

Using CS Principles With EarSketch!



Why is coding easy?

If you can understand a recipe,
You can learn to code music.

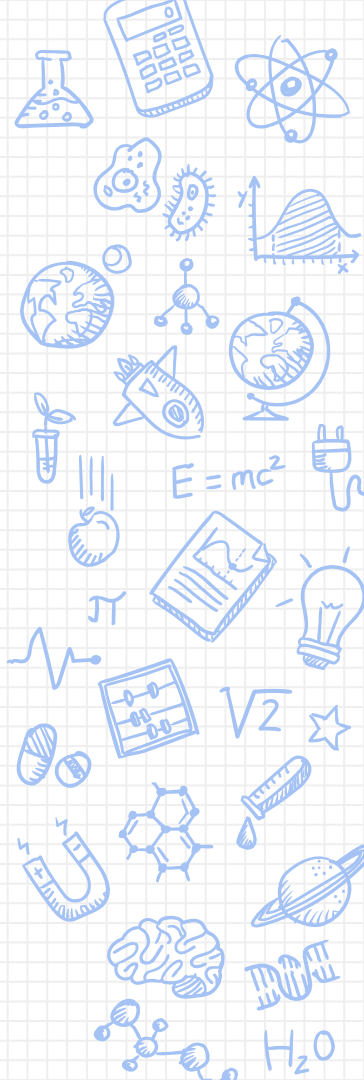
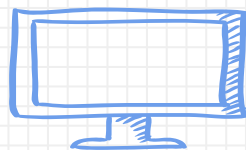
Recipe

- Ingredients
- Mixing Instructions
- Baking
- Servings
- Tasting

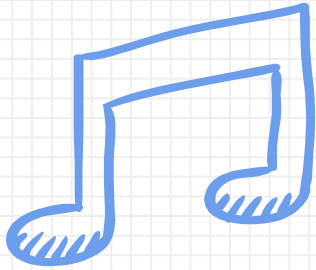


Coding

- Variable assignments
- Coding Instructions (Script)
- Running
- Output
- Debugging (Finding & Fixing Errors)



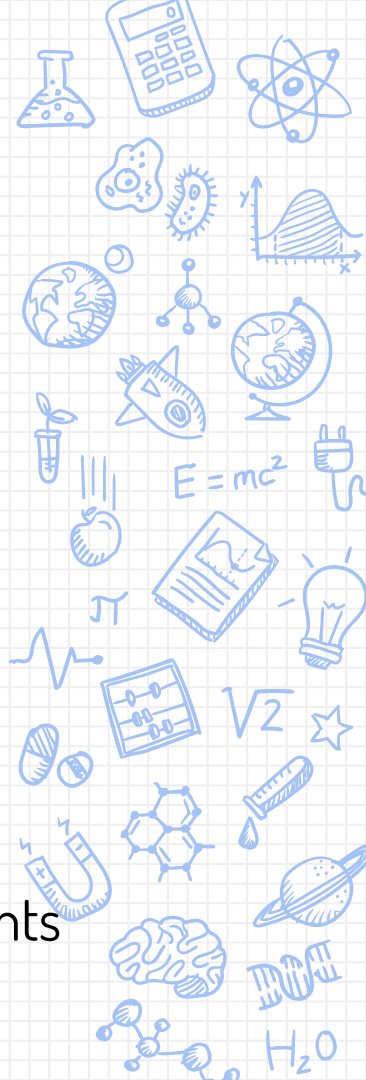
Let's use a song intro example.



Beyonce Crazy in Love link

Musical Ingredients

- **How long is this intro?**
 - In seconds?
 - In beats?
 - In measures?
(1 measure = 4 beats)
- What are the musical instruments you hear?



