



UNIVERSITY OF LEEDS

Leeds Festival of Science

SCHOOLS PROGRAMME

9 March - 5 April 2019

Primary - Secondary -
Post 16 - Teachers



 @STEMatLeeds

 Leeds Festival of Science

 www.leeds.ac.uk/festivalofscience

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Cancellation Policy

Schools that cancel at short notice, or bring significantly fewer pupils than booked, may be excluded from future events.

Photography Policy

Photographs taken during these events may be used in future publicity and marketing. Schools will be informed of sessions where a photographer will be present and will be supplied with consent forms. The forms will need to be completed by students and parents/guardians and submitted on arrival at the festival.

The 2019 schools programme is full of exciting STEM events for Key Stage 2 to 5, involving science, maths, engineering and geography. Once more, our programme offers a selection of ‘roadshow’ sessions which can be brought into school, in addition to our popular ‘on campus’ events.

HOW TO BOOK

- 1 Select your activities**
Browse our programme and shortlist all the events that interest you.
- 2 Complete the Request Form**
Fill in the online form found on our website by Friday 1 February 2019 to request activities. Send your requests in as early as possible as we begin allocating places at the start of January. Please visit www.leeds.ac.uk/festivalofscience to find the request form.
- 3 Wait for allocations to be made**
Allocations will be emailed to schools from 7 January 2019. You’ll be provided with all the information you need for your Leeds Festival of Science booking.


GET IN TOUCH

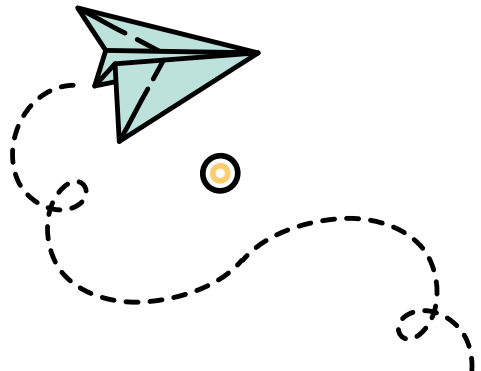
Please contact us if you have any questions or would like to learn more about what’s on offer during the Leeds Festival of Science.

 **Leeds Festival of Science**

 **@STEMatLeeds #LFoS19**

 **festivalofscience@leeds.ac.uk**

 **0113 343 7495**



PARTICLE ZOO

Learn all about the Big Bang, particles and the formation of the universe through our fun, interactive presentation.

Duration 1 hour

11 - 15 March AM or PM

Up to 30 pupils per school.
Suitable for years 5 & 6.

ROLLERCOASTERS!

Pupils will design and construct their own rollercoasters using Newton's Laws of Motion!

Duration 1 hour

11 - 15 March AM or PM

Up to 30 pupils per school.

MY FOOD IS A RAINBOW

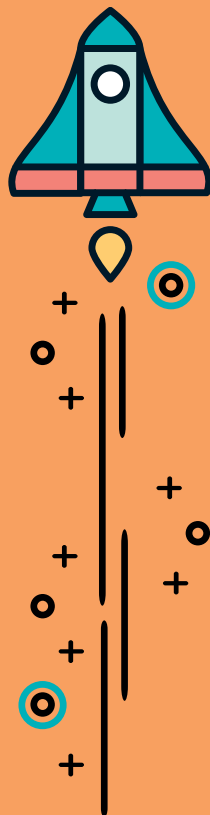
What gives food its colour and how does it affect the taste? What are superfoods and how are they good for us? Hear from food scientists and take part in some colourful experiments to get your taste buds going!

Duration 1 hour

Wednesday 13 March AM or PM

Thursday 21 March AM or PM

Up to 35 pupils per school.
Can be run twice in the same school.
Leeds or Bradford only.



*Check out
the Museum
workshops for
KS2 on page 6*

KS2 CAROUSELS

Carousel 1

SNAKES, SLUGS AND SPIDERS

Learn about different skeleton types by investigating these fascinating creatures.

MARBLE MAZES

Use your knowledge of forces and friction to build the ultimate marble maze.

Carousel 2

BEE IS FOR BIODIVERSITY

Learn about bees and biodiversity with our virtual hive, bee quizzes and games.

FOSSIL HUNT!

Hunt fossils in the classroom with our expert palaeontologist! What did these creatures look like and where did they live?

Carousel 3

WHAT A GAS!

Visit our teaching labs to learn all about gases. Explore the properties and uses of carbon dioxide and make your own bath bombs!

WHAT'S IN MY KIWI?

Seeds? Juice? There's probably lots of stuff you've never seen before too. Can you collect the DNA from your kiwi?

Carousel 4

PARTICLE ZOO

Learn all about the Big Bang, particles and the formation of the universe through our fun, interactive presentation.

ROLLERCOASTERS

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Tuesday 19 March 9:45 - 11:45

Up to 30 pupils per school.
Suitable for years 5 & 6.

DISCOVERY ZONE

A whistle-stop tour of interactive STEM activities, with at least 20 different stalls of hands-on science. Investigate the habitats of crayfish, find out about neurons, look at how your heart rate changes during exercise, and many other activities – all in one room! This is a fun, practical event for students and teachers alike. Early booking recommended!

Tuesday 26 March 9:45 - 11:45 or 13:00 - 15:00

Up to 30 pupils per school.



AMAZING ANIMALS

Learn all about amazing animal adaptations through our Natural Sciences collection of over 800,000 specimens.

