

SECONDARY PROGRAMME

ABERDEEN 2012

www.britishtscienceassociation.org



Principal Sponsors:





Welcome to the

BRITISH SCIENCE FESTIVAL PROGRAMME FOR SECONDARY SCHOOLS

The British Science Festival is one of Europe's foremost celebrations of science, engineering and technology. We are delighted to be visiting Aberdeen City and Aberdeenshire to engage students across the region and beyond in science shows, workshops and keynote talks by inspirational and exceptional communicators.

We have activity tailored to all ages.

S1 and S2

Two days of activity hosted by **Banff and Buchan College**. Shows and workshops aim to stimulate an interest in science, engineering and technology and give the students an experience that will inspire them for years to come.

Students can see energy in action at a special day of workshops and hands-on activities organised by Shell and hosted by **Satrosphere Science Centre**.

S3 and S4

Four days of activity hosted by **Aberdeen College**. The activities on offer are designed to put scientific principles in a real world context. So you want to be a doctor? offers students keen to pursue a career in medicine the chance to find out what it is really like.

They are also welcome to join in the activity at the University of Aberdeen, in particular the keynote speakers each day.

S5 and S6

The **University of Aberdeen** hosts a range of activity on four themed days. Students will be challenged by the workshops and will enjoy the opportunity to get a taster of what life might be like at college or university. They will meet a range of inspirational people in exciting jobs and recognise the infinite possibilities available to them should they choose to continue studying science, technology, engineering or maths.



FRASERBURGH
Banff and Buchan College

ABERDEEN

- University of Aberdeen Kings College Campus
- University of Aberdeen Forresterhill Health Campus
- Aberdeen College Gallowgate Campus
- Satrosphere Science Centre

Booking: The programme is free for all to attend. Please see the relevant section of the programme for booking information.

Please inform us of any **special access** needs at the time of booking.

Coach drop off points are available at all locations. However parking for coaches may not be available or may be limited.

Please ensure that there is a least **one adult to every 8 students**. The British Science Festival is open to all and responsibility for the safety of students rests with the accompanying teachers and not with British Science Festival staff, Festival Assistants or activity providers.

Catering, cloakrooms etc: Specific information about the location you will visit will be provided after you have booked.





ENERGY

You can't see or touch it . . . but you can play with it as you'll discover with Shell at Satrosphere.

Come and see science in action, see how Shell is working to ensure a better energy future.

Come and find out:

- How much energy you can create by dancing
- How to change gas into a liquid and use it to power a car

Get involved in energy challenges and competitions and win some cool prizes.

We look forward to seeing you there - Full of energy!

To book your session, please contact the Satrosphere Team on 01224 640340



**KEY**

- Biology
- Chemistry
- Computing
- Geography/Geology
- Mathematics
- Physics
- Science
- Technological Studies
- Other curricular areas

BANFF AND BUCHAN COLLEGE

**Organising your day at Banff and Buchan College.**

- Decide which day you want to bring your students.
- Read the descriptions of the activities on offer.
- Look at the timetable below and choose one from each time slot (for larger classes you may need to split up your students. The number in brackets indicates the maximum number per workshop).
- All activities are suitable for S1 and S2.
- Please try to have 2nd and 3rd choices available.
- Call **087456 807 207** to book your places.

WEDNESDAY 5TH SEPTEMBER				
10.00 - 11.00	11.00 - 11.30	11.30 - 12.30	12.30 - 1.15	1.15 - 2.15
Open Your Mind (100)	Move between sessions	Open Your Mind (100)	Lunch	Open Your Mind (100)
Real-life X-men: the Mutants are Among Us! (100)		Real-life X-men: the Mutants are Among Us! (100)		Real-life X-men: the Mutants are Among Us! (100)
Periodic Success (100)		Periodic Success (100)		Periodic Success (100)
Life Science Drawing (20)		Life Science Drawing (20)		Life Science Drawing (20)
The Incredible Machine (20)		The Incredible Machine (20)		The Incredible Machine (20)
Hands-on Area (80)		Hands-on Area (80)		Hands-on Area (80)
Sustainable Living (will include a break) (30)				

THURSDAY 6TH SEPTEMBER				
10.00 - 11.00	11.00 - 11.30	11.30 - 12.30	12.30 - 1.15	1.15 - 2.15
Open Your Mind (100)	Move between sessions	Open Your Mind (100)	Lunch	Open Your Mind (100)
Real-life X-men: the Mutants are Among Us! (100)		Real-life X-men: the Mutants are Among Us! (100)		Real-life X-men: the Mutants are Among Us! (100)
Periodic Success (100)		Periodic Success (100)		Periodic Success (100)
Life Science Drawing (20)		Life Science Drawing (20)		Life Science Drawing (20)
The Incredible Machine (20)		The Incredible Machine (20)		The Incredible Machine (20)
Hands-on Area (80)		Hands-on Area (80)		Hands-on Area (80)

HANDS-ON ACTIVITIES

Enjoy a range of fun, hands-on activities showcasing the wide variety of courses the college can offer including hydraulic engineering and pneumatics.

