

# UNIT 3, LESSON 3

## ALGORITHMS AND DEBUGGING

3RD & 4TH GRADE



Lesson created by the GMU-ODU CSforAll Team. For more information about this lesson and our CSforAll initiative, contact Dr. Amy Hutchison at [ahutchison1@ua.edu](mailto:ahutchison1@ua.edu)

# SUMMARY AND STANDARDS

## Summary:

In this lesson, students will continue planning and then animating their explanatory writing in Scratch and check for consistency.

### ELA Standards

The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.

- a) Engage in writing as a process.
- b) Identify audience and purpose.
- c) Use a variety of prewriting strategies.
- d) Use organizational strategies to structure writing according to type.
- g) Use transition words to vary sentence structure.

### CS Standards:

The student will construct programs to accomplish tasks as a means of creative expression using a block or text based programming language, both independently and collaboratively

- a. using sequencing;
- b. using loops (a wide variety of patterns such as repeating patterns or growing patterns); and
- c. identifying events.

The student will create a plan as part of the iterative design process, independently and/or collaboratively, using a variety of strategies (e.g., pair programming, storyboard, flowchart, pseudocode, story map).

Today, we are going to learn some new things in Scratch, such as new commands and how to change sprites! This will help us get ready to use Coco and Scratch to animate the writing we did last time.

## **LESSON OBJECTIVES: I CAN...**

- Review Scratch blocks and Loops
- Animate, and self-monitor my writing in Scratch using Coco Level 3 (Column 1, 2, 3, 4)
- Review writing and animation for a match
- Share my animation and writing with peers

Let's go over today's lesson's objectives: [read slide]

## MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

- Chromebook/Laptop
- Internet Access
- [Scratch for CS First](#) or Scratch online
- [Link to Coco](#)
- Teacher slide deck
- CoCo column one filled in (from last time)

### Reminder:

In this lesson, every student should be **assigned a story in CoCo using Level 3.**

The story should be titled **“Unit 3 Story.”**

Each student should save their work using this naming strategy: **“Student Name + Unit # + Descriptor”**, for example, **“Johnny Unit 3 Story”**



You will need....[read slide]

# REVIEW: LOOPS



- Review Loops and ask students to share with a partner or the class when they might use loops in their animation

# WARM UP: FINISH FILLING IN COCO!



**CO CO**  
COMPOSE & CODE

DEPICT-CS

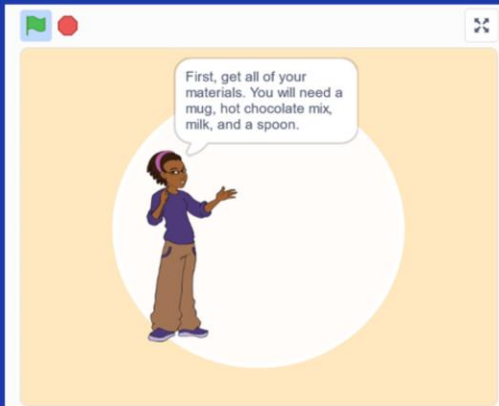
- (If necessary) Have students finish completing all sections of CoCo using their paper graphic organizer from the last two lessons.

## **BEFORE YOU BEGIN TO CODE....**

- MAKE SURE YOU HAVE A TOPIC SENTENCE**
- MATCH YOUR ANIMATION TO YOUR WRITING**
- BE CONSISTENT**
- MATCH YOUR VISUALS TO YOUR TEXT**

In Unit 1, we learned that we want to a) match your animation to your writing, b) be consistent, and c) make sure all the visuals in the frame make sense given what you have written in your text.