In this workshop you will have the chance to see animals from all over the world, as well as some of our most exciting skulls and incredible insects. Tour the store, home to over 1 million objects, and see if you can spot the adaptations that help these amazing animals to survive.

BEHIND THE SCENES

Do you have what it takes to be a museum scientist? Explore how science is used in the Discovery Centre to help us look after over 1 million objects, from grisly bug identification to protecting artefacts from the effects of light damage.

With your scientist hat on, tour our amazing purpose built storage facility.

ROCKS AND FOSSILS

Get up close to rocks and fossils from our nationally recognised Geology collection. Learn about the rock cycle, explore the differences between different types of rocks and minerals, and handle specimens from our collections.

Explore our store, home to over 1 million objects, and see some of the most exciting geology in the country, including getting up close to a real meteorite!

11 March - 5 April

Up to 35 pupils per school.
Each session is 2 hours long.
First come, first served.

Venue:
**Leeds Museums Discovery Centre,
Carlisle Road, LS10 1LB**
£65 per session

To book:
E: Emily.nelson@leeds.gov.uk
T: 0113 53 50469





MEDICAL EQUIPMENT FOR EMERGENCIES

Students will get hands-on and learn how healthcare professionals handle emergency situations. Learning to use blood pressure monitors, pulse oximeters and other medical equipment, students will play both doctor and patient in this exciting scenario-based session.

Duration 1 hour
11-29 March AM or PM

Up to 30 pupils per school.
West Yorkshire only.



ALL SCIENCES

ORIGAMI ORGANELLES

The cell is a complicated structure but one that tells a story of how we go from DNA to walking, talking humans. This session looks at the key components of a mammalian cell – its ‘organelles’ – to show how one works. Students build origami structures of each of these organelles and come together to create whole cells from their results.

Duration 1 hour
11-22 March AM or PM

Up to 30 pupils per school.



BIOLOGY

PLASTIC FANTASTIC

The recent MacArthur Foundation report warns that there will be more plastic in the sea than fish by 2050. Students will think critically about the problem and engage in hands-on activities to explore and learn about possible solutions. Focus will be on how to reduce, reuse and recycle plastic products.

Duration 2 hour
Mondays or Wednesdays 11-27 March AM

Up to 30 pupils per school.
Leeds area only.



ALL SCIENCES

STRATEGIES OF SIMPLE GAMES

There is a family of games called Nim and although their rules are simple, their strategy can be surprisingly subtle. We will play some games, discover some strategies, and also use mathematics to analyse these games.

Duration 1 hour
Mondays or Wednesdays 11-27 March AM or PM
Friday 29 March AM or PM

Up to 50 pupils per school.
Flexible timing, 1 to 2 hours.
West Yorkshire only.



MATHEMATICS

THE MATHEMATICS OF CELL DIVISION AND MULTIPLICATION

Cell numbers in our body change over time - they divide, die or differentiate (change to become a slightly different cell type). With these rules, how many cells are there at a given time? Mathematics provides a beautiful tool answer to this question: branching processes. In this session you will learn about branching processes in biology and how to write a simple computer code (in python) to simulate the dynamics of a population of cells.

Duration 1 hour

Monday 11 March AM

Tuesday 12 March AM or PM

Monday 18 March AM

Tuesday 19 March AM or PM

Wednesday 20 March AM or PM

Monday 25 March AM

Tuesday 26 March AM or PM

Wednesday 27 March AM or PM

Up to 50 pupils per school.

Ideally students would have access to computers / tablets to fully engage in activities.

BIOLOGY **COMPUTING**

MATHEMATICS

VIRTUAL REALITY INSIDE OUR SCIENCE

Using our own smartphones, dive inside the world of science, taking a look at the technology behind, and the world created by, virtual reality. Pupils will use basic VR glasses to learn about the technology and then experience virtual reality videos, and look inside plant cells

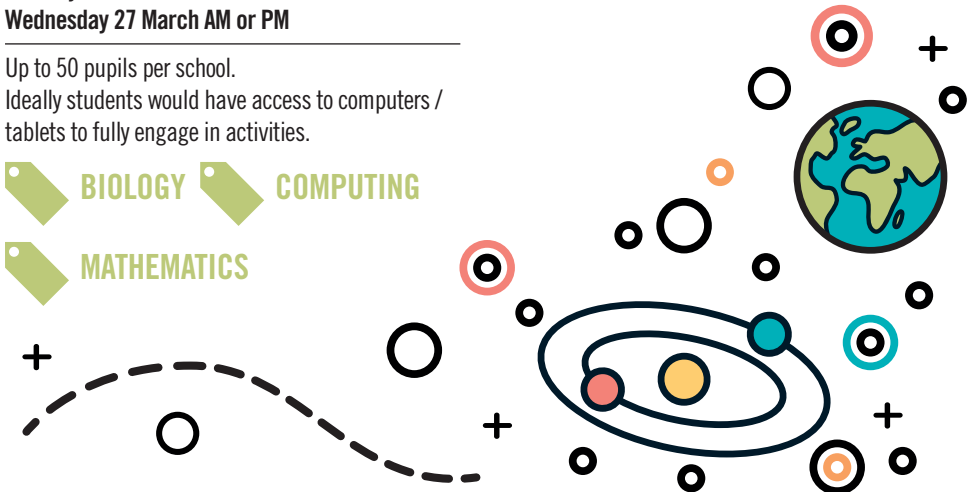
Duration 1 hour

11-22 March AM or PM

Up to 30 pupils per school.