Presented by **Banff and Buchan College and Opito** Max number of places **80**

LIFE SCIENCE DRAWING

Join us to capture scientific images and explore their meaning. Compare modern techniques with the early days of microscopy when all images had to be drawn by hand. Then take the opportunity to create your own work of art based on the cells you see through a microscope. These new images could be true-to-life or abstract. You will then see your images displayed online.

Presented by **University of Bristol** Max number of places **20**

OPEN YOUR MIND

Join us on an interactive journey through the workings of the nervous system. If you're brave enough, they'll use you as experimental guinea pigs to read your brainwaves, reveal how your nerves send and receive information, activate your muscles electrically, fool your senses into

seeing and feeling things that aren't really there and even pick up when you are lying.

Presented by **Naked Scientists** Max number of places **100**

PERIODIC SUCCESS

The periodic table has been an emblem of science for over 100 years. Behind this iconic classroom poster lives tales of romance, murder, greed and wonder. Join us as we take a guided tour around this elemental housing block. Explosions, poisonings, space exploration and novelty Victorian parlour games are all contained within the chemist's favourite poster. Which element will make you reek of garlic? Why do we love gold? And what is the disgusting secret of antimony? Join chemical physicist and material scientist Jamie Gallagher on a guided tour of the most famous of scientific symbols - the periodic table.

Presented by **University of Glasgow** Max number of places **100**

REAL LIFE X-MEN: the mutants are among us!

Find out the mutant facts from fiction by exploring the nature and structure of DNA and what happens when something goes wrong. Then dive into Darwinism to discover

how mutation has helped us all develop from single cells to the multi-cellular creatures we are today, and that while mutation is necessary, it may cause deformities or abnormalities that are as strange as any shown in the movies!

Presented by **University of Aberdeen** Max number of places **100**

SUSTAINABLE LIVING

Find out about issues relating to man-made climate change and resource depletion. Find out about why we need to use our natural resources better then explore some of the possible solutions by means of a variety of hands-on projects like turning potatoes into plastic and exploring the possibilities of building an eco house.

Presented by **University of Bradford** Max number of places **30**

THE INCREDIBLE MACHINE

Can you send a message around a room using a chain reaction between levers, weights, pulleys, slopes and rollers? Using your knowledge of forces, friction, momentum, speed, acceleration and mass you will be asked to do just that in this fun and frantic workshop.

Presented by **Science Magic** Max number of places **20**



ABERDEEN COLLEGE

EVENT	LOCATION
Chemistry: nutritional analysis of foodstuffs A workshop designed to give later secondary pupils experience of a variety of advanced analytical lab techniques.	Gallowgate
Biology: DNA profiling A workshop designed to give later secondary pupils experience of this technique which is a key feature of CSI investigations	Gallowgate
Planetarium presentation Energy and life in the cosmos	Gallowgate planetarium
Making a DNA pendant Pupils will use established techniques to extract a sample of their own DNA, which they will place in a pendant to wear and take away.	Gallowgate
Explosions, implosions and magic writing A laboratory workshop introducing pupils to the magic of chemistry, with explosive reactions and secret inks.	Gallowgate
Gunge chemistry Pupils will produce glue from milk and test the effectiveness of the glue. They will then make fluorescent "slime" which they will be allowed to take away.	Gallowgate
The science of hair and beauty	Gallowgate
Dramatised event about the cosmos	Gallowgate planetarium
Static and dynamic fitness testing Learn how to measure and assess key components of fitness to assess wellbeing	Gallowgate

FOR BOOKING CONTACT

Dr Douglas Fraser, Curriculum Leader - Science, Aberdeen College, Aberdeen AB25 1BN t: 01224 612190 e: douglas.fraser@abcol.ac.uk

Schools and Colleges Lecture Tour 2012

PHYSICS AND THE GAMES:

a winning formula

An exciting, interactive free talk for school students that builds on everyday physics to explain groundbreaking research.



Robert Gordon's College, Aberdeen
 11.45am Friday 7 September 2012

For further information and bookings contact: stuart.farmer@yahoo.co.uk

IOP Institute of Physics

SO YOU WANT TO BE A DOCTOR?



9.45am - 3.45pm

Thursday 6th and Friday 7th September

Suttie Centre

University of Aberdeen, Foresterhill Health Campus (S4)

Pupils will have the opportunity to take part in hands-on workshops and talk to doctors as well as finding out more about how best to prepare for applying to study Medicine. Workshops include sessions on rehabilitation, keyhole surgery, interactive trauma and anatomy. Schools are **limited to 5 pupils**.