# GOOD ANIMATIONS CAN BE SIMPLE OR COMPLEX!



simple example:

<https://www.dropbox.com/s/jlist1zaujjpc8e/Screen%20Recording%202023-09-18%20at%209.21.46%20PM.mov?dl=0>



more complex example:

<https://www.dropbox.com/s/nh93dmdkphd4n0z/Screen%20Recording%202023-09-19%20at%201.45.13%20AM.mov?dl=0>

Good animations that follow these guidelines can be as simple as <https://www.dropbox.com/s/jlist1zaujjpc8e/Screen%20Recording%202023-09-18%20at%209.21.46%20PM.mov?dl=0>

or as complex as

<https://www.dropbox.com/s/nh93dmdkphd4n0z/Screen%20Recording%202023-09-19%20at%201.45.13%20AM.mov?dl=0>

so long as they clearly convey the message to the reader visually and verbally!



**“ONCE UPON A TIME THERE LIVED A PRINCESS...”**



For example, if I was writing a story about “Once upon a time there lived a princess...” which one of these sprites would make more sense?

**“ONCE UPON A TIME THERE LIVED A PRINCESS...”**



For example, if I was writing a story about “Once upon a time there lived a princess...” which one of these sprites would make more sense? Probably this one. Although, if our princess played baseball later in the story, you could switch it up!

**“ONCE UPON A TIME THERE LIVED A PRINCESS IN A CASTLE.”**

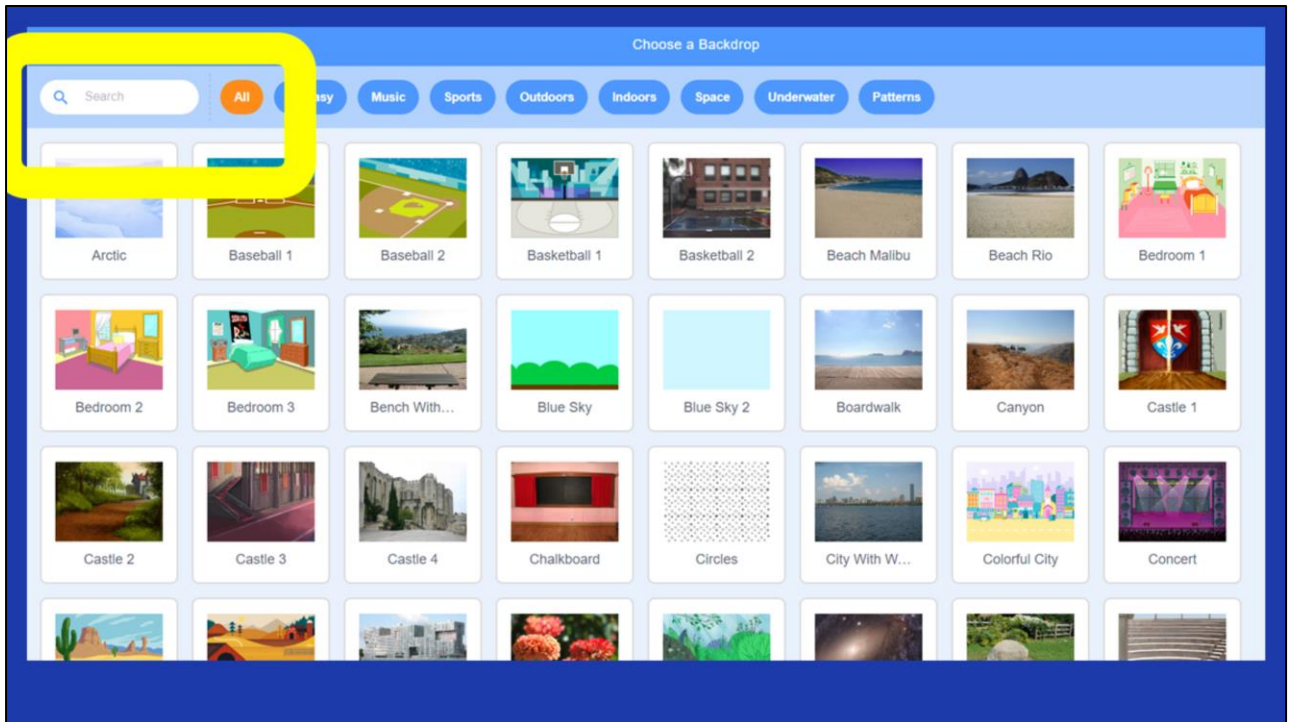


Now, if I was writing a story about a princess who lived in a castle, this backdrop would make more sense.