Please note: the session is designed for pupils to use their own phones in pairs (and to learn how to do VR at home on them) so access to these, and wifi, leads to the best learning outcomes

BIOLOGY **COMPUTING**



WHAT DO DOCTORS AND NURSES DO? AN INTRODUCTION TO HEALTH CAREERS

This session looks at the various professions within the National Health Service, inspiring pupils to think about the various skills and attributes required to be successful in these careers. Through various group activities, students will develop an understanding of the wide range of health careers available and the pathways into them.

Duration 1 hour
11-29 March AM or PM

Up to 30 pupils per school.
West Yorkshire only.
Can run multiple sessions in the same school.

 **ALL SCIENCES**

CAN YOU SOLVE IT?

Is the North Pole the only place on Earth from which you can walk 1km due south, turn and walk 1km due east, turn again and walk 1km due north and find yourself back where you started? In this fun session, we'll solve similar puzzles and explore how mathematicians think!

Duration 50 minutes
Wednesdays or Thursdays 13-28 March AM

Up to 30 pupils per school.

 **MATHEMATICS**



DO WE NEED ANIMALS IN FOOD?

Based around the development of vegetarian and vegan food substitutes, students will experiment with different types and amounts of coagulating agents to discover how they affect the final properties of cheese.

Duration 1 hour

Thursday 14 March AM or PM

Up to 30 pupils per school.



BIOLOGY



CHEMISTRY



PHYSICS

SUBATOMIC LEGO

Explore the Big Bang from quarks to protons and neutrons using LEGO in a fun, interactive workshop.

Duration 1 hour

18, 20-22 March AM or PM

Up to 30 pupils per school.



CHEMISTRY



PHYSICS

MIGHTY MIX UP!

Pupils will be introduced to emulsions and discover where they are found in everyday life, and why they are important to scientists. They'll make (and taste!) their own ice cream.

Duration 1 hour

Wednesday 20 March AM or PM

Up to 30 pupils per school.



CHEMISTRY

MICROBIAL LAVA LAMP

In this hands-on workshop pupils will make gel beads from seaweed containing yeast cells. We will show how a food biopolymer will quickly form a gel when a calcium solution is added, and demonstrate fermentation when yeast reacts with sugar to produce gases. This can be visualised as a lava lamp as the bubbles are trapped in a balloon.

Duration 1 hour

Monday 25 March AM or PM

Up to 30 pupils per school.



BIOLOGY



CHEMISTRY

POP MATHS QUIZ

Pupils compete in teams of six in this pub quiz style maths competition. For more information visit www.stem.leeds.ac.uk/popmaths. All schools welcome to apply (maximum of two teams per school).

Saturday 23 March 11:00 - 13:00

Up to 12 pupils per school.
Suitable for years 7 & 8.



PROOF OF THE PUDDING

Explore the challenges and chemistry of the M&S Melting Middle Chocolate Pudding! Find out more about how this iconic product was developed, learn about the chemistry of baking, develop your own pudding product ideas, make your own ice cream... and yes, there will be a pudding taste test!

Tuesday 26 March 10:00 - 12:00 or 13:00 - 15:00

Wednesday 27 March 10:00 - 12:00 or 13:00 - 15:00

Up to 30 pupils per school.
This workshop involves tasting an M&S Melting Middle Chocolate Pudding. This product is not suitable for people with a nut allergy, an alternative will be provided. Please notify us at the point of booking if this will affect your group.



DISCOVERY ZONE

A whistle-stop tour of interactive STEM activities, with at least 20 different stalls of hands-on science. Investigate the habitats of crayfish, find out about neurons, look at how your heart rate changes during exercise, and many other activities – all in one room! This is a fun, practical event for students and teachers alike. Early booking recommended!

Wednesday 27 March 9:45 - 11:45 or 13:00 - 15:00

Up to 30 pupils per school.



THE GREAT LEEDS BUILD OFF

Pupils will work in teams in a race against the clock to recreate a 3D design using specific materials. This workshop will be a test of team work, communication and problem solving, as each member of the team has a different role, replicating the way the engineering industry works.

Wednesday 27 March 11:00 - 12:00 or 13:00 - 14:00

Monday 1 April 11:00 - 12:00

Up to 32 pupils per school.
Suitable for years 8, 9 & 10



HOW DO VOLCANOES WORK?

Investigate how a volcano works with practical experiments that use simple but spectacular model volcanic eruptions. Find out what factors control how a volcano behaves and what type of magma is erupted. Discover all this and more in our state-of-the-art Earth Visualisation Laboratory.

Monday 1 April 10:00 - 12:00

Thursday 4 April 13:00 - 15:00

Up to 30 pupils per school. Why not make a day of it for KS3? See 'Amazing Atmosphere' below and 'Cloud weighing for beginners' on page 14.

 **ALL SCIENCES**

AMAZING ATMOSPHERE

Find out all you ever wanted to know about temperature scales, Kelvin, absolute zero, properties of liquid nitrogen, and the make up of elements in this interactive demo-based workshop.

Monday 1 April 12:45 - 13:45 or 14:00 - 15:00

Up to 60 pupils per school.

