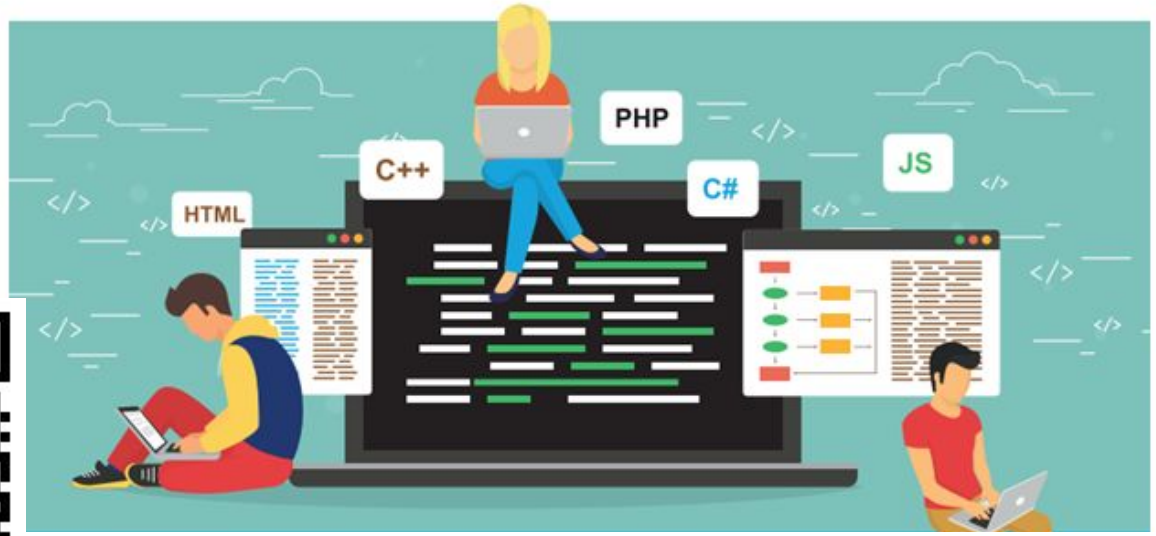
Beyond Scratch

Learn2Code



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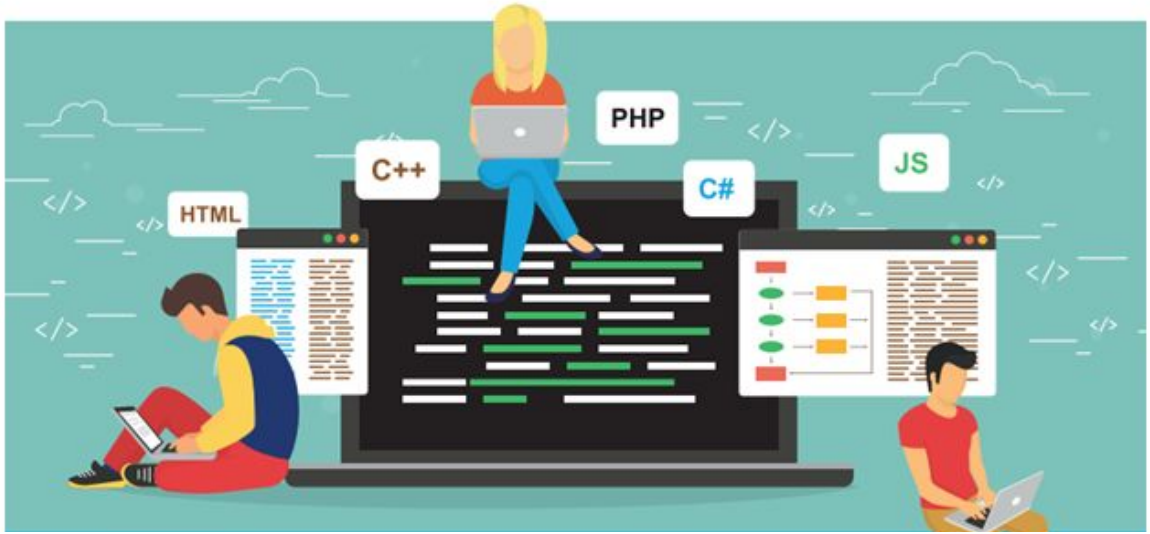
Beyond Scratch

Learn2Code



With Your Patrons

Recommended Physical Objects

Ozobots

- EVO - bluetooth & code-able

EV3 LEGO robotics

Bloxels

Finch

Cubetto

Jamie Bair!

