The 2017 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 3 February 2017 to request activities.
   Get your requests in early, as we begin allocating places at the start of January.
   Please visit [www.leeds.ac.uk/festivalofscience](http://www.leeds.ac.uk/festivalofscience) to find the request form.

3. **Wait for allocations to be made**
   Allocations will emailed to schools from 6 January 2017. 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](http://www.leeds.ac.uk/festivalofscience)
- [@STEMatLeeds](http://www.twitter.com/STEMatLeeds)
- [festivalofscience@leeds.ac.uk](mailto:festivalofscience@leeds.ac.uk)
- 0113 343 7495

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**Cancellation Policy**

Schools that cancel at short notice or bring significantly fewer pupils 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.
PARTICLE ZOO
Learn all about the world of particles through our interactive presentation, full of squishy particle families!

Duration 1 hour
Monday 6 - Friday 10 March AM or PM
Up to 30 pupils per school.
Suitable for years 5 & 6.

ROLLERC coASTERS!
Pupils will design and construct their own rollercoasters using Newton’s Laws of Motion!

Duration 1 hour
Monday 6 - Friday 10 March AM or PM
Up to 30 pupils per school.

AVOIDING ATTACK!
The “evolutionary arms race” between predators and prey has produced some fantastic examples of adaptation. Students will explore the advantages of some adaptations (camouflage and mimicry) using simple experiments, and will be presented with some real world examples of those adaptations to experience just how remarkable evolution can be.

Duration 1 hour
Tuesday 7 March PM
Thursday 9 March PM
Friday 10 March PM
Tuesday 14 - Friday 17 March PM
Tuesday 21 March PM
Friday 24 March PM
Up to 30 pupils per school.

DISCOVER ENGINEERING
Pupils will explore the fascinating world of engineering using a product designed and manufactured in Leeds! Pupils will make their own mock-product to take home, and work in teams to build a GIANT tetrahedron structure (room size permitting!) This interactive workshop challenges pupils to communicate, test and create using real life examples of engineering practices and processes.

Duration 2 hours
Wednesday 15 - Thursday 16 March AM or PM
Up to 35 pupils per school.
Suitable for years 5 & 6.

WHAT’S THE MATTER?
Explore the properties of solids and liquids and investigate some unusual materials that behave like both! Make slime and discover why it has such interesting characteristics.

Duration 1 hour
Thursday 16 March AM or PM
Up to 30 pupils per school.
Leeds or Bradford area only.

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.

Duration 1 hour
Wednesday 29 - Thursday 30 March AM or PM
Suitable for years 5 & 6.
West Yorkshire only.

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 15 March PM
Wednesday 22 March AM or PM
Up to 35 pupils per school.
Can be run twice in the same school.
Leeds or Bradford only.
KS2 Programme

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.

EARTH DETECTIVES
Explore how our Earth works, using clues from volcanoes and earthquakes.

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 world of particles through our interactive presentation, full of squishy particle families!

ELEMENTARY ENGINEERS
Pupils will explore engineering as it relates to a product manufactured here in Leeds and distributed all over the world. Pupils will get to make and take home their own mock-product.

Tuesday 21 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 28 March 9:45 - 11:45 or 13:00 - 15:00
Up to 30 pupils per school.

KS3 Programme

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
Monday 6 March - Friday 24 March AM or PM
Up to 30 pupils per school.

STRAATEGIES 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.

Tuesdays 7 - 21 March AM
Wednesdays 8 - 22 March PM
Fridays 10 - 24 March AM
Up to 50 pupils per school.
Flexible timing, 1 to 2 hours. West Yorkshire only.

BIOLOGY. CHEMISTRY. PHYSICS

Roadshow

LEGO BIG BANG!
Explore the universe from the Big Bang to the formation of the stars using LEGO!

Duration 1 hour
Monday 13 March - Friday 17 March AM or PM
Up to 30 pupils per school.

WHO WANTS TO BE A MARINE SCIENTIST? LIFE ON THE HIGH SEAS
Marine Scientist Clare Woulds has spent several months conducting research at sea, in locations ranging from the tropical Indian Ocean to sites off the Antarctic Peninsula. She will give a talk about marine science at sea, illustrated with her photographs, and followed by a question and answer session.