 **CHEMISTRY**  **GEOGRAPHY**

 **PHYSICS**

ROBO RACERS

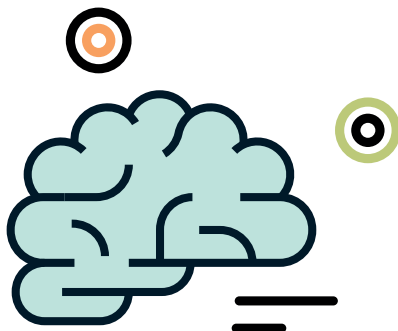
Participants will learn how to write computer code to allow them to control robot racing buggies. They will learn how to control the speed and direction of motors and read infra-red (IR) sensors. This will enable them to program the buggies to follow a line around a race track. The event will finish with a race with prizes for the team whose buggy completes a lap of the track in the fastest time.

Tuesday 2 April 10:00 - 14:00

Up to 12 pupils per school. Suitable for year 9. Pupils to bring packed lunches.

 **ALL SCIENCES**  **COMPUTING**

 **ENGINEERING**



WEATHER AND WATER: DEMISTING THE SCIENCE OF OUR ATMOSPHERE

This interactive session will allow participants to investigate the many processes that make our weather. Come and get involved with hands-on demonstrations, including making a cloud in a bottle and amazing supercooled water.

Wednesday 3 April 10:00 - 12:00 or 13:00 - 15:00
Thursday 4 April 10:00 - 12:00 or 13:00 - 15:00

Up to 40 pupils per school. Why not make a day of it? See 'A tale of two poles' below and 'Cloud weighing for beginners' on the right.



A TALE OF TWO POLES

Antarctica and Greenland are rapidly changing: the ice sheets are thinning faster than before, glaciers are speeding up and massive icebergs are calving. The polar regions play a key role in the global climate system but are very challenging to observe. Two scientists describe what we can learn about these remote regions from space, how they are changing, and challenges for the future.

Wednesday 3 April 11:00 - 12:00

Why not make a day of it for KS3?
See 'Weather and Water' above.



CLOUD WEIGHING FOR BEGINNERS

At any time it has been calculated that there is over 10 million million tonnes of water floating around above our heads! High in the atmosphere it's all about ice crystals whereas lower down water flips between a gas and liquid droplets which we see as clouds. But, just how much does a typical fluffy cloud weigh? In this talk we will examine a number of ideas, some more crazy than others, culminating in the first ever time someone has actually weighed a cloud!

Thursday 4 April 11:00 - 12:00

Why not make a day of it for KS3?
See 'Weather and Water' on the left.





FUNNY FLUIDS AND SOFT STUFF

Take a look at the weird and wonderful properties of some common substances with this mix of maths and science. Learn about polymers, non-Newtonian fluids, viscoelasticity and much more.

11-29 March AM or PM

Duration 1 hour

Up to 35 pupils per school.



HOW DO CELLS MAKE DECISIONS AND WHAT DOES IT HAVE TO DO WITH MATHEMATICS?

A series of biochemical reactions, initiated by a “receptor” molecule interacting with a “growth factor” molecule, lead to a cell deciding between different fates, such as division, death or differentiation (changing cell type). This is how cells communicate with each other, but how do they make a decision given the many different receptors on their surface and the wide array of growth factors in their extracellular space? Mathematics provides a beautiful tool to answer this question: stochastic processes. In this session you will learn about stochastic processes in biology and how to write a simple computer code (in python) to simulate the biochemical reactions that take place before a cell makes a decision.

Duration 1 hour

Monday 11 March AM

Tuesday 12 March AM or PM

Monday 18 March AM

Tuesday 19 March AM or PM

Wednesday 20 March AM or PM

Monday 25 March AM

Tuesday 26 March AM or PM

Wednesday 27 March AM or PM

Up to 50 pupils per school.

Ideally students would have access to computers/tablets to fully engage in activities.



HOW DO WE USE DNA?

DNA is the fascinating basis for all life, and yet there is a lot we don't know about it, despite great advances in technology in the last few decades. Gel electrophoresis is used by scientists the world over to investigate DNA - learn about how and why we use this technology in this hands-on session.

Duration 1 hour
11-22 March AM or PM

Up to 30 pupils per school. West Yorkshire only. Multiple sessions in the same school may be possible.



LEEDS LOVES STEM

Our student ambassadors will give a presentation and answer questions about their degree subjects, career paths and their experiences of studying at the University of Leeds.

These talks are a chance for your pupils to find out more about specific STEM subjects and opportunities in higher education. They allow pupils to explore some of the options available for further study and would be ideal for pupils making decisions about which subjects to study at a higher level.

Duration 1 hour
11-29 March AM or PM



MATHS HAS THE BEST CURVES

What is the shape of a hammock? How do foxes catch rabbits? Why do sea shells grow in spirals? In this session, we'll answer similar questions and learn how to make the most beautiful curves maths can offer.

Duration 50 minutes
Mondays and Tuesdays 11-26 March AM

Up to 30 pupils per school.



VIRTUAL REALITY INSIDE OUR SCIENCE

Using our own smartphones, dive inside the world of science, taking a look at the technology behind, and the world created by, virtual reality. Pupils will use basic VR glasses to learn about the technology and then experience virtual reality videos, and look inside plant cells

Duration 1 hour
11-22 March AM or PM

Up to 30 pupils per school. Please note: the session is designed for pupils to use their own phones in pairs (and to learn how to do VR at home on them) so access to these, and wifi, leads to the best learning outcomes



DESIGNING A MEDICINE

Help our researchers on their quest to develop anti-cancer medicines using mass spectrometry data. We can extend the workshop to 2 hours to include computer modelling if required, and if computers/ tablets are available.

