



# Starting an After School Coding Program

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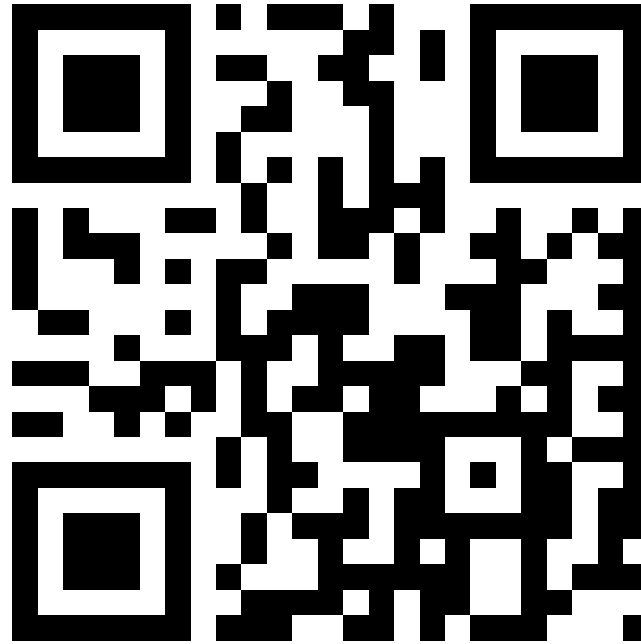


# What's the plan?

- ▶ Our district's coding story
- ▶ How might we get started with . . .
- ▶ Logistics and resources
- ▶ Let's talk

# How to reach the resources

- ▶ [www.JaredOLEary.com](http://www.JaredOLEary.com)
  - ▶ Presentations
  - ▶ Starting an After School Coding Program





# Our district's coding story

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# Why coding?



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*Photo by Cindy Hanser*

# How did we get started?



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*Photo by Cindy Hanser*

# How have we supported coding?



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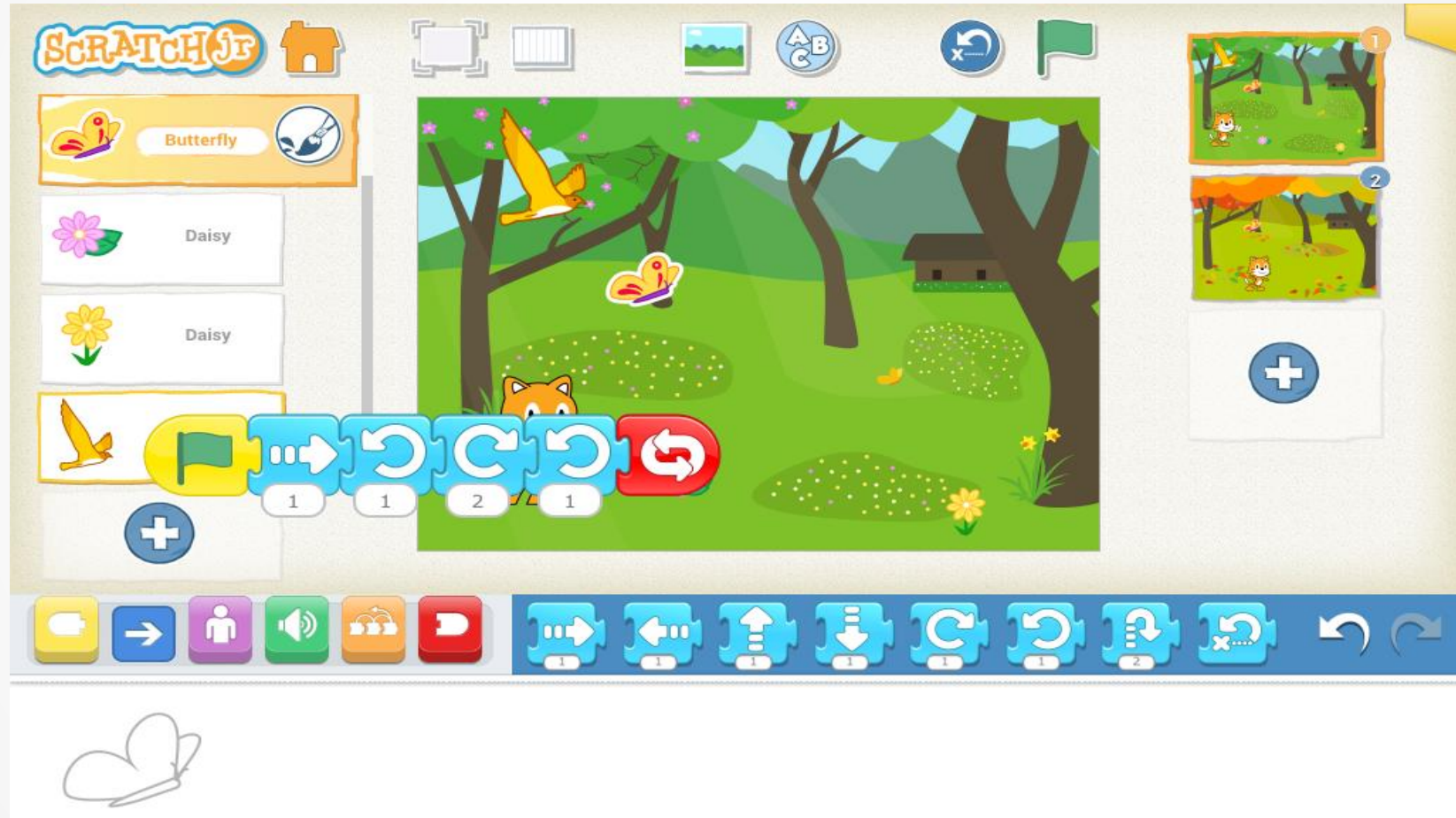
*Photo by Cindy Hanser*



# How might we get started with . . . Scratch Jr.?



# Coding through blocks



Using an iPad, click the Scratch Jr. icon



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# How might we get started with . . . Code.org?

