

THE  TIMES
CHELTENHAM FESTIVALS

7-9 June 2016

Book online:
[cheltenhamfestivals.com/
scienceforschools](http://cheltenhamfestivals.com/scienceforschools)

SCIENCE

in association with



**SCIENCE
FOR
SCHOOLS**
SECONDARY



Planner

	10am	11am	12noon	1pm	2pm	3pm
TUESDAY						
EDF Energy Arena			SS03 Chemistry Has The Power			
The Crucible	SS02 Agents Of Infection					
St Andrew's Church	DP01 Life On Mars		DP02 Life On Mars		DP03 Life On Mars	
ExperiTent	FS01 Criminal Chromatography	FS02 Criminal Chromatography	FS03 Criminal Chromatography	FS04 Criminal Chromatography		
Siemens Curiosity Zone	FS05 The Power Of Wind	FS06 The Power Of Wind	FS07 The Power Of Wind	FS08 The Power Of Wind		
GE Pavilion						
Discover Zone						
Space Experience						
EDF Energy Zone						
WEDNESDAY						
EDF Energy Arena	SS04 Engineering Superheroes					
The Crucible			SS07 Hack Your Brain			
Venue TBC	SS08 Extreme Cells	SS09 Extreme Cells	SS10 Extreme Cells	SS11 Extreme Cells		
St Andrew's Church	DP04 Build Your Own Internet		DP05 Build Your Own Internet		DP06 Build Your Own Internet	
ExperiTent	FS13 K'nex Creatures	FS14 K'nex Creatures	FS15 K'nex Creatures	FS16 K'nex Creatures		
Siemens Curiosity Zone	FS17 The Power Of Wind	FS18 The Power Of Wind	FS19 The Power Of Wind	FS20 The Power Of Wind		
Helix Theatre	SS38 KS4 Science Day – Creating Your Future					
GE Pavilion						
Discover Zone						
Space Experience						
EDF Energy Zone						
THURSDAY						
EDF Energy Arena			SS15 Level Up Roadshow			
The Crucible	SS14 Twisted Topology					
St Andrew's Church	SS21 Minecraft – Molecules In Minecraft	SS22 Minecraft – Molecules In Minecraft	SS23 Minecraft – Molecules In Minecraft	SS24 Minecraft – Molecules In Minecraft		
Helix Theatre	DP07 Underwater Investigations		DP08 Underwater Investigations		DP09 Underwater Investigations	
Siemens Curiosity Zone	FS29 The Power Of Wind	FS30 The Power Of Wind	FS31 The Power Of Wind	FS32 The Power Of Wind		
GE Pavilion						
Discover Zone						
Space Experience						
EDF Energy Zone						

2 ■ KS3 ■ KS4 ■ ALL AGES

Welcome

A warm welcome to Science for Schools 2016, a series of action-packed days for children and young people which promise to excite and inspire in equal measure.

We have a great mix of shows, hands-on workshops and interactive zones to explore and discover. Whether you wish to bring a small number or a whole year group we look forward to welcoming you in June.

Ali Mawle
Director of Education

Sharron Pearson
Education Manager

Science for Schools contacts

If you would like to contact a member of the Education Team, email us at: education@cheltenhamfestivals.com

Or give us a call:

Sharron Pearson	01242 537 250
Philippa Claridge	01242 537 267
Rose Wood	01242 537 268

Overview of prices

Event (50 minute science shows)	£5.50 per pupil
Workshops	£6.50 per pupil
KS3 Day Package	£14 per pupil
KS4 Science Day	£10 per pupil

A £5 booking fee will be added to the total cost of your booking

Discover Zone, ExperiTent workshops, GE Pavilion, Siemens Curiosity Zone, Science Trail: Free in conjunction with an event/workshop

A word from our Associate Title Partner



EDF Energy is delighted to be the Associate Title Partner of The Times Cheltenham Science Festival, and to continue to support the Science for Schools programme.

We are passionate about engaging young minds with science, so we support this extensive programme as well as Cheltenham Festivals' ambitious year-round activities for schools. LabLive takes the best of the Festival to towns around the country, and FameLab Academy develops hundreds of local secondary students as confident science communicators each year. We hope that by inspiring as many children and young people as possible that this will lead to many brilliant careers in STEM.

Stuart Crooks
Managing Director - Generation, EDF Energy

Education Programme Partners



Free Activities

For each paid activity you can book one of our dedicated zones or ExperiTent workshops. Please note that these are only available with a paid activity.

EDF Energy Zone

Years 7-9

45-minute slots available every day.