Duration 1 hour
Tuesday 14 - Thursday 16 March AM or PM
Up to 60 pupils per school.
West Yorkshire only.

BIOLOGY. CHEMISTRY. PHYSICS
**THE BUILDING BLOCKS OF LIFE**  
Discover more about DNA, from how it affects our sporting performance to where it’s found. Pupils will extract DNA from a range of fruit using household products.

**GUT INSTINCT - HOW DOES DIGESTION WORK?**  
Meet a food scientist and find out how we digest food to provide our body with nutrients and energy. This is a hands-on activity involving real foods and enzymes to illustrate the process of digestion.

**Duration 1 hour**  
**Monday 20 March AM or PM**  
Up to 30 pupils per school.

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

**Saturday 4 March 11:00 - 13:00**  
Up to 12 pupils per school.  
Suitable for years 7 & 8.

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**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.

**Wednesday 22 - Thursday 23 March**  
**Monday 27 March 10:00 - 12:00 or 13:00 - 15:00**  
Up to 30 pupils per school.

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**POLE TO POLE: LIFE AT THE ENDS OF THE EARTH**  
This is a chance for students to meet polar scientists, ask them questions about living at the poles, dress up in both modern and early-explorer clothing, run experiments on climate change and sea level rise, and learn the difference between the Arctic and Antarctic by using large 3D jigsaw puzzles to piece together the continents and see what is underneath the ice.

**Wednesday 22 - Thursday 23 March**  
**Monday 27 March 10:00 - 12:00 or 13:00 - 15:00**  
Up to 40 pupils per school.

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**GUT INSTINCT - HOW DOES DIGESTION WORK?**  
Meet a food scientist and find out how we digest food to provide our body with nutrients and energy. This is a hands-on activity involving real foods and enzymes to illustrate the process of digestion.

**Duration 1 hour**  
**Tuesday 21 March AM or PM**  
Up to 30 pupils per school.

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**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!

**Wednesday 22 - Thursday 23 March**  
**Monday 27 March 10:00 - 12:00 or 13:00 - 15:00**  
Up to 30 pupils per school.

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Up to 40 pupils per school.

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**Duration 1 hour**  
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Up to 30 pupils per school.

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**Monday 27 March 10:00 - 12:00 or 13:00 - 15:00**  
Up to 40 pupils per school.

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Up to 30 pupils per school.

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**Monday 27 March 10:00 - 12:00 or 13:00 - 15:00**  
Up to 40 pupils per school.

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**Duration 1 hour**  
**Tuesday 21 March AM or PM**  
Up to 30 pupils per school.

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**Wednesday 22 - Thursday 23 March**  
**Monday 27 March 10:00 - 12:00 or 13:00 - 15:00**  
Up to 40 pupils per school.
ROBO-SOCCER
Learn how to control small robots with your gestures using Microsoft Kinect. Design the controller for your robot so it can be easily driven around the small pitch, then test your design and skills against the other teams in a final tournament!

Tuesday 28 - Wednesday 29 March
10:00 - 12:00 or 13:00 - 15:00
Up to 12 pupils per school.
Suitable for years 9, 10 & 11.

THE ENERGY FACTORY
Where will our electricity come from in the future? What will our lives be like as we tackle the challenge of climate change by moving away from fossil fuels? Through imagining a sci-fi world of the future, pupils can learn about renewable energy technologies and how they might affect our lives.

Tuesday 28 March
13:00 - 15:00
Up to 35 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.

Tuesday 28 March 10:30 - 12:00
Thursday 30 March 10:30 - 12:00
Up to 30 pupils per school.
Suitable for years 8, 9 & 10.

A DIFFERENT KIND OF REALITY
How can you visit a distant country from the comfort of your seat? How does Google capture Street View scenes around the world? How can we record and view a moment in 360°? Pupils will explore the past, present and future of illusion, projection and virtual reality in this interactive session; unlocking the potential of smartphones to produce their own virtual tours.

Wednesday 29 March 10:00 - 12:00
Up to 30 pupils per school.
Suitable for years 8, 9 & 10.

