

# Computer Programming 2020

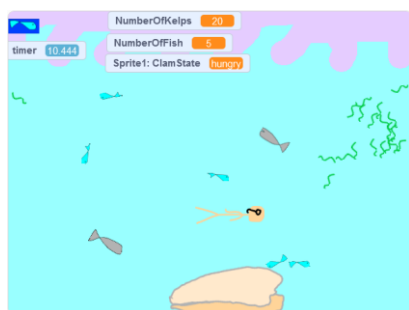
Sessions 1&2, M/W 1:30 PM – 3:00 PM

Tim Handley, Instructor

Syllabus v1.00 (2020.08.19)

## Course Overview:

A STEAM-y, project-based introduction to the art, craft, and imaginative application of computer programming. Where traditional math and programming classes step through concepts in a plainly pragmatic manner, we will help students learn programming by engaging with both everyday and out-of-the-box concepts. Using a combination of feline geometry and coordinate geometry, students will create animated stories. With lists and variables, they will create procedural poetry. With control structures and subroutines, they will create code-making and code-breaking tools. With abstraction, intuition, and clever design, they will create a virtual world with virtual creatures! And maybe more! We shall go where our curiosity takes us ...



*Virtual Seascape*

Decryption shift	Candidate plaintext
0	exxegoexsrgi
1	dwwdfndwrqfh
2	cvvcemcvqpeg
3	buubdlbupodf
4	attackatonce

*Caesar Cipher*



*Fractal Fern Leaf*

In this work, we will use [Scratch](#) - a remarkably accessible and powerful programming system developed by MIT. Scratch is a free, web-based development environment that runs well on just about any modern laptop, and on most Chromebooks. No software installation is necessary, just an internet connection and a web browser.

## Course Materials:

- **BYOD - Every student must have a web-abled device with a keyboard**
- Single subject spiral bound notebook (look for 80+ pages)
- Pencil and eraser
- Edmodo account (student and parent both)

## Course Expectations:

- Attend all classes unless ill.
- Arrive on time and prepared.
- Be mindful of yourself and your behavior.

## Grades, Tests, and Homework:

This will be a semi-formal class. There will be 2-4 formal tests, spaced evenly throughout the two sessions. The goal of the tests will be to help students check their learning, and make sure that they are on track to be fully successful in the class - able to finish their projects with pride and panache.

Students will have daily homework assignments, for a total of 2-4 hours of homework per week. All assignments will be important to achieving learning goals and creating successful projects.

## **Rough schedule of topics and activities\***

\* Details may change according to students' needs and interests

### **Session 1**

- Week 1: Human Values  
Feline Geometry and Coordinate Geometry
- Week 2: Costumes and Animation  
Loops
- Week 3: Collision Events  
Begin Interactive Story/Game Project
- Week 4: Principles for Engineering  
Continue work on Interactive Project
- Week 5: Continue work on Interactive Project
- Week 6: Variables and Messages  
List-type Variables
- Week 7: Procedural story project

### **Session 2**

- Week 1: Introduction to Ciphers
- Week 2: Caesar Ciphers  
Custom Blocks (a.k.a. functions)
- Week 3: Imagining Virtual Worlds
- Week 4: Begin Final Project: A Virtual World
- Week 5: ... continue project ...
- Week 6: ... continue project ...
- Week 7: ... continue project ...
- Week 8: Deliver final project