Liverpool Festival of science technology

29th June – 1st July 2010

LJMU · maestro · University of Liverpool · National Museums Liverpool · The City of Liverpool

Welcome to...

Liverpool Festival of Science and Technology 2010

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 and all sessions will be allocated on a first-come first-served basis. Please note that some workshops are unable to accommodate full classes so you may be asked to split your group into smaller numbers.

Choose your events

Choose 3 workshops that you would like to attend. In addition there will be lots of things to see in the museum and additional activities to excite students between timetabled sessions including Oscar the Robot and a Flight Simulator.

Timetables

- **Key Stage 2** - Page 5
- **Key Stage 3, 4 & Post-16** – Page 6 & 7

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.

Useful Information

Venues

Key Stage 2 activities will be held at the World Museum, William Brown Street 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 Street.

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.

Lunch

There are catering outlets at all of the venues, but you are advised to ensure students bring all the refreshments they will require on the day. Lunches will be eaten outside, weather permitting, otherwise alternative arrangements will be made.

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 29th June - Thursday 1st July

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
Duration: 45 minutes

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: Tues & Thurs
Duration: 45 minutes

Don't forget to visit
Oscar the Robot!

Dynamic Earth

Students will join researchers from Liverpool John Moores University and conduct a series of hands-on experiments to illustrate the dynamic nature of earth processes. Students will be able to make their own tornado, learn how glaciers move and why you shouldn't build your house on sand!

Days: Wed
Duration: 45 minutes
(Please note this session takes place in the James Parsons Building at LJMU and places are limited to small groups.)

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, Wed & Thurs
Duration: 45 minutes

Plantastic

Working in partnership with museums in Belgium, Holland and France, National Museums Liverpool has developed a new interactive science exhibition exploring the fascinating world of plants, the critical role they play in sustaining life on earth, and their importance in securing the future of our planet. This innovative touring exhibition brings plants to life and enables young people to explore how plants affect our everyday life. Presented in a fascinating and accessible way, Plantastic brings the environment to life for children and adults alike.

Days: Tues, Wed & Thurs
Duration: 45 minutes

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
Duration: 45 minutes

Science of the Circus

A fun, interactive show that gives students 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 & Thurs
Duration: 45 minutes

BOOK
0151 231 2400
NOW

Key Stage 2 programme events listed in alphabetical order

Tuesday 29th June - Thursday 1st 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: Wed
Duration: 45 minutes

The Air Show

Explore the earth's atmosphere and what happens when it isn't there anymore. Find out how a balloon flies, why can't you get a decent cup of tea on top of Mount Everest, why is outer space silent and what does air weigh? A fun workshop that shows students how to make the world's smallest tornado!

Days: Tues & Thurs
Duration: 45 minutes

The Bubble Show

Join Bubble World Record holder, Steve Allman as he investigates the stunning Science behind sop films. Find out how to blow an impossible cubic bubble, see what happens as bubbles are filled with smoke and helium, and be amazed as giant bubbles float effortlessly over your head. This unbelievable show covers everything from the Science of Light, to the mysteries of molecular forces. Washing up will never be the same again!

Days: Tues, Wed & Thurs
Duration: 45 minutes

The Fire Show

An exploration of fire in all its aspects; why do things burn? What happens when things burn? What's the link between burning and exploding? How can you make fire without matches or a lighter, can you burn metals, and how can fire be controlled safely. This workshop features dangerous custard, exploding metals and the amazing fire tornado among other fascinating and memorable experiments far too hazardous to try at home!

