

Duration: 7 Weeks, 5 days per week, 1 hour per day (33 hours total)

Outline of Coding Sessions

May 28-Jun 1, Week 1: What is Coding? - These four sessions will introduce the basis and history of coding, common uses for it, and small, interactive exercises to engage the students. The latter three sessions will begin to fully engage students to start to code. By the end of this week, students will have had some practice with many basic coding executions.

Jun 4, - Jun 8, Week 2: Applications to the Real World & Teamwork Sessions - These five sessions will be based on a reading at the beginning of the week that will challenge them to solve a real-world problem using coding. Students will also be introduced to team-based learning and will have a small project surrounding this topic.

NOT AVAILABLE THE WEEK OF June 11-June 15.

Jun 18 - Jun 22, Week 3: Turtle Graphics - During this week, we will go over simple programs that will help students review what they have learned thus far.

Jun 25 - Jun 29, Week 4: Python Libraries - Students have already seen the Turtle Graphics library. In these sessions, they will have a brief introduction to the other libraries available in Python and a review session at the end of the week.

Jul 2 - Jul 6, Week 5: Review Week - each day will be a review of all topics learned in the previous week. This will help students gather thoughts for the project preparations.

Jul 9 - Jul 13, Week 6: Project Preparations - This is the week where students will begin to think of their own projects to complete. They may use the internet, do a project based off of the project assigned in Week 5, or they can create their own. Students will be assigned to small groups of no more than 3 students. Students will be working with their groups for their projects.

Jul 16 - Jul 20, Week 7: The Final Product: Students will spend this week making last minute changes and adjustments to their code for their final project. In the last few days, they will display their work for parents and peers to view.

Week 1: What is Coding?

May 28 - June 1

Day 1, May 29: Introduction

- [Survey](#) (10 minutes)
- [PowerPoint](#) (20 minutes)
 - 15 minutes of actual presentation, 5 minutes for questions or comments
 - Show my coding project
- Introduce them to Anaconda and how to access it (20 minutes)

Day 2, May 30: The Basics and Print Statements

- Read for the topic of the day (print statements) (10 minutes)
- Go into the very [basics](#) of simple programming techniques in python (30 minutes)
 - Do some exercises beforehand to see how they will think.
 - Use of variables, assignment statements, main function, callback main function, range, python starts at 0 and ends at n-1, syntax
- Introduce print statements (10 minutes)
- Practice with print statements (10 minutes)

[Day 3, May 31: Input statements](#)

- Review print statements (10 minutes)
- Read for topic of the day: input statements (15 minutes)
- Introduce input statements (10 minutes)
- Practice with input statements (25 minutes)

Day 4, June 1: Turtle Graphics Intro

- Review input statements (10 minutes)
- Introduce turtle graphics (15 minutes)
 - Go over basic functions like forward, backward, right, left, penup, pendown
- Have students draw figures (25 minutes)
- Have students show the figures they made (10 minutes)

Some outline materials from <https://technologyforlearners.com/python-lesson-plans/>

Week 2: Applications to the Real World & Teamwork Sessions

June 4 - June 8

Day 5, June 4: Conditional statements, Part I

- Review of input statements (10 minutes)
- Read for topic of the day: for loops (10 minutes)
 - For loops, if statements
- Introduce for loops (10 minutes)
- Practice with for loops (20 minutes)

Day 6, June 5: Conditional Statements: Part II and Pseudocode

- Review for loops (10 minutes)
- Read for topic of the day: if, else, elif statements (10 minutes)
- Introduce if, else, elif statements (15 minutes)
- Practice with if, else, elif statements (25 minutes)

[Day 7, June 6: Individual Challenge](#)

- Review if, else, elif statements (10 minutes)
- Introduction to Individual Challenge (10 minutes)
- Work on Individual Challenge (40 minutes)

Day 8, June 7: Team Challenge

- Everyone shares what they did for the individual challenge to the class (15 minutes)
- Introduce the team challenge (15 minutes)
 - Introduce them to the Little Bits Kit, let them select their groups, and then have each group choose one object to build
- Start group work (30 minutes)

Day 9, June 8: Editing code

- Have them share what they did in their teams from the day before (10 minutes)
- AS A GROUP: Show them some code with things they are familiar with. Have them write (or type) [pseudocode](#) or comment what they think is happening (20 minutes)
- INDIVIDUALLY: Show them another piece of code and have them figure out what is happening. Then have them edit the code (20 minutes)

Some outline materials from <https://technologyforlearners.com/python-lesson-plans/>

Week 3: Review and Turtle Graphics

June 18 - June 22

Day 10, June 18: Review and Intro to Turtle Graphics

- Complete a series of [review problems](#) (20 minutes)
- Go over answers for review problems (10 minutes)
- Read for topic of the day: The basics of Turtle Graphics (20 minutes)
 - Describe python libraries, import method, classes, methods, moving, coordinate plane, setting x and y
- [Practice with Turtle Graphics](#) (10 minutes)
 - Spell out initials and then name

