

Liverpool Festival of  
**science**   
**technology**

30th June – 3rd July 2009

200 YEARS – CHARLES DARWIN

40 YEARS – MAN ON THE MOON

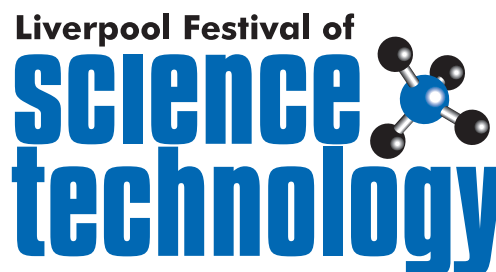


NATIONAL MUSEUMS **LIVERPOOL**

# Welcome...

... to the inaugural

## Liverpool Festival of Science and Technology 2009



The festival will be a celebration of Science, Technology, Engineering and Mathematics (STEM).

The programme will endeavour to inspire and excite the Scientists, Technologists, Engineers and Mathematicians of the future. The fun activities, enlightening workshops and thought provoking talks will give students the opportunity to experience the excitement of STEM in a way that will complement and enhance their school curriculum.

### How to plan and book your day out at the Liverpool Festival of Science and Technology

#### Book early!

Activities and workshops will fill up quickly. To avoid disappointment book early. Booking lines are now open. All sessions will be allocated on a first-come first-served basis. Please note that some workshops are unable to accommodate full classes of 30 or more pupils, maximum numbers are listed next to each workshop.

#### Choose your events

Key Stage 2 (blue pages in this programme)  
Choose 3 events for the day. Use the timetable on page 5 to help plan your day. In addition there will be lots of things to see in the museum and additional activities to excite students between timetabled sessions.

Key Stage 3, 4 and post-16 (green pages in this programme)

Choose up to a maximum of 3 events for the day, time permitting. Use the timetable on pages 6-7 to help you plan.

### Useful Information

#### Venues

Key Stage 2 activities will be held at the World Museum, William Brown St. or the Conservation Centre, Whitechapel.

Key Stages 3, 4 and post-16 events will be located at Liverpool John Moores University in the James Parsons Building, Byrom St.

#### Access

All venues for workshops and activities are fully accessible. However if any member of your party has special access needs please let us know at the time of booking.

### Make your booking

Decide which sessions you would like to book into, and then use the timetables to plan your day. Please be aware that some workshops or activities might already be fully booked, have second and third choices ready. Please complete the booking form on the back page and have it to hand before calling our booking line. When you are ready to book, call 0151 231 2400 where our experienced team will be able to advise you and ensure that your day at the Festival will be a great success.

### Once you have made your booking

Once your booking has been made you will be sent confirmation and an invoice. Final confirmation, together with information detailing your provisional timetable for the day, coach parking and drop off details etc will be sent to your school by mid June.

#### Cost

£4.00 per child

Accompanying adults are free.

#### Lunch

It may be advisable for students to bring with them all the refreshments they will require on the day, although there are small catering outlets at all the venues.

#### Cloakroom

There are no cloakroom facilities.

#### Safety and Security

The venues for the Festival are open to the public, so children should be accompanied by an adult at all times. Responsibility for the safety of pupils lies with the accompanying adults and not with the venue staff, workshop providers or Festival assistants.

## Key Stage 2 programme events listed in alphabetical order

### Tuesday 30th June - Friday 3rd July

#### **Chemistry with Cabbage**

During this practical workshop pupils will have the chance to make their own indicator from a cabbage and then use it to test a variety of household chemicals. Students will also look at neutralisation and investigate the properties of acids.

*Days: Fri*

*Duration: 45 minutes*

*Maximum number: 45*

#### **Close Encounters of the Feathered Kind**

Students will gain a thrilling insight into the amazing world of birds of prey. They will have the opportunity to watch the birds close up, to learn about their habitat and their position in the food chain. It is an experience not to be missed!

*Days: Tues, Wed, Thurs & Fri*

*Duration: 45 minutes*

*Maximum number: 30*

#### **Dinosaurs**

In 1842 a new word entered the English language, "dinosaur". These were animals unlike any other – monstrous in size and with no apparent living descendants. But what were animals such as Tyrannosaurus, Triceratops and Diplodocus truly like? Using images, activities and specimens from the museum's collections pupils will find out about the characteristics of dinosaurs and where their fossilised remains were found as well as considering the different theories and reasons why dinosaurs became extinct... or did they?