THE UPS AND DOWNS OF LIFE IN THE FREEZER: A TALE OF TWO POLES
Two scientists describe their adventures at Earth’s extremities. Dr Ryan Neely went UP to the top of the Greenland Ice Sheet to fire lasers into the sky to study clouds, whilst Dr Anna Hogg travelled DOWN to western Antarctica and used a ground-penetrating radar to investigate one of the fastest glaciers in the world.

Thursday 30 March 11:00 - 12:00 or 13:00 - 14:00
Why not make a day of it for KS3 & 4? See ‘Weather and Water’ above.
EVERYDAY CHEMISTRY
Test out your skills as an analytical chemist with a series of hands on practical activities. Then sit back and enjoy the show as we look at the chemistry in our shopping basket!
Friday 31 March 9:30 - 12:00
Up to 35 pupils per school.

EATEN ALIVE! THE FASCINATING WORLD OF PARASITIC WASPS
Parasitic wasps are a fascinating part of biodiversity and play an important role in killing insect pests in gardens or on crops. These tiny predators lay their eggs in or on the pest, which then hatch and eat them alive! We will explore the battles between wasps and pests.
Friday 31 March 10:00 - 12:00 or 13:00 - 15:00
Up to 30 pupils per school.

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
Monday 6 - Friday 17 March AM or PM
Up to 30 pupils per school. West Yorkshire only. Multiple sessions in the same school may be possible.

IS THE USE OF ANIMALS IN RESEARCH REALLY NECESSARY?
In this interactive session, students will discuss, in a non-biased, non-confrontational manner, whether the use of laboratory animals in developing new medicines is really necessary or are there alternatives? It will enable them to form their own opinions on the issue. Suitable for GCSE or A level science, psychology & religious studies students.
Duration 1 hour
Wednesday 8 March AM
Thursday 9 March PM
Wednesday 15 March AM
Thursday 16 - Friday 17 March AM or PM
Monday 20 - Tuesday 21 March AM or PM
Wednesday 22 March AM
Thursday 23 - Friday 24 March AM or PM
Up to 200 pupils per school. West Yorkshire only.

LEEDS LOVES STEM
Our student ambassadors will give a presentation and answer questions about their degree subject, 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
Wednesdays 8 - 29 March PM

ALL SCIENCES
KS4 Programme

The Aviation Academy, Leeds Bradford International Airport

T A K E O F F T O A C A R E E R I N A V I A T I O N

Activities for groups of up to 14 students for a half a day visit to the airside Craven College Aviation Academy at Leeds Bradford International Airport for interactive STEM activities with an aviation theme e.g. flight theory delivered by a pilot instructor, aircraft balance and loading, and take off, trip and landing calculations. The sessions can be adapted according to the age and abilities of the students.

Thursdays 9 - 23 March 9.30 - 11.30
Up to 14 pupils per school.

LEGO BIG BANG!
Explore the universe from the Big Bang to the formation of the stars using LEGO!

Duration 1 hour
Monday 13 - Friday 17 March AM or PM
Up to 30 pupils per school.

LEGO PARTICLE PHYSICS
Particle physics can be a bit tricky... Using LEGO, it's easy to learn the ins and outs of particle formation!

Duration 1 hour
Monday 13 - Friday 17 March AM or PM
Up to 30 pupils per school.

WHO WANTS TO BE A MARINE SCIENTIST? LIFE ON THE HIGH SEAS
Marine Scientist Clare Woulds has spent several months conducting research at sea, in locations ranging from the tropical Indian Ocean to sites off the Antarctic Peninsula. She will give a talk about marine science at sea, illustrated with her photographs, and followed by a question and answer session.

Duration 1 hour
Tuesday 14 - Thursday 16 March AM or PM
Up to 60 pupils per school.
West Yorkshire only.

MEDICINAL CHEMISTRY
Explore the process of bringing a new drug to market and experience how chemists use computer modelling in the development of medicines.

Duration 1 hour
Wednesday 22 March PM
Monday 27 March AM or PM
Up to 30 pupils per school.
Requires access to computers.

FOOD: OUR FUEL
Pupils will explore the effects of sugar in our body and look at the amount of sugar found in different foods and drinks. Includes links to respiration, refraction and chemical reactions.