Day 11, June 19: Turtle Graphics Continued

- Review basics of Turtle Graphics (10 minutes)
- More practice with Turtle Graphics with same activity from 6.18 (20 minutes)
- Read for topic of the day: [In-depth of turtle graphics](#) (20 minutes)
 - Change of color, shape, speed, x and y coordinates, window, events
- Practice with Turtle Graphics (10 minutes)

Day 12, June 20: Turtle Individual Challenge

- More practice with Turtle Graphics (20 minutes)
- Introduce Individual Challenge with Turtle Graphics (10 minutes)
- Work on Individual Challenge (30 minutes)
 - Draw a rectangle, then draw an octagon.

Day 13, June 21: Turtle Team Challenge

- Have everyone show how they solved the problem (15 minutes)
- Introduce Team Challenge with Turtle Graphics (5 minutes)
 - Will be an extension of individual challenge
 - Will let them choose their own groups this time
- Teamwork time (40 minutes)
 - Draw three equilateral triangles that are 10 spaces apart, and are different in size by multiples of 5

Day 14, June 22: Turtle Team Challenge Continued

- Groups will finish up their challenge work (10 minutes)
- Groups will present their solutions (10 minutes)
- Introduce another problem with turtle graphics (10 minutes)
- Individual practice (30 minutes)
 - Draw a star

Some outline materials from:

https://github.com/asweigart/simple-turtle-tutorial-for-python/blob/master/simple_turtle_tutorial.md

Week 4: Python Libraries and Modules

June 25 - June 29

Day 15, June 25: Python Math Library

- Review Turtle Graphics (10 minutes)
- Read for topic of the day: math library (10 minutes)
- Introduce math library (10 minutes)
- Practice with math library as a group (30 minutes)
 - Random

[Day 16, June 26: cImage Module](#)

- Review math library (10 minutes)
- Read for topic of the day: cImage module (10 minutes)
- Introduce cImage module (10 minutes)
- Practice with cImage module as a group (30 minutes)

Day 17, June 27: [Pygame](#) Module

- Review cImage (10 minutes)
- Read for topic of the day: Pygame module (15 minutes)
- Introduce pygame module (10 minutes)
- Understanding pygame code (25 minutes)

Day 18, June 28: Review Day

- Review Pygame module (10 minutes)
- Review cImage module (5 minutes)
- Review math library module (5 minutes)
- Practice problem for all three modules (40 minutes)

Day 19, June 29: Free Day (Movie, Tutorial, Speaker)

- We will discuss everyone's progress, feedback, etc (15 minutes)
- Movie, tutorial, speaker interlude (45 minutes)

Some outline materials from <https://docs.python.org/3/library/math.html#>
<https://pypi.org/project/cImage/#files>

Week 5: Review Week

July 2 - July 6

Day 20, July 2: Week 1 Review

- Pseudocode, basics, print statements, input statements, and for loops (session duration)

[Day 21, July 3: Week 2 Review](#)

- Conditional statements part I & II, comparison operators, editing code (session duration)

Day 22, July 5: Week 3 Review

- Turtle Graphics (session duration)

Day 23, July 6: Week 4 Review

- Math library, cimage module, pygame module (session duration)

Week 6: Project Selection and Preparations

July 9 - July 13

Day 24, July 9: Strings and Ints

- [Reads for the day](#) (15 minutes)
- Complete a practice problem with strings while live coding (25 minutes)
- Students will complete practice problems individually (20 minutes)

[Day 25, July 10: Project Preparations](#)

- Introduce three kinds of projects to work on (15 minutes)
- Have the students read over requirements for projects and select team members (10 minutes)
- Start pseudocode projects (35 minutes)

Day 26, July 11: Group Work

- Check over pseudocode and give feedback (15 minutes)
- Allow groups to share project ideas (10 minutes)
- Work on projects within groups (35 minutes)

Day 27, July 12: Group Work

- Work on projects within groups (session duration)

Day 28, July 13: Group Work

- Work on projects within groups (session duration)

Week 7: The Final Product

July 16 - July 20

Day 29, July 16: Group Work

- Touch base with group projects and give feedback (15 minutes)
- Work on projects within groups (45 minutes)

Day 30, July 17: Group Work

- Touch base with group projects and give feedback (15 minutes)
- Work on projects within groups (45 minutes)

Day 31, July 18: Group Work

- Touch base with group projects and give feedback (15 minutes)
- Work on projects within groups (45 minutes)

Day 32, July 19: Group Work

- Touch base with group projects and give feedback (15 minutes)
- Work on projects within groups (45 minutes)

[Day 33, July 20: Project Presentations](#)

- (15-20 minutes for preparation)
- Students will present their projects to the class and other club members (45 minutes-1 hour)