

Chapter 4 Time

Specification

FS coverage and range Solve problems requiring calculation, with common measures including time

Convert units of measure in the same system

FS exemplification

Use addition, subtraction, multiplication and division in context

Convert between hours, minutes and seconds

GCSE

GCSE specification

GM o Interpret scales on a range of measuring instruments and recognise the inaccuracy of measurements

GM p Convert measurements from one unit to another

Edexcel GCSE course

Specification A:

Foundation 11.1–11.6, 20.7

Higher Chapter 7, 23.3, 23.7

Specification B:

Foundation Unit 1: 1.2, 1.5; **Unit 2:** 17.1–17.6; **Unit 3:** 9.5

Higher Unit 1: 1.1, 1.4; **Unit 2:** 9.8, Chapter 12; **Unit 3:** 10.4, 11.5

Resources

General resources

Calendar for current year

TV schedule

Analogue teaching clocks

Local bus and train timetables

Cinema listings

Resource sheets

4.1, 4.2

Links

<http://www.nationalrail.co.uk>

<http://www.timeanddate.com>

<http://www.bbc.co.uk/tv>

<http://www.cineworld.co.uk>

ActiveTeach resources

Video

ResultsPlus Knowledge Check

ResultsPlus Problem Solving

Question Audio

Lesson 1

Objectives

- Add together lengths of time
- Write time unambiguously

Starter

- Give students the cards from Resource sheet 4.1. Ask them to read out the times shown on these analogue and digital clocks. Ask: *Can you tell whether the time shown is am or pm?*

Main teaching and learning

- Remind students of today's date. Ask them what the date will be in two weeks' time. Discuss ways to work this out (e.g. use a calendar, write down dates). Then give students the cards from Resource sheet 4.2 and ask them to solve the problems.
- Relate this activity to *Take a look: Deadlines* (p49).
- Tell students that a television programme starts at 4.30 pm and lasts for 40 minutes. Discuss strategies to work out the time the programme will finish. Then give students a copy of an evening's television schedule along with details of the programmes that a viewer wishes to watch that evening. Set questions for students to answer. For example:
 - *Can the viewer watch all of each programme or is there an overlap?*
 - *Which programmes could they watch and which should they record?*
 - *What is the total running time of all the programmes selected?*
- Discuss strategies that can be used to work out the duration of these programmes.
- Relate this activity to *Take a look: Bus times*.
- Ask students to begin working on *Have a go* Q1–7.

Issues and misconceptions

- Ensure that students use appropriate methods to work out intervals of time. Calculators should not be used as they will produce inaccurate results.

Support

- For Q1, assist students in writing 12-hour clock notation to make the numbers smaller.
- Provide students with analogue clocks with moveable hands to help solve problems.

Extension

- The following table gives the time difference between the UK and three other countries.

Country	Time difference
Venezuela	-4
Thailand	+7
Cuba	-5

- Ask students to use this information to work out the time in each of these countries for different times in the UK, e.g. 07:00, 11:30, 17:00, 21:15.

Plenary

- Give students various times in the 12- or 24-hour clock. Ask: *What time will it be 40 minutes later?*

Formative assessment

- Mark students' answers to Q1–7. Discuss different ways of working out lengths of time.

Homework

- Ask students to complete any of Q1–7 that they did not answer in the lesson.

Lesson 2

Objectives

- Subtract periods of time
- Communicate decisions

Starter

- Write some exam start times on the board along with the duration of the exams. Ask students to work out the finishing times.

Main teaching and learning

- Give students the example of getting to school in the morning. They should know what time they have to be at school. Ask: *How do you decide what time to leave home?* Discuss different methods of choice – of those students who walk to school, how do they decide when to leave? Ask: *Given that someone knows their journey time to school is 35 minutes, what is the latest time they could leave and still get to school on time?*
- Discuss different strategies to ‘subtract’ time and work backwards.
- Emphasise the importance of checking answers by working out start time plus journey time.
- Relate this activity to *Take a look: Cooking a meal* (p51).
- Give students copies of local bus and train timetables and some fictional journeys already planned. Ask: *Are these journeys possible?* Ask students to plan their own journeys that fulfil set criteria. For example, say: *You need to be at an interview at 10 am. Plan your journey from home. What is the latest you could leave?* Encourage students to set out their solutions appropriately.
- Ask students to complete *Have a go* Q8 and Q9.

Issues and misconceptions

- Ensure that students use appropriate methods to work ‘backwards’ in time. Calculators should not be used as they will produce inaccurate results.

Support

- For Q8, ask students to find the time in Johannesburg when the flight departed from Gatwick.

Extension

- Give students arrival times and durations for other flights along with time differences and ask them to work out time of departure in the country of origin.

Plenary

- Provide students with either the start or end time of a film and the duration of the film. Ask them to work out the missing start or finish time. Durations could be either in hours and minutes or (more demanding) in just minutes.

Formative assessment

- Assess how well students tackle the Plenary activity. Emphasise the need for careful checking of answers.

Homework

- Pose one or both of the following questions: *How long is it until the London Olympics start on 27 July 2012? How long until the Rio de Janeiro Olympics start on 5 August 2016?*

Lesson 3

Objectives

- Coordinate features in solving a situation
- Explain the answer clearly

Starter

- Look at the bus timetable in *Take a look: Going to the cinema* (p52). Ask students to work out how long each bus takes to travel from Letchworth to The Green, Stotfold. Other questions can be used as well. For example:
 - *How long does the first bus take to get from the Grange Estate to Fairfield Park?*
 - *Do all the buses take the same time to get from Letchworth to Fairfield Park?*

Main teaching and learning

- Ask students to work in pairs to make a plan for a school to interview candidates for a maths teaching job. The school has asked four people to attend for interview. Each person has to attend three separate interviews with the Head, the deputy Head and the Head of Maths. Each interview will last for 15 minutes. There will be a gap of 10 minutes between each interview. Students should work in pairs to produce a plan that shows all the necessary information.
- Once students have completed their plans, ask several pairs to present theirs to the rest of the class. Discuss the different ways in which the plans have been presented and whether they meet all the criteria. Ask: *Which plans were easiest to read and understand?*
- Ask students to complete *Have a go* Q10–12.

Issues and misconceptions

- Students need to be careful when converting between times given in hours and minutes and times given only in minutes, e.g. 1 hour 49 minutes is 109 minutes, not 149 minutes.

Support

- For Q12, encourage students to change the duration of time for each film into hours and minutes. Ensure that they realise, for example, that *Avatar* starts at the given times and that they will have to work out the finishing times.

Extension

- Ask students to use the cinema programme in Q12 to answer the following question:
Gemma leaves home at 12:30. It takes her 45 minutes to get to the cinema. She has to catch the 17:00 bus home. Which films could Gemma choose to watch?

Plenary

- Give students a copy of a train timetable and ask questions relating to durations of journeys.

Formative assessment

- Mark students' answers to Q10–12. Emphasise the need to show final answers clearly.

Homework

- Ask students to plan a journey to a specified nearby city using public transport. They should work out how long the journey will take in total.