Experiential Learning Librarian

Fort Vancouver Regional Libraries

jbair@fvrl.org

http://makerlibrarian.blogspot.com/

- Librarian
- Techno Enthusiast
- NOT AN EXPERT

Today We'll Learn...

- Overview of coding workshops
- Unplugged workshops
- Block-Based Coding
- Coding physical objects
- Text-based coding

- Participate
- Share resources
- Learn from each other!

Obligatory Icebreaker!

- Name
- Occupation
- One thing you hope to learn at this Preconference
- Favorite time wasting activity!

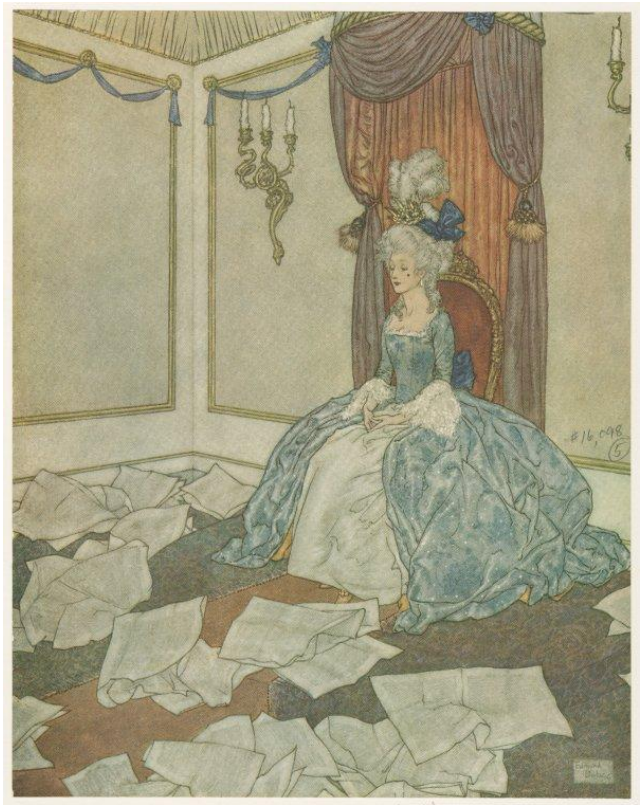


Image: NYPL Archives

CS Fundamentals

CS *FUN*damentals

[WA State Learning Standards]

- Fostering an inclusive Computing Culture
- Collaborating
- Recognizing and defining computational problems
- Developing and using abstractions
- Creating computational artifacts
- Testing and refining
- Communicating about computing

Image: NYPL Archives

Coding in the Library

- Learning to code isn't the goal
- Use vocabulary
  - Program: set of instructions to complete task
  - Algorithm: step-by-step process to complete a task
  - Command: an instruction
  - Function: type of procedure or routine
  - Iterative: repeating a process with the aim of approaching a desired goal
  - Prototype: early approximation of a final product
  - Compile + run: verify instructions and execute commands
  - Troubleshoot: systematic approach to problem solving

Image: NYPL Archives

Skill Building

- Build soft skills
  - Practice collaborating
  - Be okay with ambiguity
  - Build resilience
- Have patience
- Start small

