

Selected 2007 Challenge Activities at UOW

***Gold Fever**

This is a bridge building activity that uses a standard test rig to deliver a dynamic load. Construction materials will be supplied and are limited to those materials. The lightest bridge to hold the load wins.

Construction is one activity that requires thinking about forces and this task incorporates dynamic loading thus adding another dimension to an already complex problem.

***Mission to Mars**

This actually requires that students construct a vehicle from materials provided to transverse an undulating surface. Students will use rubber bands to provide the tension for the suspension system.

Suspension systems are very interesting and students will need to decide on the number of wheels and experiment with the tension they place on their system.

***Hover Frenzy**

The students will be given a lift fan and two motorised propulsion unit together with styrofoam, balsa, rubber strip and tape to construct a small hovercraft.

Scoring will be based on several criteria: maneuverability, time through a course, and ability to negotiate obstacles.

***Back to the Future**

Students are provided with a vehicle on which they attach a propeller or fan to drive the vehicle along rails. The students develop their own fan and can experiment with diameter and pitch. The vehicles are timed over a set distance and bonus points are available for accuracy and control.

***Confounding Communications**

Each group of students will be provided with 2 terminals, which they will use to communicate with each other using various coloured light transmitted through an optical fibre. Students will be assessed on their speed and accuracy.

There are a number protocols used in modern communications. Students will be required to develop their own protocol and use this to transmit a message or image.

***ElectraCITY**

Students will be given a board with which they can simulate power distribution. Students will be provided with different quality cables and are required to make all loads operate. Students are assessed on the cost of their network, and how many loads are shed due to the failure of a power source.

***Future Power (New for 2007)**

Students will be provided with a simulator which has two input boards. One input board allows students to switch loads in or out of their simulator. The other board has provision for four power stations chosen by the students from a pool of seven different power station options.

Students are required to adjust their supply of power to meet the load. Once the load is balanced and the score is recorded a new load profile is given to the students and they must then switch loads on and off and at the same time continue to balance the supply of power. Failure to keep the supply of power within acceptable limits will cause the system to trip meaning that all loads and power stations need to be zeroed and the system built up again.

***Leprechaun Cannon**

This is a fascinating use of a smoke ring generator. Essentially a column of air is compressed and released through an orifice. This air then strikes a target.

Students are provided with three different pipe sizes and a number of connectors that they can put together using tape. Variables are the length of the cannon, diameter of the exit muzzle, diameter of the barrel and a combination of diameters if desired. Accuracy of the cannon is a factor that must be determined quickly during initial testing. A consistent and methodical approach is needed for testing.