**“ONCE UPON A TIME THERE LIVED A PRINCESS WHO PLAYED  
BASEBALL.”**



But if I wrote about a princess who played baseball, this one could also work!



Here's another Scratch tip: when looking for sprites and backdrops, you can enter words into the "search" bar and see if any of the results match what you're looking for.

If you don't find the backdrop you're looking for you could also search the following websites for non-copyrighted images that you can upload to Scratch

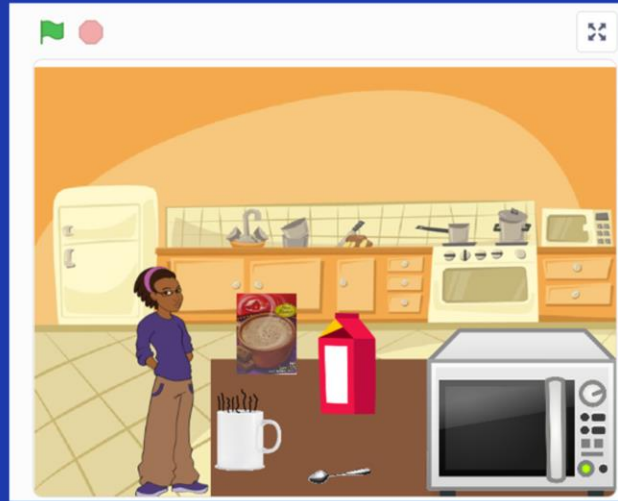
- Dribbble: <https://dribbble.com/>
- Library of Congress free to use and reuse: <https://loc.gov/free-to-use>
- Flickr: <https://flickr.com/>
- Unsplash: <https://unsplash.com/>

YOU CAN USE SCRATCH TO **ENHANCE** YOUR ANIMATION

ALL ADDITIONAL DETAILS MUST BE **RELEVANT!**

Remember how we searched for unique sprites and backdrops? And we also learned how to upload our own sprites and sounds. So there are many ways we can use Scratch to enhance our animations, or make them more exciting! We can add more details to our animations as long as we make sure that the details are relevant.

✓ LIKE  
THIS:



<https://www.dropbox.com/s/nh93dmdkphd4n0z/Screen%20Recording%202023-09-19%20at%201.45.13%20AM.mov?dl=0>

For example, here's an animation of the hot chocolate recipe that does a really great job enhancing the recipe with additional details to help the viewer imagine a person actually making hot chocolate! Let's take a look and see what they did.

[play/run scratch project]

The first thing we notice is that this computer scientist added images of real-life materials rather than cartoons. This detail enhances the animation but does not change the meaning. They also drew an arrow to show where the mix would go into the cup. Finally, they coded the objects to move and simulate the actual "making" of the drink. But nothing about the meaning changed! And it was not distracting.

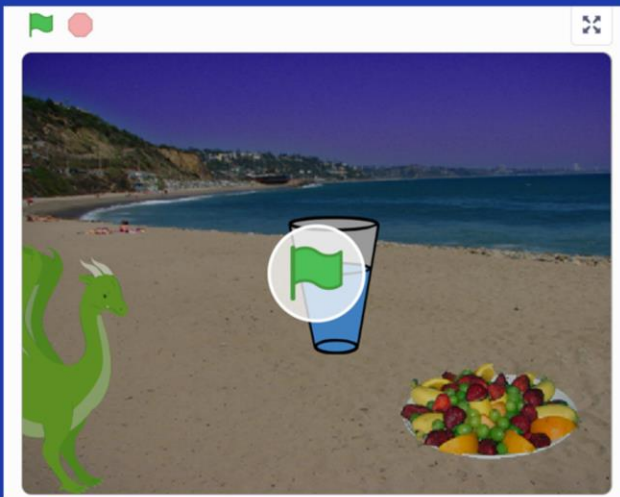
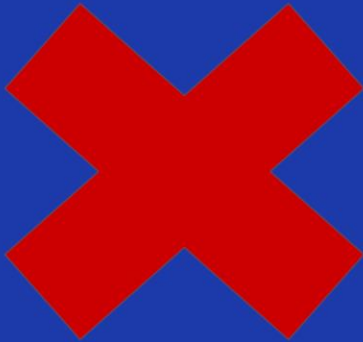
**HOWEVER!**

**☐ TOO MANY VISUALS CAN BE **CONFUSING****

Let's look at another example, where the additional details were not relevant and thus confusing.....