Duration 1 hour
Thursday 23 March AM or PM
Up to 30 pupils per school.
Requires a laboratory if possible but all equipment will be supplied.

Roadshow

COMPUTING. MATHEMATICS. PHYSICS

Book via Melissa Hodgson (Schools Liaison Assistant) mhodgson@craven-college.ac.uk
To learn more about the academy and for further information, visit www.theaviationacademy.co.uk
PHYSICS CHALLENGES

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!

Wednesday 22 March - Thursday 23 March
Monday 27 March 10:00 - 13:00
Up to 4 pupils per school.

Up to 30 pupils per school.

FOOD SCIENCE DISCOVERY 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 28 March 10:00 - 14:00
Up to 30 pupils per school.
Please bring a packed lunch.

ROBO-SOCCER

Learn how to control small robots with your gestures using Microsoft Kinect. Design the controller for your robot so it can be easily driven around the small pitch, then test your design and skills against the other teams in a final tournament!

Tuesday 28 - Wednesday 29 March
10:00 - 12:00 or 13:00 - 15:00
Up to 12 pupils per school.
Suitable for years 9, 10 & 11.

A DIFFERENT KIND OF REALITY

How can you visit a distant country from the comfort of your seat? How does Google capture Street View scenes around the world? How can we record and view a moment in 360°? Pupils will explore the past, present and future of illusion, projection and virtual reality in this interactive session; unlocking the potential of smartphones to produce their own virtual tours.

Wednesday 29 March 10:00 - 12:00
Up to 30 pupils per school.
Suitable for years 8, 9 & 10.
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 29 - Thursday 30 March
10:00 - 12:00 or 13:00 - 15:00

Up to 40 pupils per school.
Why not make a day of it? See ‘The ups and downs of life in the freezer: A tale of two poles’ on the right.

CHEMISTRY. GEOGRAPHY. PHYSICS

KS4 CHEMISTRY DAY

Join us for the day to improve your chemistry knowledge and practical skills. Try your hand at designing a new medicine, discover more about careers in chemistry and experience some advanced analytical techniques, including spectroscopy, chromatography and more.

Thursday 30 March 9:45 - 14:00

Up to 30 pupils per school.
Please bring a packed lunch.

CHEMISTRY

THE UPS AND DOWNS OF LIFE IN THE FREEZER: A TALE OF TWO POLES

Two scientists describe their adventures at Earth’s extremities. Dr Ryan Neely went UP to the top of the Greenland Ice Sheet to fire lasers into the sky to study clouds, whilst Dr Anna Hogg travelled DOWN to western Antarctica and used a ground-penetrating radar to investigate one of the fastest glaciers in the world.

Thursday 30 March
11:00 - 12:00 or 13:00 - 14:00

Why not make a day of it for KS3 & 4? See ‘Weather and Water’ on the left.

CHEMISTRY. BIOLOGY. CHEMISTRY. GEOGRAPHY. PHYSICS

IS THE USE OF ANIMALS IN RESEARCH REALLY NECESSARY?

In this interactive session, students will discuss, in a non-biased, non-confrontational manner, whether the use of laboratory animals in developing new medicines is really necessary or are there alternatives? It will enable them to form their own opinions on the issue. Suitable for GCSE or A level science, psychology & religious studies students.

Duration 1 hour
Wednesday 8 March AM
Thursday 9 March PM
Wednesday 15 March AM
Thursday 16 - Friday 17 March AM or PM
Monday 20 - Tuesday 21 March AM or PM
Wednesday 22 March AM
Thursday 23 - Friday 24 March AM or PM

Up to 200 pupils per school.
West Yorkshire only.

BIOLOGY. PSYCHOLOGY. RELIGIOUS STUDIES

LEEDS LOVES STEM

Our student ambassadors will give a presentation and answer questions about their degree subject, 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
Wednesdays 8 - 29 March PM

ALL SCIENCES

KS4 Programme

KS5 Programme

Roadshow

Campus
KS5 Programme

The Aviation Academy, Leeds Bradford International Airport

TAKE OFF TO A CAREER IN AVIATION

Activities for groups of up to 14 students for a half a day visit to the airside Craven College Aviation Academy at Leeds Bradford International Airport for interactive STEM activities with an aviation theme e.g. flight theory delivered by a pilot instructor, aircraft balance and loading, and take off, trip and landing calculations. The sessions can be adapted according to the age and abilities of the students.