# Coding through puzzles

The screenshot shows the Code Studio interface for a puzzle titled "Stage 11: Artist: Debugging". The workspace displays a character on a canvas with a partially drawn pinwheel. The code blocks are as follows:

- move forward by 100 pixels
- turn right by 90 degrees
- turn left by 90 degrees
- jump forward by 100 pixels (tooltip: Moves the artist without leaving any marks.)
- repeat ??? times
- do
- set color (red)
- set color (random color)

The nested repeat loop structure is:

```
when run
  repeat 5 times
    do
      repeat 2 times
        do
          turn right by 90 degrees
          move forward by 60 pixels
          move forward by 20 pixels
          turn right by 45 degrees
          move forward by 60 pixels
        do
          turn right by 60 degrees
```

At the bottom, a message reads: "My pinwheel is not finished. How many times do I need to repeat to finish it?"



Using any device, visit [studio.code.org](https://studio.code.org)

**C O**  
**D E**

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# How might we get started with . . . Scratch?

# Coding through projects

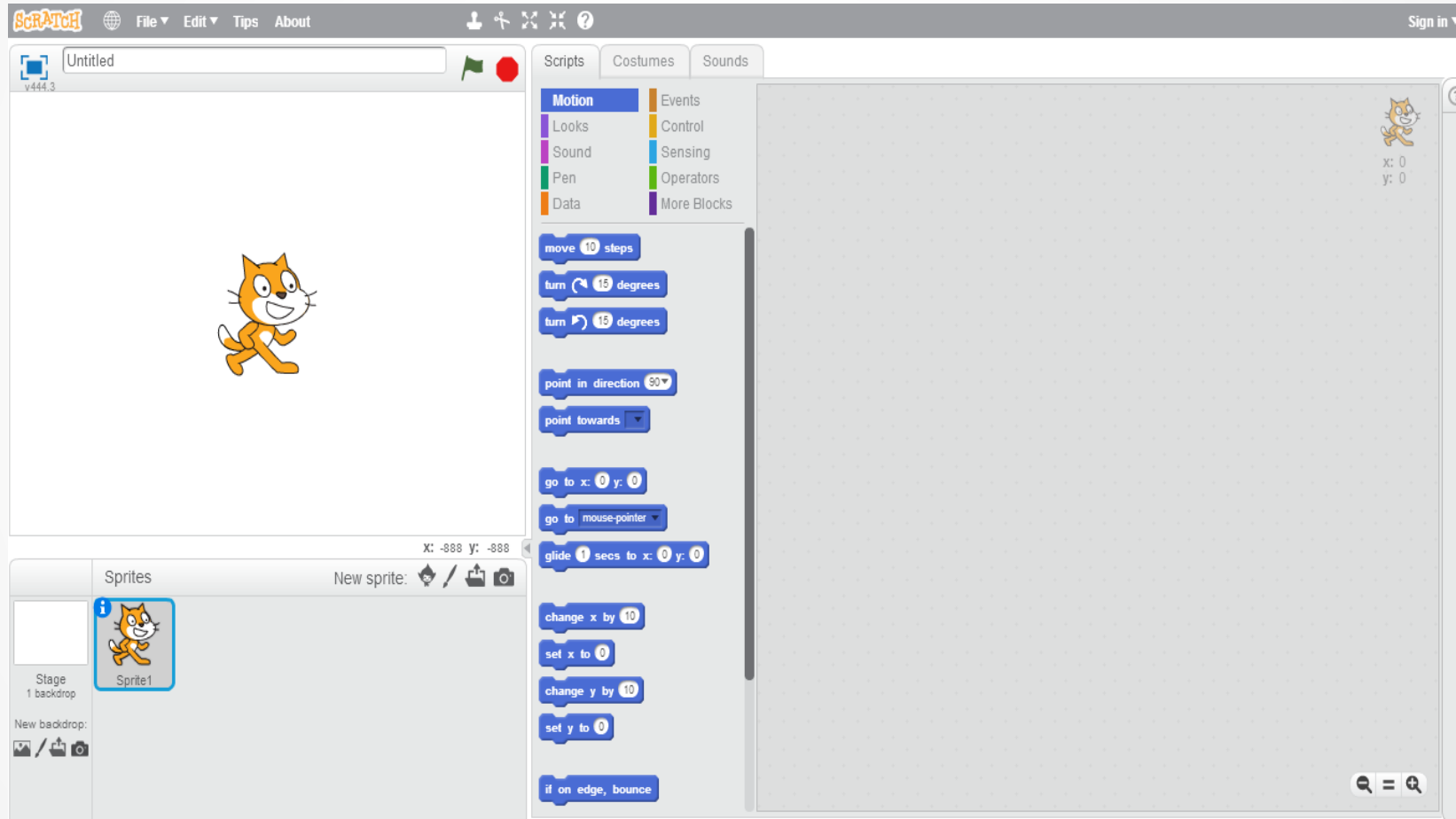
## Quarterly Project Options:

1. **Amazing Mazes**
  - a. [Step one - Starter Maze](#)
    - i. Remix this project and change the code of the ball sprite to navigate it through the maze.
    - ii. Use only the three kinds of motion blocks in a sequence to get the ball to the X.
  - b. [Step two - Loopy Maze](#)
    - i. Remix this project and change the code of the cat sprite to navigate him through the maze.
    - ii. Use only the three kinds of motion blocks and one repeat block to get him to the X.
  - c. [Step three - Advanced Maze](#)
    - i. Remix this project and change the code of the cat sprite to navigate him through the maze.
    - ii. Use only the three kinds of motion blocks in a sequence to get him to the X.
  - d. [Step four - More Amazing Mazes](#)
    - i. Pick another project from this studio and remix it to make it do something new
2. [What can you create? v3](#)
  - a. Using any combination and number of these blocks, what can you create?
  - b. Create a spinoff of the project above using only the blocks inside the project.
3. [Pong starter project](#)
  - a. How could you remix this game to do something different?
  - b. [Use this studio to learn some tips and tricks for making games](#)
4. [Remix or create your own school appropriate project](#)
  - a. Think about what kind of project you want to remix or create and what you hope to learn while working on it.
  - b. Once you have an idea of what you want to remix or create, talk with me about what you want to do and whether or not that's an ok project to work on this quarter

## Project questions to think about if you're not sure what to make

- Can you create a school appropriate project that . . .
  - . . . helps someone?
  - . . . is scary, funny, exciting, boring, musical, silly, relaxing, or colorful?
  - . . . solves a problem you see in the world?

