DTiF
Digital Technologies in focus
Initiative of and funded by the Australian Government Department of Education and Training

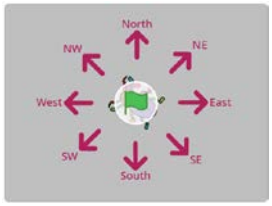
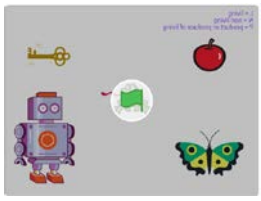
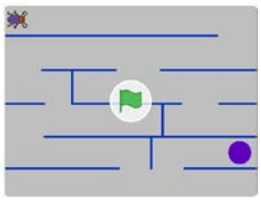
acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

CLASSROOM IDEAS: YEARS 3–6

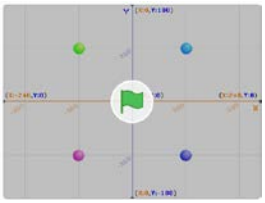
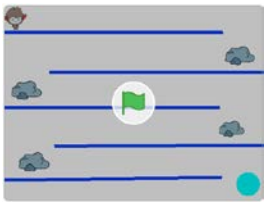
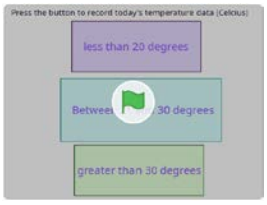
Visual programming with Scratch

The following sample activities (source: https://scratch.mit.edu/users/saraheLearn/projects/) show a range of different ideas for incorporating visual programming into teaching and learning programs. The projects *are all incomplete* and designed to be used as samples for inspiration or modification by teachers. They show the possibilities Scratch offers for integration.

Did you know Scratch is free, available in 40+ languages and has an F–2 version (ScratchJnr)?

Title of resource	Band/s	Description	Australian Curriculum content descriptions
Compass rose 	3–4	Demonstrate understanding of the compass rose in an integrated Digital Technologies, Mathematics and Geography activity using broadcast messaging (where messages are sent between sprites to trigger animation effects).	ACTDIP010 ACTDIP011
Simple classifier 	3–4	A simple quiz game example.	ACTDIP010 ACTDIP011
Australian minerals 	3–6	Designed as a way for students to demonstrate their knowledge of minerals in Australia.	ACTDIP011 ACTDIP017 ACTDIP019 ACTDIP020
Buggy maze 	3–6	An example of a maze game using responses to user input, repetition and variables. Test by using the up, down, left and right arrows on the keyboard or by using with a Makey Makey.	ACTDIP011 ACTDIP017 ACTDIP019 ACTDIP020

Australian Government Department of Education and Training CC BY 4.0

Cartesian plane 	3–6	Designed as a simple way to teach students about quadrants and Cartesian plane.	ACTDIP011 ACTDIP020
Rock cycle game 	3–6	An example of a maze game designed for a Year 4 Science teacher. Test by using the up, down, left and right arrows on the keyboard or by using with a Makey Makey.	ACTDIP010 ACTDIP011
Rocket experiment simulator 	3–6	Designed for a multi-age class (Years 3–6) for students to explain the findings of their rocket experiment.	ACTDIP010 ACTDIP011
Temperature data 	5–6	This example was designed to simply explain how to validate data. For example, if there are 30 students in a class and more than 30 responses are received then the data are invalid because a button must have been pressed more than once. (For use with an IWB or Makey Makey to gather daily temperature data.)	ACTDIP016 ACTDIP017 ACTDIP019 ACTDIP020
Temperature-water 	5–6	When a user adds temperature data (input), instructions are given as output on how much to water a ‘plant in a cup’. This was designed as part of a food and fibre unit on sustainable farming practices.	ACTDIP016 ACTDIP017 ACTDIP019 ACTDIP020
Temperature-humidity-water 	5–6	A second, more advanced temperature data example that requires modification to the code for it to function correctly.	ACTDIP016 ACTDIP017 ACTDIP019 ACTDIP020
Solar system quiz starter 	5–6	An example of a quiz requiring user input to test knowledge of the solar system. This quiz can be adapted to test knowledge on any topic.	ACTDIP020

Australian Government Department of Education and Training CC BY 4.0

Links to the Australian Curriculum

Tables 1 and 2 give teachers an opportunity to see related aspects of the Australian Curriculum: Digital Technologies which may be addressed depending upon the task.

Table 1: Links to the Australian Curriculum: Digital Technologies 3–4

Digital Technologies ***Achievement standard***	**Years 3 and 4** By the end of Year 4, students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. They explain how the same data sets can be represented in different ways. Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input. They explain how the solutions meet their purposes. They collect and manipulate different data when creating information and digital solutions. They safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.		
Strands	Digital Technologies processes and production skills • Collecting, managing and analysing data • Creating designed solutions by – Investigating and defining – Generating and designing – Producing and implementing		
Content descriptions	**Years 3 and 4** *(Depending on the task, one or more of the following may apply)* • Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009) • Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010) • Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)		
Key concepts	• data collection • data interpretation • specification • algorithms • implementation	***Key ideas***	Thinking in Technologies • computational thinking
Cross-curriculum priorities		***General capabilities***	• Information and Communication Technology (ICT) Capability • Literacy • Numeracy

Useful links

Australian Curriculum www.australiancurriculum.edu.au/

- Digital Technologies in focus (DTiF) project resources
- Digital Technologies Years 3 and 4 curriculum information
- Digital Technologies structure
- Information and Communication Technology (ICT) Capability

Scratch website www.scratch.mit.edu/

- Scratch tutorials www.scratch.mit.edu/projects/editor/?tutorial=getStarted
- A guide for teachers on ScratchJnr blocks www.scratchjr.org/learn/blocks

Australian Government Department of Education and Training CC BY 4.0

Table 2: Links to the Australian Curriculum Digital Technologies 5–6

Digital Technologies ***Achievement standard***	**Years 5 and 6** By the end of Year 6, students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. They explain how digital systems use whole numbers as a basis for representing a variety of data types. Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. They incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. They explain how information systems and their solutions meet needs and consider sustainability. Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols.		
Strands	Digital Technologies processes and production skills • Collecting, managing and analysing data • Creating designed solutions by – Investigating and defining – Generating and designing – Producing and implementing		
Content descriptions	**Years 5 and 6** *(Depending on the task, one or more of the following may apply)* • Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016) • Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017) • Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) (ACTDIP019) • Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020)		
Key concepts	• data collection • data interpretation • specification • algorithms • implementation	***Key ideas***	Thinking in Technologies • computational thinking
Cross-curriculum priorities		***General capabilities***	• Information and Communication Technology (ICT) Capability • Literacy • Numeracy

Useful links

Australian Curriculum www.australiancurriculum.edu.au/

- Digital Technologies in focus (DTiF) project resources
- Digital Technologies Years 5 and 6 curriculum information
- Digital Technologies structure
- Information and Communication Technology (ICT) Capability

Scratch website www.scratch.mit.edu/

- Scratch tutorials www.scratch.mit.edu/projects/editor/?tutorial=getStarted
- Resources for teachers www.scratch.mit.edu/educators/#resources

Australian Government Department of Education and Training CC BY 4.0