Image: NYPL Archives

Coding Workshop Best Practices

Patron-focused

Explore a variety of languages

Be honest about your skill level

Demonstrate the skills you hope to build in others

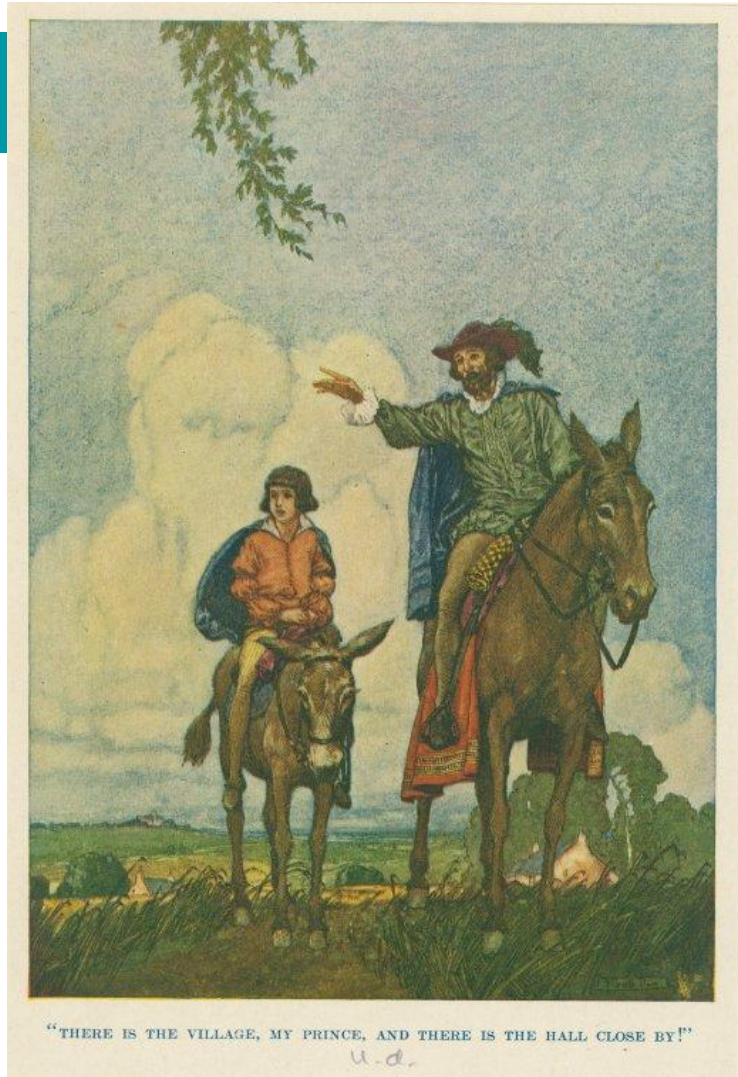


Image: NYPL Archives

Target Audience

The challenge of age-restricted workshops…

Be flexible

Work with your audience

Encourage cross-generational learning

Image used with mom's permission

Coding Resources

Print Resources

Harrop, Wendy. *Coding for Children and Young Adults in Libraries: A Practical Guide* .... 2018.

Saujani, Reshma. Girls Who Code: Learn to Code and Change the World. 2017.