*Days: Wed and Fri*

*Duration: 40 minutes*

*Maximum number: 35*

#### **Extra Electricity**

This workshop gives children an opportunity to investigate different electrical circuits, including the use of different components, using solar cells in lieu of batteries.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 45 minutes*

*Maximum number: 30*

#### **Life in a Rockpool**

This session recreates some of the wonders of rockpools using live animals from the museum's aquarium. Our expert aquarists take the group on an exploration to meet some of the animals found in British rockpool habitats. Using some of the latest technology pupils can have a close encounter with live sea creatures such as Crabs, Hermit Crabs, Anemones and Starfish. Pupils will learn about some of the adaptations that help these animals to survive in rockpools.

*Days: Tues, Thurs & Fri*

*Duration: 40 minutes*

*Maximum number: 35*

#### **Polar Bears**

Come and meet the life-like polar bear, Bjorn and his handler Ursula and find out about Polar Bears and their environment; what they eat, where they come from and even what star sign they are! Discover what it is like to get up close and personal with one of

these incredible endangered animals. Students will also be able to try on some Inuit clothing and handle Inuit objects from the museum.

This amazing show must be seen to be believed!

*Days: Thurs & Fri*

*Duration: 45 minutes*

*Maximum number: 45*

#### **Revealing All**

In order to find out more about museum objects conservators have to examine them very closely. They use many different methods to reveal the objects hidden secrets. Some involve simple observation while others require powerful microscopes and other specialised equipment. In this workshop students will see some of these methods demonstrated and have the opportunity to try out others for themselves.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 45 minutes*

*Maximum number: 35*

#### **'Science of the Circus'**

During this fun show pupils will get the chance to play on circus toys and find out about Tension, Gravity, and Friction. The fast moving show will also see 'Gary the Clown' demonstrate lots of circus skills and magic highlighting 'Forces'.

*Days: Tues & Wed*

*Duration: 45 minutes*

*Maximum number: 30*

## Key Stage 2 programme events listed in alphabetical order

### Tuesday 30th June - Friday 3rd July

#### Spiders, Scorpions and Insects

Did you know that over 80% of all living creatures on the planet are arthropods and their existence dates back before the dinosaurs! During this session the ecology, adaptations and lifestyles of these amazing animals will be examined. Using video-microscope technology, real museum specimens and live animals pupils will get the chance to interact with three really successful arthropod groups – the insects, arachnids and myriapods. See a scorpion glow under UV light, learn why stick insects camouflage and discover how we can tell a spider is a girl by her bottom!

Days: Tues & Thurs  
Duration: 45 minutes  
Maximum number: 35

#### Solids, Liquids and Gases

A tale of Victorian science. This visual show reviews some of the science of the 19th century that scientists discovered and how it laid down the foundations of our 21st century thinking.

Days: Tues, Wed, Thurs & Fri  
Duration: 1 hr  
Maximum Number: 97

#### Sorting Allsorts!

A workshop that looks at a large variety of materials and their properties. Students will use sorting diagrams to classify these materials by sorting them into specific groups and determine if they are a solid, liquid or gas.

Days: Tues, Wed & Thurs  
Duration: 45 minutes  
Maximum number: 30

#### The Magic Garden Show

What is needed to make plants grow? Students watch as a seed is planted and see it grow during the show. From what they learn the children will be able to take part in games, competitions and hands on activities.

Days: Thurs & Fri  
Duration: 45 minutes  
Maximum number: 30

#### Wonders of the Solar System

Using real images from space missions and the Hubble Space Telescope, along with fantastic computer generated video sequences students will be taken on a journey through the Solar System. Stopping off at each of the planets we will find out about their surface, atmosphere and moons and discover many things about our corner of space. We will find out about the phases of the moon and how people used the sun to tell the time before clocks and watches were invented.

Days: Tues, Wed, Thurs & Fri  
Duration: 50 minutes  
Maximum number: 62

While you are at the festival why not drop in to **The Beat Goes On** exhibition which highlights the remarkable achievements of Merseyside artists. Listen to jukeboxes, mix your own tracks, strut your stuff on our dance floor and tune into the vibe that is Liverpool music.

A small exhibition called Voyage of the Beagle and the Darwin Discovery Trail fun quiz are the latest World Museum Liverpool events marking the 200th anniversary of the great scientist's birth. Look out for Darwin you just might bump into him!

BOOK

0151 231 2400

NOW



The poster for CREST Awards features a blue starburst logo with the text 'BRITISH SCIENCE ASSOCIATION CREST Awards'. It describes CREST as a nationwide curriculum enrichment award scheme for STEM subjects. It mentions that through CREST award schemes, young people aged 11-19 explore the real nature of STEM by doing their own creative project work. It lists 'Explore a host of exciting project ideas' with the website [www.britishecienceassociation.org/crest/](http://www.britishecienceassociation.org/crest/). A section titled 'Have you finished a great CREST project?' provides instructions on how to apply for an award and lists contact information for the British Science Association. At the bottom, it states 'Great Achievement is earned at primary aged children. The scheme enables children to solve scientific problems through practical investigation. For more information visit [www.britishecienceassociation.org/crest/](http://www.britishecienceassociation.org/crest/)'. The poster also includes a photo of a group of children and a circular inset of a girl's face.

