



STEM

Science, Engineering, Technology & Math

College 101



```
when night falls
  set [zombie 1 v] to [up v]
  set [zombie 2 v] to [middle v]
  set [zombie 3 v] to [down v]
```

```
when green flag clicked
  repeat [5 times]
    if [key A pressed?]
      set [y v] to [100]
    else
      set [y v] to [0]
    end
    if [key D pressed?]
      set [x v] to [100]
    else
      set [x v] to [0]
    end
    if [key S pressed?]
      set [y v] to [-100]
    else
      set [y v] to [0]
    end
    if [key W pressed?]
      set [x v] to [-100]
    else
      set [x v] to [0]
    end
    move (x + y) steps
    end
```

Tynker Hour of Code Activities

DEBUGGER Intermediate Grades 5-8

COMIC CREATOR Intermediate

DRAGON DASH

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>Challenge: Colorful creature</title>
    <style>
      body {background-color: #f0f0ff; font-family: sans-serif; margin: 0; padding: 0; width: 100%; height: 100%;}
      p {color: #008000; font-size: 24px; margin: 0; padding: 0; width: 100%; height: 100%;}
    </style>
  </head>
  <body>
    <h1>The Coolest Creature</h1>
    <p>The snowfox is awesome because they're fast and sneaky</p>
  </body>
</html>
```

What do you see?

Class Structure: College 101

Week 1: College 101 and College Tour 1

- What, When, Why, Where, How
- U of YC entrance exam and acceptance ceremony
- Tour one college (UofU/Westminster/SLCC)

Week 2: College Project: Business Proposal

- Create business and budget
- Takes Classes based on business proposals

Week 3: College Tour 2 and Classes

- Tour one college (UofU/Westminster/SLCC)
- University of YC motto, crest, goals, mascot, colors
- Fast Track classes session

Week 4: College Project: Business Plan

- Business mockup, marketing, poster
- Takes Classes based on business proposal

Week 5: College Tour 3 and Classes

- Tour one college (UofU/Westminster/SLCC)
- Fast Track classes session

Week 6: Business Visit, Finals, and Graduation

- Visit a business based on kid's business proposal
- Cram for finals
- Take final exams
- Graduation ceremony

To do

- Combine business proposals into 1
- Draw and color poster
- Have kids practice and study proposal
- Kids present proposal to Jorge
- Kids cram for college test
-

Student Examples



Project
Author
Age



Project
Author
Age



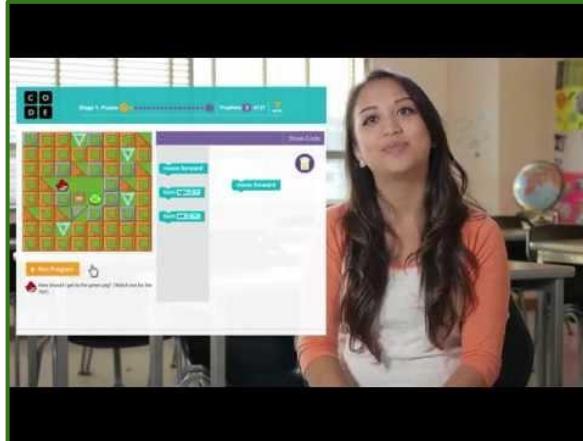
Project
Author
Age

Kids can code!

Week 1: Intros and Class Rules

Introduction

- What's your name, age, and favorite videogame?
- Have you coded before?



What is Computer Science?

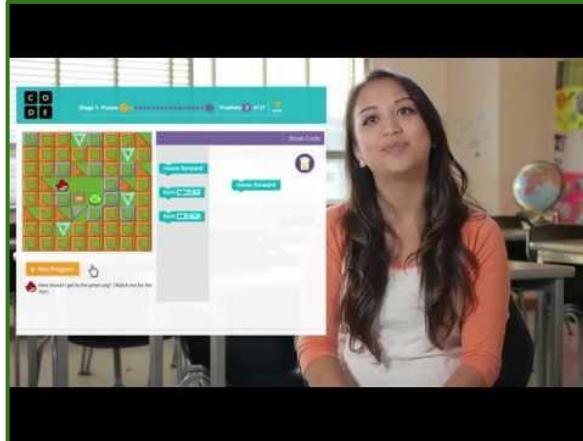
Week 1: Intros and Class Rules

Introduction

- What's your name, age, and favorite videogame?