Complete Bibliography

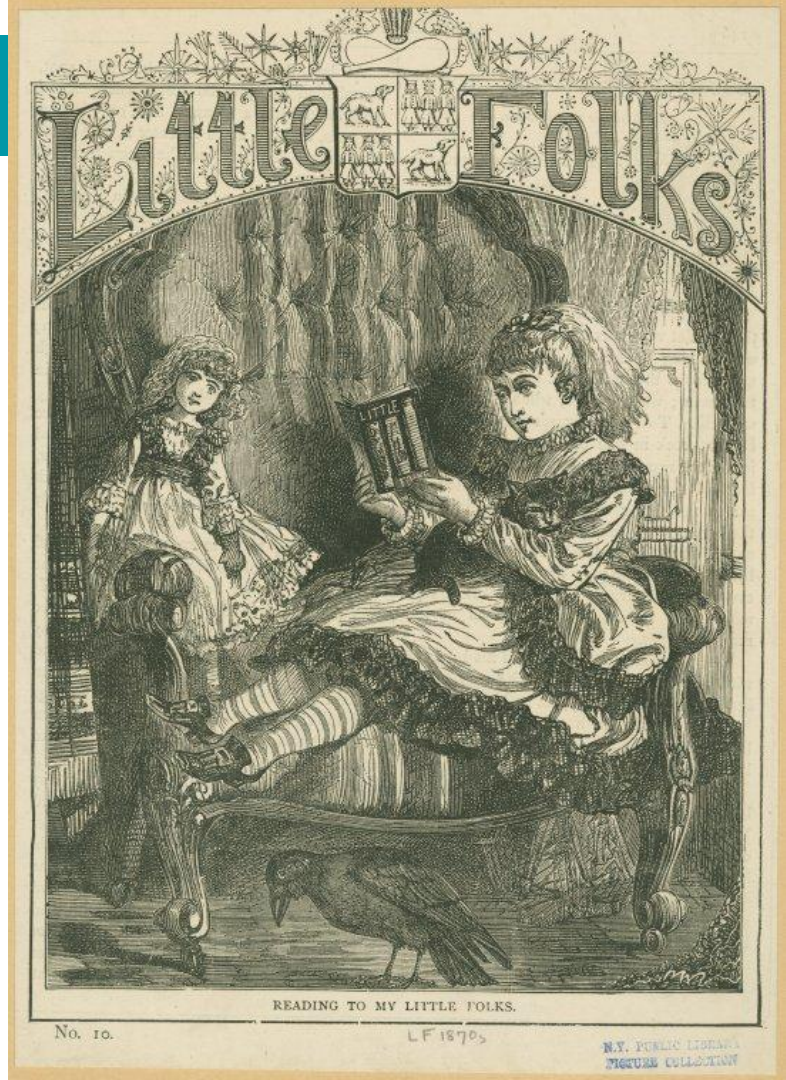


Image: NYPL Archives

Online Resources

TechSoup for Libraries

Scratch

Code Academy

Udacity

EdX

Pencilcode

WoofJS

Bento

W3schools

Mozilla Developer

Code.org

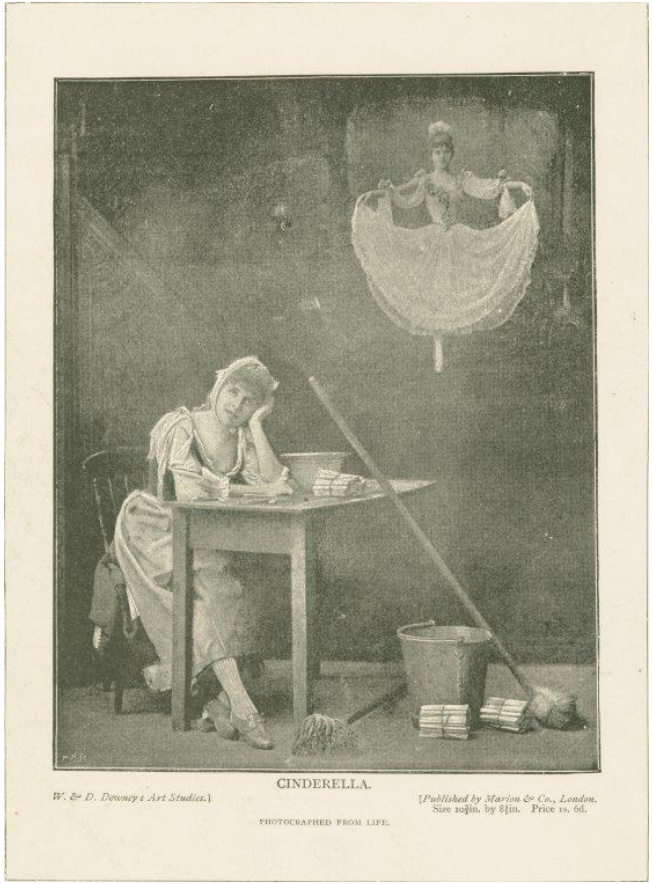


Image: NYPL Archives

Orgs

[Hour of Code]

[Girls Who Code]

[Code Club]

Image: [NYPL Archives]

Unplugged Coding

Unplugged Coding

- No computer required!
- Teach computational thinking!
  - Mental processes and strategies
    - Breaking problems down
    - Finding repeating patterns
    - Create step-by-step algorithm

