

POINTZERO: CONFINED

These 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 presented with a series of puzzles related to lifts that move according to specific mathematical rules. The aim in all cases is to get to the ground floor.

This activity is mainly ICT based. It has been designed for use with pupils in an ICT suite although it could be adapted for use in a maths classroom equipped with a data projector and whiteboard. It is suggested that pupils work together in pairs or small groups to encourage appropriate levels of participation and discussion.

The activity contains 3 options offering varying degrees of challenge. Different pupil pairs or groups within a class can work at different options. Alternatively, you may prefer to ensure each group has a mix of pupils. This will help to create appropriate conditions for peer support.

Completing an option unlocks a code which can be used when the user enters the PointZero building to reflect their progress. **Please note that these codes are not automatically saved if the user logs out.** Remind users to make a note of any codes they receive as they progress.

Each option is represented within the case study by a person in the lift who has solved how the lifts are working:

- **Option 1 (Tom's Solution):** Lifts move up and down a specified number of floors only. This option is for pupils working at **level 4 of the National Curriculum**.
- **Option 2 (Alex's Solution):** Lifts move up and down by a number of floors dictated by numbers in specific sequences. This option is for pupils working at **levels 4 and 5 of the National Curriculum**.
- **Option 3 (Mary's Solution):** Lifts stop only at specific floors dictated by a series of algebraic expressions. This option is for pupils working at **above level 5 of the National Curriculum**.

OBJECTIVES

- Pupils will use problem solving skills.
- Some pupils will generate common integer sequences (including sequences of odd or even integers, squared integers, prime numbers, triangular numbers).
- Some pupils will generate terms of a sequence using position-to-term definitions of the sequence.

RESOURCES

- Access to computer and projector or overhead projector and transparencies for the starter and plenary
- Pupils could use either mini-whiteboards, pens and erasers OR number cards
- Pupils will need access to computers, either in pairs or small groups.

DELIVERING THE CASE STUDY

- The activity can be used as a tool for revision or for consolidating and extending pupil understanding of number sequences and algebraic substitution.
- Pupils need not have any prior understanding of number sequences in order to be able to complete Option 1 (Tom's Solution).

- The starter activities give a direct lead in to the main activity.
- It is suggested that pupils work on either one or two consecutive options depending on the time available. The tasks have a similar basis and aim but are governed by different rules.
- Pupils should be discouraged from using trial and error to complete the activity. You should remind them that they are penalised for having a high number of attempts. This penalty is specified in the code that is awarded to them at the end of the activity.

HOMEWORK SUGGESTIONS

- Three homework sheets are provided for pupils to consolidate their understanding which can either be used in class or can be set as a homework task.