- Have you coded before?

Class Rules

- Listen to instructions the first time
- Respect yourself, others, and the equipment
- Raise your hand for questions, wait quietly



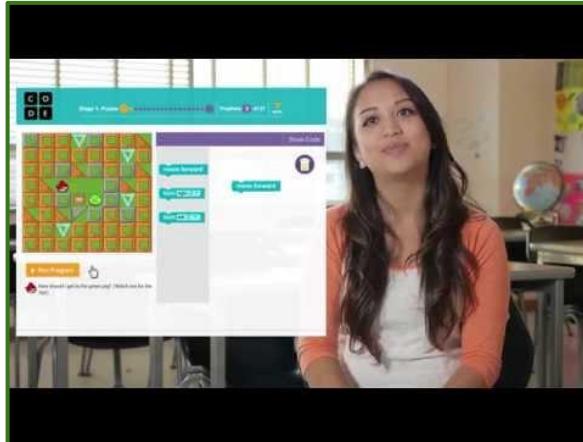
What is Computer Science?

Week 1: Intros and Terms

What is Coding Playground?

In the Coding Playground class, we'll use different websites to learn about computer science, coding, and even make our own simple games! We'll also learn about the internet and how to make a website.

We'll use Code.org, Tynker, Scratch, and Khan Academy.

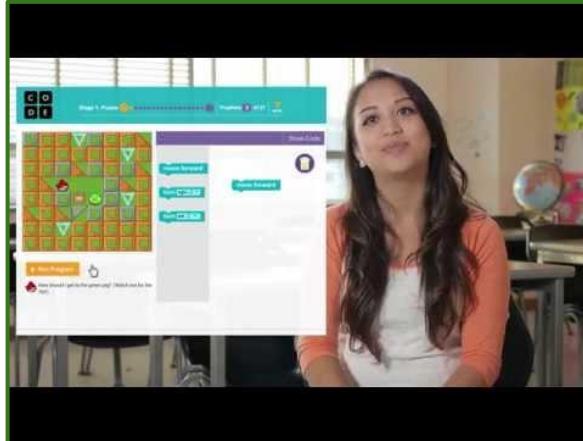


What is Computer Science?

Week 1: Terms

Do you know these terms?

- Computer Science
- Code
- Programmer

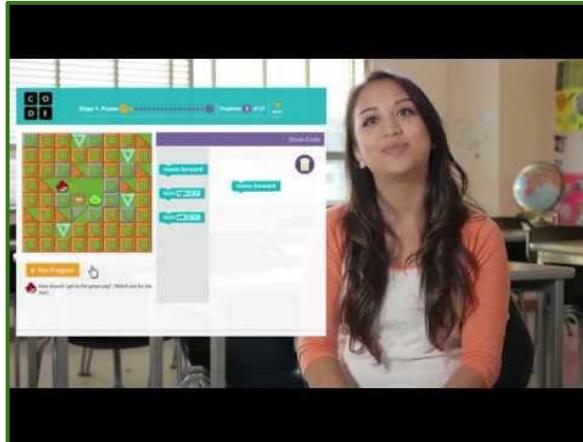


What is Computer Science?

Week 1: Terms

Do you know these terms?

- **Computer Science:** The study of code, computers, computer languages, and computer software
- **Code:** Instructions for a computer written and designed by a programmer
- **Programmer:** A computer scientist who designs and writes code



What is Computer Science?