Days: Wed
Duration: 45 minutes

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
Duration: 50 minutes

Timetables for Key Stage 2

Tuesday 29th June 2010

Session 1 (10.00 - 10.45)
Close Encounters of the Feathered Kind
Dinosaurs
Life in a Rockpool
Plantastic
Revealing All
Science of the Circus
The Air Show
The Bubble Show
Wonders of the Solar System

Session 2 (11.00 - 11.45)
Close Encounters of the Feathered Kind
Dinosaurs
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The Air Show
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Wonders of the Solar System

Session 3 (12.00 - 12.45)
Close Encounters of the Feathered Kind
Dinosaurs
Life in a Rockpool
Plantastic
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The Air Show
The Bubble Show
Wonders of the Solar System

Session 4 (13.45 - 14.30)
Close Encounters of the Feathered Kind
Dinosaurs
Life in a Rockpool
Plantastic
Science of the Circus
The Air Show
The Bubble Show
Wonders of the Solar System

Wednesday 30th June 2010

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Spiders, Scorpions & Insects
The Bubble Show
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Wonders of the Solar System

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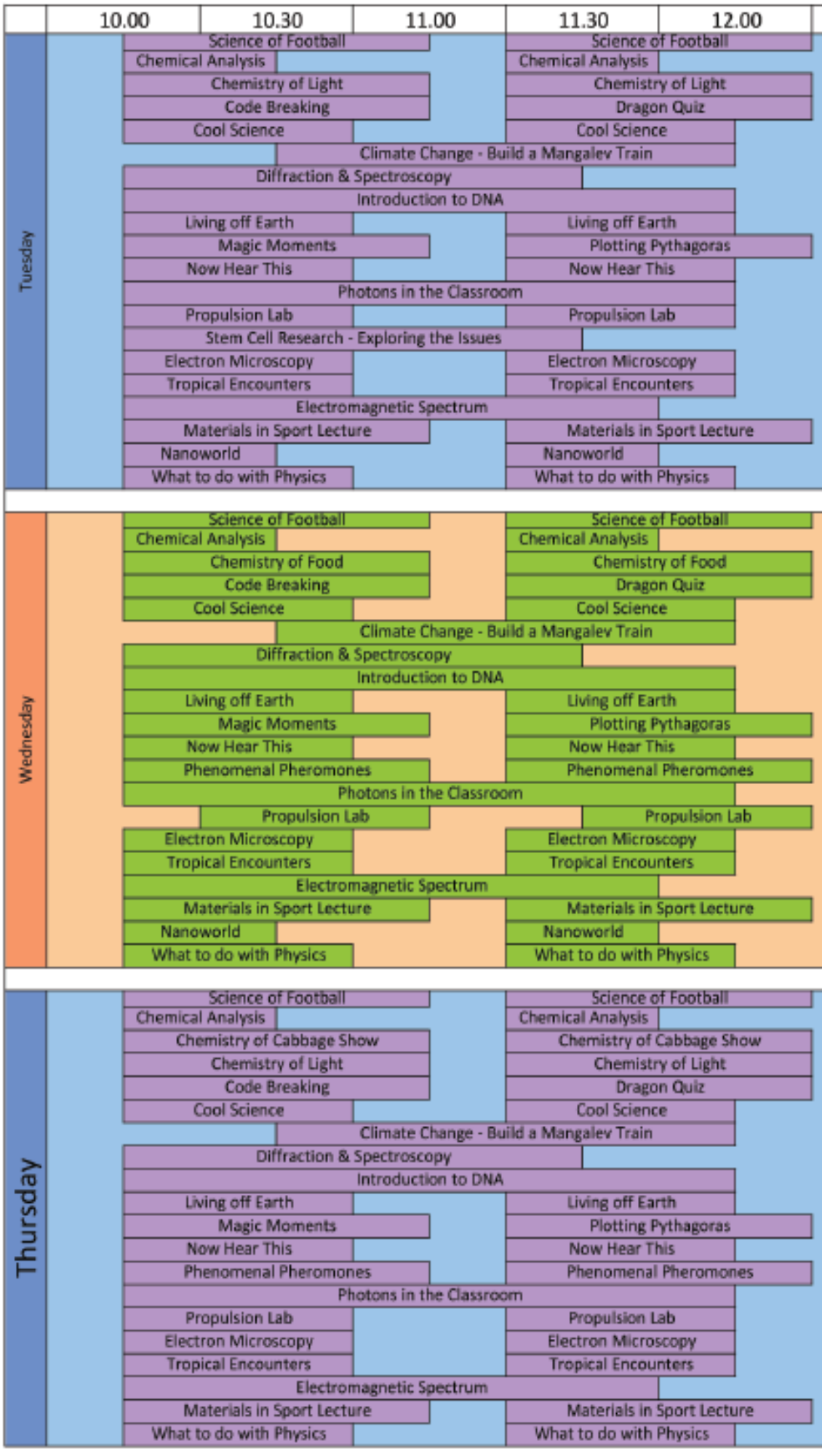
about Maestro . . .

