# Introduction to Computer Science

## Teacher Guide

### Overview

#### Contents

The *Game Builders Club* unit consists of 10 concept modules. Most concept modules contain four lessons following the Engage, Explore, Enrich, Create format. Every lesson comes with a lesson plan and a slide deck.

#### Target Student

This unit was developed for elementary grade students.

#### Student Occupancy

This unit was developed for groups from 10 to 30 students.

*Target Facilitator / Format*

This unit was developed to be used in three settings:

* **Classroom Setting** - Semester-long After School program. This unit makes a great introduction to coding before moving on to physical computing or other coding environments.
* **Half-Day Camp** – Modules could be combined into five days, 4 hours long units.
* **Full-Day Camp** - Modules could be combined and expended to five days, 6 hour-long units

*Goals*

By the end of this class, your students will be able to:

* **Work in pairs** to solve complex problems.
* Use coding and computational thinking concepts to develop and code unique programs as a form of **self-expression**.

### Engage, Explore, Enrich, Create

Each lesson has a theme: engage, explore, enrich and create. Lessons are provided in this specific order to help students build conceptual knowledge as they move from the concrete to the application of the abstract. Check out this study to learn more: [A Pedagogical Framework for Computational Thinking](http://utouch.cpsc.ucalgary.ca/docs/PedagogicalFramework-Springer2017.pdf).

**Engage -** usually unplugged activities to hook learners and introduce the concrete idea of a concept.

**Explore -** usually coding activities in Scratch, giving learners an opportunity to apply the concept.

**Enrich -** an additional activity to help learners apply the concept.

**Create -** an additional activity to help learners grasp game design concepts.

### Concept Modules

Each concept module contains lessons designed to introduce a specific concept. The chart below shows the concept module in order and the “islands” (themed learning areas) that are used in each concept module.

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| **Concept Module (Lessons)** | | **Scratch Games** |
| 1 | Introducing Scratch |  |
| 2 | First Game | Ninja On the Move |
| 3 | Loops | Ninja and the Magic Crystals |
| 4 | Drawing Backgrounds | Ninjas Maze |
| 5 | Drawing Sprites | Ninjas Bobsled Cross |
| 6 | Keeping Scores | Ninjas Ski School |
| 7 | Keeping Scores 2 | Tetris |
| 8 | Not the math again | Ninja Jumper |
| 9 | Making your custom Blocks | Two-player pong |
| 10 | Game Showcase |  |