

Speakers can visit your school and have indicated their available days (M - F) and geography (City / North) in the descriptions.

To book, please email: [csf@admin.cam.ac.uk](mailto:csf@admin.cam.ac.uk), or call 01223 766766.

## 01 Evolving animal forms

**Dr Rosalyn Wade, Museum of Zoology**

An amazing diversity of life has evolved on Earth over millions of years, with animals possessing remarkable adaptations to their habits and lifestyles. This workshop will use specimens from the Museum of Zoology to explore the process of natural selection and the adaptations we see in nature. We will look at adaptations for locomotion, feeding, predator defence and finding a mate, and see how the ideas of Darwin and Wallace are important in science today.

**Age: KS 3 - 5 Days: City M, Tu, Th, F / North M, Tu, Th, F**

**Maximum number of pupils per session: 30**

**Workshops will require table space for looking at specimens, and a projector and screen**



## 02 Bare bones and other skeletons

**Alicia Lloyd, Museum of Zoology**

Explore the diversity of skeletons in animals with specimens from the Museum of Zoology. Look at the shells of molluscs and exoskeletons of insects, as well as the bones inside ourselves and our vertebrate relatives. See what bones look like inside, look at bones from different parts of the body and what they do, and compare the skulls of different animals from lizards and fish to mammals and birds. Children will have the chance to handle real bones and examine the specimens to find clues about human and other animal lifestyles, eating habits, movement and survival. Sessions include a handling session and classroom activities led by the Zoology Museum Education Assistant.

**Age: KS 1, 2 Days - City: Tu, W, Th / North: Tu, W, Th**

**Maximum number of pupils per session: 30 Tables for handling material**

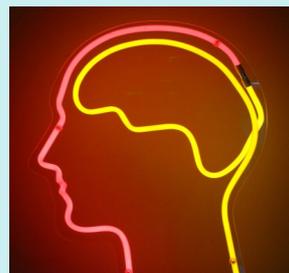
## 03 We are the brainy scientists!

**Dr Amy Milton and Dr Dawn Eagle, Department of Experimental Psychology**

A workshop on brain function. The workshop can be tailored to individual schools. Activities can include pupils conducting experiments into their reaction times and memory capacity, working together to draw and colour in pictures of brains, organs and nerve cells within the body (at life-size!) and model brains (plastic and jelly) for the pupils to play with.

**Age: KS 2 - 5 Days: City M (am), Tu (am), W (am before 12.30), Th (am before 11), F (am) / North: Tu Maximum number of pupils per session: 30**

**Large rolls of paper, pens, pencils, colouring pencils/felt tip pens, stop-watches (5), metre rulers (5) and paper on which children can record their data**



## 04 Become a rocket scientist!

**Dr Lucinda Spokes, Science Festival team**

Discover the history of rockets, share your knowledge of how they are used today, and make and launch your own paper tube rocket. The activity involves a talk and hands-on making session followed by the chance to launch rockets using compressed air. Available to Special Schools, contact us to discuss your requirements.

**Age: KS 2 - 4 Days: City M, Tu, W, Th, F / North M, Tu, W, Th, F**

**Maximum number of pupils per session: 15**

**Data projector, table, outside space to launch rocket away from trees and other children**

## Schools Roadshow 2014

### 05 Matter in the universe

**Dr Suman-Lata Sahonta, Dept of Materials Science & Metallurgy**

The Periodic Table groups together the elements according to their properties and how they react. But where did these chemical elements come from in the first place? And why does the Earth have such a different elemental makeup from the rest of the Universe? This talk investigates the formation of matter at the Big Bang and describes how matter accumulated to form stars, galaxies and the Earth itself. We look at some of the experiments that are being done at CERN to show us how matter evolves as the Universe gets older, and explore some of the weirder elements of the Periodic Table.

**Age: KS 4 - 5 Days: City Tu, Th, F / North not available**

**Maximum number of pupils per session: 50 Data projector and screen, HDMI or VGA cable**

### 06 So what would you look like if you lived in a deep cave?

**Dr Tony Whitten, Fauna & Flora International**

What is life like where there's no light? Can anything live in such conditions? Deep in caves, weird animals somehow find prey and deal with predators feeling their way around them. Apart from bats, these animals are not well known and face some unlikely threats. To explore this dark world, we'll play the game of Crickets and Woodlice.

**Age: KS 2 - 5 Days: City W (pm) / North Tu**

**Maximum number of pupils per session: to discuss with school Data projector and screen**

### 07 How does a computer work?

**Dr Alex Mendez-Feliu, Independent**

We will see the very basic components of a computer and how they interact together. We will discover that besides a screen, a keyboard and a mouse, a computer has two separate 'brains', one for thinking and another one for remembering. It also has a large storage unit and often it is connected to all other computers using the Internet.