Using a Chromebook or laptop, visit [scratch.mit.edu/create](https://scratch.mit.edu/create)

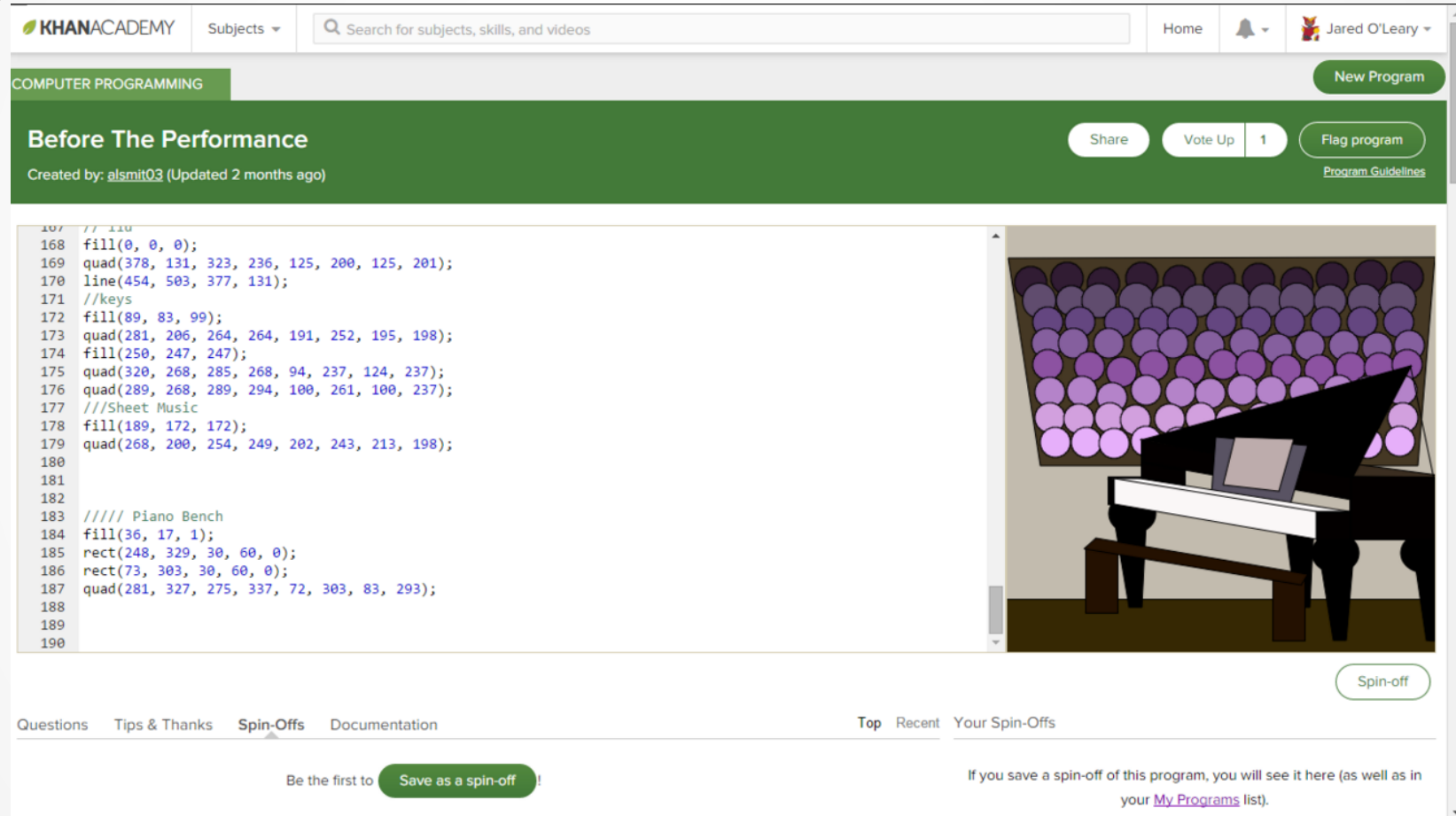






# How might we get started with . . . Khan Academy?

# Coding through text

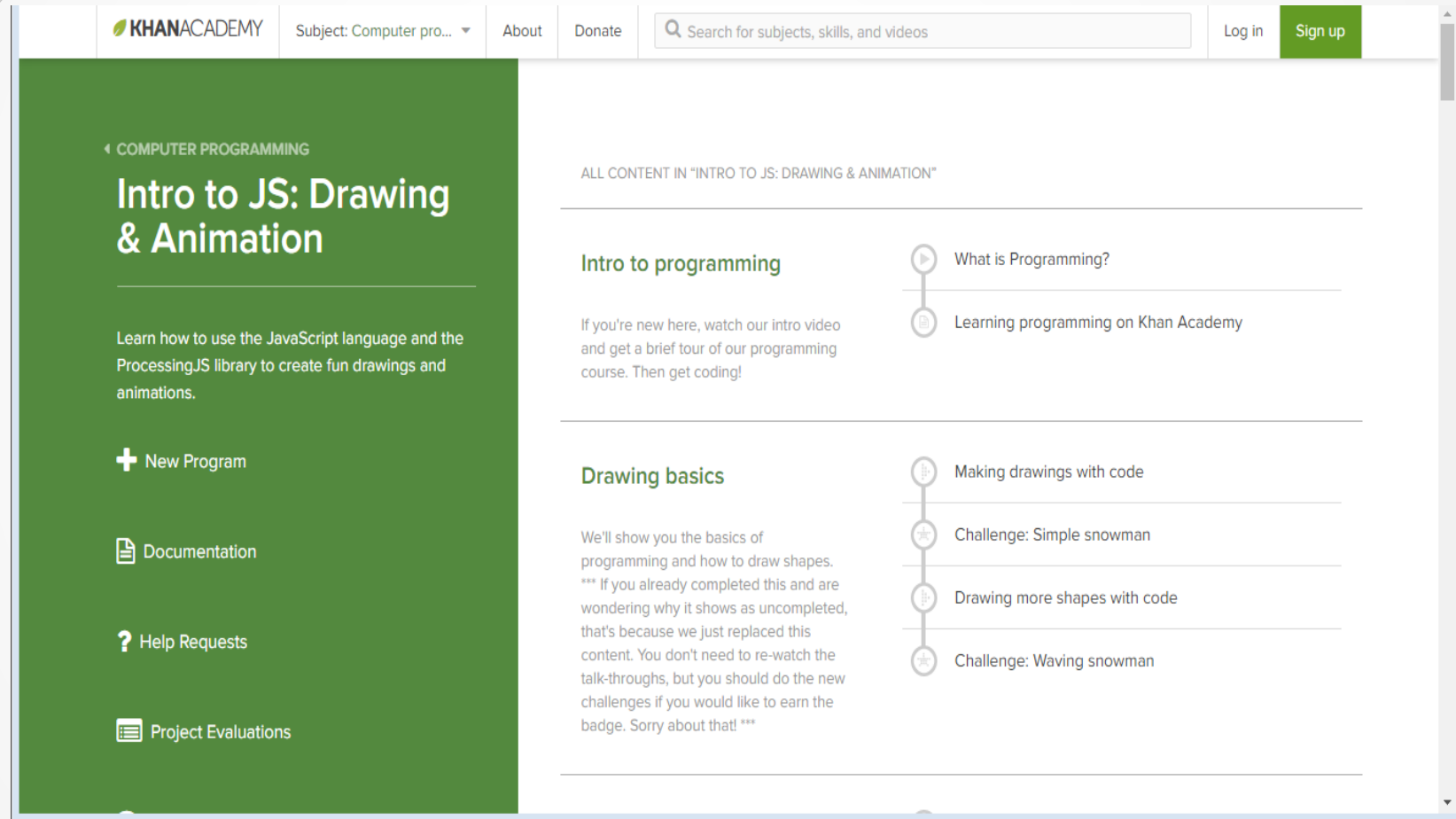


The screenshot shows a Khan Academy program page. At the top, there is a navigation bar with the Khan Academy logo, a search bar, and a user profile for Jared O'Leary. Below the navigation bar, the page is titled "COMPUTER PROGRAMMING" and "Before The Performance". The program was created by alsmi03 and updated 2 months ago. It has 1 vote up and a "Flag program" button. The main content area is split into two columns. The left column contains a code editor with the following code:

```
107 // title
168 fill(0, 0, 0);
169 quad(378, 131, 323, 236, 125, 200, 125, 201);
170 line(454, 503, 377, 131);
171 //keys
172 fill(89, 83, 99);
173 quad(281, 206, 264, 264, 191, 252, 195, 198);
174 fill(250, 247, 247);
175 quad(320, 268, 285, 268, 94, 237, 124, 237);
176 quad(289, 268, 289, 294, 100, 261, 100, 237);
177 ///Sheet Music
178 fill(189, 172, 172);
179 quad(268, 200, 254, 249, 202, 243, 213, 198);
180
181
182
183 //// Piano Bench
184 fill(36, 17, 1);
185 rect(248, 329, 30, 60, 0);
186 rect(73, 303, 30, 60, 0);
187 quad(281, 327, 275, 337, 72, 303, 83, 293);
188
189
190
```