**NOT LIKE THIS**



[HTTPS://WWW.DROPBOX.COM/SCL/FI/AKCXG1WU83Q7SMJZFLJ31/HOW-TO-MAKE-HOT-CHOCOLATE\\_DISRUPTIVE.MP4?RLKEY=BXI9OWL96G1D3F0KDT06ZTICE&ST=I78QZD8X&DL=0](https://www.dropbox.com/SCL/FI/AKCXG1WU83Q7SMJZFLJ31/HOW-TO-MAKE-HOT-CHOCOLATE_DISRUPTIVE.MP4?RLKEY=BXI9OWL96G1D3F0KDT06ZTICE&ST=I78QZD8X&DL=0)

All the written text is the same but the images don't match the text. For example, why is there a dragon in the screen? Why are they at the beach? And why does it show a glass of water instead of hot chocolate? It may seem funny but to a new viewer, it would be very confusing. We don't want that.

# INDEPENDENT PRACTICE

Now it is time to put it all together. You will use CoCo to help you create your animation in Scratch!

## INDEPENDENT PRACTICE:

1. Open **Scratch** in one tab, **CoCo** in another
1. Use CoCo to code your Scratch animation
1. Don't forget to **self-monitor** as you go!

PAUSE HERE. (10-25 MINUTES)

# WRAP UP

Great job! Now it is time to make sure your animation matches your plan.

## **ASK YOURSELF:**

- Does my topic sentence orient my reader and help set the scene?
- Does my animation in Scratch convey what I planned? Does it match my writing?
- Have I enhanced my writing in any way in Scratch?
- Is there anything distracting or unnecessary in my animation that I should remove?
- Is there anything in my animation that would make it harder for a viewer to understand my purpose?


# **SWAP SCREENS WITH A PARTNER**

# IMPORTANT!! SHARE YOUR .SB3 FILE FROM CS FIRST TO COCO

1. Create the file in CS First
2. In the Scratch editor, find the word "File" in the top-left corner.
3. Click on "File" menu and you'll see some choices pop down.
  1. Choose "Save to your computer." This will download your Scratch project.
  1. Look in your "Downloads" folder. That's where your saved project might be.
  1. Go to the CoCo website and log in to your [account. https://wego.gmu.edu/scratchgo/login.php](https://wego.gmu.edu/scratchgo/login.php)
1. Click proceed on the correct story in CoCo.

Ready To Work on Your Story?	
first story	(Locked) View >
second story	Proceed
Story 3	Proceed
1. Navigate to the section of CoCo where you can upload your project. (only sb3 type and 10Mb max).

Uploading your coding file (only sb3 type and 10Mb max):

Choose File No file chosen Save Uploaded file: [g3](#)
1. Click "Save". 

*Model how students can share Scratch creations to their teacher's studio*

**HERE IS AN OPTIONAL VIDEO TO LEARN HOW TO SHARE YOUR PROJECT IN SCRATCH  
ONLINE INSTEAD OF CS FIRST.**

**Pause here.**

Video modeling how students can share Scratch creations to their teacher's studio

[Scratch - Imagine, Program, Share](#)



## SCRATCH CHECKLIST IF NOT USING CS FIRST

- I LOGGED INTO SCRATCH
- I SHARED MY PROJECT
- I ADDED MY PROJECT TO MY TEACHER'S STUDIO

## WRAP UP: CAREERS IN TECH



Review concepts from this lesson and wrap up with this video.  
<https://youtu.be/suJZ9z426P0?si=GJI60-LhD57SXj-q>