## Timetables for Key Stage 2

### Tuesday 30th June 2009

Session 1 (10.00 - 10.45)	Session 2 (11.00 - 11.45)	Session 3 (12.00 - 12.45)	Session 4 (13.45 - 14.30)
Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind
Extra Electricity	Extra Electricity	Extra Electricity	Extra Electricity
Life in a Rockpool	Life in a Rockpool	Life in a Rockpool	Life in a Rockpool
Revealing All	Revealing All	Revealing All	Revealing All
Science of the Circus	Science of the Circus	Science of the Circus	Science of the Circus
Solids, Liquids & Gases	Spiders, Scorpions & Insects	Solids, Liquids & Gases	Solids, Liquids & Gases
Sorting Allsorts	Wonders of the Solar System	Spiders, Scorpions & Insects	Sorting Allsorts
Spiders, Scorpions & Insects		Wonders of the Solar System	Spiders, Scorpions & Insects
Wonders of the Solar System			Wonders of the Solar System

### Wednesday 1st July 2009

Session 1 (10.00 - 10.45)	Session 2 (11.00 - 11.45)	Session 3 (12.00 - 12.45)	Session 4 (13.45 - 14.30)
Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind	Extra Electricity	Close Encounters of the Feathered Kind
Extra Electricity	Extra Electricity	Science of the Circus	Dinosaurs
Revealing All	Revealing All	Solids, Liquids & Gases	Extra Electricity
Science of the Circus	Science of the Circus	Wonders of the Solar System	Science of the Circus
Solids, Liquids & Gases	Sorting Allsorts		Solids, Liquids & Gases
Sorting Allsorts	Wonders of the Solar System		
Wonders of the Solar System			

### Thursday 2nd July

Session 1 (10.00 - 10.45)	Session 2 (11.00 - 11.45)	Session 3 (12.00 - 12.45)	Session 4 (13.45 - 14.30)
Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind	Extra Electricity	Close Encounters of the Feathered Kind
Extra Electricity	Extra Electricity	Life in a Rockpool	Extra Electricity
Life in a Rockpool	Life in a Rockpool	Polar Bears	Life in a Rockpool
Polar Bears	Revealing All	Revealing All	Revealing All
Revealing All	The Magic Garden	The Magic Garden	Solids, Liquids & Gases
The Magic Garden	Wonders of the Solar System	Wonders of the Solar System	Sorting Allsorts
Wonders of the Solar System			Spiders, Scorpions & Insects
			The Magic Garden
			Wonders of the Solar System

### Friday 3rd July 2009

Session 1 (10.00 - 10.45)	Session 2 (11.00 - 11.45)	Session 3 (12.00 - 12.45)	Session 4 (13.45 - 14.30)
Chemistry with Cabbage	Chemistry with Cabbage	Chemistry with Cabbage	Chemistry with Cabbage
Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind	Close Encounters of the Feathered Kind
Dinosaurs	Dinosaurs	Dinosaurs	Dinosaurs
Extra Electricity	Extra Electricity	Extra Electricity	Extra Electricity
Life in a Rockpool	Life in a Rockpool	Life in a Rockpool	Life in a Rockpool
Polar Bears	Revealing All	Polar Bears	Polar Bears
Revealing All	The Magic Garden Show	Revealing All	Revealing All
Solids, Liquids & Gases	Wonders of the Solar System	Solids, Liquids & Gases	Solids, Liquids & Gases
The Magic Garden Show		The Magic Garden Show	The Magic Garden Show
Wonders of the Solar System		Wonders of the Solar System	Wonders of the Solar System

