2.1 Animation

Introduction
How do artists make computer animated movies? With computer of code of course! In this lesson you will learn how to program animation using Scratch.

Equipment
- ✦ Computer with Internet
- ✦ Scratch™ account (see lesson 1.1)

Vocabulary
- ✦ Pair programing – two programmers working one program on one computer
- ✦ Sprites – objects that perform actions
- ✦ Backdrops– one out of possibly many frames, or backgrounds, of the stage
- ✦ Scripts – computer code
- ✦ Costumes – a sprites appearance
- ✦ Dialogue – conversation between characters
- ✦ Animation- the process of creating the illusion of motion by means of the rapid display of a sequence of static images that minimally differ from each other
- ✦ Broadcast - a message that is sent through the Scratch program, activating receiving scripts

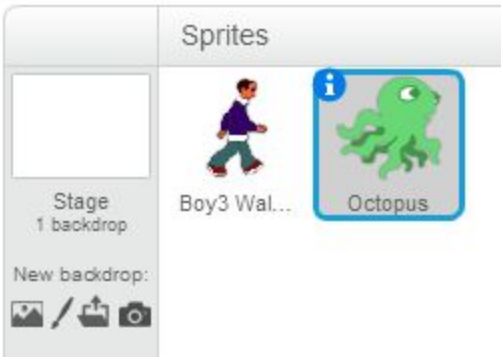
Part 1: Getting Started
Scratch is a web based programing language. In this lesson you will learn how to collect images and use computer code to build an animation in Scratch.
1. You will be completing this Unit with your partner. In **Pair Programing** you will work together on one computer alternating who is "driving" with the keyboard and mouse. Professional coders work together to reduce errors and increase creativity.
2. Launch a Web browser and navigate to the Scratch website and login to your account. http://scratch.mit.edu/

3. Click on Create to get started. 

4. First we are going to collect two **sprites**, right click and delete the cat and click on Choose sprite from library.

5. Choose Boy3 Walking and Octopus .

6. We will need two **backdrops**. Click on Choose backdrop from library



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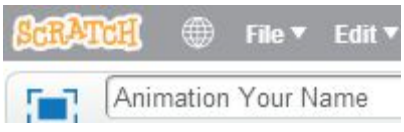
7. Choose beach malibu and underwater1 .

8. Title your project Animation and then your own name 

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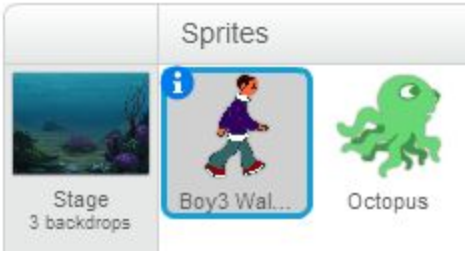
Part 2: Dialog

Now that you have collected your images we are going to program your characters to talk to each other.

9. Click on Boy3 

then click on Scripts, Events and drag and drop the "when clicked" into the script area

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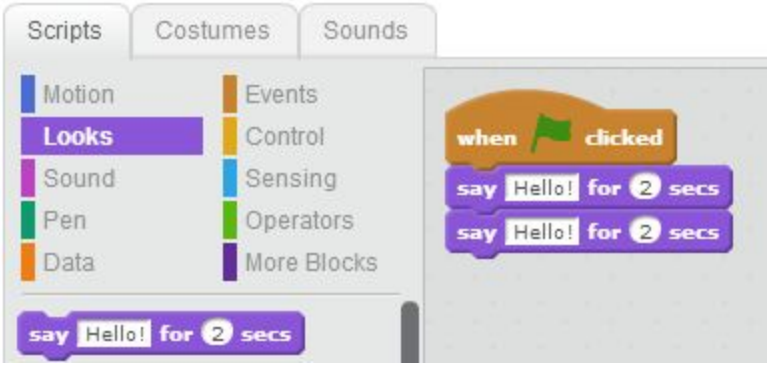
10. Click on Looks and drag and drop "say Hello! for 2 secs" two times.



11. Change the **dialogue** to 

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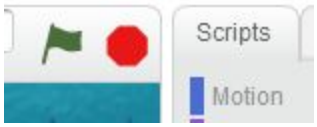
12. Add two more lines of **dialogue** 

. Click on the green flag 

and watch Bob talk!