Duration 1 hour

Tuesday 12 March AM or PM

Thursday 14 March AM or PM

Up to 30 pupils per school.



WHO WANTS TO BE A MARINE SCIENTIST? LIFE ON THE HIGH SEAS

Find out what happens at the bottom of the sea – from sandy beaches to the bottom of the Southern Ocean. What lives there, what do they eat, and what does that mean for the global Carbon cycle? Our marine scientist will address these questions, amongst photographs and accounts of what it is like to take to the high seas to conduct marine research. Topics covered will include photosynthesis and respiration, as a backdrop for introducing chemosynthesis.

Duration 1 hour

Tuesday 12 March AM or PM

Wednesday 13 March AM or PM

Thursday 14 March PM

Tuesday 19 March AM or PM

Wednesday 20 March AM

Thursday 21 March PM

Tuesday 26 March AM or PM

Wednesday 27 March AM or PM

Thursday 28 March AM or PM

Up to 60 pupils per school.

West Yorkshire only.



SUBATOMIC LEGO

Explore the Big Bang from quarks to protons and neutrons using LEGO in a fun, interactive workshop where we investigate what's inside atoms and where these subatomic particles came from.

Duration 1 hour

18, 20-22 March AM or PM

Up to 30 pupils per school.



SPECTROSCOPY IN A SUITCASE

Explore the analytical technique of UV-Vis spectroscopy using visible light to investigate different concentrations of a drug in solution. In this hands-on session pupils will use this technique to work out if a crime has been committed.

Duration 1 hour

Thursday 21 March AM

Monday 25 March AM

Up to 20 pupils per school. Leeds or Bradford only.
Could be run twice in same school if required.



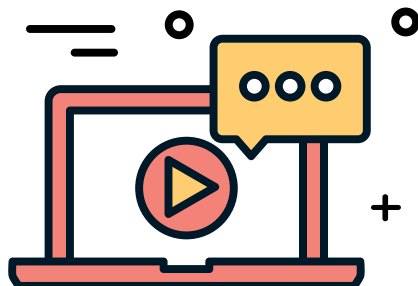
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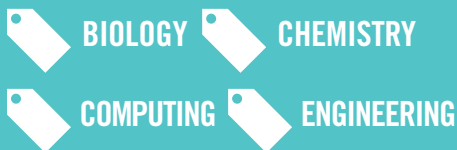


ENGINEERING EXPERIENCE FOR INTERNATIONAL WOMEN'S DAY

In honour of International Women's Day, the University is hosting a chance to experience hands-on the breadth of engineering available at Leeds. Experience 5 interactive stalls each posing a different engineering problem, and meet the real engineers conducting the research. Pupils will get to investigate areas such as Bioenergy, Fluid Dynamics, Tissue Engineering and Robotics.

Friday 15 March 9:45 - 15:00

Up to 5 pupils per school.
Female students only. Lunch is provided.



CRYPTIC CHALLENGE

Work in teams to crack the codes and discover how maths is right at the heart of cryptography.

Tuesday 26 March 10:00 - 12:00 or 13:00 - 15:00

Up to 32 pupils per school.



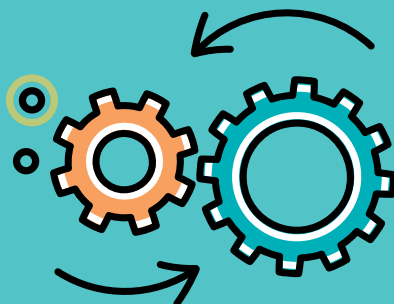
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Wednesday 27 March 11:00 - 12:00 or 13:00 - 14:00
Monday 1 April 11:00 - 12:00

Up to 32 pupils per school.
Suitable for years 8, 9 & 10

 **DESIGN & TECH**

 **ENGINEERING**  **PHYSICS**

EXPLORE STEM: ENVIRONMENTAL CHALLENGES

Join us for the day to discover more about university, STEM subjects and where they could take you! Hear from current students about what it's like to study at Leeds and take part in 3 STEM workshops around the theme of the environment. We will demonstrate the applications of chemistry and engineering in environmental science and how these subjects can provide answers to atmospheric and water pollution.

Monday 1 April 9:30 - 14:45

Up to 30 pupils per school.

 **ALL SCIENCES**

AMAZING ATMOSPHERE

Find out all you ever wanted to know about temperature scales, Kelvin, absolute zero, properties of liquid nitrogen, and the make up of elements in this interactive demo-based workshop.

Monday 1 April 12:45 - 13:45 or 14:00 - 15:00

Up to 60 pupils per school.

 **CHEMISTRY**  **GEOGRAPHY**

 **PHYSICS**

FOOD SCIENCE TASTER DAY

Get hands-on in our food science laboratories to find out how science plays a crucial role in our understanding of food and nutrition. Speak to food scientists, attend a taster lecture, have a go at spectroscopy and test your taste buds in our sensory booths!

Tuesday 2 April 9:45 - 14:15

Up to 10 pupils per school.

 **BIOLOGY**  **CHEMISTRY**

 **PHYSICS**

HOW DO WE USE DNA?

DNA is the fascinating basis for all life, and yet there is a lot we don't know about it, despite great advances in technology in the last few decades. Gel electrophoresis is used by scientists the world over to investigate DNA - learn about how and why we use this technology in this hands-on session.

Duration 1 hour
11-22 March AM or PM

Up to 30 pupils per school. West Yorkshire only.
Multiple sessions in the same school may be possible.