# timetable

	10:00	10:15	10:30	10:45	11:00	11:15	11:30	11:45	12:00	12:15	12:30	
Tuesday	Chemistry With Cabbage			Chemistry of Light						Chemistry W		
	Code Breaking			Frogs								
	Everyday Life not Rocket Science			Everyday Life not Rocket Science								
	Exploding Vegetables			Exploding Vegetables								
	Climate Change? Build you own Maglev Train!											
	Hominid Evolution			Hominid Evolution								
	Introduction to DNA											
	Living & Working in Space			Living & Working in Space								
	Universal Cycles			Proof								
	Now Hear This			Now Hear This								
	Physical Science			Physical Science								
	Scanning Electron Microscopy			The Real Science of the Circus						S		
	The Real Science of the Circus			The Wrangler								
The Wrangler			The Wrangler									
Wednesday	Army Engineering - Bridge Building			Army Engineering - Bridge Building			Army Engineering - Bridge Bu					
	Black holes, Quasars & Robotic Telescopes											
	Chemistry With Cabbage			Chemistry in Sport						Chemistry W		
	Chemistry in Sport			Chemistry of Light								
	Code Breaking			Frogs								
	Climate Change? Build you own Maglev Train!											
	Everyday Life not Rocket Science			Everyday Life not Rocket Science								
	Exploding Vegetables			Exploding Vegetables								
	Hominid Evolution			Hominid Evolution								
	Human & Animal Poisoning by Plants											
				Hunting for Asteroids								
	Introduction to DNA											
	Living & Working in Space			Living & Working in Space								
Universal Cycles			Proof									
Now Hear This			Now Hear This									
Pushing Pixels: The Art & Science			Pushing Pixels: The Art & Science									
Scanning Electron Microscopy			The Wrangler						S			
The Wrangler			The Wrangler									
Thursday	Biology in Sport			Biology in Sport						Chemistry W		
	Chemistry With Cabbage			Chemistry of Light								
	Code Breaking			Frogs								
	Everyday Life not Rocket Science			Everyday Life not Rocket Science								
	Exploding Vegetables			Exploding Vegetables								
	Climate Change? Build you own Maglev Train!											
	Fingerprints within Forensic Science											
	Hominid Evolution			Hominid Evolution								
	Human & Animal Poisoning by Plants											
	Introduction to DNA											
	Living & Working in Space			Living & Working in Space								
	Universal Cycles			Proof								
	Pushing Pixels: The Art & Science			Pushing Pixels: The Art						S		
Saturday Night Science												
Scanning Electron Microscopy												
Solutions for the Future												
The Real Science of the Circus			The Real Science of the Circus									
The Wrangler			The Wrangler									
Friday	Bending it like Beckham			Bending it like Beckham								
	Celldome			Celldome						Celldome		
	Chemistry of Light											
	Climate Change? Build you own Maglev Train!											
	Code Breaking			Frogs								
	Everyday Life not Rocket Science			Everyday Life not Rocket Science								
	Exploding Vegetables			Exploding Vegetables								
	Fingerprints within Forensic Science											
	Hominid Evolution			Hominid Evolution								
	How to Sound like a Rock Band											
	Human & Animal Poisoning by Plants											
	Introduction to DNA											
	Living & Working in Space			Living & Working in Space								
Universal Cycles			Proof									
Physical Science			Physical Science									
Pushing Pixels: The Art & Science			Pushing Pixels: The Art & Science						S			
Scanning Electron Microscopy												
Solutions for the Future												
The Real Science of the Circus			The Real Science of the Circus									
The Wrangler			The Wrangler									

	12:45	13:00	13:15	13:30	13:45	14:00	14:15	14:30	14:45	15:00	15:15	15:30	15:45	16:00
Tuesday	With Cabbage							Chemistry With Cabbage						
				Chemistry of Light				There's Maths in Game Shows!						
		Dragon Quiz		Everyday Life not Rocket Science				Everyday Life not Rocket Science						
				Exploding Vegetables				Exploding Vegetables						
		Hominid Evolution		Hominid Evolution										
				Introduction to DNA										
				Living & Working in Space								Living & Working in Space		
				Magic Moments					Plotting Pythagoras					
				Now Hear This					Now Hear This					
				Physical Science					Physical Science					
		Scanning Electron Microscopy							Scanning Electron Microscopy					
	Wednesday				The Real Science of the Circus									
				The Wrangler										
				Army Engineering - Bridge Building					Army Engineering - Bridge Building					
With Cabbage				Chemistry in Sport				Chemistry With Cabbage				Chemistry in Sport		
				Chemistry of Light										
		Dragon Quiz						There's Maths in Game Shows!						
				Everyday Life not Rocket Science					Everyday Life not Rocket Science					
				Exploding Vegetables					Exploding Vegetables					
		Hominid Evolution		Hominid Evolution										
				Human & Animal Poisoning by Planes										
Thursday					Introduction to DNA									
				Living & Working in Space								Living & Working in Space		
				Lunar Craters & Mountains										
				Magic Moments					Plotting Pythagoras					
				Now Hear This					Now Hear This					
				Pushing Pixels: The Art & Science										
				The Wrangler				Scanning Electron Microscopy				The Wrangler		
				Biology in Sport								Biology in Sport		
	With Cabbage			Chemistry of Light				Chemistry With Cabbage						
				Dragon Quiz					There's Maths in Game Shows!					
				Everyday Life not Rocket Science					Everyday Life not Rocket Science					
	Friday				Exploding Vegetables				Exploding Vegetables					
				Hominid Evolution										
				Human & Animal Poisoning by Planes										
				Introduction to DNA										
				Living & Working in Space								Living & Working in Space		
				Magic Moments					Plotting Pythagoras					
				Physical Science					Physical Science					
				Pushing Pixels: The Art & Science										
				Scanning Electron Microscopy					Scanning Electron Microscopy					
				Solutions for the Future					Solutions for the Future					
				The Real Science of the Circus					The Real Science of the Circus					
				The Wrangler					The Wrangler					

