

# Example topic and project sequences: Years 7 and 8

## How to use this resource

The following tables provide three teaching sequences with suggested projects covering two years. The sequences are distinguished by their varying emphases: general but comprehensive track, in-depth track for more able groups, and a computing science track. Each is accompanied by suggested Knowledge and Understanding content from Part 1 of the text. The tables provide a starting point for teachers in selecting projects that meet the needs of their students. The more challenging projects are positioned under Year 8.

## Developing coding and computational thinking skills through projects

By the start of Year 7 most students will have experienced programming in a visual language, such as Scratch. Most will be unfamiliar with programming in a general-purpose language. Students should gain experience and confidence in the teacher's chosen programming language(s) as early as possible. In addition to examples written in structured English, the text provides worked examples using Python.

The following presents a sequence for developing these skills:

*Chapter 3: Understanding programming using a general-purpose language* develops a solid understanding of the principles while providing practical skill building activities in the form of a guided project. Principles covered include: algorithms, flowcharts, structured English, control structures, variables, functions, and error detection and correction. Use this guided project while also having students complete online training in a chosen general purpose language. Suggestions are made on page 47 and weblinks are provided for each of these.

*Chapter 6: Guided Project: Extended guessing game* provides a project that then builds on this guided project, teaching further skills while providing the necessary scaffolding for beginners.

*Chapter 7: Project: Multiplication quiz game* and *Chapter 8: Project: Simon says – programming a game* provide opportunities for students to flex their programming muscles more independently.

At this point the teacher may present students with an independent extended group project; for example, developing a suite of three or four programs for a client, such as a member of the maths staff.

*Chapter 9: Project: Programming your own text-based adventure game* first introduces more advanced data structures through an introductory guided project. Students are then presented with the challenge of designing and building their own adventure game. The text here highlights the principles and benefits of computational thinking.

*Chapter 10: Project: Embedded systems* provides four projects using an Arduino board to apply programming skills acquired to build a real-world product and improve upon the result.

The Robotics section (Chapters 23–26) then provides practical application of programming skills and is an exciting way to conclude this sequence.

Note that the Year 9 and 10 text offers six further programming projects and two robotics projects covering more advanced aspects of programming, such as object-oriented programming and appropriate algorithm selection.

Term	Featured topic	Knowledge and understanding (Part 1 of text)	Projects (Part 2 of text)		
			General track Suggested projects	In-depth track Suggested projects	Computing science track Suggested projects
<b>Year 7</b>					
<b>Term 1</b>	<b>Data analysis</b>	<ul style="list-style-type: none"> <li>Chapter 2: Understanding data</li> <li>Chapter 5: Understanding project management</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 20: Guided project: Information systems and databases</li> <li>Chapter 21: Project: Class database</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 20: Guided project: Information systems and databases</li> <li>Chapter 21: Project: Class database</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 20: Guided project: Information systems and databases</li> <li>Chapter 21: Project: Class database</li> <li>Chapter 6: Guided project: Extended guessing game</li> <li>Chapter 7: Project: Multiplication quiz machine</li> </ul>
<b>Term 2</b>	<b>Programming</b>	Chapter 3: Understanding programming using a general-purpose language	<ul style="list-style-type: none"> <li>Chapter 6: Guided project: Extended guessing game</li> <li>Chapter 7: Project: Multiplication quiz machine</li> <li>Chapter 8: Project: Simon says – programming a game</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 6: Guided project: Extended guessing game</li> <li>Chapter 9: Project: Programming your own text-based adventure game (Students create more extensive games)</li> </ul>	Chapter 8: Project: Simon says – programming a game
<b>Term 3</b>	<b>Modelling and simulation</b>	Chapter 1: Understanding digital systems	<ul style="list-style-type: none"> <li>Chapter 11: Guided project: Using spreadsheets</li> <li>Chapter 13: Project: Temperature converter</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 11: Guided project: Using spreadsheets</li> <li>Chapter 14: Project: Roll the dice (extend to independent modelling by students)</li> </ul>	Chapter 9: Project: Programming your own text-based adventure game
<b>Term 4</b>	<b>Digital design</b>	Chapter 2: Understanding data	<ul style="list-style-type: none"> <li>Chapter 15: Guided project: Image editing</li> <li>Chapter 16: Project: A mosaic mural for the classroom</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 18: Project: Choose-your-own-adventure website</li> </ul> OR <ul style="list-style-type: none"> <li>Chapter 19: Guided project: 3D design and printing (students design, modify and build to meet a need)</li> </ul>	Chapter 18: Project: Choose-your-own-adventure website

Term	Featured topic	Knowledge and understanding (Part 1 of text)	Projects (Part 2 of text)			
			General track Suggested projects	In-depth track Suggested projects	Computing science track Suggested projects	
<b>Year 8</b>						
Term 1	Data analysis Modelling and simulation	Chapter 4: Understanding networks	<ul style="list-style-type: none"> <li>Chapter 12: Project: The chessboard problem</li> <li>Chapter 14: Project: Roll the dice</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 22: Project: Adventures in data diving</li> <li>Chapter 13: Project: Build your own interactive temperature converter (students research needs, devise and model further examples)</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 22: Project: Adventures in data diving</li> <li>Chapter 23: Guided project: Introducing robotics</li> </ul>	
Term 2	Programming	Chapter 3: Understanding programming using a general-purpose language	<ul style="list-style-type: none"> <li>Chapter 23: Guided project: Introducing robotics</li> <li>Chapter 25: Project: Sci-Fi simulations</li> </ul> OR <ul style="list-style-type: none"> <li>Chapter 26: Project: Robots walking the line</li> </ul>	Chapter 10: Project: Embedded systems	<ul style="list-style-type: none"> <li>Chapter 23: Guided project: Introducing robotics</li> <li>Chapter 25: Project: Sci-fi simulations</li> <li>Chapter 26: Project: Robots walking the line</li> </ul>	
Term 3	Digital design	Chapter 1: Understanding digital systems	<ul style="list-style-type: none"> <li>Chapter 18: Project: Choose-your-own-adventure website</li> <li>Chapter 19: Project: 3D design and printing</li> </ul>	<ul style="list-style-type: none"> <li>Project Choose your own adventure website</li> </ul> OR <ul style="list-style-type: none"> <li>Project 3D design and printing</li> </ul> (Select project not chosen Year 7)	<b>Programming</b>	Chapter 10: Project: Embedded systems
Term 4	Teacher selection of topic and project to suit class	Revision	Teacher selection	Teacher selection		Suggest <i>Digital Technologies 9 &amp; 10</i> Chapter 24: Project: PID line follower robot or further programming (see project ideas in <i>Digital Technologies 9 &amp; 10</i> in the Programming section)