Thursdays 9 - 23 March 9.30 - 11.30
Up to 14 pupils per school.

COMPUTING. MATHEMATICS. PHYSICS

Book via Melissa Hodgson (Schools Liaison Assistant) mhodgson@craven-college.ac.uk
To learn more about the academy and for further information, visit www.theaviationacademy.co.uk

DISCOVERING GEOGRAPHY WITH GIS

This computer-based practical session will introduce students to the ever-growing world of Geographical Information Systems (GIS). This activity has been designed to integrate GIS technology with popular geography topics. In this session students will have the opportunity to use free, web-based GIS software to map real-time earthquake events and world development indicators.

Duration 1 hour
Monday 13 - Wednesday 15 March AM or PM
Up to 25 pupils per school.
Suitable for students studying geography or a related subject.
West Yorkshire only.

LEGO PARTICLE PHYSICS

Particle physics can be a bit tricky... Using LEGO, it’s easy to learn the ins and outs of particle formation!

Duration 1 hour
Monday 13 - Friday 17 March AM or PM
Up to 30 pupils per school.

PHYSICS

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

Marine Scientist Clare Woulds has spent several months conducting research at sea, in locations ranging from the tropical Indian Ocean to sites off the Antarctic Peninsula. She will give a talk about marine science at sea, illustrated with her photographs, and followed by a question and answer session.

Duration 1 hour
Tuesday 14 - Thursday 16 March AM or PM
Up to 60 pupils per school.
West Yorkshire only.

BIOLOGY. CHEMISTRY. PHYSICS

MEDICINAL CHEMISTRY

Explore the process of bringing a new drug to market and experience how chemists use computer modelling in the development of medicines.

Duration 1 hour
Wednesday 22 March PM
Monday 27 March AM or PM
Up to 30 pupils per school.
Requires access to computers.

CHEMISTRY. COMPUTING

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 23 March AM or PM
Up to 20 pupils per school.
Leeds or Bradford only.
Can be run twice in same school if required.

CHEMISTRY. PHYSICS

WHAT DOES FOOD SOUND LIKE?

Find out how the structure of food is important to our appreciation and perception of food. We will describe and demonstrate how scientists use acoustic techniques to explore various physical properties of foods. These include viscosity and compressibility of liquids and emulsions, and changes in phase states.

Duration 1 hour
Wednesday 29 March AM or PM
Up to 30 pupils per school.
Suitable for students interested in food science, physics or maths.

CHEMISTRY. PHYSICS.
MATHEMATICS. FOOD SCIENCE

Roadshow

Book via Melissa Hodgson (Schools Liaison Assistant) mhodgson@craven-college.ac.uk
To learn more about the academy and for further information, visit www.theaviationacademy.co.uk
LEONARDO’S RAMP
How do we conduct research and gather findings at a university level? Why do we do the research that we do? Leonardo’s ramp is used by current engineers researching friction – join them to explore the effect of variables such as angle and material and discover how results are put to use.

Tuesday 21 - Thursday 23 March 10:00 - 12:00
Tuesday 28 - Thursday 30 March 10:00 - 12:00
Up to 30 pupils per school.

LEONARDO’S RAMP
How do we conduct research and gather findings at a university level? Why do we do the research that we do? Leonardo’s ramp is used by current engineers researching friction – join them to explore the effect of variables such as angle and material and discover how results are put to use.

Tuesday 21 - Thursday 23 March 10:00 - 12:00
Tuesday 28 - Thursday 30 March 10:00 - 12:00
Up to 30 pupils per school.

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!

Wednesday 22 - Thursday 23 March
Monday 27 - Wednesday 29 March
10:00 -12:00 or 13:00 -15:00

CHEMISTRY. DESIGN & TECH
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.

Up to 30 pupils per school.

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!