EDF Energy will be running sessions linked to their 'Pretty Curious' STEM campaign – alongside other hands-on activities to get involved with too. Find out more about the Pretty Curious campaign at edfenergy.com/prettycurious



Discover Zone

All ages

One-hour slots available every day.

The Discover Zone is a real sight to behold! Packed with interactive exhibits for all ages, and enthusiastic presenters ready to answer your most tricky questions, it's the perfect place to explore the future of technology.



GE Pavilion

All ages

One-hour slots available every day.

5...4...3...2...1... Blast off this year at the Festival with GE: discover how airplanes fly safely, experience how robots repair pipelines deep beneath the sea, and explore how GE work to improve health in developing countries. With hands-on activities available throughout the week, you can get involved and talk to the engineers who develop exciting new technologies. See you how you too can become a GE engineer of the future!



Space Experience

All ages

One-hour slots available every day.

Meet top space scientists and researchers in this interactive space experience. Bring all your burning questions about our galaxy and the universe beyond, and explore the mysteries of space!

The Power Of Wind – Siemens Curiosity Zone

Years 7-8

One-hour slots available every day.

Can you create a renewable, reliable and environmentally friendly way of generating energy? See who can raise the heaviest weight in a minute using a wind turbine. Use your engineering skills to experiment with pulleys, bands, axles and turbine blades, and get up close with this renewable energy source that currently powers one in four UK households.

siemens.co.uk/curiosity-project

SIEMENS

Other things to do to fill your day:

Science Trail

Take part at a time which suits your group.

Collect your quiz sheet and follow the Science Trail around Imperial Gardens. It's the perfect activity to engage pupils in the world of science whilst exploring all that the site has to offer.

Limited bookable lunch spaces available: enquire when booking

Free ExperiTent Workshops

KS3

Criminal Chromatography

ExperiTent

Tuesday 7 June

FS01 10-11am

FS02 11.15am-12.15pm

FS03 12.30pm-1.30pm

FS04 1.45pm-2.45pm

YRS 7-8

A ransom note has been left at the scene of a bank robbery. Can you find the suspect? Analyse the ink with chromatography; gather fingerprints and fibres; and use CCTV to build the evidence against them.

With experienced former detective **Jenny Williams** from The Detective Project, you'll use real-life techniques to catch the criminal.

[@detectivehq](http://thedetectiveproject.co.uk)

KS3

K'nex Creatures

ExperiTent

Wednesday 8 June

FS13 10-11am

FS14 11.15am-12.15pm

FS15 12.30pm-1.30pm

FS16 1.45pm-2.45pm

YRS 7-8

Why are our bones so important? Why do we need a skeleton, and what does it do? Join the **Science Oxford** team to design and build a skeleton for your own creature using K'nex, and then test whether it can protect its vital organs. Bone-shaking fun!

[@scienceoxford](http://scienceoxford.com)

KS4 Science Day

KS4

SS38

Science: Creating Your Future

Helix Theatre

Wednesday 8 June, 10am-2pm

Year 10

£10 per pupil

Tomorrow's science is in your hands. With top scientists and professionals from STEM-related fields, this packed day brings together three mini lectures on cutting-edge research, inspiring pupils to think about their own future careers and the future of science. Round off the day with a dedicated KS4 session in our interactive technology-themed Discover Zone.

10-11.30am

Three lectures from leading professionals

11.30am-12.15pm

Panel Q&A on STEM careers

1-2pm

KS4-only Discover Zone

NEW FOR 2016



KS3
**Workshop:
Life On Mars**

St Andrew's Church
DP01 9.45-11.15am
DP02 11.45am-1.15pm
DP03 1.45-3.15pm
YRS 7-9

This event is only available as part of a Day Package.

Could you be one of the best engineers on Earth – or Mars? The Institution of Mechanical Engineers is looking for young people who can tame the hostile environment of the Red Planet and flourish in outer space. With the backing of an international group of entrepreneurs, could you help design a life support system?

imeche.org
@IMechE



KS3
**Agents Of
Infection**

SS02

10-11am
The Crucible
YRS 8-9
£5.50 per pupil

How do deadly pathogens spread between us and around the world? Can we protect ourselves? Using infection-free audience participation, biologist **Erin Lafferty** will discuss some of the tools used to predict and prevent infection with new and known infectious agents like viruses, bacteria and parasites.

scinot.wordpress.com
@erinlaff



KS3
Chemistry Has The Power

SS03

12noon-1pm
EDF Energy Arena
YRS 7-9
£5.50 per pupil

Pigs might really fly in this energetic exploration with **Paul Wilson** and **David Reed** from the University of Southampton; along with flashes, bangs, Bombardier beetles and electrified gherkins! In this energy filled demonstration find out how chemical reactions power the whole world.