Week 1: Code Designer

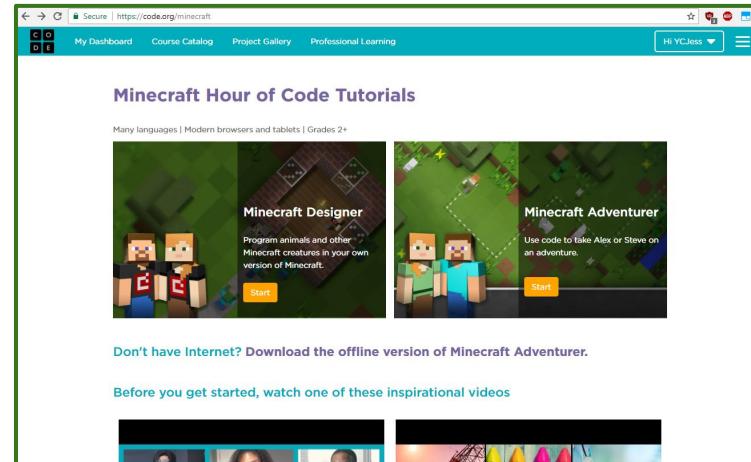
Code Designer

- Login to your **Code.org** account
- Don't worry, if you don't have one yet, you can still complete the activity!
- Start the Hour of Code **Minecraft Designer** Tutorial

As you go...

- If you have any questions, raise your hand
- Feel free to help each other!
- Tell your teacher when you're finished!

YC PRO Kids that finish early can move onto Minecraft Hour of Code: **Code Designer!**



Hour of Code Minecraft Tutorials

Week 2: Code Adventurer

Code Adventurer

- Login to your **Code.org** account
- Don't worry, if you don't have one yet, you can still complete the activity!
- Start the Hour of Code **Minecraft Adventurer** Tutorial

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!



What is a Repeat Loop?

Week 2: Tinkering with Tynker

What is Tynker?

Tynker is a website that uses a block based programming language to learn how to code games and animations. You can even create your own characters; it's easy to learn and fun!

Using what you know

You'll be using characters, backgrounds, and code blocks. More advanced tools like variables and functions are available too, and more!



Games with Tynker

Tynker Examples



Project
Author
Age



Project
Author
Age



Project
Author
Age

Kids can code!

Week 2: Tynker

Coding with Tynker Lesson 1

- Login to your **Tynker.org** account
- Don't worry, if you don't have one yet, you can still complete the activity!
- Start the first **Tynker** lesson

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!



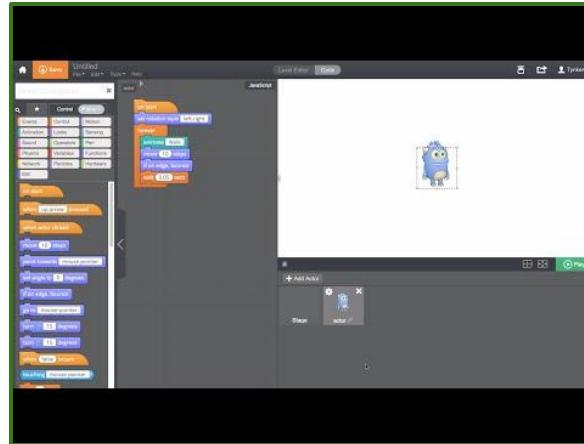
Games with Tynker

YC PRO Kids that finish early can move onto
Tynker: Lesson 2!

Week 3: More Fun with Blocks

Do you know these terms?

- Character:
- Background:
- Coordinates:

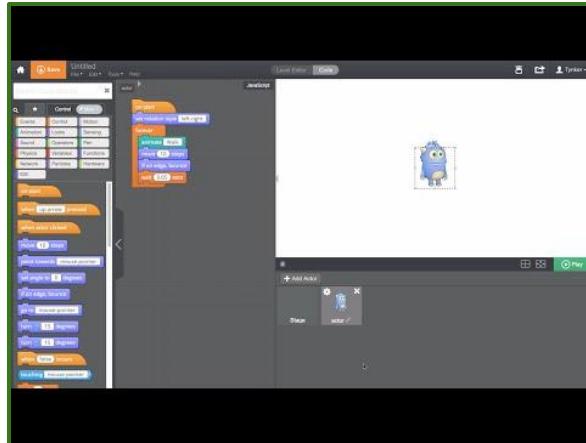


Tynker workshop basics

Week 3: More Fun with Blocks

Do you know these terms?