## Key stage 3, 4 and post-16 programme events listed in alphabetical order

### Tuesday 30th June - Friday 3rd July

#### Army Engineering – Bridge Building

This hands-on workshop will give students the opportunity to put their engineering skills to the test. In groups of 4/5 they will have to design and build a bridge. With a limited budget and basic stores they will have to carefully plan and build a successful bridge capable of holding a minimum weight of 15kg.

*Days: Wed*

*Duration: 45 minutes*

*Maximum number: 20*

*Suitable for: key stage 4*

#### Bending it like Beckham

Did you know that David Beckham is not just a footballing genius but also a scientific genius? This talk combines experimental demonstrations, volunteer help and first-class multimedia (including video and simulations of Beckham's best ever free kick). Can you come on stage and use the specially patented Free Kick Simulator 2000 to see if you can score like he can?

*Days: Wed & Fri*

*Duration: 50 minutes*

*Maximum number: 200*

*Suitable for: key stage 3 & 4*

#### Biology in Sport

This interactive session will use engaging equipment on which students will be able to test themselves on various challenges. The workshop will cover muscles, senses, joints and breathing.

*Days: Thurs*

*Duration: 1 hr*

*Maximum number: 35*

*Suitable for: key stage 4*

#### Black Holes, Quasars & Robotic Telescopes – Ask the Astronomer

Robotic Telescopes are a new development in the field of astronomy and allow us to study things in the Universe that change. This talk will explore the uses, technology and operation of

robotic telescope, the largest of which in the world were built right here in Merseyside. Students will also be given the opportunity to ask a real life astronomer a range of questions about their career or issues that relate to space.

*Days: Wed*

*Duration: 1 hr*

*Maximum number: 25*

*Suitable for: key stage 4 & post-16*

#### CellDome

Immerse your pupils in an inflatable dome experience. This interactive show gives pupils a micro view on a macro scale. Animal and plant cells and their organelles are presented, including an introduction to specialised cells, their functions and interrelations.

*Days: Fri*

*Duration: 45 minutes*

*Maximum number: 30*

*Suitable for: key stage 4 & post-16*

#### Chemistry with Cabbage Show

A one hour demonstration of chemistry experiments that you can do at home. Instructions on making your own lava lamp, how to see molecules, plastics you can make at home.

*Days: Tues, Wed & Thurs*

*Duration: 1 hr*

*Maximum number: 20*

*Suitable for: key stage 3*

#### Chemistry in Sport

This practical workshop will look at reactions, energy pathways, aerobic and anaerobic systems. Using interactive equipment and a combination of written and practical tasks students will explore the chemistry in sport.

*Days: Wed*

*Duration: 1 hr*

*Maximum number: 35*

*Suitable for: key stage 4*

#### Chemistry of Light

A fun workshop that explores the

role of light in Chemistry through dyes, specific ions, solutions, spectroscopy and bioluminescence.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 50*

*Suitable for: key stage 4 & post-16*

#### Climate Change? Build your own Maglev Train!

Not worried about Climate Change? How would you feel if you could only use your playstation/X-box/console for 1 hour per week? You are probably aware of the renewable energies, but what about alternatives such as Magnetically-Levitating Trains? Come along to find out how magnets can do more than stick to the fridge door – HUGE magnets deflect particles speeding around the LHC at CERN, others could be used as a powerful space launch vehicle. You can even build your own train!

*Days: Tues, Wed, Thurs & Fri*

*Duration: 45 minutes*

*Maximum number: 30*

*Suitable for: key stage 3 & 4*

#### Code Breaking

This workshop investigates the science of code making and code breaking. We study Caesar ciphers, Al Kindi, and frequency analysis before investigating the Dancing Men from Sherlock Holmes, and the Enigma machine.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 3*

#### Dragon Quiz

Join the Mathematics outreach team from University of Liverpool for a team based competition, relay style problem solving workshop. Dare you face the Dragon masters?!?

