

## **EXPLORERS – MINING ENTERPRISES**

The activities are designed for 60-minute lessons. You may need to adapt the materials for use in longer or shorter lessons.

### **INTRODUCTION**

In this activity, pupils are invited to destroy several asteroids blocking the Orbital Highway using some sonic charges. They must place their charges on the correct lines or in the correct regions of a grid representing each asteroid's surface if they are to detonate as required.

Pupils will use linear equations, simple quadratic equations and regions to place their sonic charges in the correct places on the grid. There are three different asteroids to choose from with increasing levels of difficulty based on the complexity of the equations and regions used.

### **OBJECTIVES**

Pupils will:

- use mathematical problem solving skills in collaboration with each other
- be able to draw and use graphs of linear equations and simple quadratic curves
- be able to represent the solution set of an inequality as a region of a graph.

### **RESOURCES**

- Teacher laptop or desktop computer (to introduce activity)
- Data projector (to introduce activity)
- Access to an ICT suite with enough computers for pupils to work in small groups
- Printed copies of the accompanying activity sheets
  - Captain's Log Sheet
  - Mission Results Sheet

### **DELIVERING THE CASE STUDY**

- The starter activity can be used to help refresh pupils understanding of linear equations and regions on a grid.
- The main activity can be used to teach linear equations and quadratic curves ranging from  $y = n$  to  $y = x^2 + a$  or as a means of teaching inequalities and regions on a grid.
- Pupils should be divided into small groups to encourage appropriate levels of participation and discussion.
- The activity can be adapted using the resources supplied for those teachers with only limited access to ICT suites.
- Teachers may wish to develop the lesson using the results gained from the activity as the basis for follow-up display work, e.g. detonation rates, income received, etc.

### **HOMEWORK SUGGESTIONS**

Ask pupils to complete their Captain's Log reflecting on their results and evaluating their performance during the activity.

Additionally, pupils could be invited to complete the accompanying homework task sheet. The sheet is divided into different sections relating to the equations and inequalities used in the main activity and gives further practice in the use of linear equations, quadratic curves and regions.