

## Programming Activity 6

### Entrance payment for a leisure centre

(Units 1 and 2 Problem solving and Programming)

#### Learning objectives

- Analyse a problem, investigate requirements and design solutions
- Understand how to create an algorithm to solve a particular problem
- Make use of programming constructs including sequence, selection and iteration. Use of loops.

#### Assessment objectives:

AO2 and AO3

#### Spec alignment

Pages 10–12, 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5

#### Task

The Riverside Centre provides fitness and leisure activities. There are various charges as set out in the following list:

Adult (over 18)	\$20
Juvenile (under 18)	\$10
Older person (65 and over)	\$15
Family discount	25%

Create and display an algorithm in pseudocode to calculate the entrance charge.

#### Misconceptions/barriers

Students often struggle with creating and ending nested IF statements. They sometimes use END IF statements to match the order of the IF statements.

#### Differentiation:

##### Low ability:

- The task could also be structured so that at first the family discount is not included, and the algorithm considers only individual entry.
- Lower ability students will need assistance with decomposing the problem and could be given assistance using questions such as:
  - What will you need to know about each customer?
  - How will you calculate a family discount?
- They could be given concrete examples of family groups, e.g.:
  - 2 people over 18 and 2 people under 18
  - 2 people over 18, 4 people under 18
  - 3 people over 18, 2 under 18 and 1 over 65.
- They could manually calculate the costs for these groups.

##### High ability:

Students should be able to tackle this task without any assistance. They should be able to decide on the inputs required and how to calculate the cost and family discount.