For a booking form, contact:

Shawn Webster by emailing shawn.webster@abdn.ac.uk

This event is for pupils who will be in S4 at the time of the event ie in September 2012 and who are interested in studying Medicine. It is a 1 day event and there is a choice of dates that pupils can attend.

KEY

- Biology
- Chemistry
- Computing
- Geography/Geology
- Mathematics
- Physics
- Science
- Technological Studies
- Other curricular areas



Tuesday 4th September ENGINEERING AND PHYSICAL SCIENCES

10.00 - 10.30	10.30 - 11.00	11.00 - 11.30	11.30 - 12.00	12.00 - 12.30	12.30 - 1.00	1.00 - 1.30	1.30 - 2.00	2.00 - 2.30
Digital Gaming Workshop (20)						Do We Really Need Satellites?		
Sustainable Living (30)								
The Mad Bad and Dangerous World of the Modern Scientist (30)		Halstead Lecture (11.15 - 12.15) (30)						
Strictly Engineering and Making Turbines (100)					Strictly Engineering and Making Turbines (100)			

Wednesday 5th September GENERAL

10.00 - 10.30	10.30 - 11.00	11.00 - 11.30	11.30 - 12.00	12.00 - 12.30	12.30 - 1.00	1.00 - 1.30	1.30 - 2.00	2.00 - 2.30
Energy Islands (28)			Isambard Kingdom Brunel Award Lecture (100)			Michael Masley		
Food Addiction: Fact or Fiction (100)								
Perspectives on Taking Stem Cells to the Clinic (50)								
Take the Risk (11.00 - 11.50) (144)			Lunchbox 2030 (30)					

Thursday 6th September BIOMEDICAL NB. These events take place at the Foresterhill campus of the University of Aberdeen

10.00 - 10.30	10.30 - 11.00	11.00 - 11.30	11.30 - 12.00	12.00 - 12.30	12.30 - 1.00	1.00 - 1.30	1.30 - 2.00	2.00 - 2.30
Come and Explore the IMS (20)		Come and Explore the IMS (20)		Lecture (100) <i>Please note this event takes place on the Kings Campus not Foresterhill</i>		Annual Microbiology Lecture		
		Take the Risk (11.00 - 11.50) (144)		Come and Explore the Suttie Centre (24)	Come and Explore the Suttie Centre (24)			
Do You Want to be Smarter? (30)		Do You Want to be Smarter? (30)						

Friday 7th September PSYCHOLOGY AND SOCIAL SCIENCES

10.00 - 10.30	10.30 - 11.00	11.00 - 11.30	11.30 - 12.00	12.00 - 12.30	12.30 - 1.00	1.00 - 1.30	1.30 - 2.00	2.00 - 2.30
Superhero Science(250)			Charles Lyell Award Lecture (100)			Our Amazing Brain		
Who Are You? The Psychology of Consciousness (100)								
The Mad, Bad and Dangerous World of the Modern Scientist (50)					Open Your Mind (250)			

psychopathy. Find out how the latest work on antisocial behaviour in children, in terms of genetics, brain structure, and behavioural development is shedding light on the causes of psychopathy, whether all callous-unemotional children will develop psychopathy or whether we can help these children behave in pro-social ways.

Presented by **Essi Viding**

Take the Risk

How do we weigh up risks reported in the media? When does a danger merit real concern? Come along to better understand risks and their effects on your daily decisions.

Presented by **University of Aberdeen**

Friday 7th September PSYCHOLOGY AND SOCIAL SCIENCES

Charles Lyell Award Lecture: What Do Dwarf Elephants Have To Do With Climate Change?

Tiny elephants once lived on islands all over the world. They evolved on many different islands, and at many different times in the last million years. Why and how did they evolve? Could the climate changes of the past be an important factor in their evolution and extinction? And could this help us understand the impact of future climate change on species from some of our most precious biodiversity 'hotspots'? Discover the latest research findings and the real-life fossil evidence behind them.

Presented by **Victoria Herridge**

BOOKING Unless otherwise stated please call **08456 808207** to book. At the British Science Festival there is something for everyone. The programme for adults features a range of events and activities that will be of interest to your students. Please visit the website for more details.

Open Your Mind

Cambridge University's Naked Scientists will take you on an interactive journey through the workings of the nervous system. If you're brave enough, they'll use you as experimental guinea pigs to read your brainwaves, reveal how your nerves send and receive information, activate your muscles electrically, fool your senses into seeing and feeling things that aren't really there and even pick up when you are lying.

