

Course 4

OVERVIEW

Course 4 is designed for students who have taken Courses 2 and 3. Students will learn how to tackle puzzles with increased complexity as they learn how to combine several concepts when solving each challenge. By the time this Course is completed, students will be creating programs that let them showcase multiple skills, including for loops and functions with parameters. Recommended for grades 4-8.

Lesson Sequence of Course 4

Online lessons are in regular text and unplugged activities are in **bolded** text.

#	Lesson Name	Description
1	Algorithms: Tangrams	If you keep an algorithm simple there are lots of ways to use it. If you want to make sure everyone ends up with the same thing, then your algorithm needs more detail.
2	Maze and Bee	First help the zombie get to the sunflower using a combination of sequences and loops, then review conditionals with the flower-hunting bee.
3	Artist: Loops Review	Use the traditional artist character, as well as a very artistic zombie, to complete and recreate repetitive drawings.
4	Variables in Envelopes	Explains what variables are and how we can use them in many different ways.
5	Abstraction with Mad Glibs	Analyze stories for differences so that they can abstract them away. Those abstracted stories become templates for fun and crazy new ones.
6	Artist: Variables	Explore the creation of repetitive designs using variables.
7	Play Lab: Variables	Play with variables in a situation that illustrates just how useful they can be.
8	For Loop Fun	Learn how to use loops with extra structure built right in.

#	Lesson Name	Description
9	Bee: For Loops	Use the Bee environment to write programs that use loops with embedded counters/index variables.
10	Artist: For Loops	Use the Artist environment to write programs with for loops, similar to what they did in the previous Bee level.
11	Play Lab: For Loops	Building on the previous Play Lab activity, students will add deeper interactivity as they build their own video games.
12	Artist: Functions	Use the Artist environment to draw complicated images using functions for repeated tasks.
13	Songwriting with Parameters	help students intuitively understand why combining chunks of code into functions is such a helpful practice.
14	Artist: Functions with Parameters	Use the Artist environment to draw complicated images using functions with parameters to create similar shapes with small differences.
15	Play Lab: Functions with Parameters	Having experienced the creation and use of functions and parameters, students will get the opportunity to use the skill in the creation of Play Lab games.
16	Bee: Functions with Parameters	This short stage illustrates how students can use their new skills with functions and parameters to change direction using binary logic.
17	Binary Images	Illustrates how a computer can store even more complex information (such as images and colors) in binary, as well.
18	Artist: Binary	Build binary images, translating 0s and 1s to offs and ons (or blacks and whites).
19	Super Challenge - Variables	Dig deep into what students have learned throughout their journey to solve a handful of complex puzzles.
20	Super Challenge - For Loops	Use a mix of different environments to test their knowledge of for loops.

#	Lesson Name	Description
21	Super Challenge - Functions with Parameters	This challenging stage allows students to hone their skills with functions and parameters to solve complex puzzles with grace and efficiency.
22	Extreme Challenge - Comprehensive	The final stage in this course is intended to test comprehension and transfer of all concepts to blended puzzles.