Introduction And Suggestions

Surveying is not a widely publicised profession, so many school leavers are unaware of it as a possible career option. These activities are aimed at introducing the type of work surveyors can be involved in, and providing students with a more realistic idea of what they have available to them.

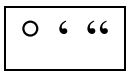
Surveying can be quite mathematical, so these activities have been aimed at the Mathematics departments of secondary schools across the country.

The activities have been written with NCEA in mind – although the levels indicated may not be entirely accurate. They have been organised into folders of what we believe to be approximately NCEA levels one, two and three. Answers are also provided in the same folders. Some of the activities cross levels or are considered to be of borderline difficulty:

"Least Squares" is challenging for level 3
"Trig and Area" is quite easy for level 3 – perhaps more level 2
"Mountains" may be close to level 3.

An indication of how each activity fits into the ***mathematics curriculum*** is included in "Strands and Levels".

Many of the activities use angles in degrees minutes and seconds, as this is how they are used in the surveying profession. Most calculators have a button which will convert angles and allow input in this form. For example, the casio fx82 series has a button with



Graphics calculators will have a function available under the angles menu which will work equally well.

It is advised that the activities that introduce degrees minutes seconds and other ideas are done before the others, but the terminology and jargon information should make it possible to do any of the activities at any stage.

Recommended:
It is recommended that you give the class an introduction to the idea of expressing angles in degrees, minutes and seconds, rather than just degrees and decimal degrees. Following this, it is suggested that:

Numbered activities should be done in order (e.g. Trig 1 before Trig 5)
Activities which should be done first:
Units (Conversions, and standard form)
Where Am I? (Latitude and Longitude introduced)

Practical activities are also possible.

e.g. The idea of backsights and foresights in levelling can be tricky to understand, so it may be wise to set up a string line (under a metre above the ground) over some points or objects of varying heights. A metre ruler can be used to measure the distance between the object on the ground and the string line, then differences in measurements will lead to differences in height. If the objects are not moved, but the string is lowered or raised, it can then be redone, proving that the level of reference for measurement does not affect the answers when calculating changes of height between objects.

It could be worth contacting a local surveying firm and arranging for a surveyor to come in and set up some of the equipment for the students to use. (They will need a reasonable amount of notice).

You may choose to use all activities or a part of them. You may also want to rearrange them. Please feel free to do this, and let us know how we can alter them to make them more useful.

Feedback is welcome. Please contact

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