- Binary Bracelets
- Coding with Cups
- Coding a person

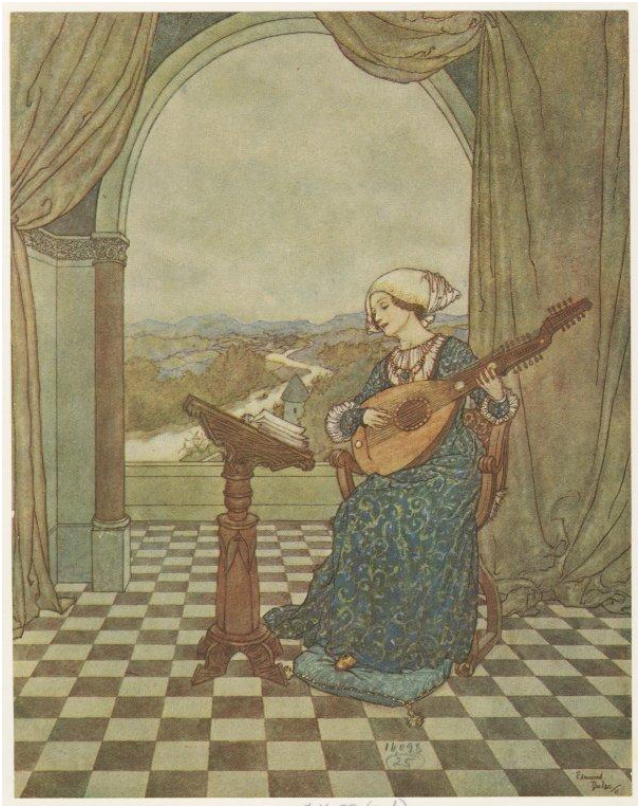


Image: NYPL Archives

Block-Based Coding

Block-Based Coding

- Instructions represented as blocks
- Pallet of commands to choose from
- Less risk of syntax errors
- Available in 150 languages
- Compatible with peripherals
  - Arduino, Little Bits, LEGO, Makey Makey
- Web-based + Offline
- Free

