE**

Inspire children and colleagues to enjoy science and develop a range of creative and cross-curricular approaches to primary science.

- 1 Jul 2016: 1 day
- www.stem.org.uk/ny007

**PRIMARIES MATHEMATICS CONFERENCE**

As an inspiring day of workshops with opportunities to discuss mathematics education with a broad range of colleagues.

- 30 Jun 2016: 1 day
- www.stem.org.uk/my007

**COMPUTING CONFERENCE WITH CAS REGIONAL CENTRE FOR YORKSHIRE AND HUMBER**

Featuring sessions from leaders in computing education and CAS Master Teachers, this conference is an ideal opportunity to learn about computing at all phases of education and to share ideas.

- 29 Jun 2016: 1 day
- www.stem.org.uk/ry007

**ENTHUSE CELEBRATION AWARDS**

5 JULY

The ENTHUSE Celebration Awards are presented each year to recognise the impact that teachers, technicians and support staff have on their pupils, colleagues, schools, colleges and peers, as a result of ENTHUSE supported professional development.

Applications are now open to apply for the awards, the dinner and ceremony will be held on 5 July at the Wellcome Trust Building in London.

- Sign up now: www.stem.org.uk/mp/enthuse-celebration-awards

**PRIMARY SCIENCE CONFERENCE**

Inspire children and colleagues to enjoy science and develop a range of creative and cross-curricular approaches to primary science.

- 1 Jul 2016: 1 day
- www.stem.org.uk/ny007

**PRIMARIES MATHEMATICS CONFERENCE**

As an inspiring day of workshops with opportunities to discuss mathematics education with a broad range of colleagues.

- 30 Jun 2016: 1 day
- www.stem.org.uk/my007
We have chosen a selection of key themes and activities for you:

TEACHING AND LEARNING
- Developing subject knowledge for primary teachers - Page 20
- Primary design and technology projects, ideas and resources - Page 19
- Differentiation: supporting able students in STEM - Page 20
- Why children need to work scientifically and how they can - Page 20
- Making powerful connections between mathematics and science - Page 20
- Making powerful connections between literacy and science - Page 20

PROGRESSION, MODERATION AND ASSESSMENT
- Assessing, moderating and tracking primary science - Page 20
- Assessment in primary computing - Page 19
- Assessment in primary mathematics - Page 19
- Assessment and progression in primary science - Page 19
- Developing the role of the science subject leader
- Raising attainment in science - Page 20

SUBJECT KNOWLEDGE
- New and aspiring primary science specialist - Page 21
- Bringing Mars exploration into the primary classroom - Page 19
- Power ups, extra lives and zombies – enriching the KS2 curriculum through games creation - Page 19
- Embedding the science national curriculum - Page 20
- Using computing and data logging to support science - Page 20
- Strengthening subject understanding in... - Page 20

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

High quality professional development that makes an impact.

You can access our CPD online, face-to-face locally through Science Learning Partnerships (SLPs) and on ENTHUSE bursary funded residential activities at the National STEM Learning Centre. We can also tailor our CPD to meet the individual needs of your department, school or network through our bespoke support.

The support we provide is grounded in up-to-date research evidence which reflects current issues in STEM education and can be mapped to national standards. Participants’ feedback consistently rates our support as of the highest quality and most impactful experiences they have had during their teaching career.

We have chosen a selection of key themes and activities for you:
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.
• Look for dates and venues online www.stem.org.uk/rp120

RAISING ATTAINMENT IN SCIENCE
Identify teaching and learning strategies that will move good lessons to outstanding lessons by focussing on the learning happening in the classroom.
• Look for 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 misconception.
• Look for 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.
• Look for dates and venues online www.stem.org.uk/rp125

USING COMPUTING AND DATA LOGGING TO SUPPORT SCIENCE
Gain hands-on practical experience using digital technologies in science and be able to develop your own ideas on the best use of the technology and integrate them into your science lessons.
• Look for dates and venues online www.stem.org.uk/rp115

USING YOUR OUTDOOR LEARNING ENVIRONMENT
Using the outside world we will create exciting and inspiring investigations that will motivate and engage your pupils to learn.
• Look for 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.
• Look for dates and venues online www.stem.org.uk/rp107

WORKING SCIENTIFICALLY IN THE PRIMARY CURRICULUM - PUPIL LED INVESTIGATIONS
You will explore a range of techniques to draw out pupil ideas and develop strategies to inspire and incorporate these ideas into your science lessons.
• Look for dates and venues online www.stem.org.uk/rp108

INTENSIVE SUBJECT-SPECIFIC CPD Accommodation and meals included
ASSESSING, MODERATING AND TRACKING PRIMARY SCIENCE
Ideal for teachers who want to familiarise themselves with the current expectations around assessment and children’s progress in science.
• Your school receives: £1,050 ENTHUSE Award
• Activity fee: £900 (ex VAT)
• 20 Oct 2016 3 days over 2 periods www.stem.org.uk/ny082

DEVELOPING AN OUTSTANDING PRIMARY SCIENCE CURRICULUM
This CPD activity will give you either a starting point or springboard to practical advice and a range of approaches for developing a primary science curriculum.
• Your school receives: £1,050 ENTHUSE Award
• Activity fee: £900 (ex VAT)
• 13 Dec 2016 3 days over 2 periods www.stem.org.uk/ny044

DEVELOPING SUBJECT KNOWLEDGE FOR PRIMARY TEACHERS
Improve subject knowledge and develop your ability to deliver high quality science lessons and address pupils’ misconceptions.
• Your school receives: £2,100 ENTHUSE Award
• Activity fee: £1,800 (ex VAT)
• 27 Sep 2016 4 days over 2 periods www.stem.org.uk/ny046