- **Character:** An object that code is applied to, **often something the player controls**, or affects the player character. Also known as an Avatar, a Sprite, or Actor.
- **Background:** A **stage** where characters move around in. Can be stationary, scrolling, and animated.
- **Coordinates:** A set of 2 numbers that **show the location of a character**, shown with X and Y. For example, a character can have the coordinates X:150, Y:200.



Tynker workshop basics

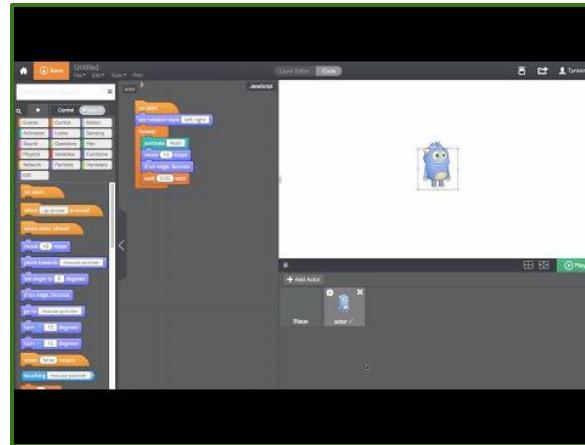
Week 3: More Fun with Blocks

Coding with Tynker Lesson 2

- Login to your **Tynker.org** account
 - Don't worry, if you don't have one yet, you can still complete the activity!
 - Start your **Tynker** lesson 2

As you go...

- If you have any questions, **raise your hand**
 - Feel free to help each other!
 - Tell your teacher when you're finished!



Tynker workshop basics

Week 4: Advanced Tynker

Advanced Tynker Terms and Tips

- Backpack
- Variable
- Function



Backpack



Functions



Variables

Week 4: Advanced Tynker

Advanced Tynker Terms and Tips

- **Backpack:** Use the **backpack** to store characters and code for other projects
- **Variable:** Use **variables** to track things like mouse clicks, that you can display and use in fun ways, like high scores!
- **Function:** Use **functions** to make your code simpler, smaller, and faster!



Backpack



Functions



Variables

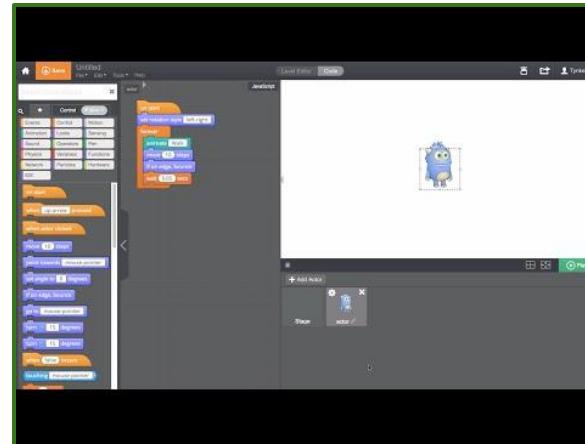
Week 4: Advanced Tynker

Coding with Tynker Lesson 3

- Login to your [Tynker.org](https://www.tynker.org) account
- Don't worry, if you don't have one yet, you can still complete the activity!
- Start your **Tynker** lesson 3

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!



Tynker workshop basics

YC PRO Kids that finish early can move onto
Starting with Scratch!

Week 4: Starting with Scratch

What is Scratch?

Scratch is a programming language that makes it easy to create interactive art, stories, simulations, games -- and share them all online.

Using what you know

You'll be using characters, backgrounds, code blocks, just like before. More advanced tools like variables and functions are available too, and more!



