

# The Great British Knot Experiment

## Knots:

We've all experienced the astonishing ability of rope, flex, string and the like to become hopelessly knotted if carelessly handled. As anyone who owns an iPod or mobile phone knows, anything but the most careful winding of the headphone cord or power cable results in the formation of knots and tangles.

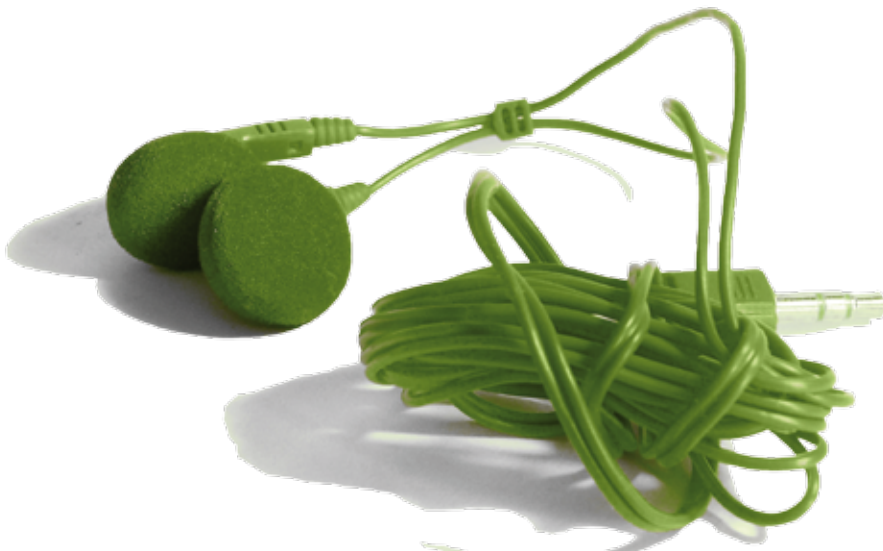
This is more than simply an irritation, however it poses a threat to life at several different levels. A single knot can reduce the breaking strength of climbing rope by up to 50%. Spontaneous knot formation occurring in umbilical cords in around 1 per cent of pregnancies, quadruples the risk of fetal mortality. Spontaneous knotting in DNA leads to faulty gene transcription and a three to four order of magnitude increase in mutation rate

Despite this, remarkably little is known about the formation of knots – or how to prevent them. So we are proposing a mass experiment to fill in some of the gaps in the science of knots and address a mathematical conjecture.

We are looking for groups of keen students in schools who want to involve themselves in active data gathering and interpretation and to contribute to a genuine piece of novel science.

Your school's involvement and effort need not be extensive. The experiment can be carried out in school, in a class environment, with minimal resources (several lengths of string), and typically involving an hour or so per week for two or three weeks. It could form part of a national curriculum case study in Key Stage 3 or 4 to use mathematics to solve problems, or as an open ended mathematical investigation.

The results of this major experiment will be announced at an open public talk at the forthcoming British Science Festival hosted at Aston University in September 2010. If you are interested, a study pack with full details will be sent out in April, to the first 1000 schools who register their intent to participate, in time for the experiments to be performed during May/June. Registration is by contacting the Knot Experiment Coordinator, Vicky Bond by email or post.



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**This event is part of the  
British Science Festival  
in Birmingham from  
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