Skirting Science!

HANDS-ON INSPIRING SCIENCE

Organised by:
Soroptimist
International
Weston-super-Mare

29 June 2017
at
Churchill Academy and Sixth Form

Final Programme

Timetable

9.30 – 9.45 ***Arrival***

9.50 – 10.10 ***Introduction***

Christine Ramshaw PhD MEng CEng MICE

Christine decided to become a civil engineer when she was about 14 years old. She has worked for 27 years in geotechnical engineering consultancy in the UK, New Zealand, Western Australia and Canada. She has had a fascinating career that has used all of the subjects that she studied at school - she even used her French when working in Montreal! The work is tremendously varied; she has been involved in everything from complex finite element computations, preparation of drawings and specifications, negotiating contracts, discussing drilling techniques, logging soils and rocks in the field, logistics for investigations in remote areas, project management, financial management to people management (interviews, performance appraisals and team-building). A great career for people who are interested in everything!

10.15 – 11.15 ***Workshops – Slot 1***

11.15 – 11.20 ***Change over***

11.20-12.20 ***Workshops – Slot 2***

12.20 – 13.00 ***Lunch (for girls)***

13.00 – 14.00 ***Workshops - Slot 3***

14.05 prompt ***Departure***

Workshop No.	*Description*
1 FOUNDATION JAMES DYSON ***T11***	**CAN YOU BE A DESIGN ENGINEER?** ***Danya Walker*** Listen to a design engineer talk about their work and tackling some of the following challenges: Lava Lamps Floating Paperclips and Scared Pepper Non-Newtonian Fluid Balloon Kebabs Lenz Law Cardboard Chair Spaghetti Bridges Geodesic Domes
2 THE COLLEGE OF OPTOMETRISTS ***T2***	**NEW DIMENSIONS IN OPTICS** The New Dimension workshops are hands-on sessions in which students can find out all about the world of eye testing, eye health and how the eye works – and, more importantly, how these form the basis of optometrists' and dispensing opticians' jobs. You'll test the workings of your own eyes, marvel at mind-bending optical illusions and find out whether you've got what it takes to cut it in this exciting profession.
3 University of BRISTOL ***T7***	**SHARING MOLECULES – SOME CHEMISTRY YOU CAN TRY AT HOME** ***Dr Natalie Fey*** Interesting and intriguing chemical experiments can be found almost anywhere around us. In this hands-on workshop we will try out some of them, using things you can find at home. This will show how you can relate the structures of molecules to their colours, smells and reactions.

Workshop No.	*Description*
4 University of the West of England BRISTOL ***T1***	**CRACKING THE GENETIC CODE TO BUILD A "PRO-BOT"** ***Dr Debbie Lewis, Jack Bevan*** Pupils work in teams to build Lego robots (or 'pro-bots') from the genetic code. Session focuses on mutations and differences in the "pro-bots"; In the process, they learn how genes influence processes within our cells and the importance of this in identifying and treating different diseases. This activity is supported by The 100,000 Genomes Project from Genomics England, who are working to identify new ways to aid diagnosis and advance medical knowledge. Prior knowledge of the genetic code is not necessary, although basic KS3 appreciation of the location and role of DNA would be useful.
5 Micrima ***T12***	**PROCESSING YOUR VOICE AND MEDICAL EQUIPMENT** ***Ana Iriate and Elizabeth Blake*** In the first part of the workshop we will learn some of the basic techniques of Digital Signal Processing and then apply them to your own voices. In the second part of the workshop we will see how the same techniques we have studied can be applied in a wide range of different environments (medical imaging, astronomy, biometry, seismology, economy...).
6 AIRBUS ***T17***	**PLANE CABIN DESIGN** **Your Task – Design an A320 Cabin** As a design team, you must design a passenger cabin for one of our aircraft.

Workshop No.	Description
7 University of BRISTOL ***T19***	**BUILDING A BINARY CALCULATOR** ***Dr Naim Dahnoun*** In this experiment you will be introduced to binary numbers and some basic digital electronic components in order to design a binary calculator which forms the basis of a computer.
8 BUROHAPPOLD ENGINEERING ***T6***	**HOLD BACK THE FLOOD!!** ***Brittany Harris and Richard Claydon*** Civil Engineering is about understanding what the public needs and wants – and then making it happen in an environmentally friendly way, from the design and construction of buildings and bridges, to the management of water resources and waste. This activity will look into the modern day problems civil engineers have to deal with due to climate change and the rise of natural disasters, from increased flooding, to earthquakes, and erupting volcanoes. Join our exciting activity where you will be designing and building your own homes to be resilient to these natural disasters – and be prepared to have your designs tested!
9 WESTON COLLEGE ***T18***	**LEGO EV3 ROBOTICS** ***Jason Hill*** Build, connect and control your own EV3 robot to complete in a series of competitive challenges.

Workshop No.	*Description*
10 Rolls-Royce ***T10***	**Rolls-Royce RACING AIR ENGINES** ***Joana Slater, Patricia Patilla Sanchez, Rosie Wayland and Alexa Clayton*** Have you got what it takes to work as a team to build and complete a winning air engine? Find out how engines work and then create your own to power your vehicle across the finishing line. The winning team will win a small prize.
11 University of BRISTOL **Mobile Teaching Unit** ***Car Park***	**SEPARATING BLOOD!** ***Christopher Cammies, Samantha Moore and Ingeborg Hers*** Meet biomedical/medical scientists who research blood. Find out about how blood moves around the body, the contents of blood and why we don't bleed to death when we cut ourselves. Students will get to 1. Use pulse oximeters to measure their heart rates and oxygen content of their blood. 2. Perform an experiment using Gilson pipettes and size exclusion chromatography to separate proteins found in blood.
12 THE DETECTIVE PROJECT ***T8***	**THE SCIENCE OF CRIME** ***Jenny Williams*** We bring science to life to show how forensic science is used by crime scene investigators. Teams will work together to examine a crime scene, identify a victim and work out how they died!

Workshop No.	Description
13 High Tech Bristol and Bath CIC ***T9***	**MY ROBOT PET** ***Dr John Bradford*** We use the Raspberry Pi to control a small robot to behave like a small pet - with unpredictable results!
14 ***T3***	**GENES IN A BOTTLE** ***Dr Caroline McKinnon*** Your DNA makes you unique. As Biochemists, we study DNA at times to determine what goes wrong within the body and what can be done to rectify this. In this workshop we will learn about DNA and you will perform your very own DNA extraction to make a necklace this is as individual as you.
15 ***T5***	**LICENCE TO CLEANSE! – avoiding attack by air and water** ***Alan Hill and Sue Hill*** How clean is clean? Water reaches your taps safe and uncontaminated. Clean air rooms enable safe production of life saving drugs. Learn how to keep the world safe and reduce contaminate by environmental control.
16 Royal United Hospitals Bath NHS Foundation Trust ***T13***	**A SCIENTIST'S VIEW OF DISEASE** ***Nicola Hodges*** This workshop puts you in the place of the scientists in pathology, you will have a look at a patient's symptoms and pathology results and try to diagnose the patient's disease**.**

HOSTED BY:

Churchill Academy and Sixth Form

Logo by Helen Davies

Committee:

Soroptimist International Weston-super-Mare

Ruth Thomas, Melanie David, Anne Graham and Susan Long

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