Scratch Overview

Scratch Examples



Project
Author
Age



Project
Author
Age



Project
Author
Age

Kids can code!

Week 4: Starting with Scratch

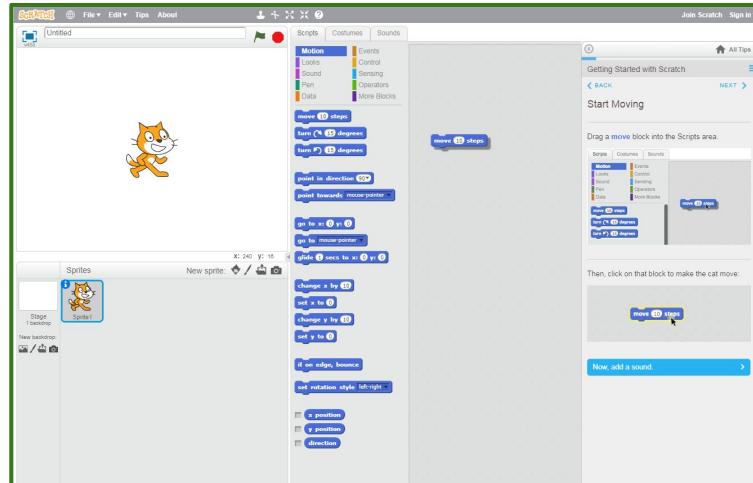
Coding with Scratch Lesson 1

- Login to your **Scratch** account
- Don't worry, if you don't have one yet, you can still complete the activity!
- Start your first **Scratch** lesson

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!

YC PRO Kids that finish early can move onto **Scratch: Lesson 2!**



Scratch Workspace

Week 5: More fun with Scratch

Coding with Scratch Lesson 2

- Login to your **Scratch** account
- Don't worry, if you don't have one yet, you can still complete the activity!
- Start your **Scratch** lesson 2

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!



Scratch Make It Fly! Lesson

Week 5: Build it with Scratch

Make a Game

- Decide on a simple game mechanic that has at least 1 character that the player controls, 1 background, and a simple interaction.
- Using Scratch, design and code this game however you'd like!

Examples

- Scrolling background with jumping character
- Maze Game with zap walls
- Clicker game with dodging enemies



Scratch Make It Fly! Lesson

Week 6: HTML and CSS

All about websites

The internet is a huge network of connected computers that use websites to share all kinds of information. Websites are a collection of webpages of information that connected computers can see.

Do you know these Internet terms?

- Website
- HTML
- CSS



Welcome to the Web

Week 6: HTML and CSS

All about websites

The internet is a huge network of connected computers that use websites to share all kinds of information. Websites are a collection of webpages of information that connected computers can see.

Do you know these Internet terms?

- **Website:** A collection of webpages of information that connected computers can see.
- **HTML:** Special text that builds the framework and structure for information on the internet.
- **CSS:** Special text that works with HTML to change the style of internet information.



Welcome to the Web

HTML/CSS Examples



Project
Author
Age



Project
Author
Age



Project
Author
Age

Kids can code!

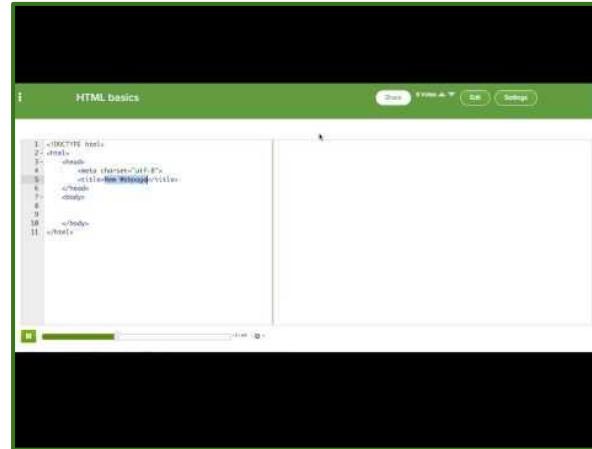
Week 6: HTML and CSS

Intro to HTML with Khan Academy

- Go to Khan Academy's [Intro to HTML](#) website and start your lesson. If you need help, ask your teacher.