KS3 Day Packages: Tuesday 7 June

£14 per pupil

If you are looking for a full visit in one easy booking then a Day Package is for you. Each package can accommodate 35-40 pupils (plus teachers) and comprises an event, an extended workshop, and a guaranteed session in the Discover Zone.

DP01	Package 1	9.45-11.15am 12noon-1pm 2-3pm	Life On Mars Chemistry Has The Power Discover Zone
DP02	Package 2	10-11am 11.45-1.15pm 2-3pm	Agents Of Infection Life On Mars Discover Zone
DP03	Package 3	10-11am 12noon-1pm 1.45-3.15pm	Discover Zone Chemistry Has The Power Life On Mars



KS3

Workshop: Extreme Cells

Venue TBC

SS08 10-11am

SS09 11.15am-12.15pm

SS10 12.30pm-1.30pm

SS11 1.45pm-2.45pm

SS12 3-4pm (Home educators only)

YRS 7-9

£6.50 per pupil

It may be smaller than the eye can see, but microscopic life is capable of some incredible things! From sub-zero temperatures to excessive pressure and high acidity – meet the danger-seeking cells that thrive in harsh environments. Make a 3D cell sculpture to take home, as scientist-turned-artist **Lizzie Burns** shares her cell survival guide.

sciencetolife.org



KS3

SS04

Engineering Superheroes

10-11am

EDF Energy Arena

YRS 7-9

£5.50 per pupil

Uncover the secret world of superhero science with nanochemist **Suze Kundu**. Are super strength powers, invisibility, gadget-filled costumes, and the ability to fly confined to movies and comic books? Be prepared to question what is science fiction, and what is rapidly becoming science fact.

<http://t.co/XEa4H00iDQ>

@FunSizeSuze



KS3
Build Your Own Internet

St Andrew's Church
 DP04 9.45-11.15am
 DP05 11.45am-1.15pm
 DP06 1.45-3.15pm
 YRS 8-9

This event is only available as part of a Day Package.

What is the Internet? How does it work? And how can we maintain privacy and security in something so vast and sprawling? With games and challenges, computing expert **Dave Cohen** from Royal Holloway, University of London reveals the protocols and algorithms that operate behind the scenes of the Internet you thought you knew.



KS3
Hack Your Brain

SS07

12noon-1pm
The Crucible
 YRS 7-9
£5.50 per pupil

Get to know the inner workings of your brain in this fast-paced journey around our nervous system with **Ginny Smith** as your tour guide. Explore how nerve cells send messages through the brain and body as we create a giant 'neuron' live on stage. Watch an audience member hack these signals to control someone else's movements.

[@ginnysmith1.wix.com/sciencecommunicator](http://ginnysmith1.wix.com/sciencecommunicator)
[@GinnyFBSmith](https://twitter.com/GinnyFBSmith)

KS3 Day Packages: Wednesday 8 June

YRS 8-9
£14 per pupil

If you are looking for a full visit in one easy booking then a Day Package is for you. Each package can accommodate 35-40 pupils (plus teachers) and comprises an event, an extended workshop, and a guaranteed session in the Discover Zone.

DP04	Package 1	9.45-11.15am 12noon-1pm 2-3pm	Build Your Own Internet Hack Your Brain Discover Zone
DP05	Package 2	10-11am 11.45-1.15pm 2-3pm	Engineering Superheroes Build Your Own Internet Discover Zone
DP06	Package 3	10-11am 12noon-1pm 1.45-3.15pm	Discover Zone Hack Your Brain Build Your Own Internet



KS3
Underwater Investigations

Helix Theatre
 DP07 9.45-11.15am
 DP08 11.45am-1.15pm
 DP09 1.45-3.15pm
 YRS 7-9

This event is only available as part of a Day Package.

What can you uncover in our underwater world? Biologist and TV presenter **Ben Garrod** guides you as you search for animals in our on-site Festival pond. Draw your discoveries to help study them, and use taxonomic keys to identify and find out more about your specimens.

<http://t.co/ogABqNB4lz>
 @ben_garrod

KS3 Day Packages: Thursday 9 June

£14 per pupil

If you are looking for a full visit in one easy booking then a Day Package is for you. Each package can accommodate 35-40 pupils (plus teachers) and comprises an event, an extended workshop, and a guaranteed session in the Discover Zone.