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 3*

## Key stage 3, 4 and post-16 programme events listed in alphabetical order

### Tuesday 30th June - Friday 3rd July

#### Everyday Life is not Rocket Science . . . Or is it?

What has space exploration ever done for us?

You mean apart from satellite tv, air-max trainers, smoke detectors . . . memory foam, cordless tools, GPS . . .

Okay but only a few astronauts ever get to actually go into space right?

WRONG, many non-astronauts have already been in space! And in the near future it could be you. How? New technologies, new materials...

Come along to find out about the most exciting careers and opportunities & the latest breakthroughs in space science!

*Days: Tues, Wed, Thurs & Fri*

*Duration: 45 min*

*Maximum number: 30*

*Suitable for: key stage 3*

#### Exploding Vegetables and other Fuels of the Future

An explosive workshop which looks at the combustive properties of a range of fuels linking them to the reasons why new fuels of the future are required. Can the heat energy from sparks be used to explode a cow? How is lightning formed? And can Norbet, our resident dragon demonstrate how The Great Fire of London started? These are just a few of the questions to be explored.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 30*

*Suitable for: key stage 3 & 4*

#### Fingerprints within Forensic Science

This workshop will start with an introduction to fingerprints, how they are formed during gestation and then onto the chemical composition of the deposited fingerprints on various surfaces. Enhancement methods for latent fingerprints from crime scenes will also be discussed before giving

students the chance to take and enhance fingerprints using a number of techniques.

Background on amino acid structure and the chemical reactions occurring will be included.

*Days: Thurs & Fri*

*Duration: 2 hr*

*Maximum number: 25*

*Suitable for: key stage 4 & post-16*

#### Frogs

This workshop investigates the classic frogs problem and is aiming to introduce the pupils to the idea of a systematic approach to mathematical investigations using algebra, number properties and sequences.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 3*

#### Hominid Evolution

This workshop draws on the expertise of staff at National Museums Liverpool in this controversial area. Spanning 7 millennia it allows pupils to use high quality replica fossil evidence to explore key aspects of hominid evolution such as upright walking, diet, hands and grip and allows them to consider the evolutionary advantages of different adaptations. The workshop looks at the infamous Piltdown forgery of the 'missing link'. – Allows pupils to weigh up the guilt or otherwise of key suspects and gain an insight into the motivation behind the manipulation of evidence it represents.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 3 & 4*

#### How to Sound Like a Rock Band!

Ever wondered about the science and technology behind a band? This workshop will feature the

rock band WhiteHorse with which Prof David Burton will explore ideas such as; what is sound, how can it be amplified, controlled, synthesised, altered etc., instruments their design and how they work, the science behind great guitar techniques, digital sampling, PA systems, feedback control, live mixing etc. Oh, yeah, and we'll also play some kickass rock 'n' roll along the way!

*Days: Fri*

*Duration: 2hrs*

*Maximum number: 400*

*Suitable for: key stage 4 and post-16*

#### Human & Animal Poisoning by Plants

Students will have the opportunity to see, handle and smell a range of edible and poisonous plants. Learn the importance of identification and an understanding of the significance of the chemistry of plants in avoiding poisoning of humans, pets and farm animals.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 90 minutes*

*Maximum number: 100*

*Suitable for: key stage 3, 4 & post-16*

#### Hunting for Asteroids

Asteroids are cold lumps of rock and iron that roam the Solar System. Many have collided with the Earth in the past, and some even think a large asteroid was responsible for wiping out the dinosaurs. In this workshop, we explore the method used by astronomers to look for dangerous asteroids, and examine what can be done to protect ourselves.

*Days: Wed*

*Duration: 1 hr*

*Maximum: 25*

*Suitable for: key stage 3 & 4*

#### Introduction to DNA

This workshop gives students the opportunity to work with PCR and electrophoresis equipment

## Key stage 3, 4 and post-16 programme events listed in alphabetical order

### Tuesday 30th June - Friday 3rd July

and to consider how Biochemists' work relates to DNA.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 2 hr*

*Maximum number: 32*

*Suitable for: key stage 4 & post-16*

#### Living and Working in Space

An interactive workshop giving students an insight into what it is like to live and work in space. Pupils will have the opportunity to participate in a number of activities which will demonstrate aspects of space medicine and exercise, working in gloves and picking up moon rocks.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 30*

*Suitable for: key stage 3, 4 & post-16*

#### Lunar Craters & Mountains

A brief look through a telescope shows us that the Moon is a dusty world of craters, mountains and Lunar Seas (or Mare). In this workshop, we look at the lunar surface in more detail using images captured by the robotic Liverpool telescope. We then use those images to measure the size of craters and the height of mountains on the Moon.