Presented by **Naked Scientists**

Our Amazing Brain

Dr Peter Naish is a renowned expert in many areas of psychology, most notably in hypnosis. His interest in hypnosis and its impact on memory mean that Peter is often asked to serve as an expert witness in court cases where these are issues. He has also performed ground-breaking research into the similarities in the brain between a person in a hypnotised state and someone suffering PTSD. Peter's enthusiasm and wide ranging interests in psychology make him an engaging and inspiring presenter for all ages.

Presented by ?

Superhero Science

An interactive comedy and magic show exploring the science behind superhero powers. What is fact, what is fiction and what might be feasible in the future? Topics include: mind reading, telekinesis, photographic memory, invisibility, x-ray vision, levitation and super strength.

Presented by **Lab Monkey Productions**

Maximum number of places

The Mad, Bad and Dangerous World of the Modern Scientist

This exciting interactive event aims to showcase the many different options available to students thinking of pursuing a scientific career. We are 6 researchers from the university working on fighting infectious diseases and pain, exploring remote rainforests, and finding ways to search for life on Mars. Using videos of our day-to-day working lives, we will take you directly into the laboratories, offices and field expeditions where we do our research, highlighting the many different types of scientific fields available to work in.

Presented by **University of Aberdeen**

Who Are You? The Psychology of Consciousness

Most of us believe that we, and those around us, are conscious. But what does this mean - Awake? Aware? Attending? Intending? Having an enduring self-identity? This session asks what science can tell us about some of these issues. Speakers will cover the latest work looking at awareness in patients in Coma and the 'Vegetative State,' how damage to the brain can lead to curious features such as a loss of consciousness for one side of space and what experiments with healthy individuals can tell us about how conscious we all are of things that influence our behaviour.

Presented by **British Science Association Psychology Section with the Medical Research Council Cognition and Brain Sciences Unit**



2012

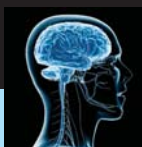
TECHFEST-SETPOINT
Promoting Science, Technology, Engineering and Mathematics

SECONDARY SCHOOLS OUTREACH PROGRAMME

These presentations have been compiled to provide a resource which explores and enhances topical science subjects within your school, and represents a wide range of subjects from science to the social sciences, we hope you enjoy the selection.

Presentations will be offered in your school (unless otherwise arranged) at **NO COST** and on a day and time convenient to both yourselves and the presenters, who have given dates on which they will be available throughout the programme period of 10th September - 10th October (inclusive).

- Some presentations have limited availability and we hope that schools making bookings will be willing to act as hosts to groups from other schools,
- Presentations last around an hour unless otherwise stated
- Presentations are searchable by subject or year group on our website www.techfestsetpoint.org.uk/tis/secondary
- For booking details please either complete a booking form (downloadable from the above website) or contact **Colin McFadyen** on **01224 272285** or c.mcfadyen@abdn.ac.uk



Naked Scientists on Tour

Open Your Mind: A Spine Tingling Tour of the Brain S1 – S6

Dr Hannah Critchlow from the Naked Scientists, Cambridge University and Neuroscientists from the University of Aberdeen

Cambridge University's Naked Scientists are taking audiences on an interactive journey through the workings of their nervous systems. If you are brave enough, they'll use you as experimental guinea pigs to read your brainwaves, reveal how your nerves send and receive information, activate muscles electrically, fool your senses into seeing and feeling things that aren't really there and even pick up when you are lying. The show will be followed by a session of questions and hopefully some answers from Hannah and Neuroscientists from the University of Aberdeen.

Aberdeen City, Aberdeenshire.

Only available from **10th Sept to 14th Sept Inclusive**



Can Science and Philosophy Co-exist?

S3-S6

(Philosophy / RME)

Mauro di Lullo,
University of Aberdeen

Science and philosophy have always learned from each other. Many general guiding ideas that lie at the foundation of modern science were first enunciated by the insightful and perceptive force of philosophical thought. One example is the idea of the atomic structure of things voiced by Democritus and conjectures about natural selection were made in ancient times by the philosopher Lucretius. Later the French thinker Diderot anticipated the theory which would define a scientific fact.

This interactive presentation will allow school groups to explore if philosophy and science are still relevant to each other and if they can co-exist.

Living with Microbes

S1-S4

Novabiotics Ltd.

Find out about how and why we share our lives with a bewildering array of microbes. Learn about the impact good and bad bugs have on our bodies, homes and the environment. Discover how to tell the 'good bugs' from the 'bad bugs' and ways that you never thought would be possible in which useful microbes can help in everyday life.

Aberdeen City, Aberdeenshire and Moray.

Drugs from the Deep

S1-S6

Professor Marcel Jasper,
University of Aberdeen

More than 60% of the drugs used today, such as penicillin, are derived from natural sources or are based on molecules found in nature. The oceans provide a rich source of new organisms, such as sponges and soft corals, which can be explored for their potential to produce compounds which can fight diseases.