Monday 27 March 9:30 - 15:30

FOOD SCIENCE DISCOVERY 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 28 March 10:00 - 14:00
Up to 30 pupils per school. KS5 pupils can book as individuals if the school allows. Please bring a packed lunch.

BIOLOGY. CHEMISTRY. PHYSICS

STRING VEST TO BULLET PROOF VESTS
Explore the extraordinary versatility and breadth of characteristics of textile fibres, in the context of how we use them in day-to-day life. Strength, elongation, abrasions, resistance and fatigue will be put to the test using exciting experiments and lively demonstrations in the University’s School of Design.

Monday 27 March 13:00 - 15:00
Wednesday 29 March 13:00 - 15:00
Up to 30 pupils per school.

BRINGING THE OUTSIDE IN: GEOLOGICAL MAPPING IN VIRTUAL LANDSCAPES
White, fluffy clouds sail across the blue, sunlit sky. Birds sing, sheep graze, seagulls bounce off the beach(!) and flies buzz around the dead sheep. Explore a virtual landscape, discover rock outcrops and create your own geological map.

Tuesday 28 March 10:30 - 12:00
Suitable for all, but particularly relevant to geology and geography A level students.

COMPUTING. DESIGN & TECH. GEOGRAPHY. GEOLOGY
MIX AND MATCH MATHS DAY
Join us for a day of mathematical activities! Choose from one of the following options, all culminating in the W. P. Milne Sixth Form Lecture ‘How to solve equations’.

MATHEMATICS

OPTION A HANDS-ON MATHEMATICS, TALKS AND TOUR
Activities include creating chaos and exploring the maths of soap bubbles in a ‘hands-on mathematics’ session, campus tours, and talks about studying mathematics at Leeds.

Wednesday 29 March 11:00 - 14:20
This event is held in collaboration with the Yorkshire Branch of the Mathematical Association.

OPTION B UNTANGLING KNOT THEORY
It's not only mountaineers, scouts, and sailors who study knots, but also mathematicians. In fact, knot theory has turned out to be an extraordinarily deep subject – the fundamental question of determining whether two knots are the same turns out to be surprisingly difficult. This subject also has numerous and diverse applications, from the knotting of our own DNA to quantum physics. In this session we will meet several mathematical techniques for analysing and classifying different knots.

Wednesday 29 March 10:30 - 12:30
Followed by an optional talk about studying maths at university or campus tour.

OPTION C MATHS AND MAGIC
It is possible to shuffle a pack of cards so that the cards from two halves are perfectly alternated. While this shuffle looks perfectly fair, it is almost as unfair as you can get! The shuffler can work out the destination of each card and, with a bit of thought, can deal winning hands of cards effortlessly. The possibilities of using this in card magic or to cheat are immense! In this talk we will look at this “perfect” shuffle and the interesting mathematics behind it. (Involves audience participation)

Wednesday 29 March 12:00 - 13:00

HOW TO SOLVE EQUATIONS
(W P MILNE LECTURE FOR SIXTH FORMERS)
What strategies do mathematicians use to solve equations? We’ll focus on some classic examples from number theory, and see that sometimes the key to success is to use unexpected areas of maths – and that sometimes solving even simple equations can be very challenging.

Wednesday 29 March 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.

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 30 March 10:30 - 14:30
Interested students should apply online at www.physics.leeds.ac.uk/TasterDay

THE UPS AND DOWNS OF LIFE IN THE FREEZER: A TALE OF TWO POLES
Two scientists describe their adventures at Earth’s extremities. Dr Ryan Neely went UP to the top of the Greenland Ice Sheet to fire lasers into the sky to study clouds, whilst Dr Anna Hogg travelled DOWN to western Antarctica and used a ground-penetrating radar to investigate one of the fastest glaciers in the world.

Thursday 30 March 11:00 - 12:00 or 13:00 - 14:00
Teachers Programme

PROBLEM SOLVING—SO WHAT IS NEW?

In this session we will consider how we can develop problem solving strategies in the classroom by supporting teachers with professional development and resources.
- Does lesson study have a distinct role?
- How can the new Core maths level 3 award support this?
- What about assessment and links to handling data and experimentation?

Thoughts from a serial head of maths and maths hub lead...

