Digital Animation 101

The Guide

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Equipment Needed

- Laptops (1 per student + 1 for presenter, book in Sierra)
- Projector & Screen

Curriculum

Program Length: 2 hours

Program Description:
SCRATCH is a free, web based digital animation software developed by MIT (Massachusetts Institute of Technology) for youth to learn computer programming basics by creating interactive, multimedia projects.

Six mini-lessons are outlined below. Each lesson can be covered in approximately 15 minutes and builds on the one previous. This program can be broken down into 6 consecutive (daily, weekly, bi-weekly, etc.) mini-lessons for an on-the-floor introduction to digital animation (for those branches with frequent groups of afterschool students), or can be taught in its entirety in approximately 1 ½ - 2 hours depending on the skill level of your class. Extra challenges are presented under each section as extension activities for more advanced students.

Grades: 5th – 8th graders (can be adapted for use with older or younger students with basic computer skills)

Timeframe: 2 hours, or broken down into six 15 minute mini-lessons.

Marketing Blurb:
SCRATCH Digital Animation 101
Grades 5-8

Learn how to create your own digital animation from SCRATCH! Students in 5th-8th grade are invited to join us as we explore, create and share our own stories, games, music and art! Imagine! Program! And Share! Registration is limited.

Note: If you do not currently have a Scratch account, please bring a valid email address.

Set-Up:
- Projector/Screen with Presenter’s laptop
- 1 laptop/PC at each station

Helpful language to set expectations:
“There are a few things I need you to hear before we start”:
- “We will be learning to use SCRATCH for this program today.”
- “The only website you should be using while in this program is SCRATCH. If you decide to go to Youtube, Facebook or another website that is not part of this program, you will be asked to leave.”
Optional Introduction Video: [http://vimeo.com/65583694](http://vimeo.com/65583694)
You may want to share the video at the beginning of your program to show teens the types of creations they can make in Scratch.

**Steps:**
- Go to SCRATCH Website: ([http://scratch.mit.edu](http://scratch.mit.edu)). Use Google Chrome browser if explorer or another browser isn’t displaying correctly.

- If you are a new user, click on Join Scratch on the top right of the screen. Choose a Scratch Username, and create a password and click “Next”. Enter your birth month & year, gender, country and Email address (this can be a personal email address or parent’s email address). Click on “Okay Let’s Go!”

**Part 1: The Basics**

- Open SCRATCH (scratch.mit.edu) in a Google Chrome browser
- Go to CREATE tab
- Go to the SCRIPTS tab
- Under EVENTS choose one of the first three options:
  - Click and drag into gray program script area on right. This will be what you do to signal your program to begin playing.

Now we’ll add characters, motion and sound.

Characters are called “sprites.” For now, we’ll use the Cat “sprite” that the program opened with.

Now let’s make our Cat Sprite move.

Each Sprite comes with different “Costumes.” These are multiple drawings of the same Sprite so that they can look like they are moving in your program. You can create your own “costumes,” or choose from those that are provided for you.

For now we will use the Cat sprite Costume1 and Cat sprite Costume2 that our program opened with.

- Under the SCRIPTS tab, go to MOTION.
• Click on the first option “move 10 steps.” Drag it to the gray program script area and connect it to the EVENTS that you chose to begin your program. When you double click on your script, your sprite should move 10 steps to the right.
• Again, click and drag the first option “move 10 steps.” Connect it under the other MOTION block. Change the text to say “-10” steps. When you double click on the script “move -10 steps,” your sprite should move 10 steps to the left.

Challenge Question: Why would we need to tell our Sprite to move backward? (If not it will walk off the screen.) What else could we tell our Sprite to do to keep it from walking off the screen? (Hint: look under MOTION menu.)

Challenge Question: Now it looks like our Cat Sprite is not moving. Why do you think that is? (Answer: The script is telling your sprite to perform both tasks simultaneously. Hint: Add some time between steps from the CONTROL menu so that your sprite does not move forward and backward at the same time.)

Now let’s add some music for our Sprite to dance to.
• Under SCRIPTS, go to SOUND
• Click and drag the option “play drum __ for __ beats.” Drag it to the gray program script area and connect it below the first “move 10 steps” block.
• Click and drag the same option “play drum __ for __ beats.” Connect it under the “move -10 steps” block.

Challenges:
1. Experiment with step sizes: very small, small, larger, very large
2. Experiment with sounds: select and combine different sounds
3. Experiment with dances: two, three or more steps in the dance. Select and combine short and long steps.

Part 2: Repeating Actions
• Make your program repeat infinitely. Under SCRIPTS, go to CONTROL
• Select “forever” and connect it under the EVENT that you chose to begin your program. (For example, )

(Note: The “forever” loop should automatically expand around the rest of your script, but if you have trouble with it you could also click and drag the rest of your script off to the side to separate it from the EVENTS and then reattach it with the connected loop.)

