Science Stars – Teachers Information Sheet 2012

Tuesday 3rd July and Wednesday 4th July
The Stopford Building, Oxford Road, Manchester, M13 9PT

Arrival and Departure:

The Stopford Building is building number 79 on the campus map and is opposite the Students' Union. Please ask your coaches to drop off and pick up pupils on Acker Street next to the Stopford Building.
University staff and student guides will be in the foyer of the building to meet you. You will register and pick up identification badges here and you will be allocated two students per group who will be your tour guides for the day.

Campus Map: http://www.manchester.ac.uk/aboutus/travel/maps/az/

Timetable:

9.20-10.00:	Introduction and Lecture
10.00-10.45:	Workshops
10.45-11.00:	Break
11.00-12.30:	Workshops
12.30-1.30:	Lunch and tour
1.30-2.45:	Workshops
2.45 -3.00:	Evaluation

Breaktime arrangements:

We will provide soft drinks and biscuits. We ask that pupils with an allergy or special dietary requirements provide their own refreshments.

Lunchtime arrangements:

At lunchtime you will go on a tour of the campus during which time you will sit down for lunch either outside or in one of our cafe areas (depending on the weather!). Please can all pupils and teachers bring their own lunches. We will expect you to stay with your group of pupils during the lunch break.

Equipment and safety:

Pupils will be provided with a disposable laboratory coat to wear on the day. For safety purposes no open toed shoes are allowed in the laboratories and long hair must be tied back.

Contact: Charlotte Alcock
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Workshops

The Worm Wagon (3rd July only)

People and animals can be infected by many types of bugs that affect our guts and can make us sick. One common type of infection is from parasitic worms, or helminths, which can live in our guts. We have lived with parasitic worms for a very long time and the oldest mummy in Europe (Oetiz, 3300BC) was found to have a worm infection!

In our experience the concept of worms living happily in the gut is a source of fascination (or horror!) for the majority of people, whatever age group. Therefore the subject is naturally engaging. We have a range of activities in which we explore different aspects of research life including "Field work" in which we mimic real field work activity and look at real worms and "Lab work" in which students try to address a scientific hypothesis. Educational outcomes are on many levels. An understanding of the interaction between parasite and host is key, and can usually be grasped by even the youngest scientists. Similarly the impact of hygiene is also an important message from this activity. In addition, an understanding of the host response to invasion of the gut lining and the role of inflammation as a defence is also a key objective. Immunology impacts on many aspects of our daily life and experience, and an appreciation of the behind-the-scenes armoury that is triggered by infection can be an enticing subject for young adults interested in biology and the human body.

Diabetes Diagnosis (4th July only)

The aim of this workshop is to introduce students to diabetes, the causes, symptoms and long term effects of the disease.
Students will 'diagnose' 4 patients based on their symptoms and 'blood' samples as well as working out the carbohydrates in a chocolate cake.
They will also find out what can happen when diabetes is not managed correctly.

Exploring the heart

At this workshop, you will learn all about the heart by doing three different activities:

Touching real sheep hearts: You will be able to learn how real hearts look and feel, by putting on gloves and aprons and handling them! You will be able to see all the different sections of the heart and put your fingers through the tubes that enter and leave the heart (blood vessels).

T-shirt drawing: Here, you will learn about surface anatomy (which organs go where in the body) by drawing organs onto a white t-shirt. You can them keep the t-shirt for future reference!

Resuscitation: You will learn the principles of resuscitation by having a go at trying to restart the heart on our plastic dummies.

DNA Extraction

The aim of this workshop is to introduce students to DNA. As an introduction, students will be asked a couple of questions relating to the structure, function and cellular location of DNA and asked to answer using a flashcard system. The main part of the session will be a practical involving the extraction and visualisation of DNA from raspberries and cheek cells. In addition, students will be given the opportunity to observe how DNA samples are analysed using gel electrophoresis. Finally, during the summary session, each student will be issued with a length of string to represent the uncoiled length of DNA in a single cell. The pieces of string will then be stretched out around the laboratory to help emphasise the size and abundance of DNA within the human body.

Brain sense and sense-abilities

Students explore the different senses, how the sense organs are connected to the brain and also what can happen when the brain is damaged. This workshop consists of seven work stations based around the brain and the senses. Students in small groups (4-5 students each) will be guided through each activity by an expert demonstrator, spending 5 minutes at each hands-on activity. Activities include: a mystery smell test, two-point touch discrimination, monocular vs. binocular vision target practice, a fast talking timed stroop test, disorienting mirror drawing, a sound conductivity experiment and a brain injury case study. This fun quick-fire workshop is designed to illustrate the complex way our brains allow us to experience the world around us and to highlight the importance of neuroscience as a research topic.

Cells!

The aim of the workshop is to help the students see the amazing complexity inside cells. All living things are made out of cells and the cells have certain things in common (organelles) and specialisations that make them different. Pupils will:

- isolate their own cheek cells
- look at protozoa under the microscope
- look at bacteria swimming in media under the microscope