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!

A screenshot of the Khan Academy HTML basics exercise. The interface has a green header bar with the title "HTML basics". Below the header is a code editor window showing the following HTML code:

```
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>My First Cities</title>
</head>
<body>
<h1>Hello</h1>
</body>
```

The code editor has a syntax highlighting feature where tags like <html> and <h1> are colored blue. The bottom of the screen shows a progress bar indicating the user has completed about half of the exercise.

HTML Basics

YC PRO Kids that finish early can move onto [Javascript with Khan Academy!](#)

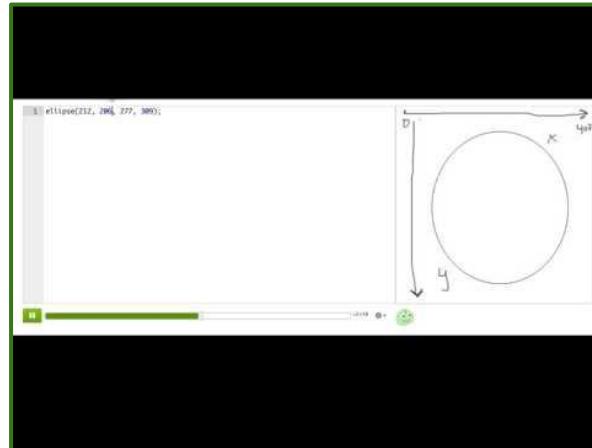
Week 6: Javascript

Intro to Javascript with Khan Academy

- Go to Khan Academy's [Intro to Javascript](#) website and start your lesson. If you need help, ask your teacher.

As you go...

- If you have any questions, **raise your hand**
- Feel free to help each other!
- Tell your teacher when you're finished!



Drawing with Code

Materials and Supplies

Instructor Supplies

- **Notebook:** for notes and scribbles
- **Pens/pencils:** for writing
- **Personal iPad:** for reference and class management
- **Wifi Hotspot:** all YouthCity sites should have 1 wifi hotspot that student iPads can use to access websites out of the computer lab



Student Supplies

- **Desktop computers:** used for coding
- **Student iPads:** all websites used in class can be used with an iPad if computers are not available, or if coding out of the computer lab

Wifi Hotspot: connect student iPads to the Hotspot to let kids code anywhere!

Teacher Tips

Class Management:

- Set firm ground rules at the start and **constantly reaffirm rules** throughout the class. Access to computers and ipads naturally distracts children.
 - *Listen to instructions the first time*
 - *Respect yourself, others, and the equipment*
 - *Raise your hand for questions, wait quietly*
- **Feel empowered as a facilitator.** Maintain control and give time outs to children who are disruptive and are consistently unable to listen to instruction.
- As a facilitator, this is an active class. You will be asked questions consistently. **Encourage students to help each other** and stick to the raise your hand and wait rule.
- **Heap praise upon kids**, as they complete lessons, help each other, work quietly, etc.

Teacher Tips

Technology

- Create Teacher accounts at Code.org, Tynker.org, and Khanacademy.org. Accounts are fast and free. If you'd like, you can ask your manager for the site's youthcity gmail account. You can also create your own gmail account for just for YouthCity teaching purposes.
- Each website has tools for student login, class rosters, and class management. Utilize them.

Advanced Students

- You need to **recognize advanced students quickly** or they will lose interest and become distracted. Have them assist others, use the **tips for advanced lessons**.
- Scratch.com is also good end of class incentive for kids to finish early, but make sure they **play with the code, not the games**.

Resources

Links:

- [Gmail](#) : Create one for YC Classes.
- [Code.org](#) : Intro to block based coding
- [Tynker.com](#) : Robust block based coding suite
- [Khan Academy](#) : Html and other advanced lessons

Contacts:

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Version

- 10/09/17: 1.0 Jess Ung
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