Saturday 11 March 14:00 - 15:30

No booking required, please just come along on the day. The session will take place in MALL 1, School of Mathematics which will be open from 1:30pm.

MATHEMATICS

HOW TO SOLVE EQUATIONS
(W P MILNE LECTURE FOR SIXTH FORMERS)

What strategies do mathematicians use to solve equations? We’ll focus on some classic examples from number theory, and see that sometimes the key to success is to use unexpected areas of maths - and that sometimes solving even simple equations can be very challenging.

Wednesday 29 March 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

Public Programme

There will be plenty of activities such as workshops and talks for everybody to enjoy – please keep an eye on www.leeds.ac.uk/festivalofscience for details!

In particular, save the date for:

BE CURIOUS 2017: ABOUT LEEDS AND YORKSHIRE

Ever wondered what happens in a University? Ever been curious as to what studies and research are done in Leeds and what relevance they have to you living in the Leeds and Yorkshire area? Now is your chance to discover the vast array of exciting things that go on at the University of Leeds. All age groups are welcome at this event with many activities aimed at a family audience. There is no need to book, just come along to the FREE event.

Saturday 25 March 10:00 - 16:00

Visit our website to find out more www.leeds.ac.uk/becurious

Self-Led Trails

LEEDS CITY CENTRE MATHS TRAIL

A self-led maths trail around the Leeds Market and Corn Exchange
Trail available from www.leeds.ac.uk/festivalofscience

LEEDS CITY WALK – GEOLOGY OF BUILDINGS IN LEEDS

This self-led geological walk around the buildings of Leeds city centre offers a chance to look at the history of the Earth through the materials used to build the city over the last 800 years.
Trail available from www.leeds.ac.uk/festivalofscience
### ROADSHOW PROGRAMME OVERVIEW

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<tr>
<th>AUDIENCE</th>
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## Campus Programme Overview

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<td>KS3/KS4/ KS5</td>
<td>10:00 - 12:00 or 13:00 - 15:00</td>
<td>Proof of the pudding</td>
<td>9, 17, 22</td>
</tr>
<tr>
<td>KS4, KS5</td>
<td>10:00 - 14:00</td>
<td>Food science discovery day</td>
<td>17, 23</td>
</tr>
<tr>
<td>KS3</td>
<td>10:30 - 12:00</td>
<td>HESCO engineering challenge</td>
<td>10</td>
</tr>
<tr>
<td>KS5</td>
<td>10:30 - 12:00</td>
<td>Bringing the outside in: Geological mapping in virtual landscapes</td>
<td>23</td>
</tr>
<tr>
<td>KS3/KS4</td>
<td>13:00 - 14:00</td>
<td>The great Leeds build off</td>
<td>10, 17</td>
</tr>
<tr>
<td>KS3</td>
<td>13:00 - 15:00</td>
<td>The energy factory</td>
<td>10</td>
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<tr>
<td><strong>WEDNESDAY 29 MARCH 2017</strong></td>
<td></td>
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</tr>
<tr>
<td>KS3</td>
<td>09:45 - 11:45 or 13:00 - 15:00</td>
<td>Discovery Zone</td>
<td>11</td>
</tr>
<tr>
<td>KS3/KS4</td>
<td>10:00 - 12:00</td>
<td>A different kind of reality</td>
<td>11, 17</td>
</tr>
<tr>
<td>KS5</td>
<td>10:00 - 12:00</td>
<td>Leonardo’s ramp</td>
<td>22</td>
</tr>
<tr>
<td>KS3/KS4</td>
<td>10:00 - 12:00 or 13:00 - 15:00</td>
<td>Weather and water: Demisting the science of our atmosphere</td>
<td>11, 18</td>
</tr>
<tr>
<td>KS3/KS4</td>
<td>10:00 - 12:00 or 13:00 - 15:00</td>
<td>Robo-Soccer</td>
<td>10, 17</td>
</tr>
<tr>
<td>KS3/KS4/ KS5</td>
<td>10:00 - 12:00 or 13:00 - 15:00</td>
<td>Proof of the pudding</td>
<td>9, 17, 22</td>
</tr>
<tr>
<td>KS5</td>
<td>10:30 - 12:30</td>
<td>Untangling knot theory</td>
<td>24</td>
</tr>
<tr>
<td>KS5</td>
<td>11:00 - 14:20</td>
<td>Hands-on mathematics, talks and tour</td>
<td>24</td>
</tr>
<tr>
<td>KS5</td>
<td>12:00 - 13:00</td>
<td>Maths and magic</td>
<td>24</td>
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<tr>
<td>KS5</td>
<td>13:00 - 15:00</td>
<td>String vest to bullet proof vests</td>
<td>23</td>
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<tr>
<td>KS5</td>
<td>14:30 - 15:30</td>
<td>How to solve equations (W P Milne Lecture for sixth formers)</td>
<td>24</td>
</tr>
</tbody>
</table>
### Summer Schools

