Chapter 4 Time

Specification

FS coverage and range	Use, convert and calculate using metric and, where appropriate, imperial measures
FS exemplification	Including time

GCSE

GCSE specification	**GM o** Interpret scales on a range of measuring instruments and recognise the inaccuracy of measurements
Edexcel GCSE course	**Specification A:** **Foundation** 11.1–11.3, 11.6 **Higher** Chapter 7 **Specification B:** **Foundation Unit 1:** 1.2, 1.5; **Unit 2:** 17.1–17.3, 17.6 **Higher Unit 1:** 1.1, 1.4; **Unit 2:** Chapter 12

Resources

General resources	Show-me boards Clocks (optional)
Links	http://www.networkrail.co.uk/aspx/3828.aspx http://www.teachingtime.co.uk/ http://www.teachingideas.co.uk/maths/contents11measure.htm
ActiveTeach resources	Video ResultsPlus Knowledge Check ResultsPlus Problem Solving Question Audio

Lesson 1

Objectives

- Learn to recognise information that is not needed
- Add together lengths of time
- Learn to write the time properly
- Make a plan of a schedule for a situation
- Use units of time
- Plan different events that happen at the same time
- Design a programme

Starter

- Give students a list of time intervals and get them to divide them into those that are correctly written and those that are incorrectly written (see Know Zone (p44)). Discuss the meaning of 1.4 hours (1 hour 24 minutes) and emphasise that 0.4 hours isn't 40 minutes.

Main teaching and learning

- Ask students to discuss how to calculate the time between 09:24 and 11:36; 11.22 am and 2.36 pm; 07:43 and 09:14. Ask: *What makes the last question more challenging?*
- Use *Take a look*: Journey time (p45) to demonstrate a reliable technique. Encourage students to consider what information in the question is needed, explaining that questions often include redundant information.
- Ask students to complete *Have a go* Q1 and Q2.
- Discuss *Take a look*: Festival. Ask: *What is the key information in the question? Is it easy to rule out certain combinations? Do any other combinations meet John's criteria?*
- Discuss *Take a look*: Cinema. Ask: *What is the key information? How does the start and finish time table help you plan? Why is it a good idea to use a table?*
- Ask students to complete Q3 and Q4.

Issues and misconceptions

- Students may struggle to convert to a common unit of time.
- Encourage students to plan prior to constructing a rota.

Support

- For Q2, encourage students to construct a calendar from the start of May to 4 June.

Extension

- Ask students to design a schedule for a knock-out football competition with 10 teams playing 30 minute matches on 3 pitches.

Plenary

- Ask students to estimate the number of seconds they have spent at school since Year 1.

Formative assessment

- Give students contextualised start and finish times and get them to calculate the elapsed time. For example, ask: *John starts a marathon at 11:20 and finishes at 16:40. How long did he take to run the marathon?* Start with small time intervals and build up to include days, months and years. Ask them to write their answers on show-me boards.

Homework

- Pose the following problem: The school has invited five teachers to be interviewed for a job. Each candidate must have a tour of the school with two students (30 minutes), conduct a trial lesson (40 minutes) and have an interview with the head teacher (30 minutes). Taking into account break times, construct a timetable that shows the candidates, head teacher and students where they need to be throughout the day.

Lesson 2

Objectives

- Use suitable forms to identify the problem
- Change and improve the features of a programme
- Show a programme clearly

Starter

- Tell students that average life expectancy in Britain is 79.4 years. Ask them to measure their pulse over a chosen period of time and estimate how many times their heart will beat in their lifetime.

Main teaching and learning

- Put an example of a train timetable on the board. (Timetables can be found at www.networkrail.co.uk/aspx/3828.aspx.) Ask students to explain what the timetable is showing.
- Discuss *Take a look*: Competition (p48). Read through the exam tips and discuss why each point is important.
- Ask students to create their own version of the events programme and then peer-assess each other's programmes, sharing areas of good practice with the rest of the class.
- Discuss *Have a go* Q5 before asking students to complete it. Ask:
  - *What information is redundant?*
  - *Is there more than one possible route?*
  - *Are certain routes preferable to others?*
- Discuss Q6 before asking students to complete it. Ask:
  - *What does the question mean by 'analyse'?*
  - *What mathematical tools could we use to analyse?*
  - *Is it a good idea to analyse E and W separately?*
  - *Should we draw comparisons between E and W?*

Issues and misconceptions

- In Q5 students may forget to include arrival and waiting times.

Support

- For Q6, help students to interpret the information provided in the table and encourage students to create their own table with additional columns.

Extension

- Ask students to use a graphical representation to decide if there is a correlation between the amount of money owed and the time taken for the payment to be received in Q6.

Plenary

- As a class, discuss and list three aspects of presenting and communicating solutions that students have developed over the last two lessons.
- Ask students to give one example of something they still need to improve on when presenting and communicating solutions.

Formative assessment

- Ask students to peer-assess the format used to communicate the solutions to Q5 and Q6.

Homework

- Ask students to use train and/or bus timetables from the internet to plan a journey from home to a place of interest.