**Instructional Days**: 5-6

**Topic Description:** This lesson describes the methods of moving Sprites in Scratch.

**Objectives:**

The students will be able to:

* Explain the 3 major ways to move sprites.
* Choose the appropriate method of moving to make a cat circle the bases.

**Outline of the Lesson:**

* Journal Entry (5 minutes)
* moving.sb (20 minutes)
* Discussion of answers to questions (15 minutes)
* baseball.sb (70 minutes)

**Student Activities:**

* Complete journal entry.
* Examine moving.sb.
* Discuss answers to questions.
* Complete baseball.sb.

**Teaching/Learning Strategies:**

* Journal Entry: Briefly describe how you would graph in your Algebra class (The x-y coordinate plane, etc.)
  + Have students work individually and then share with their elbow partners.
* moving.sb
  + Circulate the room and help students answer the questions.
* Discussion of answers to questions
  + Emphasize that the “repeat” block will do whatever is inside it n times. This behavior can be called iteration or looping.
  + Point out that iteration is a construct that is used in other programming languages.
  + Emphasize the differences between the 3 ways to move.
  + Emphasize how the sprites will reinitialize themselves when the green flag is clicked.
* baseball.sb
  + Circulate the room and help students finish baseball.sb.
  + After a student can get the cat around the bases, encourage them to use the “point in direction” block to get the cat to turn the correct way when running.
  + If students need a hint for the extra credit, show them the “next costume” and “switch to costume“ blocks under the “Looks” tab.

**Resources:**

* Moving Project
* Moving Project Solutions.
* moving.sb
* baseball.sb
* baseball solution.sb

**Moving Project**

There are basically 3 ways to move sprites in Scratch. Try the file moving.sb and answer the questions below:

1. Click the green flag. What do the three animals do?
2. Look at the scripts for each of the 3 sprites. What 3 blocks do all three sprites use?
3. What blocks does the cat use to move?
4. What block does the dog use to move?
5. What block does the monkey use to move?
6. Describe in your own words how the move block works.
7. Describe in your own words how the go to xy block works.
8. Describe in your own words how the glide block works.
9. Some of the blocks require x: and y: coordinates. Place the mouse over the white window and look at the mouse x: and mouse y: numbers underneath the bottom. How are the x: and y: coordinates determined in Scratch?
10. Use what you’ve learned about moving to get the cat to run the bases (as realistically as possible – bases are run counter clockwise) in baseball.sb. Make sure that when you click the green flag, the cat starts at home plate again.
11. Extra Credit: Make the cat change costumes so that it looks like it is running as it circles the bases.

**Moving Project Solutions**

There are basically 3 ways to move sprites in Scratch. Try the file moving.sb and answer the questions below:

1. Click the green flag. What do the three animals do?

They move across the screen.

1. Look at the scripts for each of the 3 sprites. What 3 blocks do all three sprites use?

When green flag clicked, go to x:\_ y:\_, and wait \_ sec

1. What blocks does the cat use to move?

Repeat \_ and move \_ steps

1. What block does the dog use to move?

go to x:\_ y:\_

1. What block does the monkey use to move?

Glide.

1. Describe in your own words how the move block works.

Move the sprite n steps. If n is positive, the direction will be to the right.

1. Describe in your own words how the go to xy block works

Move immediately to that (x,y) position.

1. Describe in your own words how the glide block works.

Take n seconds to move from my current position to (x,y).

1. Some of the blocks require x: and y: coordinates. Place the mouse over the white window and look at the mouse x: and mouse y: numbers underneath the bottom. How are the x: and y: coordinates determined in Scratch?

It is just like the 2 dimensional x y graphs from Algebra. (0,0) is in the exact middle of the stage.

1. Use what you’ve learned about moving to get the cat to run the bases (as realistically as possible – bases are run counter clockwise) in baseball.sb. Make sure that when you click the green flag, the cat starts at home plate again.
2. Extra Credit: Make the cat change costumes so that it looks like it is running as it circles the bases.