



## Project Overview



Aberdeen Section

[www.spe-uk.org](http://www.spe-uk.org)

Supported by



Contact: Roseanne Miller

Email: [roseannemiller@techfest.org.uk](mailto:roseannemiller@techfest.org.uk)

Tel: 01224 272285

# TECHFEST

Promoting Science, Technology, Engineering and Mathematics

Scottish Charity No SC010349

## Maths in the Pipeline: An Overview

### Background

TechFest is a charitable organisation, based in Aberdeen, promoting and delivering Science, Technology, Engineering and Mathematics events to schools. Maths in the Pipeline is a day of workshops and challenges for able Mathematicians (often S4, aged about 15). The event introduces the pupils to applications of Mathematics in the Oil and Gas Industry.

### What Happens at Maths in the Pipeline

A prompt start is needed as there is a lot of material to cover. The arrival time varies with location. It can be as early as 8:45am.

Pupils, nominated by their teachers and interested in attending, are allocated to teams for the day. We try to ensure that no two pupils in a team are from the same school. An ice-breaker starts the day. The teams work independently of teachers with support from a team of enthusiastic Industry Professionals.

The days work starts with an overview of the industry, based on the Captain Field in the Moray Firth. Beforehand students and teachers can undertake a virtual visit to the Captain Field via the website:

<http://resources.schoolscience.co.uk/SPE/index.html>



The morning workshops, designed and presented by Industry Professionals and Lecturers, gives pupils an opportunity to apply their Maths to realistic problems encountered in the Industry. The problems cover subsurface, pipelines, platforms and optimisation.

The teams tackle a business challenge in the afternoon. The winning team members are awarded a prize and all participants and schools are presented with a certificate.

### Outcomes

Pupils and teachers enjoy seeing the practical side of Maths. They learn new methods and see first-hand the value of Maths to Industry. They enjoy working alongside Industry Professionals and finding out about their jobs and career paths.

## Maths in the Pipeline: The Morning Workshops

The three workshops follow the 'Oil Story'. They have been designed to encourage teamwork and introduce the pupils to Mathematical modelling. Each workshop is at a suitable level and runs for around 50 minutes. Real data is used throughout.

1. **Journey to the Centre of the Earth** – estimate the volume of oil under a subsurface contour map.
2. **Plight of the Navigator** – calculate the best route for a helicopter to visit several North Sea platforms.
3. **Highs and Lows of Forecasting** – a time series analysis of UK gas production.

## Maths in the Pipeline: The Afternoon Business Challenge

The highlight of the day and time to test out the teamwork developed in the morning. With a deadline to meet and critical choices to be made this is a field development optimisation problem requiring accuracy and teamwork. Each team is called upon to give a five minute presentation of their solution with all team members taking part.

## Comments from Pupils

*"It has really helped me understand how I may apply Maths to real-life problems."*

*"We worked well as a team by each of us doing a different task."*

*"The mentors helped you to develop your ideas. Increased your general knowledge."*

*"We got a good view of different jobs from the industry, e.g. commercial advisor, operations engineer."*

## Personalised Skills Developed

Pupils identified they had developed the following skills during Maths in the Pipeline.

- Problem Solving
- Teamwork
- Communication
- Presenting to others

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## Event Information

**Venue:** A smart, business-like venue TBC

**Times:** Arrival often by 8.45am  
Programme starts at 9am prompt  
Programme ends at 3.30pm

**Schools:** Places are offered to all schools in the area and then allocated to each school wanting to take part. A teacher from each school always attends.

**Pupils:** Able and enthusiastic Mathematicians. Teachers may select S3 or S4 pupils.

**CONTACT:** Roseanne Miller    **EMAIL:** [roseannemiller@techfest.org.uk](mailto:roseannemiller@techfest.org.uk)    **TEL:** 01224 72285  
Buchart Centre, University of Aberdeen, University Road, Aberdeen, AB24 3UT

[www.techfestsetpoint.org.uk](http://www.techfestsetpoint.org.uk)        