The right column shows a preview of the program's output, which is a stylized illustration of a piano and a bench in front of a wall of purple circles. Below the preview is a "Spin-off" button. At the bottom of the page, there are tabs for "Questions", "Tips & Thanks", "Spin-Offs", and "Documentation". The "Spin-Offs" tab is active, showing a "Save as a spin-off" button and a message: "If you save a spin-off of this program, you will see it here (as well as in your My Programs list)." The page also includes a "Share" button, a "Vote Up" button with a count of 1, and a "Flag program" button.

# When you have the time . . .



The screenshot shows the Khan Academy website interface. At the top, there is a navigation bar with the Khan Academy logo, a subject dropdown menu set to 'Computer pro...', and links for 'About' and 'Donate'. A search bar is present with the placeholder text 'Search for subjects, skills, and videos'. On the right side of the navigation bar, there are 'Log in' and 'Sign up' buttons.

The main content area is divided into two columns. The left column has a green background and contains the following elements:

- A breadcrumb link: 'COMPUTER PROGRAMMING'.
- The course title: 'Intro to JS: Drawing & Animation'.
- A description: 'Learn how to use the JavaScript language and the ProcessingJS library to create fun drawings and animations.'
- A '+ New Program' button.
- A 'Documentation' link with a document icon.
- A 'Help Requests' link with a question mark icon.
- A 'Project Evaluations' link with a list icon.