Lasers and their Applications

S5-S6

Dr Nigel Langford, University of Strathclyde

This presentation will demonstrate just what makes lasers work, what makes them so special and what applications they have around us, from optical communications to medical diagnostics.

Using a Kinect to 'hold' microscopic particles – why traditional science needs interdisciplinary thinking

S4-S6

Dr David McGloin, University of Dundee

How can light be used to trap and manipulate microscopic particles? How can we use a Kinect games controller to pick up particles as small as a blood cell? This talk will discuss why modern scientists and engineers have to be interdisciplinary in their thinking to tackle important scientific questions.

The Magnificent Mould, The Frightening Fungus

S5-S6

Professor Neil Gow,
University of Aberdeen

From yeasts to mushrooms, fungi affect our daily lives and are vitally important in nature. From single microbes to huge colonies the size of villages, they represent one of the most fascinating groups of life. We harvest their many amazing properties for our own good but we also struggle to keep them in check as they become more common agents of disease.

Most people turn up their nose at the humble fungus - if they only knew what they have to offer.

This lecture will introduce you to these surprising and wonderful microbes.

Rainbows: A Natural Phenomena Explained by Physics

S1-S4

Christine MacLeman & James Reid,
University of Aberdeen

Physics is a very important science as it allows us to understand how nature works on a fundamental level. One of the most beautiful natural phenomena to occur are rainbows which can be fully explained using physics! We will talk about how rainbows were viewed scientifically and religiously throughout history before giving a full explanation of their formation using optics. We will also perform some simple experiments to create rainbows before your very eyes!

Aberdeen City, Aberdeenshire only.

Arctic Islands of Science

S1-S6

Dr Alison McLure,
Institute of Physics

Dr. Alison McLure, Institute of Physics

Svalbard, far to Norway's Arctic north, is an island group with glaciers, fjords, reindeer, seabirds and also scientific research. Alison McLure, back from her second scientific expedition, shows images of landscape



and wildlife in a sometimes bleak yet breathtakingly beautiful setting. Also, find out what types of science projects are carried out in such a far flung place.

Areas of Strange Shapes

S1-S4

Dr Jarek Kedra,
University of Aberdeen

This unusual, investigative workshop allows groups to discover how to determine the areas of strange shapes. It builds on the knowledge of the usual formulae for the area of a rectangle, a triangle and a trapezium, and works up to increasingly more unusual shapes.

Aberdeen City and Aberdeenshire.

How Can Technologies Improve the Quality of Life in Older Adults Living with Chronic Pain in Rural Areas?

S3-S6

Gillian Dowds,
University of Aberdeen

If you couldn't leave your house for a week what would you most miss doing? In this event discover how technologies can deliver innovative new services. Gillian Dowds will discuss work from the dot.rural project at the University of Aberdeen on how simple digital technology such as a webcam and TV set can bring the outside in, extending the range of interactions one can have with the outside world from their living room.

What have Scottish Scientists Done for Us?

S1-S6

Dr Nigel Langford,
University of Strathclyde

An informal review of Scottish scientists on everyday life through the ages.

Chemistry + Biology = New Medicines

S4-S6

Novabiotics Ltd.

Uncover one of the biggest fundamental issues in healthcare - the design and creation of smarter, safer and better drugs against infectious fungal and bacterial diseases. Here the science of both chemistry and biology that is used to create new medicines is revealed.

Aberdeen City, Aberdeenshire and Moray.

Plants as Drugs

S4-S6

Professor Gabrielle Hawkworth,
University of Aberdeen

This talk will give examples of anti-cancer drugs, anti-inflammatory drugs, anti-microbial drugs and recreational drugs of plant origin - their mode of action and any adverse side effects. It will also include discussion of how drugs are discovered and developed, why some drugs have been withdrawn from the market and the role of pharmacologists in drug discovery and development.

DNA Lab

S1-S6

Dr John Barrow,
University of Aberdeen

DNA is found in virtually all of the trillions of cells that we have in our bodies. It is the stuff that makes us all unique and it also has crucial roles to play in our health and well-being. Our DNA forms the human genome, which acts as an instruction book to produce each and every one of us.

In this hands-on practical session learn about the role DNA plays in our bodies, build your own DNA molecule and extract your very own DNA to take away!

Aberdeen City and Aberdeenshire.

What Do Scientists Do?

Why Science at School is Important

S2-S6

Dr David McGloin,
University of Dundee



(Careers)

This talk is aimed at highlighting what science actually is and what professional scientists do. It aims to indicate why school science is important even if you end up not pursuing a career in science. It will make use of real world examples and try to give a feel for scientific career options.

May be of most use for pupils choosing subjects or university courses.