Challenges:
1. Experiment with a second repeat block for a second dancing sprite.
2. Experiment playing sequences of multiple sounds again and again.
3. Experiment creating two or three repeat blocks and control them one by one, or all together with the green flag and the stop sign.

**Part 3: Switch Costumes & Play with Color**

The Cat Sprite comes with two costumes. Other figures in the Sprite library come with more costumes. Under **COSTUMES**, check the name and total number of costumes your Sprite has. You can also rename your costumes here, add more or edit your costumes.

- Under **SCRIPTS**, go to **LOOKS**.
- Click and drag “switch costume to ___” under the “move 10 steps” block. Select your first costume from the drop down menu.
- Click and drag “switch costume to ___” under the “move -10 steps” block. Select your second costume from the drop down menu. Your script should look something like this:

![Script Diagram]

Test out your program – does it look like your sprite is dancing?

We can also play with the color of our Sprites.

- Under **SCRIPTS**, go to **EVENTS**
- Select “when ___ key pressed” and drag it to the gray program area. For now, select “when SPACE key pressed.”
- Under **LOOKS** select “change ___ effect by ___” and attach it to the **EVENT** “when ___ key pressed” in the gray script area. For now, select **COLOR** and leave the effect by “25”.

*Press the space bar to watch your sprite change colors.*

**Challenges:**

1. Experiment with different rates of changing the color.
2. Experiment with two different sprites and see how they change colors.
3. Experiment with different keys to control how a sprite changes colors.
4. Experiment adding sounds when you change colors.

**Part 4: Create Your Own Sprites & Backgrounds** (Import other Sprites, use the graphic editor to create new Sprites)

- Show the YouTube Video: [http://www.youtube.com/watch?v=TJ-KwrTDDI4](http://www.youtube.com/watch?v=TJ-KwrTDDI4)
There are four methods of adding a new Sprite. You can choose a sprite from the SCRATCH library. “Sprites” can also be drawn, uploaded from a picture you have saved to your computer, or uploaded from a photo taken by the camera on your computer.

- Add a second sprite.

- Under the “Costumes” tab, edit your Sprite so it is facing the opposite direction. (Hint: There is a flip left-right button at the top right corner.)

There are also four methods of changing your Backdrop. You can choose a Backdrop from the SCRATCH library. “Backdrops” can also be drawn, uploaded from a picture you have saved to your computer, or uploaded from a photo taken by the camera on your computer.

- Select Stage 1 backdrop and choose a backdrop from the SCRATCH library.

Challenges:

1. Experiment drawing and painting your own sprites and backgrounds
2. Experiment by having your sprites dance, change colors, play sounds, etc.
3. Explore and explore with the large library of sprites and backgrounds of Scratch.
4. Experiment by creating several different costumes for a sprite.

Part 5: Speaking and Thinking

Next we will make our Sprite talk or think.

- Under Sprites, click on the first Sprite you want to have speak or think. (It will have a blue box around what you have selected.)
- Under the Scripts tab, go to **LOOKS**. Select “Say___” and drag it into the gray program script area. Type in the (clean) message that you want your Sprite to say. For example, “Hello! How are you?” (NOTE to teens: Keep your message clean.😊)
- When you double click on the “Say___” script, it will make your Sprite say the message.
- You can choose to have the Sprite say the message for a certain duration of time, or permanently.
- You could also select the “Think” block, which will let you see when your Sprite is thinking.

**Challenges:**

1. Experiment by making your Sprite think or speak and adding it to your program script.
2. Experiment with two sprites speaking to each other
3. Experiment by using key of the keyboard to control when they speak
4. Experiment by adding sounds when the sprites speak.

**Part 6: Sounds, Voices and Music**

- Using the tab “Sounds” in the programming areas, we can associate audio files with our Sprites. You can choose an audio file from the SCRATCH library, record a new sound with your computer/laptop’s microphone, or upload a sound file saved to your computer/laptop.
- Search through the SCRATCH library’s sound files and select one by double clicking on it.
- Record a sound to match the message you had your Sprite say. For example, “Hello! How are you?” (NOTE to teens: Keep your message clean.😊) Give your recording a name.

**Challenges:**

1. Make your recording and sprite’s message play at the same time (HINT: Add a new control block to your program script for the speaking sprite).
2. Experiment with two or more sprites singing together
3. Experiment adding image effects with the voices and music
4. Experiment controlling with the keyboard the sequence of sounds

**Additional Challenges:**

1. Experiment by creating your own sprites and making your own animation.
2. Experiment making animations with some of the sprites from the Scratch Libraries.
3. Experiment by animating two or three or more sprites at the same time.
4. Experiment by adding sounds as the sprites are animated.
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Challenges:

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Recommended Room Set-up:

- Projector cart with the presenter’s laptop/PC
- 6 tables that face the projector screen (3 on each side with an aisle in between)
- 12 chairs (2 per table that face the screen)
- 2 laptops per table