The right column has a white background and contains the following elements:

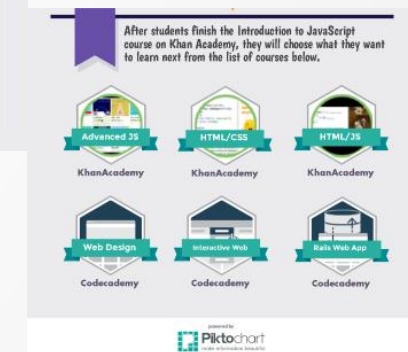
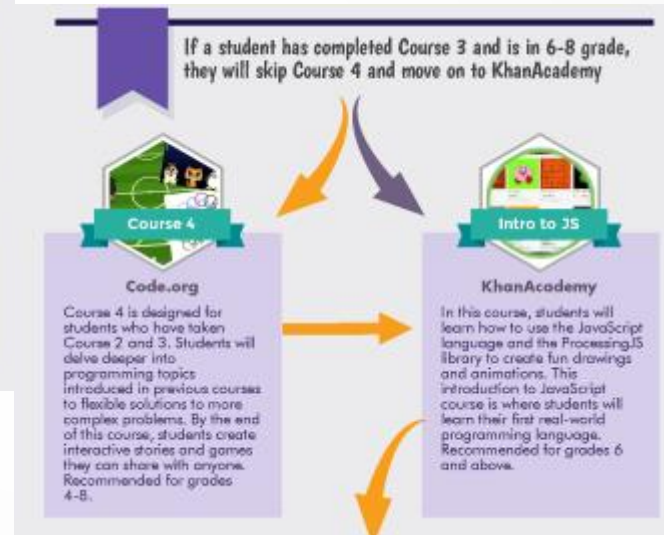
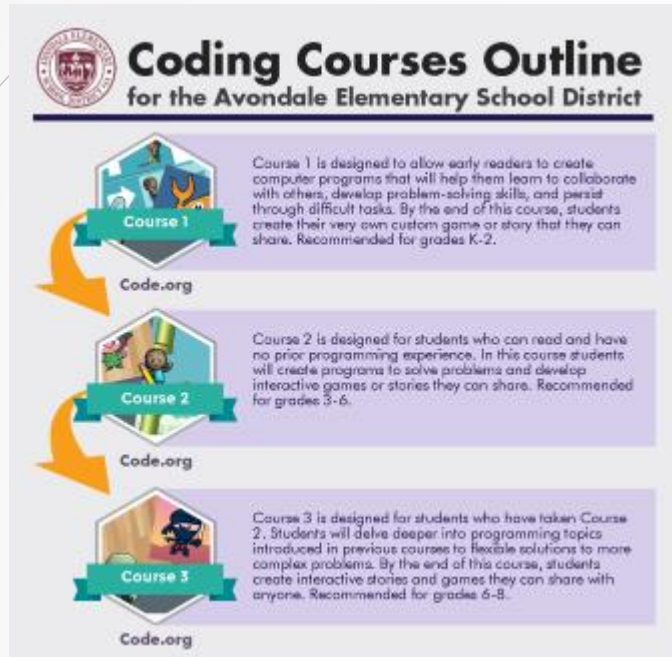
- A header: 'ALL CONTENT IN "INTRO TO JS: DRAWING & ANIMATION"'. Below this is a horizontal line.
- A section titled 'Intro to programming' with a play button icon. Below the title is a paragraph: 'If you're new here, watch our intro video and get a brief tour of our programming course. Then get coding!'.
- A list of two items, each with a play button icon:
  - 'What is Programming?'
  - 'Learning programming on Khan Academy'
- A section titled 'Drawing basics' with a play button icon. Below the title is a paragraph: 'We'll show you the basics of programming and how to draw shapes. \*\*\* If you already completed this and are wondering why it shows as uncompleted, that's because we just replaced this content. You don't need to re-watch the talk-throughs, but you should do the new challenges if you would like to earn the badge. Sorry about that! \*\*\*'.
- A list of four items, each with a play button icon:
  - 'Making drawings with code'
  - 'Challenge: Simple snowman'
  - 'Drawing more shapes with code'
  - 'Challenge: Waving snowman'