... 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
Tel: 0151 231 2400

timetable


10.00
10.30
11.00
11.30
12.00
Tuesday
Science of Football
Chemical Analysis
Chemistry of Light
Code Breaking
Cool Science
Climate Change - Build a Mangalev Train
Diffraction & Spectroscopy
Introduction to DNA
Living off Earth
Magic Moments
Now Hear This
Photons in the Classroom
Propulsion Lab
Stem Cell Research - Exploring the Issues
Electron Microscopy
Tropical Encounters
Electromagnetic Spectrum
Materials in Sport Lecture
Nanoworld
What to do with Physics
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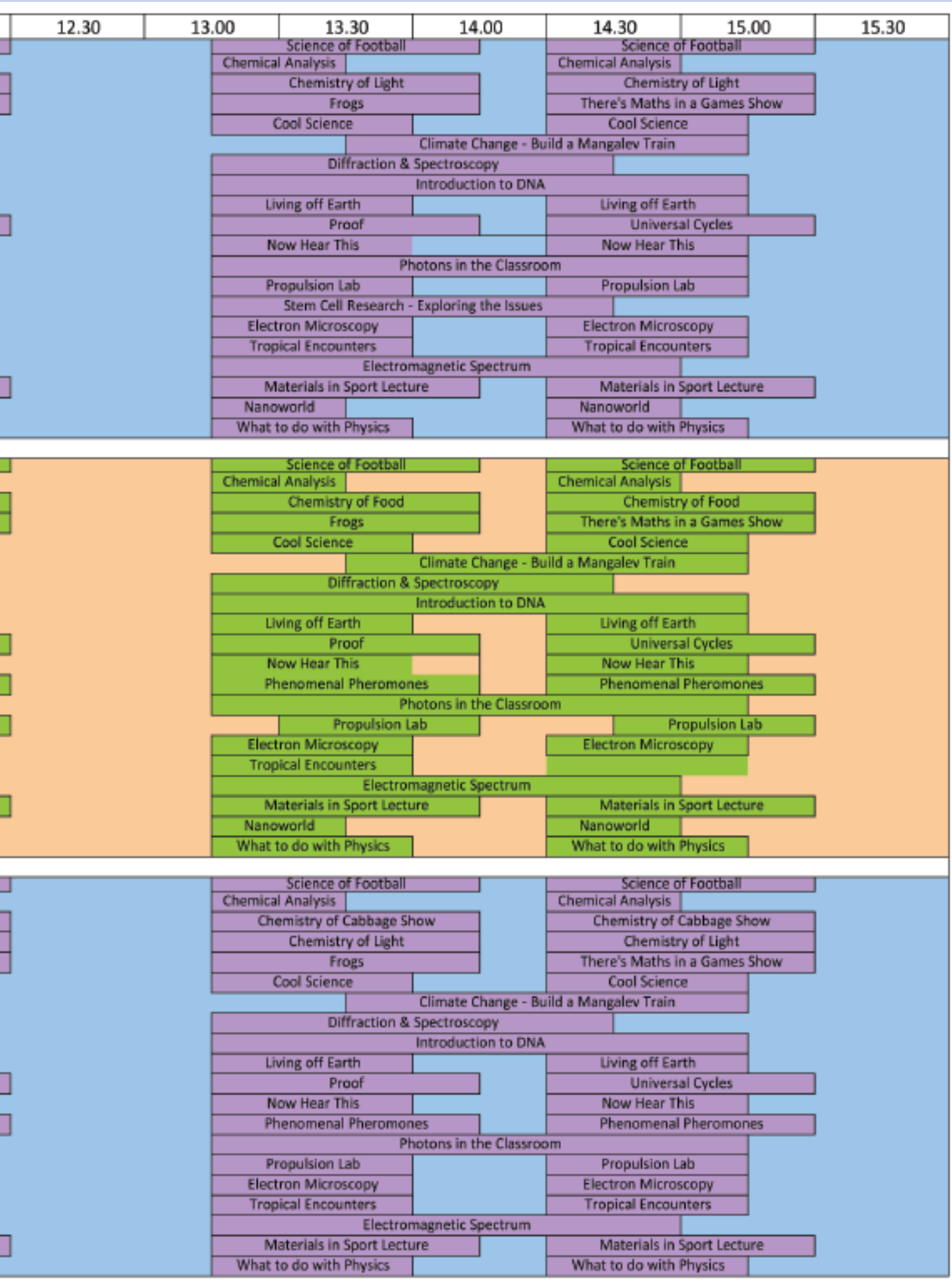
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Key stage 3, 4 and post-16 programme events listed in alphabetical order