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

- **Bioscience**
  - Dates: 27 - 28 June
  - Stay: 1 night

- **Food Science**
  - Dates: 27 to 29 JUNE
  - Stay: 2 nights

- **Engineering**
  - Dates: 26 to 29 JUNE
  - Stay: 3 nights

- **Mathematics**
  - Dates: 28 to 30 JUNE
  - Stay: 2 nights

- **Electronics**
  - Dates: 10 to 14 JULY
  - Stay: 4 nights

- **Physics**
  - Dates: 11 to 13 JULY
  - Stay: 2 nights

Visit [www.stem.leeds.ac.uk/summerschools](http://www.stem.leeds.ac.uk/summerschools) to learn more!

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### CAMPUS PROGRAMME OVERVIEW

<table>
<thead>
<tr>
<th>AUDIENCE</th>
<th>TIME</th>
<th>ACTIVITY</th>
<th>PAGE</th>
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<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td><strong>THURSDAY 30 MARCH 2017</strong></td>
<td></td>
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<tr>
<td>KS4</td>
<td>09:45 - 14:00</td>
<td>KS4 chemistry day</td>
<td>18</td>
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<tr>
<td>KS5</td>
<td>10:00 - 12:00</td>
<td>Leonardo’s ramp</td>
<td>22</td>
</tr>
<tr>
<td>KS3/KS4</td>
<td>10:00 - 12:00</td>
<td>or 13:00 - 15:00 Weather and water: Demisting the science of our atmosphere</td>
<td>11, 18</td>
</tr>
<tr>
<td>KS3</td>
<td>10:30 - 12:00</td>
<td>HESCO engineering challenge</td>
<td>10</td>
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<td>KS5</td>
<td>10:30 - 14:30</td>
<td>Year 12 physics taster day</td>
<td>25</td>
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<tr>
<td>KS3/KS4/</td>
<td>11:00 - 12:00</td>
<td>KS5 13:00 - 14:00 The ups and downs of life in the freezer:</td>
<td>11, 18</td>
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<tr>
<td></td>
<td>11:00 - 12:00</td>
<td>or 13:00 - 14:00 A tale of two poles</td>
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</tr>
<tr>
<td>KS3/KS4</td>
<td>13:00 - 14:00</td>
<td>The great Leeds build off</td>
<td>10, 17</td>
</tr>
<tr>
<td><strong>FRIDAY 31 MARCH 2017</strong></td>
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<tr>
<td>KS3</td>
<td>09:30 - 12:00</td>
<td>Everyday chemistry</td>
<td>12</td>
</tr>
<tr>
<td>KS3</td>
<td>10:00 - 12:00</td>
<td>or 13:00 - 15:00 How do volcanoes work?</td>
<td>9</td>
</tr>
<tr>
<td>KS3</td>
<td>10:00 - 12:00</td>
<td>or 13:00 - 15:00 Eaten Alive! The fascinating world of parasite wasps</td>
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### THE AVIATION ACADEMY, LEEDS BRADFORD AIRPORT

<table>
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<tr>
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<tbody>
<tr>
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<tr>
<td><strong>THURSDAY 9, 16 OR 23 MARCH 2017</strong></td>
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</tr>
<tr>
<td>KS4/KS5</td>
<td>9:30 - 11:30</td>
<td>Take off to a career in aviation</td>
<td>14, 20</td>
</tr>
</tbody>
</table>
Alternative Formats
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