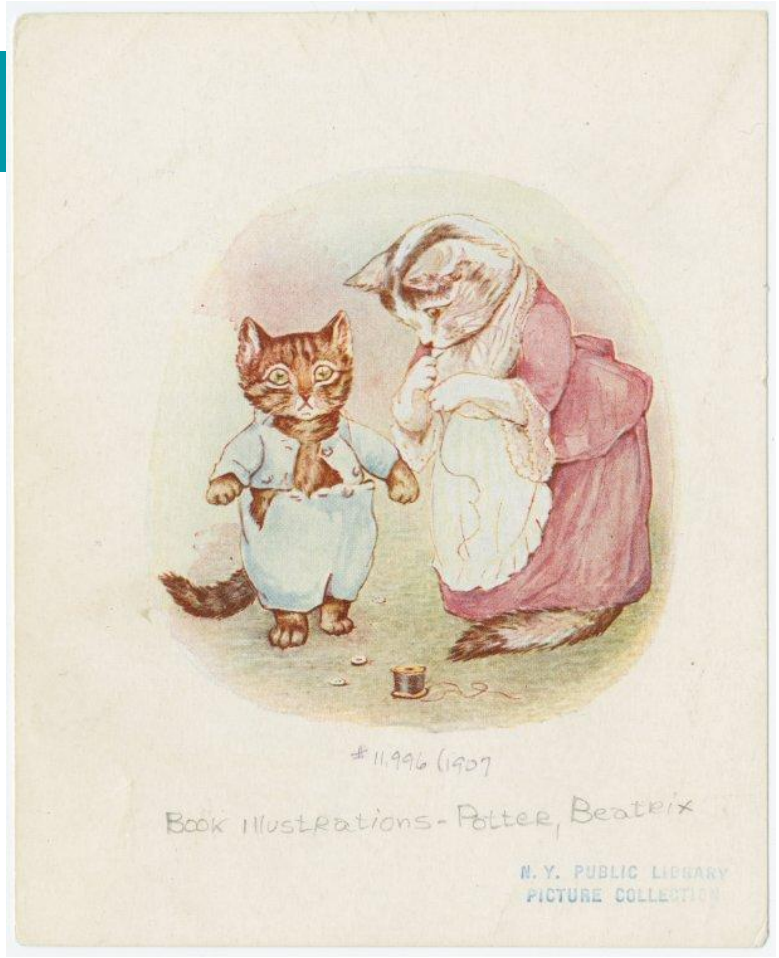


Image: NYPL Archives

Block-Based Coding

- Limiting
- Similar and serve similar purposes

- Scratch
- Tynker
- Thunkable

Image: NYPL Archives

Coding Physical Objects

Entry-Level

- Code-a-Pillar
- Dash + Dot
- Cubelets
- Edison

Image: NYPL Archives

Intermediate

- Sphero Sprk+
- MakeyMakey