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Duration 1 hour
11-29 March AM or PM



PLAYING DICE WITH EPIDEMICS

During this session, we will explain how probability theory and random processes can be used in order to mathematically and computationally simulate epidemics in real life. This can help to assess the efficacy of control strategies for avoiding the spread of a given disease among individuals in a population. To this aim, we will make use of an original series of video games, "Hospital Infections", in which we simulate the spread of an infectious disease within patients in a hospital ward.

Duration 1 hour
11-13 March AM or PM
20-22 March AM or PM

Up to 30 pupils per school. Ideally students would have access to computers/tablets to fully engage in activities.



DESIGNING A MEDICINE

Help our researchers on their quest to develop anti-cancer medicines using mass spectrometry data. We can extend the workshop to 2 hours to include computer modelling if required, and if computers/ tablets are available.

Duration 1 hour
Tuesday 12 March AM or PM
Thursday 14 March AM or PM

Up to 30 pupils per school.



WHY KNOT?

Take a rope, tie any knot, and glue the ends of the rope. Take another rope, repeat. How can you tell if the two knots are the same? How can you tell if a knot can be unknotted without cutting the rope? Learn all this and why mathematicians are concerned with these questions.

Duration 1 hour

Thursdays or Fridays 14-29 March AM

Up to 20 pupils per school.
West Yorkshire only.



MATHEMATICS

SPECTROSCOPY IN A SUITCASE

Explore the analytical technique of UV-Vis spectroscopy using visible light to investigate different concentrations of a drug in solution. In this hands-on session pupils will use this technique to work out if a crime has been committed.

Duration 1 hour

Thursday 21 March AM

Monday 25 March AM

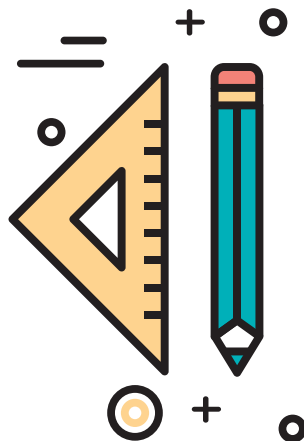
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CHEMISTRY



PHYSICS



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Get hands-on in our food science laboratories to find out how science plays a crucial role in our understanding of food and nutrition. Speak to food scientists, attend a taster lecture, have a go at spectroscopy and test your taste buds in our sensory booths!

Tuesday 2 April 9:45 - 14:15

This is for students who would like to explore food science at university level. Teachers can book groups, or interested individual students can apply online at: www.stem.leeds.ac.uk/foodscience/tasterday



BIOLOGY



CHEMISTRY



PHYSICS

KEY STAGE 5 MATHS DAY

Choose one of the 2 options below and then attend our W. P. Milne Sixth Form lecture (see right). Suitable for maths A Level students. Students to bring packed lunches.

OPTION A

HANDS-ON MATHEMATICS

Activities include creating chaos and exploring the maths of soap bubbles in a 'hands-on mathematics' session, a campus tour, and a talk about studying mathematics at Leeds.

Wednesday 3 April 11:00 - 14:20

This event is in collaboration with the Yorkshire Branch of the Mathematical Association.

OPTION B

HIDDEN SYMMETRIES OF NATURE

Symmetry is all around us. Just think of the left-right symmetry of your body or the hexagons of a honeycomb. Buildings, paintings and music can also be symmetric. But symmetry isn't just something that's pretty. It's a powerful tool that can be used to understand nature from planets to particles. Followed by an optional campus tour.

Wednesday 3 April 11:00 - 13:00

W P MILNE LECTURE FOR SIXTH FORMERS TO INFINITY AND BEYOND

The infinitely large and the infinitely small are mind-blowing concepts that have helped mathematicians to solve some very real, and finite, problems. Katie Chicot explores the mysteries and mis-conceptions of infinity, from ancient puzzles to some of the very latest mathematical research, taking you to infinity... and beyond.

Wednesday 3 April 14:30 - 15:30

This event is held in collaboration with the Yorkshire Branch of the Mathematical Association and can be booked independently of the options above.



MATHEMATICS

YEAR 12 BIOLOGICAL SCIENCES DAY

Students are invited onto campus for a day of practical Biological Sciences, getting hands-on with sophisticated DNA technology and spectrophotometry to diagnose patients, and researching how drugs can be detected in sport. There will also be the chance to pose questions to experts in the field. Expect to come away with undergraduate-level experience in the area!

Thursday 4 April 9:30 - 15:00

Up to 30 pupils per school.

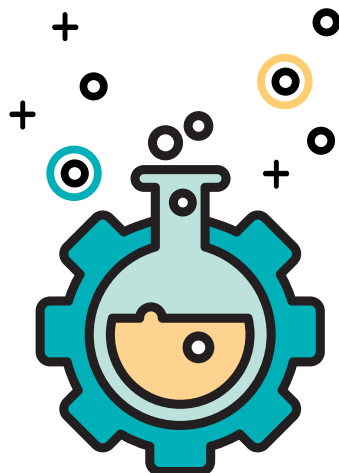


YEAR 12 PHYSICS TASTER DAY

Join us as an undergraduate student for the day. You'll attend a lecture, solve challenging problems during a workshop and complete an undergraduate-level lab session. This is a great opportunity for A level students studying both Maths and Physics to experience university life and see what it's like to study in higher education.

