

UNIVERSITY OF ST. ANDREWS

GENERAL RISK ASSESSMENT FOR TUSLIP DAY OF PHYSICS

School/Unit/ResidenceSchool of Physics and Astronomy.....

Title of work activitySixth year pupils travel to St Andrews to take part in a day of physics activities

Description of work activity:

Sixth year school pupils come on hired coaches to/from St Andrews.

Experimental work in St Andrews teaching labs and PC Classroom

Lunch

Lectures with demonstrations and discussions

Description of significant hazards: (*e.g. Slipping/tripping; Stress; Fire; Work at Height; Pressure Systems; Electricity; Dust; Fumes; Manual Handling; Noise; Poor Lighting; Low temperatures; Vehicles; Moving parts of machinery*)

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- 1) Risks associated with transport
- 2) Interpersonal problems, including child protection issues
- 3) Teaching laboratory – use of mains-powered equipment – electric shock risk
- 4) Teaching laboratory – High voltages on e/m experiment – electric shock risk
- 5) Teaching laboratory – liquid nitrogen burns and asphyxiation risk
- 6) Teaching laboratory – laser radiation – eye damage risk
- 7) PC Classroom – risk of access to inappropriate materials
- 8) Morning lecture – tripping and sliding risk
- 9) Lunch – risk of food poisoning or choking
- 10) Afternoon lecture – high voltage on demonstration
- 11) Afternoon lecture – liquid nitrogen burns and asphyxiation risk
- 12) Afternoon lecture – laser radiation – eye damage risk
- 13) Fire risk
- 14) Teaching laboratory – radiation risk

Groups who may be at risk:

Staff, students, and school visitors

List existing controls and decide whether these precautions are adequate or more are required.

Has adequate information, instruction and training been given?

Are adequate systems or procedures in place?

Check that

- *Standards set by legal requirements are being met*
- *Generally accepted industrial standards are in place*
- *Precautions represent good practice*
- *Precautions reduce risk as far as reasonably practicable*

The activities are operated with regard to the School's safety policy, which is available to view via the "Staff and Students" page of the School website. As well as conventional safety inspections, an annual laser safety inspection is carried out. Particular comments are given in the next section. We have taken advice from School science advisers.

List outstanding risks and the action to be taken where it is reasonably practicable to do more:

Give priority to those risks which affect large numbers of people and/or could result in serious harm. Apply the following principles, if possible, in the following order:

- * *Remove the risk completely;*
- * *Try a less risky option;*
- * *Prevent access to the hazard (e.g. guarding);*
- * *Organise work to reduce exposure to the hazard;*
- * *Issue personal protective equipment;*
- * *Provide welfare facilities (e.g. washing facilities for removal of contamination and first-aid);*

1) Risks associated with transport. – There is always risk associated with traffic accidents, but we have booked coaches from companies that we believe to be reputable, that are used by schools, and that tell us that they conform with all the necessary regulations for transporting school pupils. There are risks associated with walking to/from and waiting for buses. We expect these risks not to be significantly greater than the risks encountered by pupils travelling on the normal school transport service. In common with school transport services, and with regard to these being senior school pupils, we are not providing supervision on the coaches beyond anything offered by the driver.

2) Interpersonal problems, including child protection issues. We endeavour to operate the activities in line with the University's evolving policy, and in line with national regulations. The bus companies tell us that their drivers have successfully gone through the disclosure process. The activity leader (Bruce Sinclair) has done likewise. All staff and students involved with the activity are instructed not to allow themselves to be alone with visitors, and to observe what is going on around them. There may be issues of conflict between school pupils, but we hope that this risk is low enough that bus drivers can deal with it on buses and staff can intervene if issues are seen at the University. The pupils are going to be waiting for buses in public areas, and there is not a security entry system in the University, so it is possible that undesirable contact may be made with third parties. We do not think that this risk is significantly higher than that experienced by these senior pupils on a daily basis elsewhere. When the pupils are on University premises we will endeavour to be aware of what is happening, and we state on the relevant web pages that pupils should be aware of the risks from other people.

