

## **EXPLORERS – PATROL SERVICES**

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 find a safe route through a notoriously perilous region of space called the Twilight Nebula. They will be faced with a number of different threats but can maximise their chances of survival using a series of threat assessment readouts.

Pupils will compare fraction, decimal and percentage-based probabilities to evaluate the threats arising in the nebula. They will also need to form judgements on the probability of combined events in order to identify those routes offering the greatest chance of survival.

This activity is mainly ICT-based.

### **OBJECTIVES**

Pupils will:

- use mathematical problem solving skills in collaboration with each other
- use the multiplicative law of probability in combined events
- use an experimental method to find an estimate of a probability.

### **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
- Calculators (optional)

### **DELIVERING THE CASE STUDY**

- The starter activity can be used to help refresh pupils understanding of the probabilities of combined events.
- The main activity can be used to teach the probability of combined events with particular emphasis on  $p(A \text{ AND } B)$ . The multiplication and addition laws are treated on an intuitive level. We have suggested repeating the activity 20 times but you may wish to do more or less than this.
- 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 with 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. survival rates, points lost to each threat, 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. This gives further practice in calculating the probability of combined events.