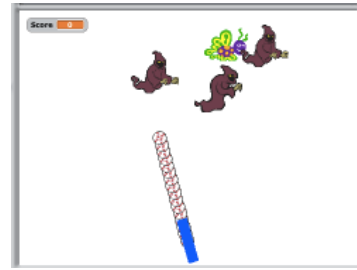


# Scratch Lesson – Target Game

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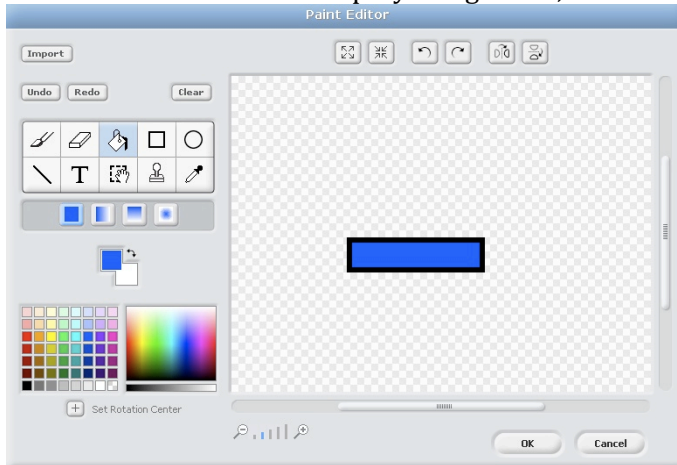
Instruction updates by Scott Blanck, Start Code



## Step 1: Drawing Your Sprite (The Cannon) and making it point.

A Sprite is a character or object in your game. Sprites can move and be active or be props that stay still. We will draw a Sprite that will act as the "cannon."

1. Open Scratch
2. Delete the Cat.
3. Click the "Paint New Sprite" icon.
4. Draw the cannon. To simplify things later, draw the cannon pointing to the right.



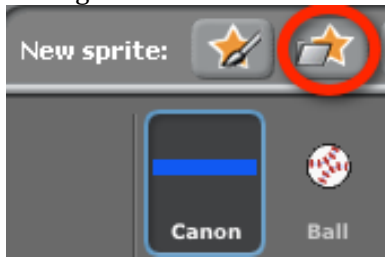
5. Name the Sprite. (Always name your Sprites - this is like doing comments in text based programming - it will help you and people who read your programs figure out the flow of the program.)

6. We want the "Cannon" to turn left and right as the user presses the arrow keys.
  - a. Drag a yellow "When Space key Pressed" into the Scripts pane.
  - b. Add a "turn 15 degrees" clockwise to this Script.
  - c. Change "Space" to "right arrow"
  - d. Do the same for the left arrow.



## Step 2: Creating the "Ball" and making it Move, Stamp, and Aim.

1. Click the "Select Sprite From File" icon and choose a Sprite. I choose a ball from "Things." You can choose something else if you like.



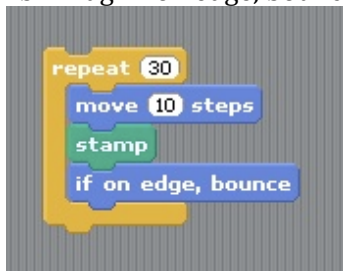
2. Name your Sprite. (I called it "Ball")

3. We want the ball to move 300 steps. We will use the "Repeat" and "Move 10 steps" command. Drag a "Repeat" into the Balls Scripts pane. Put a "move 10 steps" inside the repeat.



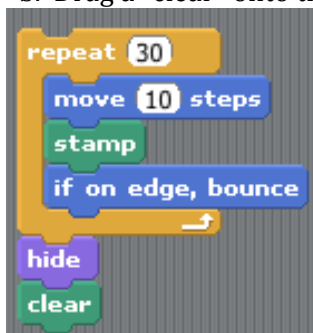
4. If we double click on the Script, the ball will move. Now we want the ball to "stamp" (leave a trail) and bounce off the edge:

- Drag "stamp" into the "repeat 30" stack.
- Drag "if on edge, bounce" into the "repeat 30" stack.



5. Now we want the Ball to "hide" after the script is done: ("Hide" makes a Sprite invisible. "Clear" erases "stamps" and "pens.")

- Drag a "hide" onto the bottom of the "repeat."
- Drag a "clear" onto the bottom of "hide."