13. Click on 

and drag and drop 

three times. Change the **dialogue** to 

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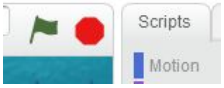
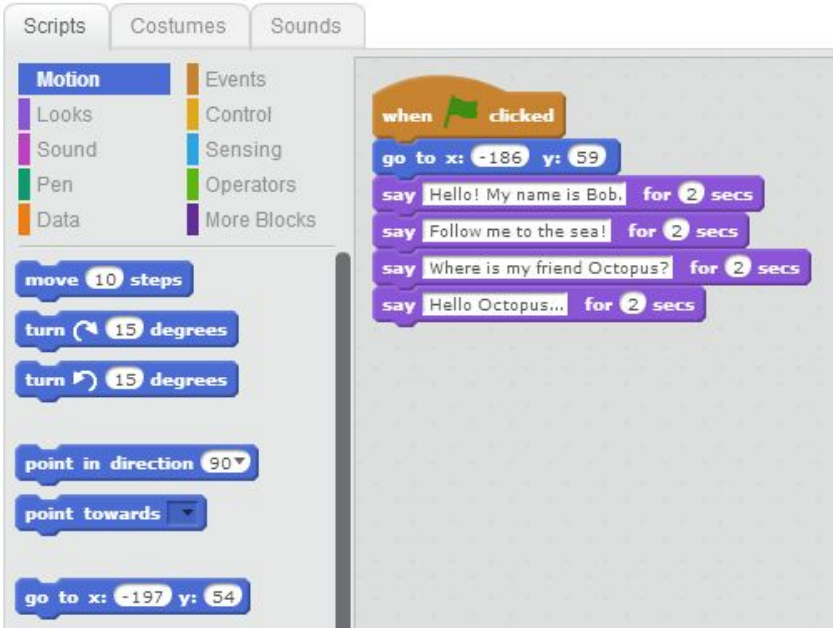
Part 2: Moving Characters

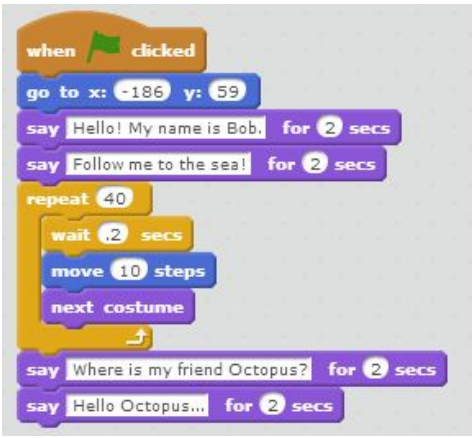
14. First we are going to position our character at his starting place, click on 

, drag and drop "go to x: -186 y: 59" to under "when clicked". Now click on the green flag 

and watch Bob move to his starting place and say his dialog.

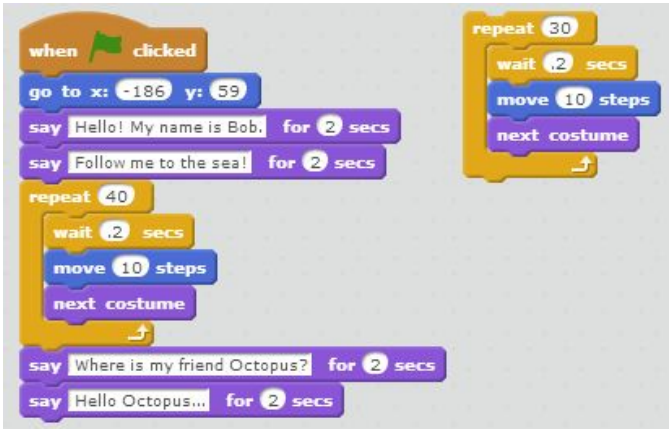


15. Click on Bob's Costumes and lets take a look at his four static images. These images are Bob in his four walking positions. We will program Scratch to show one image at a time .2 seconds apart from each other. That is 5 images every second!



16. Click on Scripts and build this code. Change the repeat to 40, the wait to .2 and move the repeat to the middle of the dialog code. Click on the green flag to give it a try.

17. Build this code. Note that "repeat" is **30** and "wait" is **.2**.

Bob's code will look like this. 

