Course F

Overview
The final course in CS Fundamentals is tailored to the needs of students in the fifth grade.

In this course, students will investigate problem-solving techniques and discuss societal impacts of computing and the internet. By the end of the course, students will have created interactive stories and games that they can share with their friends and family.

In Course F, students begin to understand how the concepts that they have learned impact the world around them and how they can be applied to solve interesting and personally-relevant problems. By this point, students should be cognitively mature enough to think about plans that they want to bring to life and have the skills to start down that path.

Starting with the first few lessons, students are given greater autonomy and creative freedom in programming, which also necessitates an increased emphasis on debugging and problem solving. Students in the fifth grade should be expected to take the first steps in solving all of their own coding problems as they arise. When solving problems, they should be encouraged to work with peers to overcome obstacles rather than relying on the teacher to do so.

Remember, *solving* a puzzle is not as important as *understanding* a puzzle, so when students are stuck, encourage them to look at several angles until a solution begins to appear.

Core concepts:
- Digital Citizenship
- Variables
- Data
- For Loops
- Sprites

Attitudinal goals:
- I can use computer science to solve real and meaningful problems.
- Programming is creative.

Key teaching tips:
- Talk with students before you begin about how they may experience frustration.
- Use pair programming and encourage students to help each other.
- Require students to make a first attempt at problem solving before asking for help.
- Remind students of the importance of persistence.
- Encourage students to use a journal during and after activities.
- Promote an environment of cross-team collaboration for group activities and projects.

CS Fundamentals Curriculum Guide

Course F: Lesson Outlines

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

Concept Chunk	#	Lesson Name	Description
Ramp Up	1	Functions in Minecraft	Students will begin to understand how functions can be helpful in this fun and interactive Minecraft adventure.
	2	Swimming Fish with Sprite Lab	This lesson is designed to introduce students to the Sprite Lab programming environment and allow them to apply concepts they learned in other environments to this tool.
	3	Alien Dance Party with Sprite Lab	Using Sprite Lab students create their own alien dance party with interactions between characters and user input.
	4	Drawing with Loops	This Artist stage will allow students to create images of increasing complexity using new blocks and the concept of loops.
	5	Nested Loops in Maze	In this online activity, students will have the opportunity to push their understanding of loops to a whole new level.
Digital Citizenship	**6**	**The Power of Words**	Created by Common Sense Education, students learn what they should do when someone uses mean or hurtful language on the internet.
Variables	**7**	**Envelope Variables**	This lesson explains what variables are and how to use them.
	8	Variables with Artist	Students explore the creation of repetitive designs using variables in Artist.
	9	Changing Variables with Bee	Students will get further practice with variables with the bee.
	10	Changing Variables with Artist	This artist level takes variables to new heights.
Data	11	Simulating Experiments	By running a simple simulation in Sprite Lab, students will experience how computing can be used to collect data that identify trends or patterns.
	12	AI for Oceans	This tutorial is designed to quickly introduce students to machine learning, a type of artificial intelligence. Students will explore how training data is used to enable a machine learning model to classify new data.
	13	**The Internet**	In this lesson, students will pretend to flow through the internet, all the while learning about connections, URLs, IP addresses, and the DNS.
For Loops	**14**	**For Loop Fun**	Students play a game with dice to learn a powerful new programming concept: for loops.
	15	For Loops with Bee	This lesson focuses on `for` loops as students look for patterns in puzzles with the bee.
	16	For Loops with Artist	Students continue to practice `for` loops, this time with Artist.
Sprites	17	Behaviors in Sprite Lab	Here, students will use Sprite Lab to create their own customized behaviors.
	18	Virtual Pet with Sprite Lab	In this lesson, students will create an interactive Virtual Pet that looks and behaves how they wish.
Project	19	End of Course Project	Students will be given their own space to create their project with either Artist or Sprite Lab.