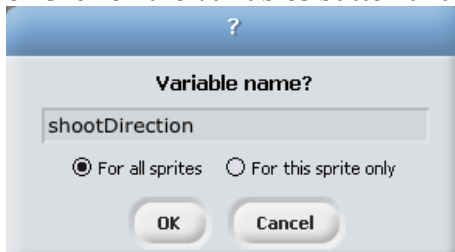


6. We want the Ball to start this script when the space key is pressed:
  - a. Drag a "when space key pressed" into the scripts pane.
  - b. Add a "go to Canon"
  - c. Add a "show"
  - d. Add a "point in direction 90"
  - e. Make all these one stack



7. Press the space bar. Your Ball should "shoot" from the Cannon. **However, it does not aim.** In order to aim we have to tell the Ball what direction the Cannon is pointing in. We are going to use a Variable for this function.

8. Click on the Variables button and make a variable called "shootDirection."

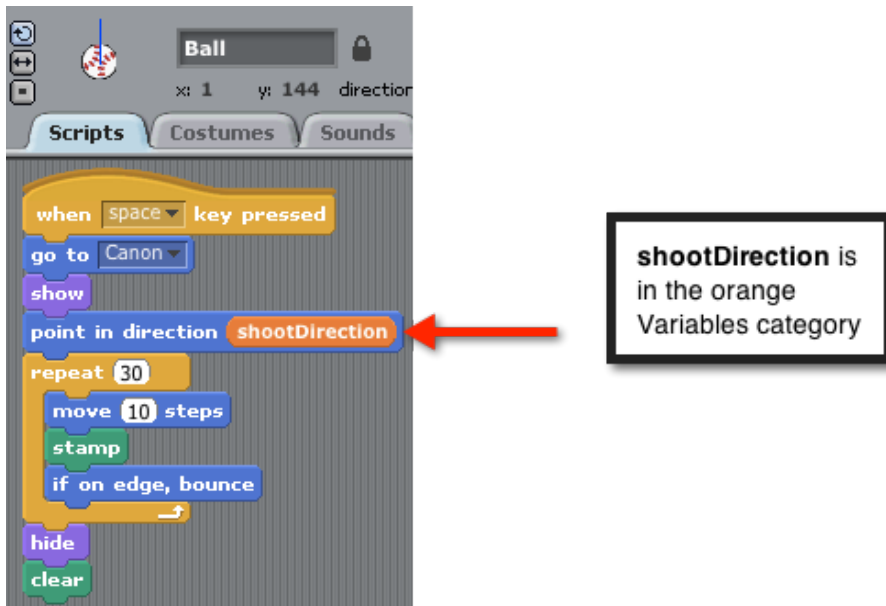


9. On the **Canon** (or "Canon"), make the "shootDirection" variable = to the Cannon's direction:

- a. Drag a "When Green Flag Clicked" and "forever" into the scripts pane.
- b. Drag the "set shootDirection to 0" inside the forever
- c. Click on "Motion." Drag the blue "direction" and put it in the script like below.



10. Click on the Green Flag and use the arrow keys to move the Cannon. The shootDirection variable should change as the Cannon turns.
11. Pass the "shootDirection" variable value to the "Ball."
  - a. Click on the Ball Sprite
  - b. Drag the Orange "shootDirection" oval from the Variable pane into the "point in direction" script of the Ball.



12. Click the Green Flag. (This starts the program) Aim with the arrows and press the space bar. This should "shoot" the Ball from the Cannon.

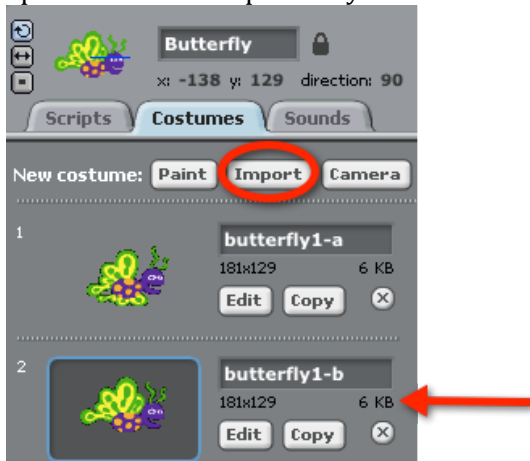
### Step 3: Creating the Targets. Automatic Movement and Conditional Statements.