18. Now we are going to program the Octopus. First we need to duplicate one of her costumes, click the Octopus Sprites, click Costumes, choose the first costume 

and right click on it and choose duplicate. Your costumes will now look like this 

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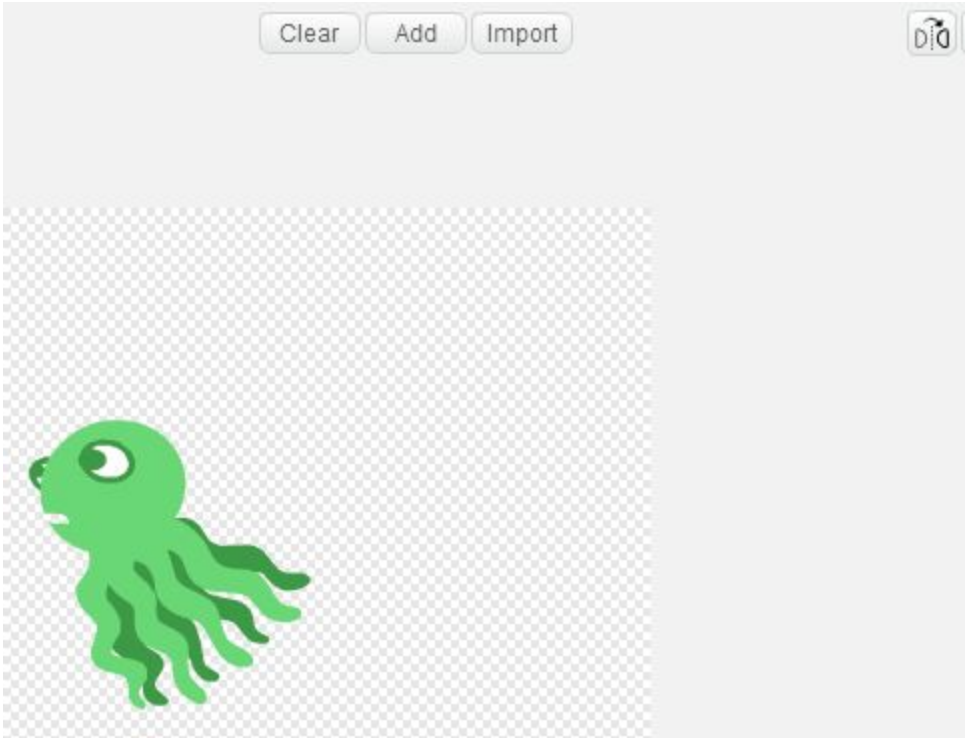
19. Make sure octopus-a2 is chosen and reverse it



. Now it will look like this

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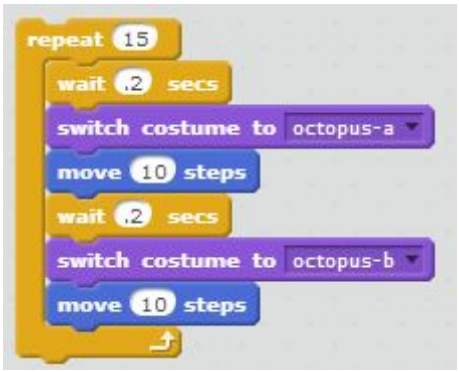
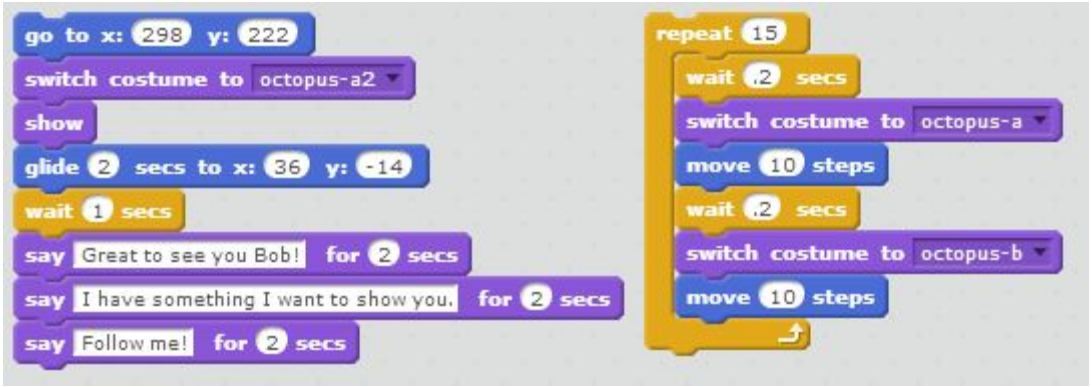
20. Now we want her to glide into the scene. Click on the Scripts and build this code.

Note that you need to change "go to x:**298** y:**222**,
change "switch costume to **octopus-a2**" the reversed octopus and
change "glide 2 seconds to x:**36** y:**-14**.



21. Finally lets make the octopus swim by building this code.
Note that "repeat" is **15**.
both "wait" are **.2** and
"switch costume to" is **octopus-a** and **octopus-b**.