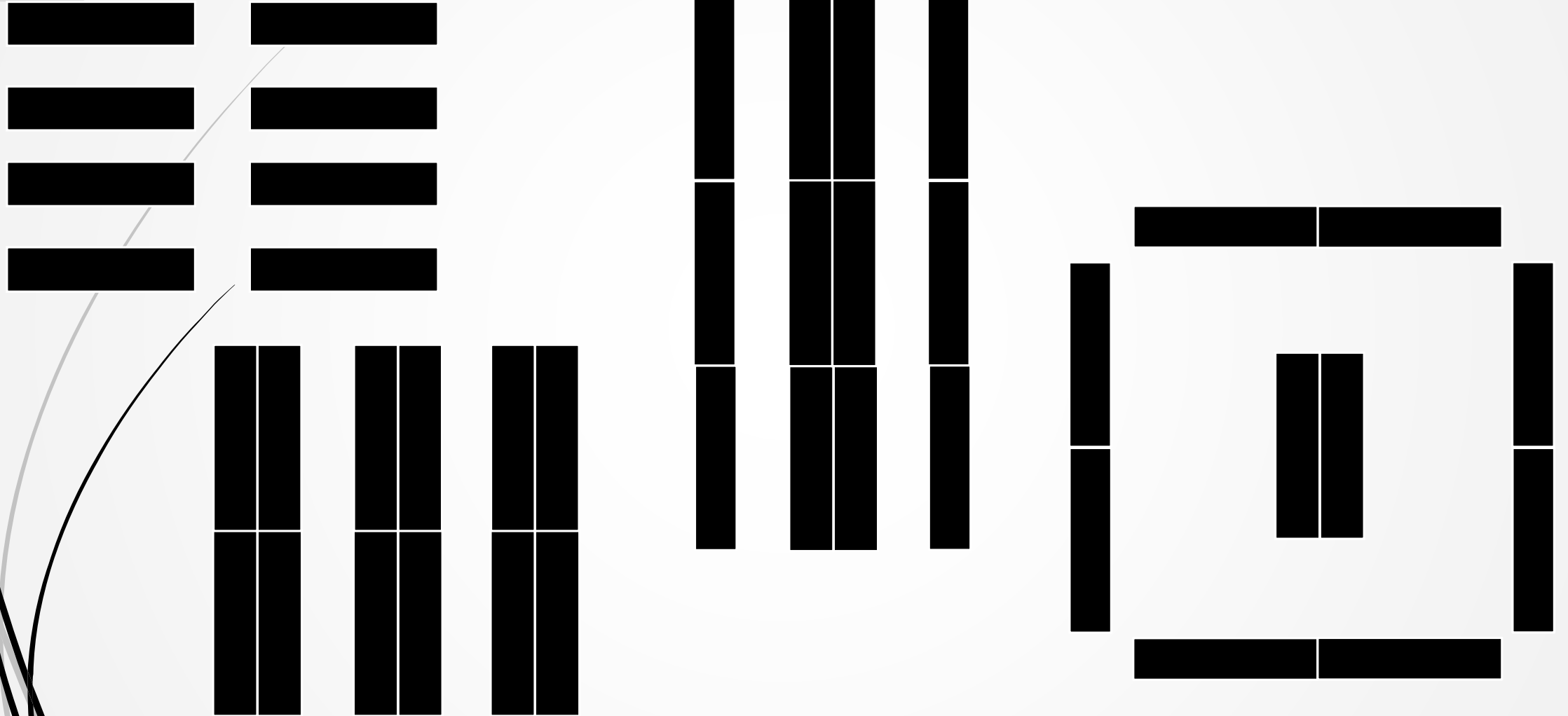
# Logistics and resources

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# How might platforms work together?



# What do our labs look like?



# How might we facilitate these classes?

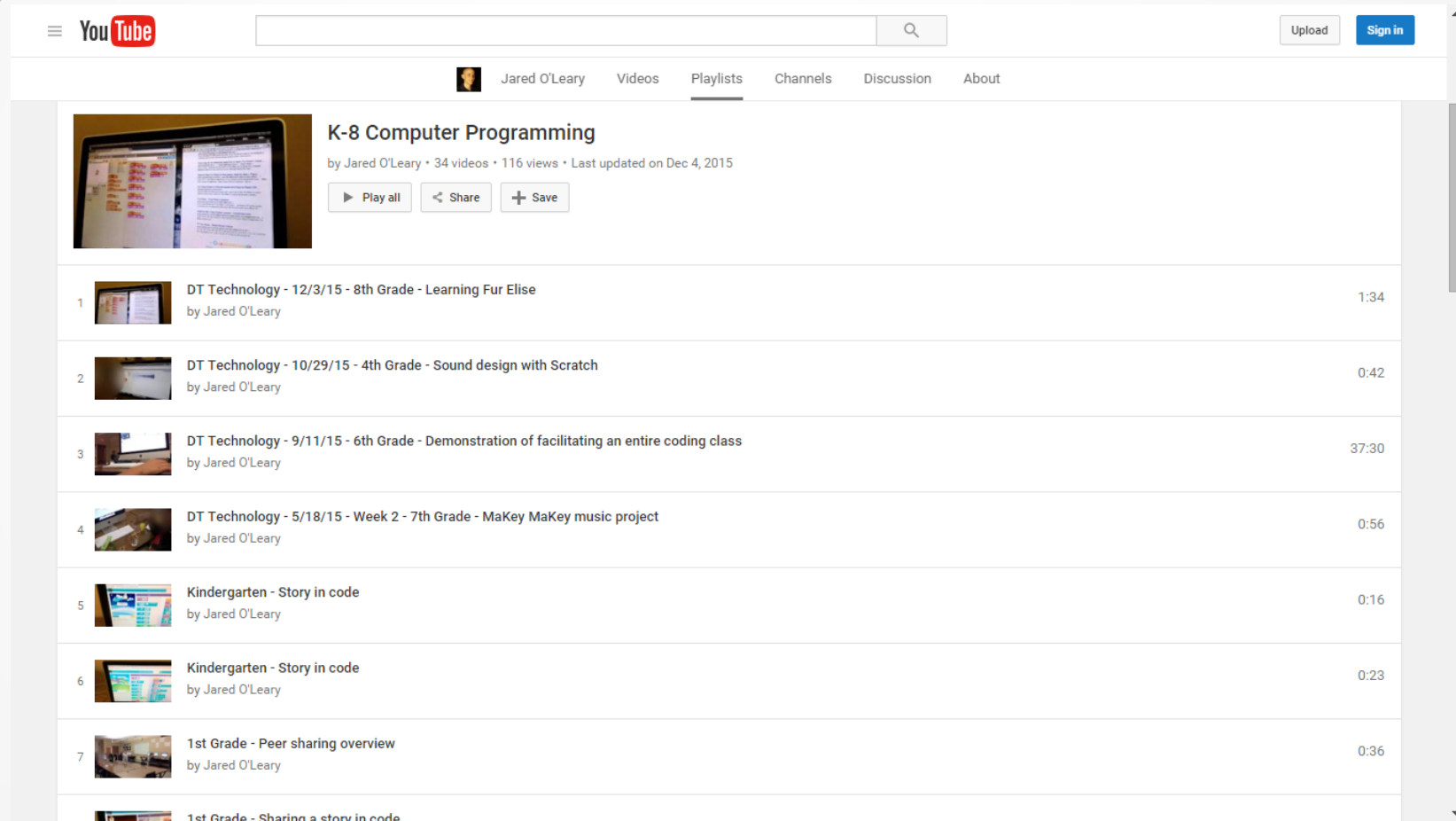
The screenshot shows the Scratch programming environment for a game titled "Minotaur" by DTTTechnology. The stage features a maze with a Minotaur and Blockman. The code is organized into several sections:

- When clicked:** Hides the "Minotaur captures" variable, sets "MinotaurSpeed" to 2, hides the Minotaur, sets its size to 15%, waits 3 seconds, goes to the "Items" sprite, points in a direction, and shows the Minotaur.
- Forever loop:** A "repeat until" block with the condition "color is touching?". Inside, it switches to a "Hit box" costume, moves the Minotaur at "MinotaurSpeed" steps, and checks if "color is touching?". If true, it switches to a "Minotaur" costume, broadcasts "Caught", changes "Minotaur captures" by 1, shows "Blockman escapes", says "You're mine!!!", and stops all.
- When I receive Treasure:** Waits 2 seconds, sets "x" to -1, and says "My treasure?!?!?" for 2 seconds.
- When I receive Freedom!:** Waits 2 seconds and says "Nooo!!!!" for 2 seconds.
- When any key pressed:** Switches to "Hit box" costume, then uses a "pick random" block to choose a direction (1 to 4). It then checks if the direction is 0, 1, 2, or 3, and points in that direction.