The Gene Machine

S1-S6

Dr John Jones,
James Hutton Institute



(Ethics / RME)

Developments in DNA technology mean that it may soon be possible to produce a genetic profile for everyone. However, the phenotype (features) of any living thing is a result of both its genes and its environment. "Meet the Gene Machine" is a short, lively drama and discussion designed to raise awareness of the interplay between genes and environment and of the ethical implications of genetic profiling.

Dundee, Perth & Kinross.

Keep Smiling

S1-S6

Dr Morag McFadyen & Dr Lesley Diack,
The Robert Gordon University



(History & Culture, Philosophy / RME)

What makes a good smile and what do we need to keep smiling? This workshop investigates a holistic view of a smile, integrating the social, cultural and historic aspects of a smile together with biological and medical issues necessary to keep us smiling.

Nutrition - From Cavemen to Campaigns

S1-S6

Dr Fiona Comrie,
Food Standards Agency for Scotland



(Home Economics)

This talk takes an historic (and prehistoric) look at human food consumption to get pupils engaged with how food issues are more important for us than ever. There is a degree of flexibility in this presentation, if a class have specific topics of interest in food and nutrition the presenter can look at addressing these as well.

Aberdeen City and Aberdeenshire.

Can Genomic 'Dark Matter' Make You Sick?

S4-S6

Dr Alasdair Mackenzie,
University of Aberdeen

Thanks to the sequencing of the human genome we can detect all of the genes which keep us staying healthy. However, we have recently found out that there is much more information in the genome than just genes. How much of this mysterious genomic "dark matter" exists within our cells. Why is it there? What does it do and can it make us sick? Alasdair Mackenzie from the University of Aberdeen has spent 10 years studying genomic "dark matter" and will explain some of its fascinating properties.

Aberdeen City and Aberdeenshire.

Forensic Science Today

S1-S6

Dr Andrew Gibb,
Grampian Police Forensic Science Laboratory



(Careers)

This talk will take you into the life of a modern day forensic laboratory. It will briefly describe the science behind the techniques used, before explaining the role of the forensic scientist within criminal investigations, collecting these factors together with the use of casework samples. Necessary qualifications for the available roles will also be discussed.

Aberdeen City and Aberdeenshire.

You Decide: Pesticides v Pest Management

S4-S6

Dr Nick Birch,
James Hutton Institute

Currently we lose about 30-40% of our crops to pests. That's enough to feed 1 billion people! Despite using high inputs of pesticides these losses haven't gone down over recent decades and we now have many pests that are resistant to pesticides, causing new problems. Some of the new options for pest control include using nature's defences in coordinated ways (Integrated Pest Management) which could possibly include the use of GM (genetically modified) crops with built in resistance to pests. The pros and cons of pesticides and new alternatives for controlling pests will be presented, before having a debate on the topic.

Dundee, Angus, Perth & Kinross.

Waves: From Ultrasound to Ultraviolet

S5-S6

Dr Nigel Langford,
University of Strathclyde

This talk will help the audience to understand the many different waves which affect our everyday lives and appreciate how many of these waves have been harnessed for our benefit in applications such as musical instruments, ultrasound scanners, DVD's and CD players, optical communications, security monitoring of banknotes and much more.

Space Ethics

S3-S6

Dr Tony Milligan,
University of Aberdeen



Is space exploration worth the expense? Can we ever hope to colonise even the nearest planets? Should private corporations be licensed to mine asteroids for minerals and should they have a right to claim asteroids as their own property? On a basic level, do we have a duty to extend human life and what should we be prepared to sacrifice in order to do so? This talk will explore one of the great emerging ethical problems of our time.

Skeletons Out of the Closet

S1-S6

Dr Fraser Coxon,
University of Aberdeen



Although we may think of the skeleton as an inactive scaffold, in reality our bones are continually repaired through a process known as remodelling. When this goes wrong, bones become weak and fracture easily, for example in the disease osteoporosis. This presentation will explain these processes visually using microscopic images and animations.

Aberdeen City and Aberdeenshire.

Renewable Energy Wheel of Science

S1-S2

Live Wire Productions



The Live Wire Renewable Energy Wheel of Science 2012 challenges its young secondary school audiences' knowledge about the problems and benefits of solar, wind and water as alternative energy sources.

Groups will compete in the new sustainable Energy Challenge Game Show where informative, enthusiastic Livewire presenters address the students.

Laboratory Toolbox

S1-S6

Novabiotics Ltd.



Interested in knowing what tools are specific for a modern day drug discovery lab? All breakthroughs in science are assisted by laboratory tools and we need skills in their use to become the next generation of famous scientists. A mix of biology, chemistry, physics and maths are at the core of them all.

Aberdeen City, Aberdeenshire & Moray.