22. Octopus' complete code will look like this.

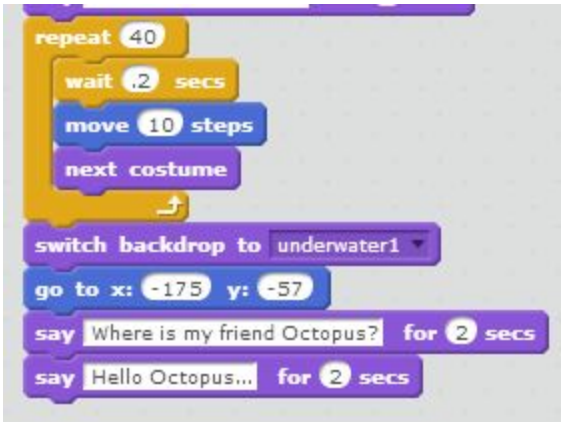


Part 3: Backdrops & Broadcasts

23. Lets choose which Backdrop will show first, click on 

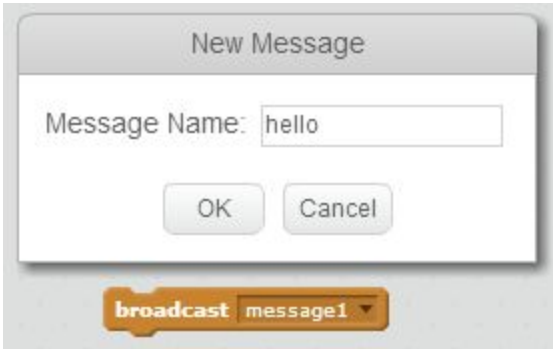
choose Scripts and add "switch backdrop to **beach malibu**", like this.

Note that the backdrop is **beach malibu**.



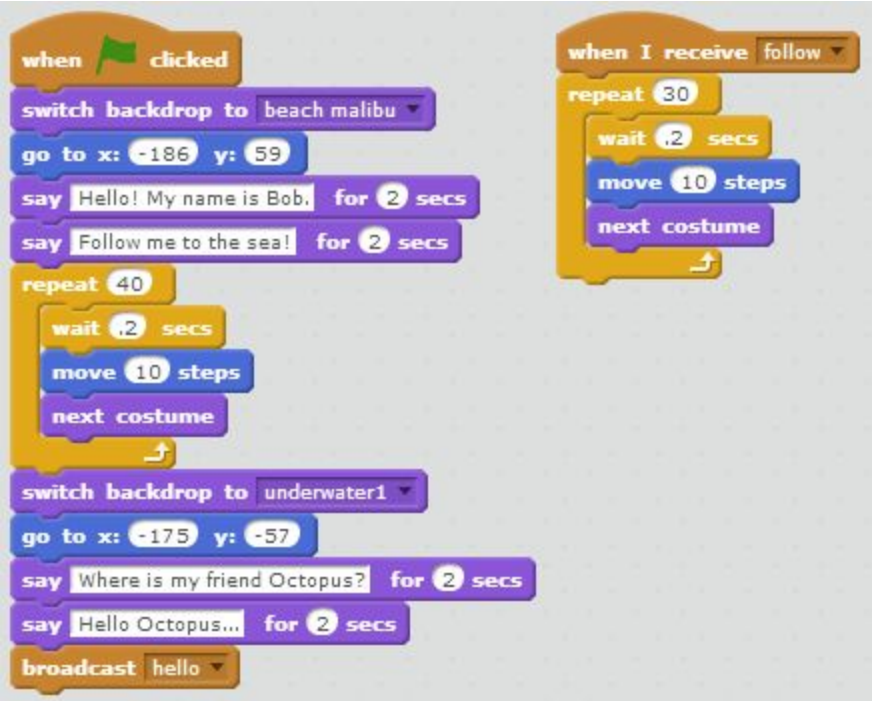
24. Add this code below the repeat.
Note "switch backdrop to **underwater1**" and
"go to x:**-175** y:**-57**.

25. That completes the Backdrop scene change, now lets use **Broadcast**. We use Broadcast just like a loudspeaker, when you Broadcast a message in Scratch it is heard in all parts of Scratch. With Broadcast we communicate with other Sprites.
Choose Events and broadcast. click on the black triangle and choose new message and type hello.



Attach it to the bottom and your code will look like this.