Tuesday 29th June - Thursday 1st July

The Science of Football - 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). Come on stage and use specially patented Free Kick Simulator 2000 to see if you can score like he can!

Days: Tues, Weds & Thurs
Duration: 50 minutes
Suitable for: key stage 3 & 4

Chemical Analysis at the Speed of Light

An interactive workshop that ask the Students to explore the effect of placing different metals ions into a heat source and use their findings to analyse what metals can be found in human sweat!

Days: Tues, Weds & Thurs
Duration: 30 minutes
Suitable for: key stage 3, 4 & Post-16

Chemistry with Cabbage Show

A fun packed demonstration of exciting experiments that students can do at home! Come and find out how to make your own Lava Lamp; make plastics at home and find out how to see molecules.

Days: Thurs
Duration: 50 minutes
Suitable for: key stage 3 & 4

Chemistry of Food

We all love food, but what does a chef do with ingredients to create great flavours? This workshop will explore the hottest and tastiest food known so hold onto your hats and your tongues!

Days: Wed
Duration: 60 minutes
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
Duration: 60 minutes
Suitable for: key stage 4 & Post-16

Code Breaking

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

Days: Tues, Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3

Climate Change? Build your own Maglev Train!

Not worried about climate change? How would you feel if you could only use your Games Console for one hour a week? You are probably aware of 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!

Days: Tues, Wed & Thurs
Duration: 90 minutes
Suitable for: key stage 3

Cool Science

An interactive, lively, sometimes messy talk aims to get students interested in physics by performing low temperature experiments with liquid nitrogen. Students will be shown how temperature affects the properties of materials.

Days: Tues, Wed & Thurs
Duration: 50 minutes
Suitable for: key stage 3

Diffraction & Spectroscopy

Come along and explore diffraction and spectroscopy and attempt to solve an astrophysical problem. Through team work and discussion students will consider the relevance of spectroscopy and perform some straightforward calculations to see the power of physical modelling.

Days: Tues, Weds & Thurs
Duration: 90 minutes
Suitable for: Post-16

Dragon Quiz

Dare you face the Dragon masters? Join the Mathematics outreach team from the University of Liverpool for a team based, problem solving workshop. Pit your wits against the Dragons and complete as many of the problems as you can in an attempt to steal the Dragon's treasure!

Days: Tues, Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3

Frogs

An interactive workshop investigates the classic frogs problem and aims to introduce the students to the idea of a systematic approach to mathematical investigations using algebra, number properties and sequences.

Days: Tues, Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3

Introduction to DNA

A very hands-on workshop that gives students the opportunity to work with PCR and electrophoresis equipment and to consider how Biochemists' work relates to DNA

Days: Tues, Wed & Thurs
Duration: 120 minutes
Suitable for: key stage 4 & post-16

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

Tuesday 29th June - Thursday 1st July

Living and Working off Planet Earth

A revealing and informative introduction into how space exploration is essential for the study of planet Earth. Students will learn about what Astronauts actually do during a mission; get the chance to try some related hands on demonstrations and are shown how space exploration can help us in looking after our planet.

Days: Tues, Wed & Thurs
Duration: 45 minutes
Suitable for: key stage 3, 4 & post-16

Magic Moments

This workshop investigates the theory of moments, giving the students the opportunity to design and build a weighing machine.