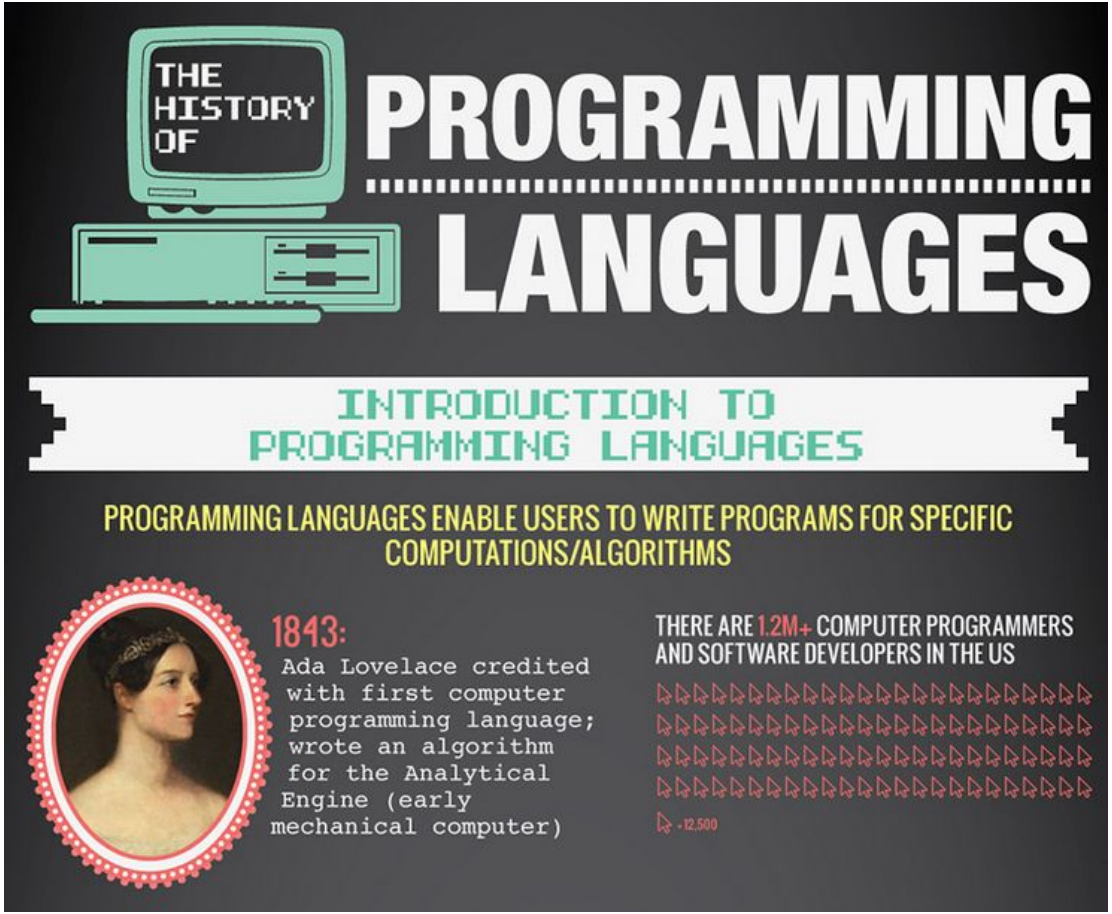
Image: NYPL Archives

Advanced

- Wink/Arduino
- LEGO Boost
- Soft Circuits:
  - Lilypad
  - Adafruit

Image: NYPL Archives

Text-Based Coding

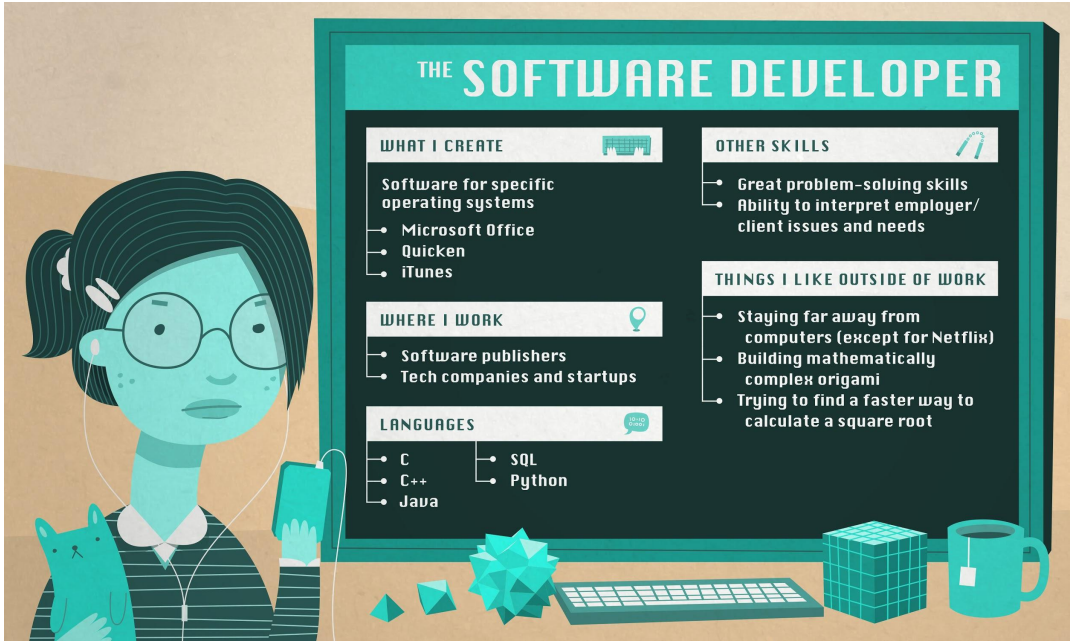


Source: veracode.com

Ask Yourself...

Why do I want to learn to code?

Which language is best suited for my needs?