Thursday 4 April 10:00 - 14:30

Interested students should apply online at www.stem.leeds.ac.uk/physics/tasterday



ENRICHING THE TEACHING OF A LEVEL STATISTICS: A STUDY DAY FOR TEACHERS

SOME STATISTICAL STARTERS

This session will introduce some starters for teaching statistical topics as part of AS and A level Mathematics.

STATISTICAL SOFTWARE AND SIMULATION IN THE CLASSROOM

This session will look at a selection of free or inexpensive statistical analysis software and explore how they can be embedded in lessons alongside real datasets to enhance student dialogue around statistical concepts.

Saturday 9 March 11:00 - 15:00

The day is run in conjunction with the Yorkshire Branch of the Mathematical Association. For more details and to register for the study day please e-mail Alan (A.Slomson@leeds.ac.uk). Registration fee £30 (includes lunch).

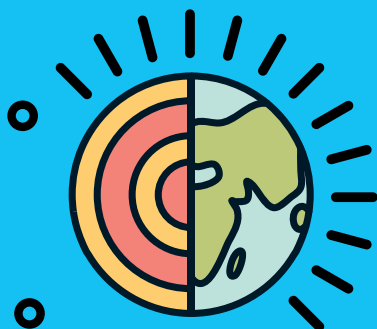


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Wednesday 3 April 14:30 - 15:30

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Roadshow Programme Overview

Audience	Time	Activity	Page
MONDAY 11 MARCH 2019			
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4	AM	Maths has the best curves	17
KS3	AM	Plastic fantastic	8
KS3	AM	The mathematics of cell division and multiplication	9
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS2	AM or PM	Particle Zoo	4
KS5	AM or PM	Playing dice with epidemics	22
KS2	AM or PM	Rollercoasters!	4
KS3	AM or PM	Strategies of simple games	8
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
TUESDAY 12 MARCH 2019			
KS4	AM	Maths has the best curves	17
KS4/KS5	AM or PM	Designing a medicine	18, 22
KS4	AM or PM	Funny fluids and soft stuff	16
KS4	AM or PM	How do cells make decisions and what does it have to do with mathematics?	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS2	AM or PM	Particle Zoo	4
KS5	AM or PM	Playing dice with epidemics	22
KS2	AM or PM	Rollercoasters!	4
KS3	AM or PM	The mathematics of cell division and multiplication	9
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18

Roadshow Programme Overview

Audience	Time	Activity	Page
WEDNESDAY 13 MARCH 2019			
KS3	AM	Can you solve it?	10
KS3	AM	Plastic fantastic	8
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS2	AM or PM	My food is a rainbow	4
KS3	AM or PM	Origami organelles	8
KS2	AM or PM	Particle Zoo	4
KS5	AM or PM	Playing dice with epidemics	22
KS2	AM or PM	Rollercoasters!	4
KS3	AM or PM	Strategies of simple games	8
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
THURSDAY 14 MARCH 2019			
KS3	AM	Can you solve it?	10
KS5	AM or PM	Why knot?	23
KS4/KS5	AM or PM	Designing a medicine	18, 22
KS3	AM	Do we need animals in food?	11
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS2	AM or PM	Particle Zoo	4
KS2	AM or PM	Rollercoasters!	4
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
FRIDAY 15 MARCH 2019			
KS5	AM or PM	Why knot?	23
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22

Roadshow Programme Overview

Audience	Time	Activity	Page
FRIDAY 15 MARCH 2019			
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS2	AM or PM	Particle Zoo	4
KS2	AM or PM	Rollercoasters!	4
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
MONDAY 18 MARCH 2019			
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4	AM	Maths has the best curves	17
KS3	AM	Plastic fantastic	8
KS3	AM or PM	The mathematics of cell division and multiplication	9
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS3	AM or PM	Strategies of simple games	8
KS3/KS4	AM or PM	Subatomic LEGO	11, 19
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
TUESDAY 19 MARCH 2019			
KS4	AM	Maths has the best curves	17
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS3	AM or PM	The mathematics of cell division and multiplication	9
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17

Roadshow Programme Overview

Audience	Time	Activity	Page
TUESDAY 19 MARCH 2019			
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
WEDNESDAY 20 MARCH 2019			
KS3	AM	Can you solve it?	10
KS3	AM	Plastic fantastic	8
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Mighty mix up!	11
KS3	AM or PM	Origami organelles	8
KS5	AM or PM	Playing dice with epidemics	22
KS3	AM or PM	Strategies of simple games	8
KS3/KS4	AM or PM	Subatomic LEGO	11, 19
KS3	AM or PM	The mathematics of cell division and multiplication	9
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
THURSDAY 21 MARCH 2019			
KS3	AM	Can you solve it?	10
KS4/KS5	AM	Spectroscopy in a suitcase	19, 23
KS5	AM	Why knot?	23
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS2	AM or PM	My food is a rainbow	4
KS3	AM or PM	Origami organelles	8
KS5	AM or PM	Playing dice with epidemics	22
KS3/KS4	AM or PM	Subatomic LEGO	11, 19

Roadshow Programme Overview

Audience	Time	Activity	Page
THURSDAY 21 MARCH 2019			
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
FRIDAY 22 MARCH 2019			
KS5	AM	Why knot?	23
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	How do we use DNA?	17, 22
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Origami organelles	8
KS5	AM or PM	Playing dice with epidemics	22
KS3/KS4	AM or PM	Subatomic LEGO	11, 19
KS3/KS4	AM or PM	Virtual reality inside our science	9, 17
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
MONDAY 25 MARCH 2019			
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4	AM	Maths has the best curves	17
KS3	AM	Plastic fantastic	8
KS4/KS5	AM	Spectroscopy in a suitcase	19, 23
KS3	AM	The mathematics of cell division and multiplication	9
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3/KS4	AM or PM	Microbial lava lamp	11, 19
KS3	AM or PM	Strategies of simple games	8
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
TUESDAY 26 MARCH 2019			
KS4	AM	Maths has the best curves	17
KS4	AM or PM	Funny fluids and soft stuff	16
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8