The boys final code will look like this



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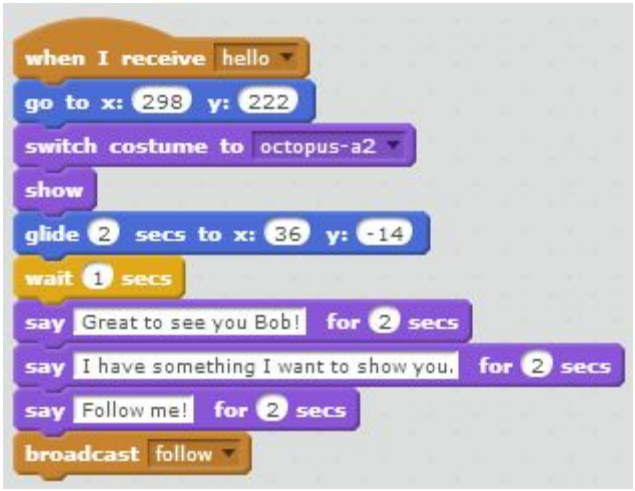
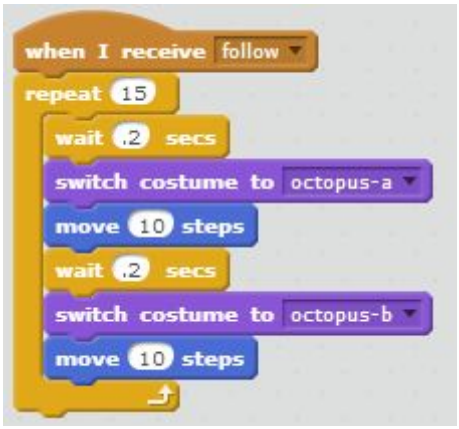
26. Choose the Octopus' Sprite and add "when I receive hello" to the top of the code.

It will look like this. 

27. Now the Octopus will Broadcast a message, add "broadcast follow" the same way you did with "broadcast hello". The code will look like this.



28. Add "when I receive follow" to the repeat 

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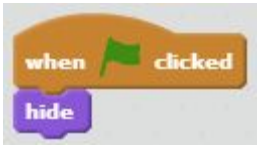
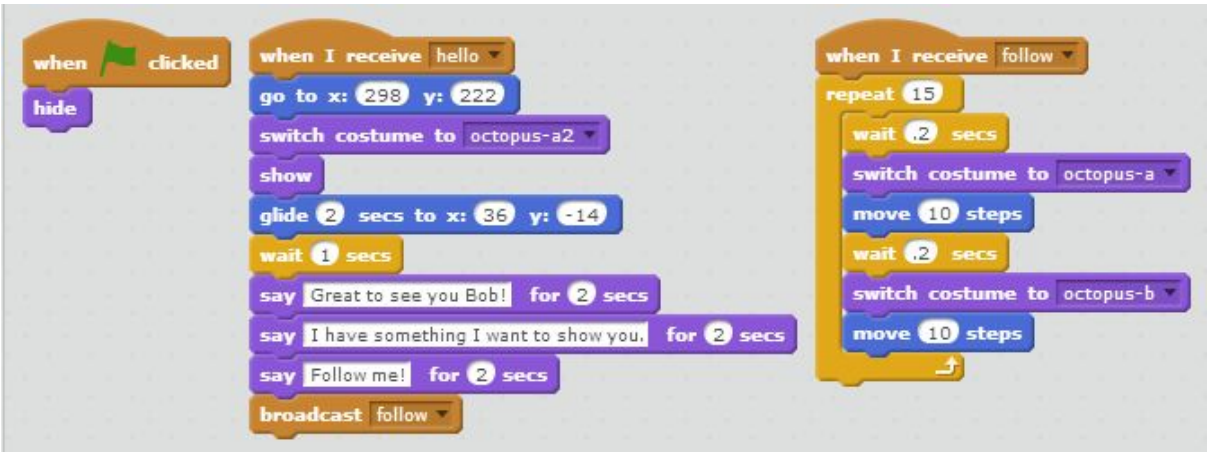
29. Switch to the boy's Sprite and add "broadcast follow" to his repeat.

30. Now for a final bit of housekeeping. We don't want the Octopus in the first scene so lets hide her, switch to her Sprite and and this code 

. Her final code will look like this!

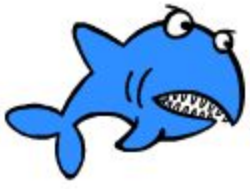


31. Click the green flag and enjoy your animation!

Part 4: Your Turn!

32. Open up your Scratch Animation program and continue the adventure!

33. Start by choosing a new backdrop and have Bob and Octopus move to the new scene.


Shark

34. In the new scene have the characters meet a third new character. (there is a fun shark you might like to try)

35. Continue adding on to your animation and story. Other changes you can make: backdrops, sounds and music. For an advance skill you can record voices in Scratch and have the characters really talk! When ever you need help or want to add skills you can always search Scratch Wiki http://wiki.scratch.mit.edu/wiki/Scratch_Wiki_Home. Enjoy!