Source: udemy.com

Similarities of all Languages

Basic constructs for branching

Basic constructs for looping

Calling methods or procedures

A way to organize code at a high level

Source: Dr. Margaret Hamilton, NASA

Similarities of all Languages

Basic constructs for branching

Basic constructs for looping

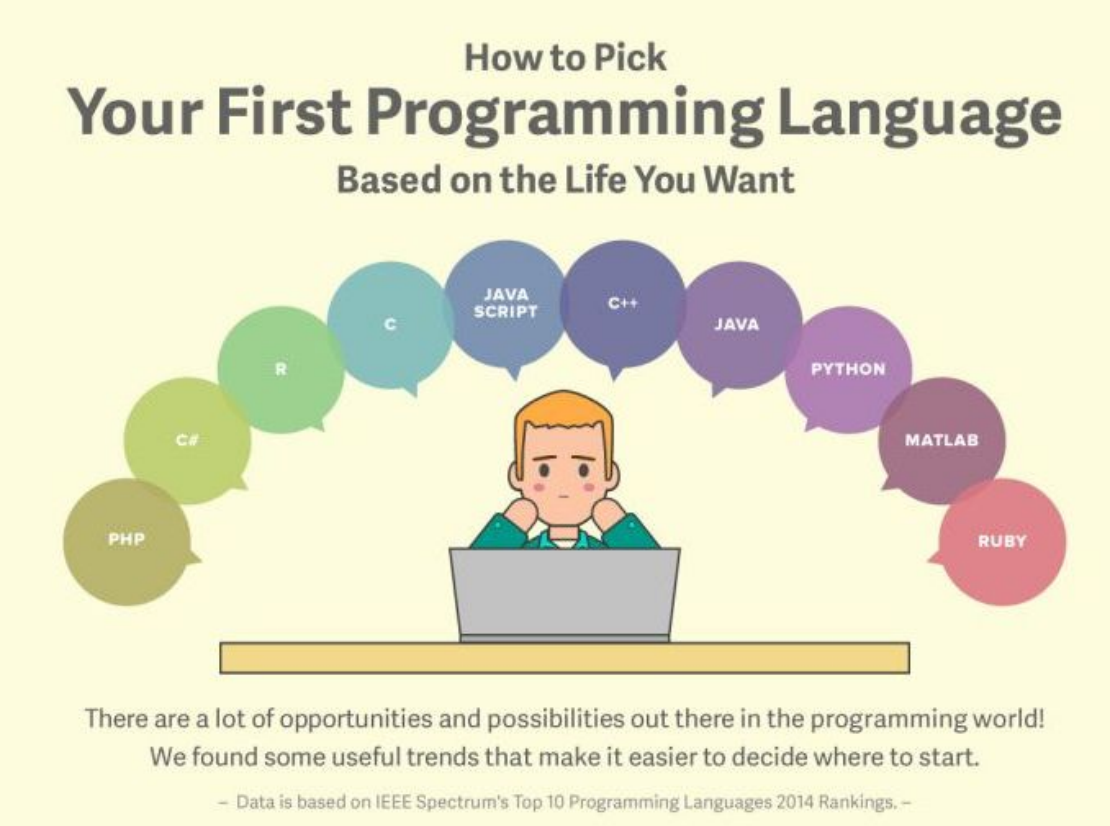
Calling methods or procedures

A way to organize code at a high level

Source: Dr. Katie Bouman, CIT

Tiobe Index

PyPL Index



Source: udacity.com

Transition Platforms

- Simplified text input
- Graphic output

- PencilCode
- CodeMonkey

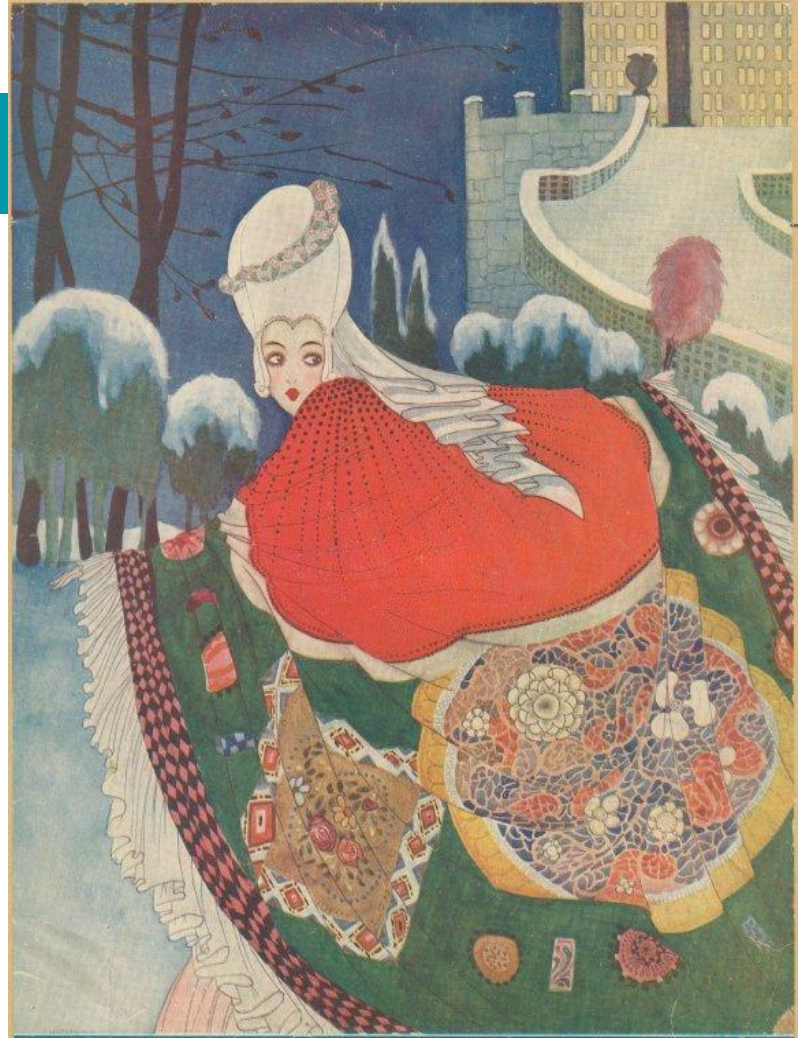


Image: NYPL Archives

Project-Based Coding

- Learn language dynamics while working toward a tangible outcome

- Python: Codesters, Trinket.io, Earsketch
- Lua: Tic-80
- C#: Unity
- Blocksmith
-

Image: NYPL Archives

MIT CSAIL
@MIT_CSAIL

Follow

Left: MIT computer scientist Katie Bouman w/stacks of hard drives of black hole image data.

Right: MIT computer scientist Margaret Hamilton w/the code she wrote that helped put a man on the moon.

(image credit @floragraham)

#EHTblackhole #BlackHoleDay #BlackHole

8:58 AM - 10 Apr 2019

Source: MIT