**Age: KS 2 Days: City M, Tu, W, Th, F / North M, Tu, W, Th, F**

**Maximum number of pupils per session: 15 Blackboard or whiteboard**

### 08 What's fun about taking part in research?

**Laura Watson, Clinical Research Facility, Addenbrookes Hospital**

Some people think medical research is scary and all about drug trials. Well it's not! There are many studies that children (and adults) can take part in and find out all about their health and literally what makes them tick. You could see a picture of your bones, measure how much energy you are using, have a look at what's in your blood and see how fit and active you are. Find out how all of us can keep everyone well.

**Age: KS 1 - 5 Days: City M, Tu, W, Th, F / North M, Tu, W, Th, F**

**Maximum number of pupils per session: 30 Data projector and screen**

### 09 Powerful plant patterns and surprising structures

**Bronwen Richards, Botanic Garden**

Find out about the varied and beautiful patterns within plants including the hidden markings present on many flowers and see exactly how a bee would see these markings. To tie in with Fairtrade Fortnight, which will mark the launch of a special campaign that aims to transform the banana industry, we will also investigate the structure of a banana leaf and find out how waterproof it is.

**Age: KS 1 - 2 Days: City Th (pm), F (am) / North Tu Maximum number of pupils per session: 30**

**Data projector and screen. Table for displaying plants for students to handle and have a closer look at. Table space for students to do 'see like a bee' flower patterns activity or to make a banana leaf pot.**

### 10 Demystifying cancer

**Dr Robin Hesketh, Department of Biochemistry**

This session will take those who know little or nothing about biology and lead them into the wonderful world of cells and molecules, and show how 'normal' can become 'abnormal' and describe how cancers develop. We will look at where we've got to and where we're going in terms of detection and treatment and how astonishing technical advances are opening a new vista in the greatest revolution in the history of medical science.

**Age: KS 3 - 5 Days: City M, Tu, W, Th, F North M, Tu, W, Th, F**

**Maximum number of pupils per session: 40 Data projector and screen**

## Schools Roadshow 2014

### 11 Weird and wacky wildlife

**Jonathan Lawson, Department of Genetics**

The planet Earth is full of life. Living things are almost everywhere, from the ocean depths to the Himalayas, from the frozen poles to the baking deserts. Through videos, photos and simple demonstrations, we'll look at some of the strangest ways that living things around the world adapt to the places that they live and discover how this helps them to survive in the wild. We'll see animals that disappear, bugs that explode, plants that move and germs that look like animals.

**Age: KS 1 - 5 Days: City M, Tu (am), W, Th, F / North M, W, Th, F**

**No maximum number of pupils Data projector and screen, flipchart/ whiteboard, table**

### 12 Thorium-fuelled Nuclear Power: what's all the fuss about?

**Dr Geoff Parks, Department of Engineering**

Nuclear energy based around the exploitation of thorium rather than uranium is receiving an increasing amount of media attention. Some supporters are going so far as to call thorium a 'super fuel'. This talk examines what the potential advantages (and disadvantages) of thorium really are and what role it might play in the future.

**Age: KS 5 Days: City Tu, W, Th / North Tu, W, Th**

**No maximum number of pupils Data projector and screen**

### 13 How does the brain work and what can happen when it gets older?

**Dr Maria Jimenez, Department of Medical Genetics**

In this talk we will explore the basic units that constitute the brain: the neurons. Neurons work as an electric switch, billions of neurons are connected and signals are transmitted by nerve impulses. But, what happens when the brain gets older? We will learn how, in some people, old neurons can degenerate quicker and lead to diseases such as Alzheimer's or Parkinson's disease. And we will discover how scientists are trying to find a cure for these diseases.

**Age: KS 2 - 3 Days: City M, Tu, W, Th, F / North not available**

**Maximum number of pupils per session: 30 Data projector and screen**

### 14 Looking at the past and predicting the future of cancer

**Dr Andrew Holding, CRUK - Cambridge Institute**

By 2030, the lifetime risk for developing cancer will be nearly 50%. Yet, deaths from cancer have fallen. Cancer is a disease of paradoxes. Chronic myeloid leukaemia (CML) was once a rare and fatal disease, but the development of a treatment, Gleevec, now means that hundreds of thousands of people live with the disease. This means that a once rare cancer is now commonplace. Join Andrew to look at how everything from chemical weapons to immortality has shaped cancer's past, and what his own research into breast cancer is doing to try and lead to a better future.

