

Unit 6.1: Smart communities

Share your feedback at rpf.io/experience-cs-feedback to help us as we update these materials.

Introduction

In this unit, students explore how people can use computing and technology to make their surroundings more responsive to the needs of their community. They begin by exploring computing concepts such as loops, variables, sensing, and conditional statements to program simulations of responsive systems. They then apply those concepts in a user-centred design cycle to consider, plan, and prototype improvements to their school community.

Guidance for Irish teachers — Post-primary

This unit was written for Grade 6 learners in a US context. It introduces students to how computing and technology can be used to understand and improve their local environment. For Irish post-primary schools, it aligns well with the Junior Cycle curriculum, as students develop core skills in coding, design thinking, problem-solving, user-centred design, and digital creativity. Students explore programming concepts and apply them through a structured design thinking cycle where they focus on investigating needs, generating ideas, creating prototypes, gathering feedback, and refining solutions.

The unit aligns strongly with the Junior Cycle Coding and Digital Media Literacy short courses. It also supports Applied Technology and Science, as students prototype responsive systems and model real-world interactions. In addition, it aligns with four strands within the Mathematics specification. It also contributes to Wellbeing, as learners engage in creativity, collaboration, empathy-building, and reflective discussion while designing solutions to improve their school community.

Using the Experience CS resources in your classroom

The Experience CS resources are designed to be inclusive, and feature examples, names, images, and activities that have been chosen to reflect a diverse range of people and life experiences. However, it is not possible to make resources perfectly suited to every context and classroom. To support teachers to adapt the resources to meet the needs of their students, the resources are provided in formats that can be edited and modified easily.

The lesson plans, slide decks, and student resources included in the Experience CS units are provided in American English. The unit overviews, however, have been localised for Irish educators and include terminology used in Ireland and a section titled 'Curriculum specification' that lists the most relevant links to curricula taught in Ireland. This provides an equivalent to the 'Standards' section in the lesson plans, which is designed for US-based educators.

Since all resources are fully editable, you can easily adapt them to meet your students' needs, for example, by incorporating terminology used in Ireland alongside American English words (such as those used in Scratch projects) or making materials more accessible for a particular class or group of learners.

Overview of lessons

Lesson	Brief overview	Learning objective
1: Places and spaces	Students explore how our surroundings can shape how we behave. Students use event blocks, motion blocks, and loops to create a simulation.	Students will modify the sequence of a program to accomplish a task.
2: Variables	Students investigate the use of variables as a way to track values in a program. They explore the user-centred design cycle and program a solution to meet a specific user's needs.	Students will use variables to program a solution that meets a specific user's needs.
3: This sentence is true	Students discuss different ways that Booleans, conditionals, and loops work together to react to changes. Students then use flowcharts to analyse a program before applying their learning by constructing a program with given constraints.	Students will develop a program in which a sprite reacts to sensed changes in its environment.
4: Design thinking challenge	Students participate in a guided design thinking sprint focused on a school-related scenario. The activity emphasises empathy, problem definition, and ideation. Today's activity is unplugged and does not require students to use computers.	Students will determine different approaches to solve a problem.
5: Prototype a solution	Students are introduced to the concept of algorithms and their connection to flowcharts. They return to their design sprint from the last lesson and create a flowchart as a prototype of their solution.	Students will prototype a solution to a problem.
6: Testing	Students develop and share a feedback survey to test their prototyped solution with target users. Students incorporate feedback from the survey to modify their prototype to better meet user needs.	Students will use feedback to improve their prototype.
7: Sharing your work	Students create a portfolio from their planning and prototyping documentation. They use a 3, 2, 1 protocol to reflect and share about their design choices in the context of meeting user needs.	Students will explain the design choices they made in their projects.

Each lesson includes opportunities for formative assessment, which are outlined in the lesson plans. The unit also includes a summative assessment, with a clear rubric to assess students' final projects.

Curriculum specification

Junior Cycle Key Skills	Lesson						
	1	2	3	4	5	6	7
Managing Myself: Setting goals, planning and organising work, making decisions, and using digital tools to manage learning	✓	✓	✓	✓	✓	✓	✓
Staying Well: Developing confidence, resilience, and positive relationships while working safely and ethically with digital technologies		✓	✓	✓	✓	✓	✓
Communicating: Explaining ideas, presenting work, discussing solutions, documenting decisions, and preparing to share with an audience	✓	✓	✓	✓	✓	✓	✓
Being Creative: Imagining and designing digital or physical artefacts, exploring alternatives, solving problems creatively, and prototyping	✓	✓	✓	✓	✓	✓	✓
Managing Information & Thinking: Researching, evaluating information, planning, debugging, analysing systems, and solving problems logically	✓	✓	✓	✓	✓	✓	✓
Being Literate: Writing instructions, documenting prototypes, preparing presentations, reading flowcharts, and composing user-friendly wording	✓	✓	✓	✓	✓	✓	✓
Being Numerate: Interpreting variables, patterns, logic, loops, decision structures, survey data, efficiency testing	✓	✓	✓		✓	✓	✓
Working with Others: Participating in pair programming, peer feedback, collaborative design, team testing, and reflective discussion	✓	✓	✓	✓	✓	✓	✓

Coding short course	Lesson						
	1	2	3	4	5	6	7
Strand 1: Introducing computer science	✓	✓	✓		✓	✓	
Strand 2: Let's get connected				✓			
Strand 3: Coding at the next level		✓	✓		✓	✓	✓

Digital Media Literacy short course	Lesson						
	1	2	3	4	5	6	7
Strand 1: Understanding myself when engaging online	✓			✓			
Strand 2: Evaluating online content		✓	✓			✓	
Strand 3: Following my interests online	✓		✓		✓		
Strand 4: Publishing online						✓	✓

Other cross-curricular links	Lesson						
	1	2	3	4	5	6	7
Applied Technology – Principles and practices	✓	✓			✓		✓
Applied Technology – Energy and control			✓			✓	
Applied Technology – Technology and society				✓		✓	✓
Science – Nature of science	✓	✓	✓	✓	✓	✓	✓
Science – Physical world			✓				
Mathematics – Unifying	✓		✓	✓			✓
Mathematics – Number				✓			
Mathematics – Statistics and probability					✓	✓	✓
Mathematics – Algebra and functions	✓	✓	✓				

Resources are updated regularly – the latest version is available at: experience-cs.org



This resource is licensed by the [Raspberry Pi Foundation](http://RaspberryPiFoundation) under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International licence. To view a copy of this licence, visit creativecommons.org/licenses/by-nc-sa/4.0/.