A Guided Tour of the Universe

S1-S4

Professor Henry Ellington,
Emeritus Professor,
The Robert Gordon University

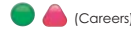


This highly popular lecture takes pupils on a fascinating journey that starts in our solar system, then moves to the stars and the Milky Way, of which they form a part, and finishes up in the farthest reaches of the extra-galactic universe. This presentation incorporates images from the Hubble Space Telescope.

Anatomy: A 'Dead' Science?

S4-S6

Dr Elizabeth Welsh,
University of Aberdeen



This is a presentation defining anatomy as a 'classic science, and explaining how this ancient discipline remains at the forefront of today's modern careers in scientific research, medicine, forensics, art and digital design. In a visually stimulating talk, we will touch on both the historical and modern aspects of Anatomy, and inspire those who may be looking to pursue a fascinating career in the versatile field of life science.

Is it Ethical to Test Medicines on Children?

S4-S6

Dr Pam Dicks,
University of Aberdeen and the
Scottish Children's Research Network
Young Persons Group



Members of the Scottish Children's Research Network Young Persons Group will hold a scripted debate on whether it is ethical to test new medicines in children. The debate will include examples from history of medical research, the case for and against medical research and introduce the concept of medical ethics and research governance in a thought provoking, entertaining and interactive way.

It is expected that although the debate will be lead by the YPG, pupils will participate and debate some of the most challenging ethical dilemmas.

The Where, Why and How of Red Kites - Britain's Most Stunning Bird of Prey

S1-S6

Danny Heptinstall,
University of Aberdeen



Why do birds of prey choose to move in one direction and not the other? Why do they choose to nest here and not there? Join Danny Heptinstall, ecology PhD student at the University of Aberdeen's dot.rural digital economy research hub, as he talks us through the life of a red kite and shows us that by studying one species we can start to understand the behaviour of a whole range of other species.

Big Bugs have Little Bugs: Insects and their Bacterial Symbionts

S3-S6

Dr Ali Karley,
James Hutton Institute



The survival of many insects depends on the presence of bacteria that live inside them, known as symbionts. These bacterial symbionts perform many different functions, from providing essential nutrients through to protecting insects from attack by natural enemies. Meet some of these insects and find out how the fascinating relations with their microbial partners have enabled them to survive.

Perth & Kinross and Dundee.

From the Deepest to the Driest Place on Earth

S3-S6

Professor Marcel Jaspers,
University of Aberdeen



Organisms from extreme environments seem to produce the best drugs, why is this? This talk will explore extreme environments from the deepest ocean trenches to the driest deserts and explain why they are such excellent sources of chemical diversity and possibly new drugs.

Antarctica, You Can Go Far with Physics

S1-S6

Dr Alison McLure,
Institute of Physics



The Antarctic is a remarkable continent - remote, hostile and uninhabited, yet it is of key importance to our understanding of how the world works. For early explorers Antarctica was the ultimate survival contest. For scientists it remains a place of intellectual challenge.

Find out what kind of science is carried out in the Antarctic. Meet a physicist and meteorologist and find out how physics took her to Antarctica and what life there is like.

X-Boxes, Older Adults and Chronic Pain

S4-S6

JP Vargheese,
University of Aberdeen



As people continue to live longer this creates a greater demand on healthcare resources. We can use a variety of technology to help healthcare professionals working with older adults.

However, this may reduce the personal and social aspect of healthcare for older adults and have a negative effect on their health. We need to develop ways of including personal and social aspects of healthcare for older adults into our future designs. Kinect for the x-box is one way of doing this.

How does the forming baby know to make just one head, one body, two arms and two legs?

S1-S6

Professor Neil Vargesson,
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Follow the amazing journey of how a baby develops and forms all of the organs, arms, legs and head in the right place. How do we know how this process occurs and why is it the same in all of us, everytime.

This journey uses videos and pictures to show you this amazing process. We will also look briefly at how by understanding normal development scientists can help treat babies with illnesses.

Aberdeen City and Aberdeenshire.

Science and Art of Weather Forecasting

S1-S6

Dr Alison McLure,
Institute of Physics



The weather affects us all and is a particularly British obsession. Find out from a meteorologist how weather forecasts are prepared and the art involved in presenting them.



History and Philosophy of Science S4-S6

Professor Henry Ellington,
Emeritus Professor,
The Robert Gordon University



Topics Include:

- Is there any real conflict between science & religion? If so, can this be resolved? (Ideally 1 Morning or Afternoon)
- The epistemological status of scientific knowledge - How our ideas developed. (1 hour)
- How can we protect and preserve the environment without giving up our comfortable lives? (1 hour)

Aberdeen City and Aberdeenshire.

