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The Geometry of the Dambusters

Abstract

This workshop focusses on the mathematics involved in an event that took place on the night of 16 May 1943 when a significant raid took place during World War II. It has been part of my teaching since 2003 and I also use it regularly with students at mathematics masterclasses. This academic year I am collecting feedback from three groups of 13 year-old students (two groups of 30 and one of 45), one group of pre-service teachers who are going to start teaching in the UK and two other groups of pre-service teachers. The results of this feedback will be presented to participants in the workshop. This is a subject that needs sensitive treatment and the research paper that accompanies the workshop materials mentions how the political and national sensitivities are dealt with.

i) The following materials will be used in the workshop: 3 A4 worksheets, 1 A3 worksheet, a PowerPoint presentation, various geometrical instruments and the following article that describes the worksheets and how they were used in school. Ransom, P. (2004). The Maths Busters – the geometry of the Dam Busters. *Mathematics in School* 33(2), 22-24

ii) The age of the students who have worked with these materials range from 13 upwards and they are of average and above ability. The work has also been used with teachers in pre- and in-service education.

iii) The workshop will be presented by Flight Sergeant 'Kidnap' Ransom in 1940's Royal Air Force uniform and participants in this workshop will work in twos or threes. They will hear about the Dambusters raid of 1943 and how mathematics was used to navigate the Lancaster aeroplanes over Germany. Participants plot the route on A3 maps, working with scales and bearings then look at how the lights were arranged on the plane using geometrical constructions to find the angles at which the lights were inclined. They will also plot the locus of the Lancaster over the dam. These two activities involve ruler and compass constructions and are excellent problem-solving activities. They will develop their mental geometry with a short exercise that should improve their 3D coordination. With clips from the Dambusters film they then make a bomb-aimer's sight and test it. This activity involves creativity in the mathematics classroom. As far as possible, this workshop will recreate, in the form of mathematical theatre, what happened with Squadron X (later known as Squadron 617, the Dambusters squadron) in 1943.

It is expected that all the materials (worksheets and a research paper) will be posted onto the ESU-8 website in advance with the PowerPoint uploaded after the event, but participants will get everything on a CD-ROM.

Remark (by the Organizers): Additional material has already been uploaded on the ESU-8 website.