3) Use of mains powered equipment in the teaching labs. Our equipment is subject to a periodic electrical test in line with University policy. Students will be supervised in the lab and unsafe practices stopped.

4) High voltages on e/m experiment. Pupils will be supervised when doing this experiment, and will be warned of the inherent safety issues. Engineering controls in the form of a load resistor of high value minimise the inherent risk. The high voltage wires are insulated and will be connected by staff, and students are told not to interfere with them.

5) Liquid nitrogen in the teaching laboratory. Asphyxiation risk is minimised by using laboratories with reasonably large volume and decent ventilation. Pupils are supervised when working with liquid nitrogen, and are instructed on the safe use of the material.

6) Laser radiation in teaching labs. All lasers used will be of class two, ie of relatively low eye risk. Pupils using lasers will be required to sign to say that they have read the safety instructions, and they will be supervised in the use of the lasers to ensure that these instructions are followed.

7) PC Classroom – risk of access to inappropriate materials. Pupils will be supervised and any observed attempts to access inappropriate material will be stopped.

8) Morning lecture – tripping and sliding risk – Any cables that need to be on the floor and in a walking route will be covered with an anti-trip cover to minimise the risk of tripping. A soap solution will be used to create bubbles; this should be largely contained in the collection tray that will be used, and spillage on the floor wiped up with paper towels.

9) Lunch – risk of food poisoning or choking. Visitors have been asked to bring their own packed lunches. Choking should be of no more hazard here than normally. The University has first aiders in case of need.

10) Afternoon lecture – Physics of Food – Risks of cold burns or asphyxiation with the liquid nitrogen, and for anyone consuming the ice cream risks of food poisoning or allergic reaction.

Control Measures

Cryogenic Fluids

Students will not come into contact with the liquid due to being some distance away.

The demonstrator is trained in its use, standard practice for safe handling of cryogenic fluids will be followed (goggles and gloves)

The lecture theatre is large and well ventilated.

A dedicated Dewar will be used to transport the nitrogen and the nitrogen will be filtered as it is transferred to the Dewar. (Alternative, nitrogen in external container so none comes into contact with the ice-cream)

Food

Basic food hygiene will be followed.

All ingredients will be correctly stored prior to the lecture.

The ice-cream contains milk but no other common allergens.

11) Afternoon lecture – demonstrations - liquid nitrogen burns and asphyxiation risk. Pupils are protected by being some distance from the liquid nitrogen. The member of staff using this in the demonstration is experienced in its use. The lecture theatre is well-ventilated to minimise asphyxiation risk.

12) Afternoon and morning lectures – laser radiation – the lasers used are class two lasers which are of relatively low risk. Only members of staff will be permitted to operate these, and they are trained in their safe use.

13) Fire risk – The School aims to operate according to its stated safety policies to minimise the risk of fire. Smoke detectors are present throughout the building to maximise the chance of the alarm being sounded early on in a fire. The operation of the fire alarm results in loud sirens being heard throughout the building. Pupils are instructed by printed material on their arrival that if they hear the fire alarm they should make an orderly exit

from the building by the labelled fire routes, and make their way to an assembly point outside the main entrance to the School.

14) Teaching laboratory – radiation risk. One of the experiments involves the use of radioactive sources. These are sealed sources of a strength considered to be safe for supervised use by students. Students are advised not to stand directly in the path of the radiation, and are supervised.

Signature of Assessor Date 13.9.10

Name of AssessorBruce Sinclair Review Date

Notes:

- 1) The completed risk assessment form must be kept by the assessor and a copy given to the School Safety Officer.
- 2) This assessment must be reviewed and where appropriate revised if there is reason to suspect it is no longer valid or there has been a significant change to the task procedure.
- 3) This assessment must be made available to and discussed with all staff engaged on activities to which it relates.