DP07	Package 1	9.45-11.15am 12noon-1pm 2-3pm	Underwater Investigations Level Up Roadshow Discover Zone
DP08	Package 2	10-11am 11.45-1.15pm 2-3pm	Twisted Topology Underwater Investigations Discover Zone
DP09	Package 3	10-11am 12noon-1pm 1.45-3.15pm	Discover Zone Level Up Roadshow Underwater Investigations



KS3
Twisted Topology

SS14

10-11am
The Crucible
 YRS 7-9
£5.50 per pupil

Get ready to blow your mind with mega mathematician **Katie Steckles** on this three dimensional journey. While she deforms and twists objects beyond what you thought possible, you'll discover what changes and what stays the same in this introduction to the slightly surreal world of topology.

katiesteckles.co.uk
 @stecks



KS3

Workshop: Molcraft – Molecules In Minecraft

St Andrew's Church

SS21 10-11am

SS22 11.15am-12.15pm

SS23 12.30pm-1.30pm

SS24 1.45pm-2.45pm

YRS 7-9

£6.50 per pupil

See Minecraft like you've never seen it before – at a molecular level! Welcome to Molcraft, where you can explore amazing molecular structures like the proteins that carry oxygen around your blood. **Mark Lorch** and **Phil Bell-Young** from the University of Hull will help you hunt down hidden treasure and solve puzzles dotted around the Molcraft world.

hull.ac.uk/scienceoutreach

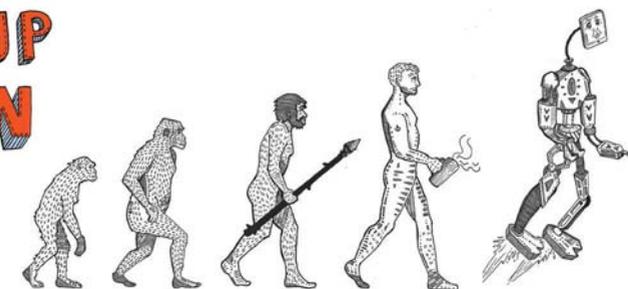
@Sci_ents

@Philby91



UNIVERSITY OF Hull

LEVEL UP HUMAN



KS3

SS15

Level Up Roadshow

12noon-1pm

EDF Energy Arena

YRS 7-9

£5.50 per pupil

Cybernetically-enhanced super-humans are something we won't see in our lifetime – or are they? Find out what's next for humanity as **Simon Watt** explores the almost unbelievable reality of human enhancement. With some wacky suggestions to improve the human race (and some of your own) find out what could really be around the corner.

readysteadyscience.com

@LevelUpHuman

Tuesday 7 June, 4-6.30pm

Teacher Twilight Reception

FREE What's The Big Idea? People-focussed engineering education

The UK requires an additional 150 engineers a day for the next ten years. Teachers have a key role to play in enthusing the next generation to meet the shortfall.

Join the **Institution of Mechanical Engineers** for a drinks reception, a panel discussion on the role of STEM education in engineering, and a compelling vision for the future of engineering education in schools. The **Big Ideas** project offers a vision of how the UK engineering and education communities can work together to achieve a step-change. These ideas are not a short-term fix, but are the beginning of a long term joint effort to shift perceptions and behaviours.

During the evening there will also be time to explore the The Times Cheltenham Science Festival *Discover Zone* and collect useful resources for your classroom.

Book your **FREE** ticket via the usual booking form and watch out for further information in the spring about the speakers at this event.

Institution of
**MECHANICAL
ENGINEERS**

FAQs

How do I book tickets?

It's simple! Once you've decided which activities you want to book just go to cheltenhamfestivals.com/scienceforschools and fill in and submit the booking form. **Booking opens 8am on Tuesday 2 February 2016. Please be aware there will be a £5 administrative booking fee applied to each booking.**

What happens next?

1. You will receive a booking confirmation via email. If any of your choices are not available, we will be in touch to discuss alternative options.
2. **Monday 9th May** is the deadline for notifying us of changes to your numbers as a result of fluctuations in class size. We will do our best to accommodate such changes, but please understand that we may be unable to do so.
3. After this date an invoice will be sent to your school finance office.
4. You will receive the following documents – please bring them with you:
 - A ticket document
 - A site map
 - An information letter with important details about your visit

It is helpful for every accompanying adult in your party to have a copy of these documents with them.

Getting to the Festival

For full details about arriving, parking, getting to venues and more, please refer to the FAQs at cheltenhamfestivals.com/education/planning-your-visit where you will also find our cancellation policy and advice for preparing a risk assessment.

**Don't miss our
free Teacher
Twilight Reception**
See page 15 for
details