Coding Ingredients (Data Types)

Examples

- Numbers
 - Integers
 - 3, 4, 8
 - Floating point
 - 4.235, 5.091349
 - Strings
 - Constants
 - Variables
- | | Data Type |
|--|------------------|
| – Do not have spaces | |
| – Can't used reserved Python words or functions like print | |
| – Should be meaningful but not too long | |
- "my first mix", '0++-'
 - Y03_bass, Techno_Dub_3
 - horn, horn2, guitar, drum

EarSketch Interface: :Log In

The screenshot displays the EarSketch interface, which is divided into several functional windows:

- Left Panel (Sounds):** A library of sound samples including Y03_BASS_1, Y03_CRASH_1, Y03_DRUMS_SAMPLE_1, Y03_HI_HATS_1, Y03_HORNS_1, Y03_KICK_1, Y03_OLD_STRINGS_1, Y03_OPEN_HI_HATS_1, Y03_SNARE_1, and Y03_TAMBOURINE_1. It also features a search bar and filters for Artists, Genres, and Instruments.
- Top Center (DAW):** A digital audio workstation interface showing a timeline with three tracks. Track 1 is labeled 'Y03_HORNS_1', Track 2 is 'Y03_K...', and Track 3 is 'Y03_E...'. The interface includes playback controls (play, stop, undo, redo, volume) and a search bar.
- Bottom Center (Code Editor):** A code editor window titled 'untitled.py' with a 'Run' button and 'Options...' dropdown. The code contains a comment block and an import statement:

```
6 #  
7 # description:  
8 #  
9 #  
10 #  
11  
12 from earsketch import *  
13  
14
```
- Right Panel (Document Viewer):** A document viewer displaying a page titled 'Making Music With Computers' and 'Why Learn Programming for Music?'. The text discusses various ways to get involved in making music and the benefits of learning programming for music.

The purpose of each window of the EarSketch interface is...

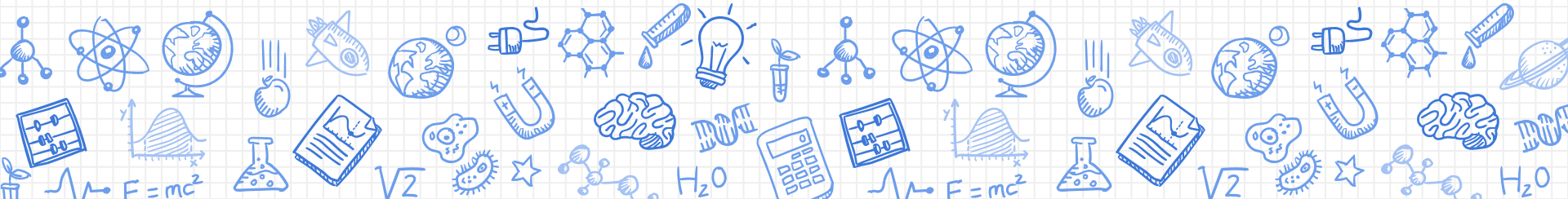
Reusable Sauces (Functions)



- Function
 - a block of organized reusable code that does a single action
 - has its own ingredients
 - abstraction
 - Example: print 'My First Mix'

Reusable Sauce: fitMedia Function

- `fitMedia(music sample, track number, start, end)`



Reusable Sauce: fitMedia Function

- fitMedia(music sample, track number, start, end)

Data
Types

Constant
or
Variable

Integer

Floating
Point

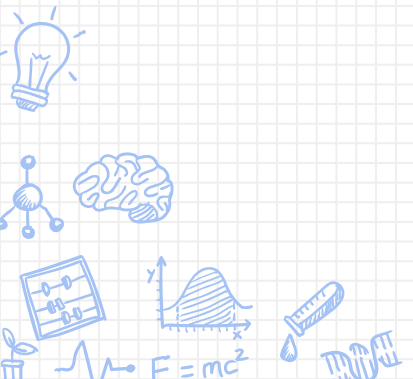
Floating
Point

The background features a light blue grid pattern. In the corners, there are clusters of hand-drawn blue icons representing various scientific and technological fields. Top-left icons include a Bohr-style atom, a beaker with a chemical reaction, the formula H2O, a globe, a lightbulb, a rocket, and a molecular structure. Top-right icons include a calculator, a hexagonal molecular structure, a globe, a power plug, a book, a cell, a star, a magnet, and a test tube with a plant. Bottom-left icons include a lightbulb, a brain, a molecular structure, an abacus, a graph with axes, a rocket, and the formula E=mc^2. Bottom-right icons include a magnet, a hexagonal molecular structure, a globe, a planet, a rocket, a DNA helix, a star, a lightbulb, and the formula H2O.

Explore the tutorials on the right of the screen in Earsketch on
your own...



Interactive Demo: DJ Amit



Time to work on 2 Music Compositions Incorporating What You Learned from DJ Amit

After:

Mingle!

Share what your small
groups created with at least
2 other groups.