*Days: Wed*

*Duration: 1 hr*

*Maximum: 25*

*Suitable for: key stage 3 & 4*

#### Magic Moments

This workshop investigates moments, giving the students the opportunity to design and build a weighing machine. Then they solve some problems before a grand finale of a trebuchet as an application of moments.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 4*

#### Now Hear This

An interactive science show that demonstrates Music Technology in

a way never heard of before! Rob Wix is an accomplished presenter and musician, having written and produced music for television, radio and Edinburgh Festival comedians. During the show he reveals the science of sound, the waves, the vibrations and how sound travels. Using the latest computer and keyboard technology Rob explores the sounds of computer games, mobile phones and even the voices in the audience. Volunteers can try out mixing, recording and having their voices rearranged with some very peculiar results!

*Days: Tues & Wed*

*Duration: 50 minutes*

*Maximum number: 100*

*Suitable for: key stage 3 & 4*

#### Physical Science

This interactive workshop (supported by the Institute of Physics) looks at the Physics, such as speed, forces and light and sound, behind four sports activities. Using engaging equipment students will collect data, which they will then use, together with information worksheets to answer a series of questions at the end of the workshop.

*Days: Tues & Fri*

*Duration: 1 hr*

*Maximum number: 35*

*Suitable for: key stage 3*

#### Plotting with Pythagoras

This workshop uses sloping squares to find Pythagoras's Theorem. The workshop then goes on to apply it to finding straight line distances on OS maps. It finishes with a typical question in a real life context.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 4*

#### Proof

This workshop investigates the classic problem of adding sets of

consecutive numbers. It then develops the idea of algebraic proof, up to proof by induction. It finishes with some exam questions on proof.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 4*

#### Pushing Pixels: The art and science of digital imaging.

Digital imaging technology is all around us, capturing and processing data collected from CCTV cameras, mobile phones, and digital video recorders. But what exactly is a pixel and how can they be manipulated? Join 'Show Me Learning' Steve Allman as he explores the digital imaging; capturing and pushing pixels using emerging interactive and visual technologies. Throughout the show, Steve records and manipulates images and video of his audience to use in the show finale, a stunning video performance – mixed live using cutting edge VJ-ing technologies.

*Days: Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 150*

*Suitable for: key stage 3 & 4*

#### Saturday Night Science

Can reaction dynamics explain that boy meets girl moment? Can studying spectroscopy turn you into a John Travolta on the dance floor? Can chemistry help you pull? Come along to this scientific guide to a night out on the town and find out where you have been going wrong.

*Days: Thurs.*

*Duration: 50 minutes*

*Maximum number: 200*

*Suitable for: key stage 3 & 4*

#### Scanning Electron Microscopy (SEM)

An exciting interactive demonstration of the 2 new Scanning Electron Microscopes and their use in all areas of

## Key stage 3, 4 and post-16 programme events listed in alphabetical order

### Tuesday 30th June - Friday 3rd July

science with particular emphasis on forensic and material science.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 45 minutes*

*Maximum number: 8*

*Suitable for: key stage 4 and post-16*

#### **Solutions for the Future Workshop**

This hands-on workshop gives budding entrepreneurs the opportunity to design and make a revolutionary product for future generations. Pupils will first look at carbon footprints and embodied energy.

*Days: Thurs & Fri*

*Duration: 2hr 30minutes*

*Maximum number: 40*

*Suitable for: key stage 3 & 4*

#### **There's Maths in Game Shows!**

This workshop investigates the mathematics which can be obtained from some popular game shows including: Countdown, Blockbusters, Deal or No Deal, and Who Wants to be a Millionaire?

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 3*

#### **The REAL Science of the Circus**

Presented by James Soper who, before training as a teacher, was a professional circus performer and is a Guinness World Record Holder for juggling. This show combines spectacular circus skills, volunteer help and a multimedia presentation to show the science of forces (gravity, magnetism, pushes, pulls and twists).

*Days: Tues & Thurs*

*Duration: 50 minutes*

*Maximum number: 200*

*Suitable for: key stage 3 & 4*

#### **The Wrangler**

Galileo is in his cell in Rome after questioning by the Inquisition. He speaks of Aristotle's universe, the Pendulum, Theories of Motion, the Telescope, Archimedes, Kelpler and Cannonballs. A thought-provoking lecture which leaves one in no doubt why this rebellious man presented such a problem to the authorities.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 150*

*Suitable for: key stage 3*

#### **Universal Cycles**

This workshop investigates the problem of listing all the

possibilities of arranging a set of objects. With some magic and some discrete maths, the workshop looks at how this maths can be used.