Two yellow callout boxes provide additional context:

- The first callout explains that the code makes the Minotaur appear and move around the map. It notes that "MinotaurSpeed" starts as fast as Blockman but slows down when the Minotaur appears after Blockman finishes talking. It also mentions that the Minotaur appears after the "go to Items" block.
- The second callout explains that the code makes the Minotaur move forward until he touches a wall. Once he touches a wall, it runs the code to make him turn, then it repeats again. It notes that once the Minotaur touches Blockman (if color green is touching yellow), the Minotaur says something, the global variable changes by one, and the game ends. It also notes that the Minotaur is black, but it's checking if the color green is touching the color yellow. It asks if the user noticed the "Hit box" and "Minotaur" costumes, pointing out that the colorful costume allows for checking if the Minotaur is near a wall, while the all-black costume allows for not showing wall sensors.

# What might a class look like?



The screenshot shows a YouTube channel page for 'Jared O'Leary'. The channel name is at the top, followed by navigation links for Videos, Playlists, Channels, Discussion, and About. The 'Playlists' tab is selected, showing a playlist titled 'K-8 Computer Programming' by Jared O'Leary, with 34 videos and 116 views, last updated on Dec 4, 2015. Below the playlist title are buttons for 'Play all', 'Share', and 'Save'. The playlist contains 7 videos, each with a thumbnail, title, and duration:

Video Number	Video Title	Duration
1	DT Technology - 12/3/15 - 8th Grade - Learning Fur Elise	1:34
2	DT Technology - 10/29/15 - 4th Grade - Sound design with Scratch	0:42
3	DT Technology - 9/11/15 - 6th Grade - Demonstration of facilitating an entire coding class	37:30
4	DT Technology - 5/18/15 - Week 2 - 7th Grade - MaKey MaKey music project	0:56
5	Kindergarten - Story in code	0:16
6	Kindergarten - Story in code	0:23
7	1st Grade - Peer sharing overview	0:36



# Are there curricular resources?

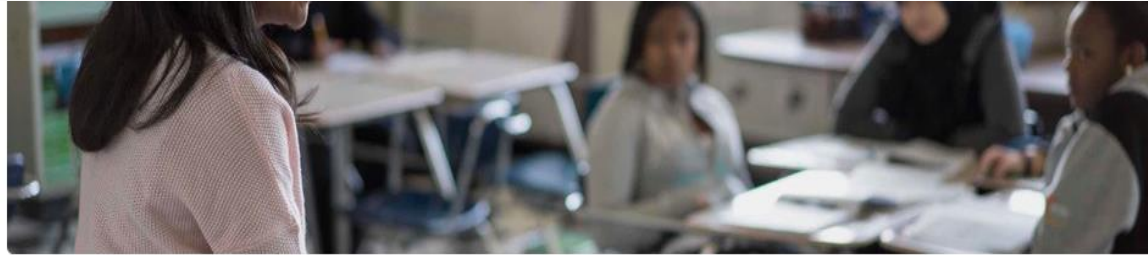
## Avondale Elementary School District



## Computer Programming Curriculum Guide



# Code.org resources



## Elementary school

Teachers say our five elementary courses are "totally awesome sauce" and fun for all students, even pre-readers.

[Learn more](#)

## Middle school

Our middle school offerings include modules to integrate CS into Algebra and Science. We are working on a new course to release in 2017.

[Learn more](#)

## High school

We offer two year-long courses for high school: an intro course and an AP course. Both are designed to broaden participation in CS.

[Learn more](#)

