Lesson 5.3: Animation

Objectives

In this lesson, students will:
- ❖ Learn about animation and how to create animation programmatically.
- ❖ Experiment and practice building a project on their own using loops, costume changes, x/y positioning, new backdrops and motion.

Preparation

- ❏ Computers with internet connection
- ❏ Print student activity worksheet (one per students or one per student pair)

Agenda

1. Programming Animation — 20 mins
2. Student Activity — 20 mins
3. Wrap Up and Reflections — 10 mins

Resources & Links

- ❏ Animation Demonstration: https://scratch.mit.edu/projects/324845826

1. Programming Animation

Engage students ia a teacher led discussion and demonstration:

Can someone tell us what animation is ?
Do you know how animation is created ?

In its basic form, animation is making characters move. But to make animation seem more real and life like, there are some tricks in the trade.

Let's take a quick look at an example of animation in Scratch:
https://scratch.mit.edu/projects/324845826

Let's look at a couple of ways that you can create animation in Scratch.

A. One way to create animation is by changing costumes repeatedly.
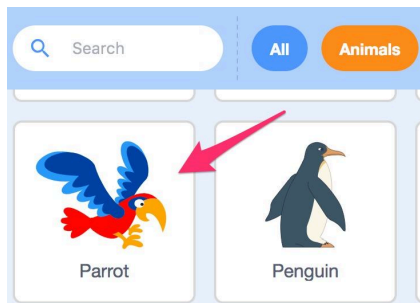
1. First, choose a sprite that moves, like a bird. We will call this our *animation sprite*. Make sure the bird has multiple costumes. When you hover over the sprite in the sprite library, it will switch between costumes if it has more than 1.
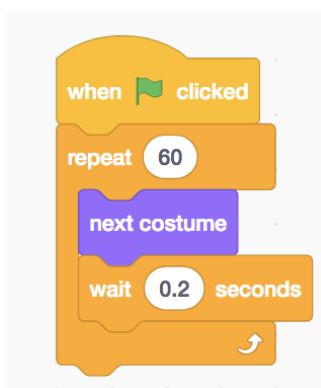
2. Repeatedly switching between 2 costumes that show the wings in different positions, will make it look like it is flying.   We want the bird to flap its wings many times, so we need a loop. Inside the loop we go to the next costume.

3. **Demonstrate** the code without the wait block by clicking on the repeat block. Because computers are really fast, the wing flapping is really fast and over in the blink of an eye and we may miss the motion. To slow the computer down we can add a wait statement between each costume change.   Add the *When green flag clicked* and test what you have created so students can see.

Students' Turn:

Instructions to give to students:

1. Create a new scratch project and add a sprite that has multiple costumes.
2. Animate the sprite by repeatedly changing its costume.
3. Remember to wait for a few fractions of a second (0.3 or 0.2) so there is some time to see the sprite move.

B. Another way to create animation is by moving something in the background. Notice that the bird flying does not look very real. A trick in the film and video industry is to move things in the background from right to left. This makes the object appear as if it is moving to the right.
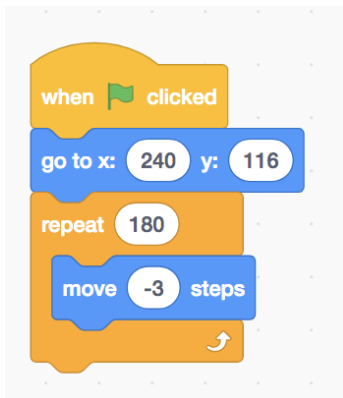
Let's move some clouds in the background. First we create a cloud sprite. We want the cloud to move from right to left. To do that we can use a move in a repeat block. We want the cloud to start at the far right of the screen. Since we want the cloud to move to the left, we need to use a negative number. The repeat block needs to repeat enough times for the cloud to reach the other side of the screen. When it reaches the other side, it has to go back to the far right side of the stage so it can start moving again to the left.

Click on the block of code to run and test it. Notice that the cloud only moves across the screen once. We want it to be moving across the screen as long as the program is running.

What do we need for that?   Prompt students to give some answers.

We need a **FOREVER** block around the code to continuously move the clouds across the screen.

Finally we add the When green flag clicked so we can start our program as we can click on all the sprites
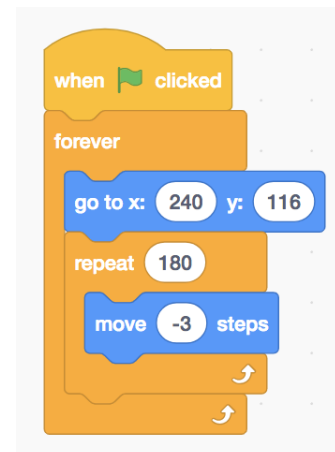
Test the code by clicking on the green flag.   Much better. Now it looks like the bird is flying!

2. Student Activity: Animation!

Distribute the student activity worksheet.   You may want to have students practice working in pairs. Students should experiment creating animations using different sprites, costumes and backgrounds.   Remind them that making a sprite dance or jump up and down is also animation.
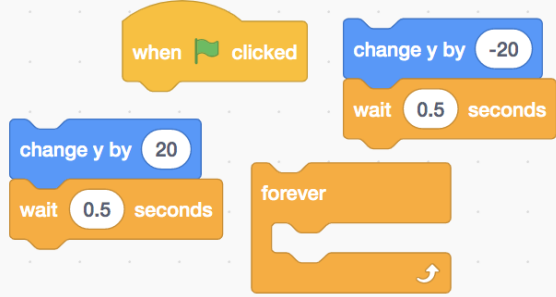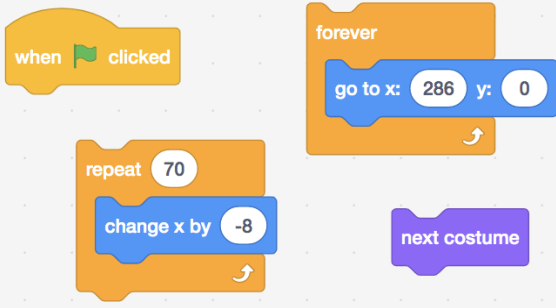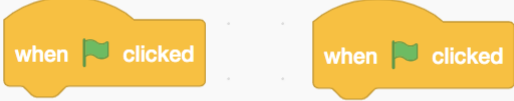
3. Wrap Up and Reflections

Reflection Points:
- What did you like about today's activity?   - What are 2 ways to create animation in Scratch?   - To create animation just using the Sprite, what does a Sprite need to have?   - What is the difference between a forever loop and a repeat loop?

Student Activity Worksheet: Animation!

What to do:	Using/Details:
In your animation project, add another sprite (**your animation sprite**) or use your existing one. Animate it by repeatedly moving it up and down (change y) or side to side (change x)	when 🚩 clicked · change y by -20 · wait 0.5 seconds · change y by 20 · wait 0.5 seconds · forever
Add a sprite that you can move across the stage in the background For as long as the program runs: ● Move the sprite across the stage from right to left repeatedly ● When it reaches the left side, move it back to the right side. ● Switch costumes if the sprite has multiple	when 🚩 clicked · forever · go to x: 286 y: 0 · repeat 70 · change x by -8 · next costume
Try moving your **animation sprite** up and down and change its costumes **at the same time**	when 🚩 clicked · when 🚩 clicked
Explore and Experiment: ● Change the backdrop ● Animate running sprites or dancing ● Use the switch costume block instead of next costume	Ballerina · switch costume to toucan-b ▾ · Blue Sky · Blue Sky 2 · Boardwalk