**Age: KS 2 - 5 Days: City not available / North M, Tu, W, Th, F**

**Maximum number of pupils per session: 150 Data projector and screen**

### 15 On your table and in your tummy - what are you eating?

**Dr Siobhan Braybrook, Sainsbury Laboratory**

Have you ever looked at a vegetable? I mean really looked? Do you think you've ever eaten a flower? What about a leaf? We will examine some common vegetables, discover together what part of the plant we are eating, and learn what its true purpose was for the plant.

**Age: KS 2 Days: City not available / North Th, F Maximum number of pupils per session: 30**

**White board / flip chart and coloured markers, paper, coloured pencils. Tables or desks for students to work around in groups of 2-3.**

### 16 Beginners guide to astronomy (KS 1) 17 Life on other planets (KS 1)

### 18 Astronomy and light (KS 2) 19 Keeping up with the Universe (KS 4 - 5)

### 20 Building galaxies in an expanding Universe (KS 4 - 5)

**Dr Lisa Jardine-Wright, Cavendish Laboratory**

Five lectures for different age groups, all of which aim to enrich our understanding of the Universe we live in.

**Age: KS 1,2, 4, 5 Days: City M, Tu, W, Th (am), F / North M, Tu, W, Th (am), F**

**No maximum number of pupils Data projector and screen**

## Schools Roadshow 2014



### 21 Chromatography (KS 2)

### 22 Blood, circulation and the heart (KS 2)

### 23 Clinical trials and pain (KS 4 - 5)

**Dr Jo Montgomery, Napp Pharmaceuticals**

A range of hands-on activities for different age groups. Discover what makes up different colours, how the heart works (including a real heart!) and what goes into conducting a clinical trial.

**Days: City Tu, W, Th / North Tu, W, Th**

**Maximum number of pupils per session: 30**

**Data projector and computer. No projector is required for chromatography.**

**Hand washing facilities are required for blood circulation and the heart**

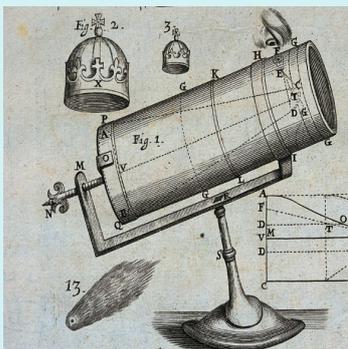
### 24 Why do we use animals in research?

**Linden Smith and colleagues, Babraham Institute**

An interactive and lively session that discusses the pros and cons of using animals in research. This session offers a way for children and teachers alike to learn about the basics of laboratory animal science and how it improves the lives of people and the wider benefits to society. During the session, we will uncover the truth behind animal testing myths and include a balanced view of the animal rights movement. In addition, the scientists attending will share information on careers in the field of biomedical research. The session will include interactive polls and a number of fun games to find out exactly where animals fit into research.

**Age: KS 3 - 4 Days: City W / North Tu Maximum number of pupils per session: ~30**

**Data projector and screen (we will bring props and show short video clips during the presentation)**



### 25 Sun, Moon, Stars... what do astronomers do?

**Scott Thomas, Institute of Astronomy**

The Universe is vast beyond imagining! This tailored talk will explore a variety of topics in astronomy – from an awe-inspiring journey through our solar system, constellations and spacecraft (younger children) to the discovery of ancient and modern astronomy and how to get involved (high school age). A number of props will be used, including meteorites and telescopes, to stretch the imagination and inspire young minds to learn more.

**Age: KS 3 - 5 Days: City M, Tu, W, Th, F / North M, Tu, W, Th, F**

**Maximum number of pupils per session: 40**

**Data projector and screen (Scott will bring props, including planet models, meteorites and telescope)**

### 26 Contagious cancers

**Andrea Strakova, Department of Veterinary Medicine**

Join Andrea for a talk that will reveal unexpected findings about two very unique cancers that have adapted to transfer by the means of living cancer cells between their hosts – Tasmanian Devils and domestic dogs. We will explore what a cancer is and how it can become contagious. What might be the mechanisms allowing this and what can we learn from it? We will also consider the implications for Tasmanian Devils, which are threatened with extinction by this cancer.

**Age: KS 2 - 5 Days: City Tu (pm), W, Th, F (am) / North W, Thu**

**Maximum number of pupils per session: 60**

**Data projector and screen. Whiteboard.**

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The Cambridge Science Festival Schools Roadshow events are free talks or workshops given at your school, by leading academics from the University of Cambridge or industry.

To book, please email us on [csf@admin.cam.ac.uk](mailto:csf@admin.cam.ac.uk), or call 01223 766766.