Days: Tues, Wed, Thurs and Fri
Duration: 60 minutes
Suitable for: key stage 4

LEGO Mindstorm

Controlling a robot is a really simple exercise. In this workshop students will have the opportunity to programme a simple robot to react to situations. The activity can be tailored for complete novices to students who already have some simple programming skills.

Days: Tues, Wed & Thurs
Duration: 90 minutes
Suitable for: key stage 3 & 4

Now Hear This

An interactive science show that demonstrates Music Technology in a way never heard 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 & Thurs
Duration: 50 minutes
Suitable for: key stage 3 & 4

Phenomenal Pheromones

How do you chat up a moth? Do bees on say "BUZZ"? Parlez vous ant-speak? If you have ever wanted to talk to insects then this is your chance to learn their lingo. Plus can pheromones get you out of that awkward "asking her out moment"? An interactive talk for all noses!

Days: Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3, 4 & post-16

Photons in the Classroom

Students are introduced to the "What space science has done for us" interactive presentation which explores some astronomical topics. Using National Schools Observatory software students are asked to analyse data taken from the Liverpool Telescope; a fully robotic astronomical telescope that is owned and operated by the Astrophysics Research Institute of Liverpool John Moores University. To conclude students will then be asked to highlight how space exploration has benefited us in everyday life and is used to create new technologies.

Days: Tues, Wed & Thurs
Duration: 120 minutes
Suitable for: key stage 4

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
Duration: 60 minutes
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
Duration: 60 minutes
Suitable for: key stage 4

Propulsion Lab

A fascinating insight into the workings of rocket engines, Propulsion Lab looks at the science involved, as well as the technology needed to launch people into space. Featuring dramatic demonstrations, this science show inspires students about exciting things which can be done with science and the amazing careers and opportunities it can lead to.

Days: Tues, Wed & Thurs
Duration: 50 minutes
Suitable for: key stage 3 & 4

Scanning Electron Microscopy (SEM)

Come and have a look at the new Scanning Electron Microscopes at Liverpool John Moores University. Students will be given a full tour of the Microscope and how they are used in all areas of science with particular emphasis on forensic and material science.

Days: Tues, Wed & Thurs
Duration: 45 minutes
Suitable for: key stage 4 and post-16

Solids, Liquids & Gases

This visual show reviews some of the science of the 19th century that scientist discovered and how

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

Tuesday 29th June - Thursday 1st July

it laid down the foundations of our 21st century thinking.

Days: Tues, Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3

Stem Cell Research – Exploring the Issues

Stem cells have the potential to help us treat serious diseases, but their use raises many contentious issues. Following a short presentation students are asked to discuss the issues raised in the film; the media and its impact upon our understanding of stem cell research; the use of embryos in research and the public trust of scientists.

Days: Tues
Duration: 90 minutes
Suitable for: Post-16

Supermarket Science

Join "Scientific Sue" on a shopping journey of discovery. Find out how to make a toilet roll dance in the sky, turn toffee into honeycomb and use vegetable juices to produce colour changes. Be amazed at just how much science there is in a supermarket and how science can be explosive, funny and do-able. Shopping will never be the same again!

Days: Tues, Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3

The Electromagnetic Spectrum: What Can You See?

An interactive workshop that shows students how important Physics is in the real world; and in particular their lives through the Electromagnetic Spectrum. Exploring the Technology that has been developed through utilising the different band of the spectrum. Students are then given the opportunity to perform some simple experiments and then asked to discuss the findings of some of the most exciting recent physics findings.

Days: Tues, Wed & Thurs
Duration: 105 minutes
Suitable for: key stage 4 (Year 10)

The RSC Materials in Sport Lecture

A fast moving lecture that looks at the Chemistry behind the materials that are used by modern sports people to enhance their performance. Delivered by an Olympic Athlete, the lecture utilises film, talk and props to thoroughly engage the audience and offers the opportunity for a Q & A Session. The students will look at how Lycra is used in the construction of clothing, canoes, bikes and much more.