Roadshow Programme Overview

Audience	Time	Activity	Page
TUESDAY 26 MARCH 2019			
KS3	AM or PM	The mathematics of cell division and multiplication	9
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
WEDNESDAY 27 MARCH 2019			
KS3	AM	Can you solve it?	10
KS3	AM	Plastic fantastic	8
KS4	AM or PM	Funny fluids and soft stuff	16
KS4	AM	How do cells make decisions and what does it have to do with mathematics?	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	Strategies of simple games	8
KS3	AM or PM	The mathematics of cell division and multiplication	9
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
THURSDAY 28 MARCH 2019			
KS3	AM	Can you solve it?	10
KS5	AM	Why knot?	23
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical equipment for emergencies	8
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10
KS4	AM or PM	Who wants to be a marine scientist? Life on the high seas	18
FRIDAY 29 MARCH 2019			
KS5	AM	Why knot?	23
KS4	AM or PM	Funny fluids and soft stuff	16
KS4/KS5	AM or PM	Leeds Loves STEM	17, 22
KS3	AM or PM	Medical Equipment for Emergencies	8
KS3	AM or PM	Strategies of simple games	8
KS3	AM or PM	What do doctors and nurses do? An introduction to health careers	10

Campus Programme Overview

Audience	Time	Activity	Page
SATURDAY 9 MARCH 2019			
Teachers	11:00 - 15:00	Enriching the teaching of A level statistics: A study day for teachers	26
FRIDAY 15 MARCH 2019			
KS4	9:45 - 15:00	Engineering experience for International Women's Day	20
TUESDAY 19 MARCH 2019			
KS2	09:45 - 11:45	KS2 Carousels	5
SATURDAY 23 MARCH 2019			
KS3	11:00 - 13:00	Pop Maths Quiz	12
TUESDAY 26 MARCH 2019			
KS2	09:45 - 11:45 or 13:00 - 15:00	KS2 Carousels	5
KS4	10:00 - 12:00 or 13:00 - 15:00	Cryptic Challenge	20
KS3/KS4	10:00 - 12:00 or 13:00 - 15:00	Proof of the pudding	12, 20
WEDNESDAY 27 MARCH 2019			
KS3	09:45 - 11:45 or 13:00 - 15:00	Discovery Zone	12
KS3/KS4	10:00 - 12:00 or 13:00 - 15:00	Proof of the pudding	12, 20
KS3/KS4	11:00 - 12:00 or 13:00 - 14:00	The Great Leeds Build Off	12, 21
MONDAY 1 APRIL 2019			
KS4	09:30 - 14:45	Explore STEM: Environmental challenges	21
KS3	10:00 - 12:00	How do volcanoes work?	13
KS3/KS4	11:00 - 12:00	The Great Leeds Build Off	12, 21
KS3/KS4	12:45 - 13:45 or 14:00 - 15:00	Amazing atmosphere	13, 21
TUESDAY 2 APRIL 2019			
KS4/KS5	09:45 - 14:15	Food science taster day	21, 24
KS3	10:00 - 14:00	Robo racers	13
WEDNESDAY 3 APRIL 2019			
KS3	10:00 - 12:00 or 13:00 - 15:00	Weather and water: Demisting the science of our atmosphere	14
KS3	11:00 - 12:00	A tale of two poles	14
KS5	11:00 - 13:00	Hidden symmetries of nature	24
KS5	11:00 - 14:20	Hands-on mathematics, talks and tour	24
KS5	14:30 - 15:30	To infinity and beyond (W P Milne Lecture for sixth formers)	24

Campus Programme Overview

Audience	Time	Activity	Page
THURSDAY 4 APRIL 2019			
KS5	09:30 - 15:00	Year 12 biological sciences day	25
KS3	10:00 - 12:00 or 13:00 - 15:00	Weather and water: Demisting the science of our atmosphere	14
KS5	10:00 - 14:30	Year 12 physics taster day	25
KS3	11:00 - 12:00	Cloud weighing for beginners	14
KS3	11:00 - 12:00	How do volcanoes work?	13

Museum Overview

Audience	Venue	Activity	Page
11 MARCH - 5 APRIL 2019			
KS2	Discovery Centre	Amazing animals	6
KS2	Discovery Centre	Behind the scenes	6
KS2	Discovery Centre	Rocks and fossils	6

SUMMER SCHOOLS

Join us at the University of Leeds to discover what it's like to study STEM at university!



Bioscience
16 - 17 JULY

Y12

 1 night



Food Science
10 to 12 JULY

Y12

 2 nights



Mathematics
26 to 28 JUNE

Y12

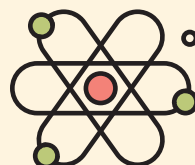
 2 nights



Physics
9 to 11 JULY

Y11

 2 nights

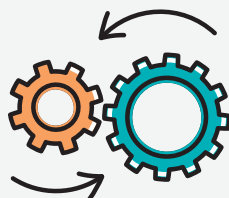


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www.stem.leeds.ac.uk/summerschools

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