Could New Visual Digital Media Technology Help People Reconnect with Nature? S1-S6

Audrey Verma,
University of Aberdeen



Could new visual digital media technology help people reconnect with nature? Audrey Verma, University of Aberdeen From electronic messaging and social networking to online information databases and forums, many of us now rely on technological gadgets to understand and connect with the social world around us. What are the possibilities of using similar technologies to enable people to reconnect with the natural environment? In this talk, Audrey Verma examines whether the use of nature-related new digital media, such as websites featuring satellite-tracked animal locations and webcam feeds of charismatic species, could help us to experience the natural world in a meaningful way.

Tangleproteins S1-S3

Professor Marcel Jaspers,
University of Aberdeen



We often think of protein as one of the basic food groups contained in products such as meat, fish, eggs, beans and dairy foods. The truth is that proteins are the building blocks of life. Proteins play many roles in nature ranging from the protection to the sending of signals and carrying out chemical reactions. Learn how the basic parts of the protein fit together to make larger structures using an innovative protein modelling kit developed at University of Aberdeen.

Combating Infectious Diseases S1-S3

Novabiotics Ltd.



Become a bug detective to discover which harmful microbes cause which type of infections and how these can be prevented and treated. Find out everything you ever wanted to know (and some things you maybe didn't!) about antibiotic resistance and what can be done to detect and prevent it.

DNA Sequencing Your Life, Your Genes S3-S6

Dr Craig Simpson,
James Hutton Institute



DNA sequencing protocols have progressed immensely in the past five years to the point where individual genomes are being sequenced. This presentation will chart the progress of DNA sequencing from the first genomes sequenced to the next generation

sequencing protocols being used to sequence individual genomes. We will describe its use at the James Hutton Institute, browse and query public DNA databases and question the ethics of using available DNA sequences.

How Can the Internet Help Us? S1-S6

Fiona Heeson,
University of Aberdeen



New technologies are being developed to provide Internet to smaller communities throughout Scotland. Discover some of the challenges and benefits of implementing high-speed Internet. How communities interact and use the Internet both personally and for business will be highlighted. Specific emphasis will be placed on the benefits of Internet for children and teenagers, such as new spaces for creativity.

How Do We Know If Drugs are Good or Bad or Both? S5-S6

Professor Neil Vargesson,
University of Aberdeen



Using the example of the drug Thalidomide, which 50 years ago caused thousands of babies around the world to be born with severe problems, this talk will look at the thalidomide disaster and what scientists have done to understand how the drug works but also what scientists have learnt from the disaster? By the end of the talk I hope to have persuaded you why scientists do what they do.

Aberdeen City and Aberdeenshire.

Pearl Mussels in Peril: Conservation Management of a Critically Endangered Species S1-S6

Dr Susan Cooksley,
James Hutton Institute



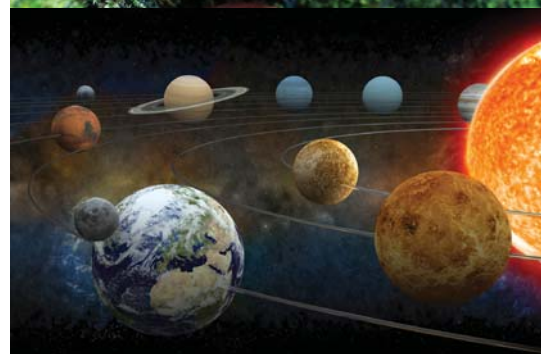
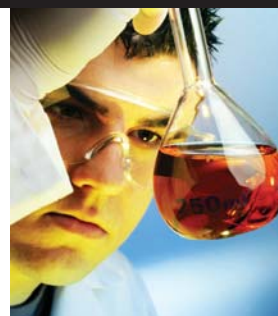
The freshwater pearl mussel is an important part of Scotland's biodiversity and cultural heritage. The species is one of the most critically endangered molluscs in the world, having been affected by deteriorating water quality, river engineering and pearl fishing. Now on the brink of extinction, the freshwater pearl mussel is witness to our rivers' deteriorating status and urgently needs conservation throughout its global range. Find out more about the history, ecology, protection and ongoing conservation management of this incredible Scottish species.

How Our Health Depends on Biodiversity S3-S6

Professor Marcel Jaspers,
University of Aberdeen



Our fascination with things we can see may be affecting our relationship with those we can't. Buried, deepsea and microscopic creatures have a profound impact on life as we know it, from cleaning water, removing carbon dioxide and making the next wonder-drug. We are losing all kinds of biodiversity before it is even identified. Can this be rectified? Do we even know what we are losing? This talk will explain how humans are affecting biodiversity in many unintended ways and what could be lost.



DISCLOSURE POLICY

TechFest-SetPoint supports disclosure for all people who work in schools. All our presenters have been advised that they must complete disclosure procedures. However we are unable to confirm if they have complied with this advice. Schools should check with the presenter, make their own risk assessment and ensure that members of the teaching staff are present throughout all presentations.

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