Days: Tues, Wed & Thurs
Duration: 50 minutes
Suitable for: key stage 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
Duration: 60 minutes
Suitable for: key stage 3

Tropical Encounters

An amazing opportunity to get up close and personal with a variety of fascinating exotic animals such as Meerkats and Snakes to name just a few. Learn about the environments that they come from as well as what makes them unique and specialto the animal kingdom.

Days: Tues, Wed & Thurs
Duration: 60 minutes
Suitable for: key stage 3, 4 & post-16

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 and Fri
Duration: 60 minutes
Suitable for: key stage 4

Welcome to Nanoworld

A brief tour of the Nanoworld starting with an investigation of the strange behaviour of a ferrofluid. Students will also have the opportunity to see some gold nanoparticles and how their colours can be affected.

Days: Tues & Wed
Duration: 30 minutes
Suitable for: key stage 3 & 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
Duration: 50 minutes
Suitable for: Post-16

BOOKING FORM	
School Name	
Teacher Contact	
Department	
School Telephone Number	
School Fax Number	
School/ Personal E-Mail	
Mobile Number	

Before You Phone

- Read the brochure carefully.
- Decide which workshops you would like to attend.
- Use the form below to assist you with questions you will get asked when making the booking.
- Phone 0151 231 2400

Our team will do our best to accommodate your requirements but we do ask that you are flexible with the order and times that you visit the workshop.

Date of Attendance	Workshop	Nos. of Students	Year Group	Nos. of Adults

Jet Fighter Experience

Experience a pure adrenaline rush as you fly through the atmosphere in a Jet Fighter. A state-of-the-art simulator will recreate, for those who dare, the sensation, speed and G-force as this heart-in-the-mouth ride takes you up, up and away. This one is not for the faint hearted, but if you love speed and butterflies in the pit of your stomach, then the Jet Fighter is most certainly an experience for you.

Please ask about available flights when booking your workshops.

Thank you . . .

. . . to everyone involved in this year's Liverpool Festival of Science & Technology

Core Partners

Workshop providers

Workshop Name	Provider
Chemical Analysis at the Speed of Light	School of Pharmacy & Chemistry, Liverpool John Moores University
Chemistry of Food	Maestro Services 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
Cool Science	Department of Physics, University of Liverpool
Diffraction & Spectroscopy	Department of Physics, University of Liverpool
Dinosaurs	National Museums Liverpool
Dragon Quiz	Mathematics Outreach Team, University of Liverpool
Dynamic Earth	School of Natural Sciences & Psychology, Liverpool John Moores University
Frogs	Mathematics Outreach Team, University of Liverpool
Introduction to DNA	Greater Manchester STEM Centre
LEGO Mindstorms	Greater Manchester STEM Centre
Life in a Rockpool	National Museums Liverpool
Living and Working Off Planet Earth	Astro Info Service Limited
Magic Moments	Mathematics Outreach Team, University of Liverpool
Now Hear This	SCItillate
Phenomenal Pheromones	Make it Molecular
Photons in the Classroom	Department of Physics, University of Liverpool
Plantastic	National Museums Liverpool
Plotting with Pythagoras	Mathematics Outreach Team, University of Liverpool
Proof	Mathematics Outreach Team, University of Liverpool
Propulsion Lab	Starchaser
Revealing All	The Conservation Centre
Scanning Electron Microscopy	Faculty of Science, Liverpool John Moores University
Science of the Circus	Gary the Clown
Solids, Liquids & Gases	Greater Manchester STEM Centre
Spiders, Scorpions and Insects	National Museums Liverpool
Stem Cell Research - Exploring the Issues	School of Biological Sciences, University of Liverpool
Supermarket Science	Science2Life
The Air Show	L M Interactive
The Bubble Show	Show Me Learning
The Electromagnetic Spectrum: What Can You See?	Department of Physics, University of Liverpool
The Fire Show	L M Interactive
The RSC Materials in Sport Lecture	By Design Group
The Science of Football - Bending it Like Beckham!	Science Shows for Schools
There's Maths in Game Shows!	Mathematics Outreach Team, University of Liverpool
Tropical Encounters	Tropical Inc.
Universal Cycles	Mathematics Outreach Team, University of Liverpool
Welcome to Nanoworld	Department of Chemistry, 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