DIFFERENTIATION: SUPPORTING ABDENT STUDENTS IN STEM
This course supports you in providing differentiation for high ability students and ensuring that they are sufficiently challenged to fulfil their potential.
• Your school receives: £1,050 ENTHUSE Award
• Activity fee: £900 (ex VAT)
• 2 Nov 2016 3 days over 2 periods www.stem.org.uk/ny048

EMBEDDING WORKING SCIENTIFICALLY IN THE PRIMARY CURRICULUM
Practical science is essential for inspiring children and teachers alike, you will develop practical strategies to enhance learning in primary science.
• Your school receives: £1,050 ENTHUSE Award
• Activity fee: £900 (ex VAT)
• 2 Nov 2016 3 days www.stem.org.uk/ny070

ENRICHING PRIMARY SCIENCE THROUGH INSPIRATIONAL IDEAS
A perfect opportunity to explore some of the activities which you could do during science weeks with something for every budget.
• Your school receives: £1,050 ENTHUSE Award
• Activity fee: £900 (ex VAT)
• 14 Nov 2016 1 day www.stem.org.uk/ny046

IMPROVING NUMERACY AND LITERACY THROUGH SCIENCE
Revealing how to use the curiosity and enthusiasm generated through science, to connect with support and enhance children’s learning in mathematics and English.
• Your school receives: £1,400 ENTHUSE Award
• Activity fee: £1,200 (ex VAT)
• 27 Sep 2016 4 days over 2 periods www.stem.org.uk/ny030

NEW AND ASPIRING PRIMARY SCIENCE SPECIALIST
This CPD activity will help you develop the knowledge, skills and confidence to become a primary science specialist covering the way science is taught in your school.
• Your school receives: £3,150 ENTHUSE Award
• Activity fee: £2,925 (ex VAT)
• 28 Nov 2016 6 days over 3 periods www.stem.org.uk/ny045

SUPPORTING SEN PUPILS IN THE PRIMARY SCIENCE SUBJECT
Focusing on how best we can support and motivate less able pupils, you will be given the opportunity to engage with current theory and best practice in the field.
• Your school receives: £1,050 ENTHUSE Award
• Activity fee: £900 (ex VAT)
• 7 Nov 2016 3 days over 2 periods www.stem.org.uk/ny043

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 in your classroom.
• Look for dates and venues online www.stem.org.uk/rp116

FOCUSING ON THE BIG IDEAS IN PRIMARY SCIENCE, HELPING YOU MAKE A DIFFERENCE TO CHILDREN’S LEARNING BY IDENTIFYING AND CHALLENGING MISCONCEPTION
• Look for dates and venues online www.stem.org.uk/rp103

MAKING POWERFUL CONNECTIONS BETWEEN MATHS 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.
• Look for dates and venues online www.stem.org.uk/rp113

LOOKING FOR DATES AND VENUES ONLINE
Look for dates and venues online
www.stem.org.uk/rp109
www.stem.org.uk/rp111
www.stem.org.uk/ny052
www.stem.org.uk/rp103
www.stem.org.uk/rp124
www.stem.org.uk/rp125
www.stem.org.uk/rp115
www.stem.org.uk/rp112
www.stem.org.uk/ny054
www.stem.org.uk/ny044
www.stem.org.uk/ny048
www.stem.org.uk/ny046
www.stem.org.uk/ny045
www.stem.org.uk/ny043
www.stem.org.uk/online-cpd
www.stem.org.uk/mp/bespoke-cpd

FOR MORE DATES AND VENUES VISIT WWW.STEM.ORG.UK/CPD

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.

YOUR SCHOOL RECEIVES: £1,050 ENTHUSE AWARD
ACTIVITY FEE: £900 (EX VAT)

FOR MORE DATES AND VENUES VISIT WWW.STEM.ORG.UK/CPD

CPD LISTING Primary STEM Learning magazine

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.
Supporting state funded schools across the UK
with access to high impact professional development.

ENTHUSE AWARDS
Bursaries available to all state funded schools and colleges in the UK to support participation in professional development through the National STEM Learning Centre and partners in Scotland, Northern Ireland and Wales. See our full CPD listing on page 18.

www.stem.org.uk/mp/enthuse

INTENSIVE ENTHUSE AWARDS
£5,000 bursaries to support in-school, consultant led professional development for state schools in England that have not participated in Project ENTHUSE supported professional development in the last five years.

www.stem.org.uk/mp/intensive-enthuse

ENTHUSE PARTNERSHIPS
£12,000 for groups of between four and eight primary schools located in England, working together to address local issues of underachievement in science/STEM subjects.

www.stem.org.uk/mp/enthuse-partnership

TEACHER INDUSTRIAL PARTNERS’ SCHEME
To ensure that your students are informed for the next academic or industrial phase of their lives, it is crucial that teachers keep up-to-date with both modern career options and routes into academia.

www.stem.org.uk/mp/tips

www.stem.org.uk/mp/taps

Don’t miss out
on everything our website has to offer

www.stem.org.uk

Join our community
Share ideas, problems and best practice
in our vibrant community groups

Personalise your experience
Use your dashboard to find and store
information tailored to your interests

Recognition
Demonstrate the positive impact of your professional development

Access resources
Download exciting resources
to use in the classroom and
share your own

Book CPD activities
Enhance your learning with CPD activities
and have a positive impact on yourself,
your students and your school

Bespoke CPD
Identify your CPD needs and
get tailored support to meet your requirements
National STEM Learning Centre and Network

Working to achieve a world leading education for all young people in science, technology, engineering and mathematics.

Find out more at www.stem.org.uk

Please see www.stem.org.uk/science-learning-partnerships for the latest information. All venues are correct at time of print, March 2016.