## Additional Resources

### Hour of Code

Celebrated in December, but available year-round, the Hour of Code is the

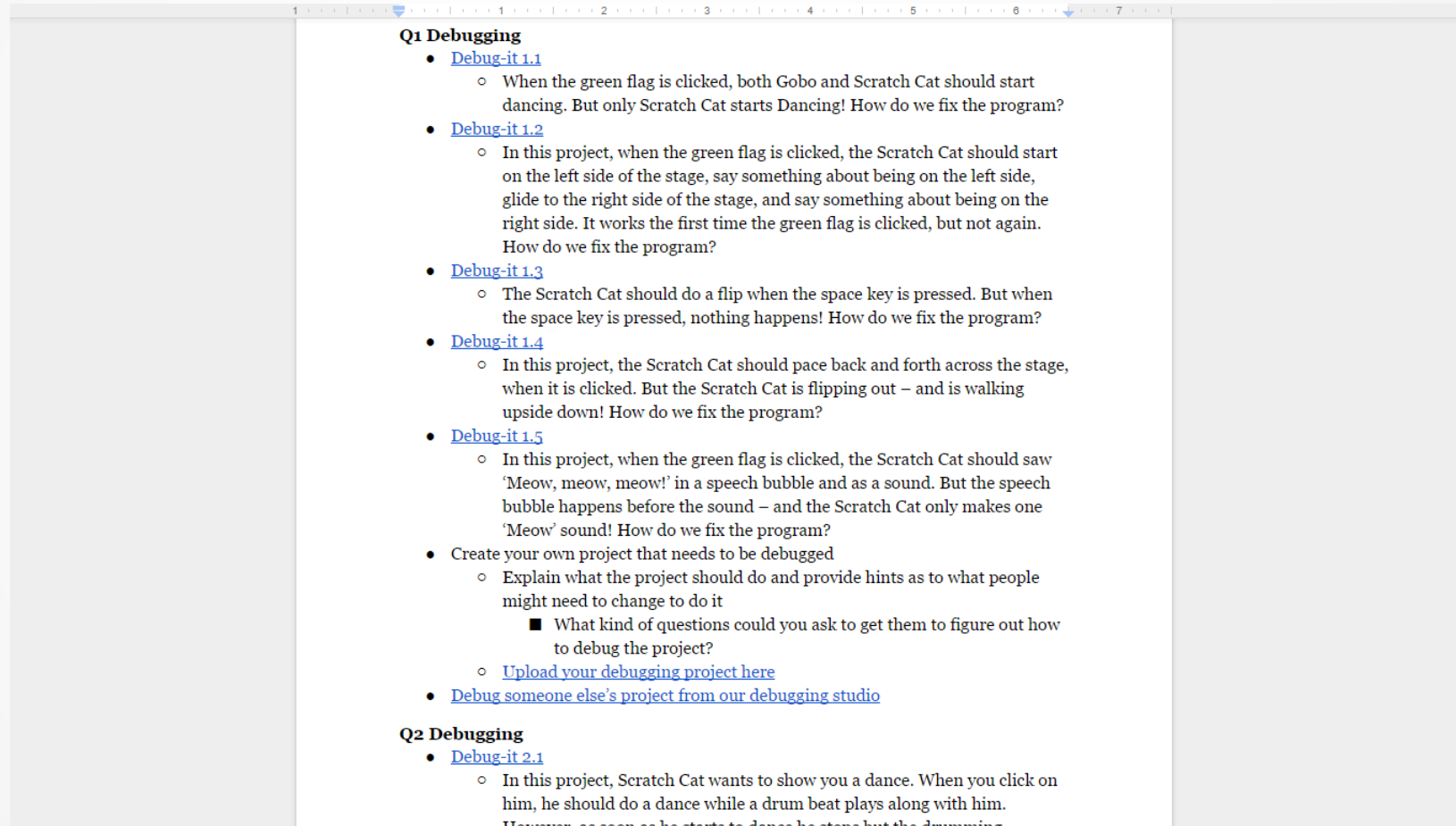
### Partner with us

Bring computer science to your country, state, region or school

### Beyond Code.org

There are many fantastic courses and organizations helping schools adopt

# Scratch and Scratch Jr. resources



**Q1 Debugging**

- [Debug-it 1.1](#)
  - When the green flag is clicked, both Gobo and Scratch Cat should start dancing. But only Scratch Cat starts Dancing! How do we fix the program?
- [Debug-it 1.2](#)
  - In this project, when the green flag is clicked, the Scratch Cat should start on the left side of the stage, say something about being on the left side, glide to the right side of the stage, and say something about being on the right side. It works the first time the green flag is clicked, but not again. How do we fix the program?
- [Debug-it 1.3](#)
  - The Scratch Cat should do a flip when the space key is pressed. But when the space key is pressed, nothing happens! How do we fix the program?
- [Debug-it 1.4](#)
  - In this project, the Scratch Cat should pace back and forth across the stage, when it is clicked. But the Scratch Cat is flipping out – and is walking upside down! How do we fix the program?
- [Debug-it 1.5](#)
  - In this project, when the green flag is clicked, the Scratch Cat should say 'Meow, meow, meow!' in a speech bubble and as a sound. But the speech bubble happens before the sound – and the Scratch Cat only makes one 'Meow' sound! How do we fix the program?
- Create your own project that needs to be debugged
  - Explain what the project should do and provide hints as to what people might need to change to do it
    - What kind of questions could you ask to get them to figure out how to debug the project?
  - [Upload your debugging project here](#)
- [Debug someone else's project from our debugging studio](#)

**Q2 Debugging**

- [Debug-it 2.1](#)
  - In this project, Scratch Cat wants to show you a dance. When you click on him, he should do a dance while a drum beat plays along with him. However, as soon as he starts to dance he stops but the drumming

# JavaScript resources

- [Object-Oriented Design](#)
- Drawing Basics
  - [V1](#)
    - // This program isn't making the second eye on my face.
    - // How could we debug the program to fix this mistake?
  - [V2](#)
    - // The house is missing its roof
    - // What do we need to change to add in the roof?
  - [V3](#)
    - // I want the OhNoes picture in the center of the screen; however, it is too narrow and in the upper left.
    - // How could we fix the placement and shape of the OhNoes picture?
- Coloring
  - [V1](#)
    - // I have five fills; however, I only have four colors.
    - // In addition, the first scoop is white rather than than blue, and the cherry is yellow rather than red.
    - // What mistake did I make with the fill commands and how can we fix it?
  - [V2](#)
    - // I have a simple picture of grass, clouds, and a sun; however, all I see is the sky
    - // What mistake did I make and how can we fix it?
  - [V3](#)
    - // On this plate is a twinkie; however, the twinkie has sharp edges rather than rounded edges.
    - // What could we do to make the rectangles edges rounded?
- Variables
  - [V1](#)
    - // This frog has the same size eyes on each eye; however, I want one of his eyes to be twice as big as the other without having to write a new variable
    - // How could we make one of the frogs eyes twice as big?
  - [V2](#)
    - // I want one tooth to be five pixels longer than the other; however, it is much longer than that.
    - // What mistake did I make and how can we fix it?
  - [V3](#)
    - // This frog is missing his big eye and only has black pupils



# How might I learn how to code?

- ▶ Platforms that teach the basics
  - ▶ [Code.org](#)
  - ▶ [Codecademy](#)
  - ▶ [CS First \(Scratch\)](#)
  - ▶ [Khan Academy](#)
- ▶ Analyze code
  - ▶ [JavaScript example projects](#)
  - ▶ [Scratch projects with comments](#)
  - ▶ [Github](#)
- ▶ More resources
  - ▶ [The coding corner](#)

# Let's talk

- [www.JaredOLEary.com](http://www.JaredOLEary.com)
  - Presentations
  - Starting an After School Coding Program