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: key stage 4*

#### **What Can You Do with a Physics Degree?**

Anything You Want To! Physics is one of the most fascinating subjects to study at university and you can do anything with a degree in physics. Ever wondered why physics graduates are sought after in so many areas from engineering to finance? Come along to hear about some of the latest exciting research, based on the principles you are learning at A-level and to find out, not just about the huge variety of careers from physics, but why our graduates are so highly valued!

*Days: Tues, Wed, Thurs & Fri*

*Duration: 1 hr*

*Maximum number: 40*

*Suitable for: post-16*

## about Maestro...

... Maestro is a not-for-profit organisation providing inspirational STEM activities and programmes for students aged 4 – 19 years. We design and deliver a range of innovative activities and workshops for schools and colleges that give students the opportunity to experience the excitement of STEM in a way that will complement their school curriculum.

We also support and broker a wide range of national schemes developed to meet the needs and interests of the budding young scientists, technologists, engineers and mathematicians of the future.

To find out more:

[www.maestroservices.org.uk](http://www.maestroservices.org.uk)

Tel: 0151 231 2400



Workshop Name	Provider
Bending it like Beckham	Science Shows for Schools
Biology in Sport	Learn by Design
Black Holes, Quasars & Robotic Telescopes – Ask the Astronomer	Astrophysics Research Institute - Liverpool John Moores University
Bridge Building	The Army
Celldome	Techniquest
Chemistry in Sport	Learn by Design
Chemistry of Cabbage	Lorelly Wilson Ltd
Chemistry of Light	Maestro Services Ltd
Chemistry with Cabbage Show	Lorelly Wilson Ltd
Climate Change? Build your own Maglev Train!	Department of Physics - University of Liverpool
Close Encounters of the Feathered Kind	Corio Raptor Care
Code Breaking	Mathematics Outreach Team - University of Liverpool
Dinosaurs	National Museums Liverpool
Dragon Quiz	Mathematics Outreach Team - University of Liverpool
Everyday Life is not Rocket Science . . . or is it?	Department of Physics - University of Liverpool
Exploding Vegetables and other Fuels of the Future	Science2Life
Extra Electricity	Sphere Science
Fingerprints within Forensic Science	School of Pharmacy & Biomeolecular Science - Liverpool John Moores University
Frogs	Mathematics Outreach Team - University of Liverpool
Hominid Evolution	National Museums Liverpool
How to Sound like a Rock Band	The General Engineering Research Institute – Liverpool John Moores University
Human & Animal Poisoning by Plants	School of Biological Sciences – University of Liverpool
Hunting for Asteroids	Astrophysics Department – Liverpool John Moores University
Introduction to DNA	Greater Manchester STEM Centre
Life in a Rockpool	National Museums Liverpool
Living and Working in Space	Astro Information Service Ltd
Lunar Craters & Mountains	Astrophysics Research Institute - Liverpool John Moores University
Magic Moments	Mathematics Outreach Team - University of Liverpool
Now Hear This	SCIntillate
Physical Science	Learn by Design
Plotting Pythagoras	Mathematics Outreach Team - University of Liverpool
Polar Bears	Los Kaos Ltd
Proof	Mathematics Outreach Team - University of Liverpool
Pushing Pixels: The art and science of digital imaging.	Show Me Learning
Revealing All	National Museums Liverpool
Saturday Night Science	Make it Molecular
Scanning Electron Microscopy (SEM)	Faculty of Science - Liverpool John Moores University
Science of the Circus	Gary the Clown
Solids, Liquids and Gases	Greater Manchester STEM Centre
Solutions for the future	SCIntillate
Sorting Allsorts!	Maestro
Spiders, Scorpions and Insects	National Museums Liverpool
The Magic Garden Show	Gary the Clown
The REAL Science of the Circus	Science Shows for Schools
The Wrangler	Past Present Science
There's Maths in Game Shows!	Mathematics Outreach Team - University of Liverpool
Universal Cycles	Mathematics Outreach Team - University of Liverpool
What can you do with a Physics Degree?	Department of Physics - University of Liverpool
Wonders of the Solar System	National Museums Liverpool

## BOOKING FORM

Use this form to help answer questions that you will be asked when booking a group into the Festival

Email address:

Date	Year Group/Key Stage	Number of Students	Number of Staff
30th June 2009			
1st July 2009			
2nd July 2009			
3rd July 2009			

Workshop Choice and Times of Sessions (please have reserve choices in case workshops are already full)

Any Special Requirements e.g. access needs?

Permission to photograph students?

YES

NO