We have created the Cannon and the Ball. Now it is time to make the targets. We will create one Target that moves, and hides when hit by the ball.

1. Click the "Select Sprite from File" icon and select a Sprite that **has multiple costumes**. (We will use this later to simulate movement with animation.) The Bat or Ghoul or Dragon sprites will also work.



2. If you want to animate your sprite while moving, click the "Costumes" tab on the new Sprite. Use the "Import" key to select the sprite's **second costume**.



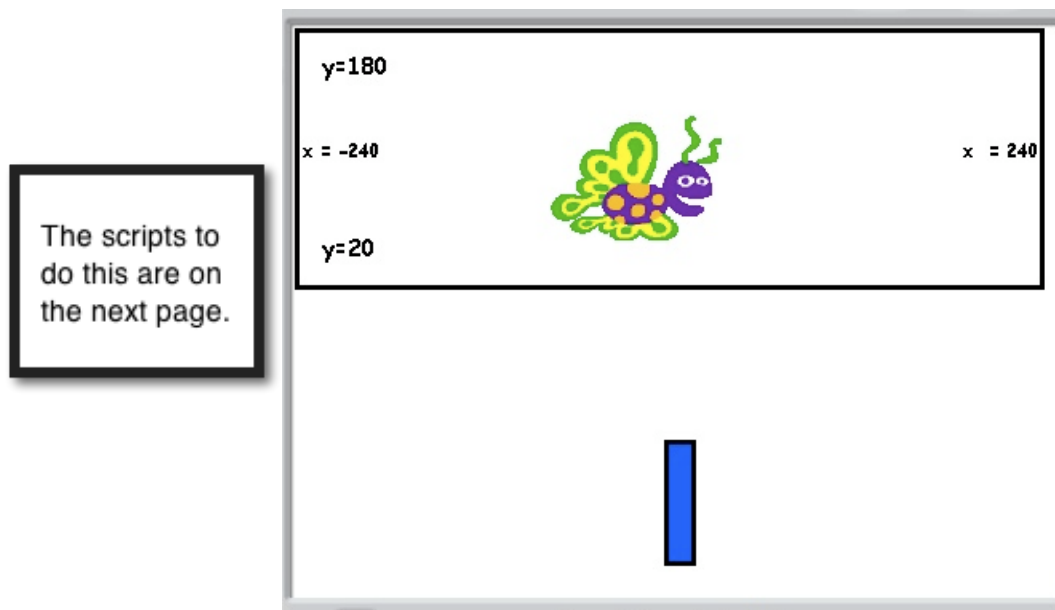
3. To animate the sprite add these scripts to switch between the two costumes.



4. We want the Sprite to Glide to random locations on the top area of the World. The World is an XY plane with x axis values from -240 to 240 and y axis values from -180 to 180.

The Target will glide between points ranging from: x: -240 to 240  
y: 20 to 180

We are limiting the Y positions so the Target only flies in this top box:



5. Name the Sprite (I chose "Butterfly")
  - a. Drag a "When Green Flag Clicked" into the scripts pane.
  - b. Drag and connect a "Forever" to the "When Green Flag Clicked"
  - c. Drag a "glide 1 secs to x: y: "



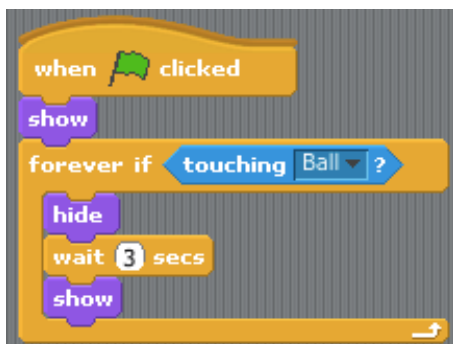
6. Now set the random numbers:
  - a. Click on the Green "Operators" tab and drag two "pick random" green ovals to the scripts pane.
  - b. Put "-240" in one "pick random" value and "240" in the other.
  - c. In the second "pick random," put the values 20 and 180



7. Drag the "pick random -240 to 240" to the x value of the "glide" block. Drag the "pick random 20 to 180" to the y value of the "glide" block.
8. Click the Green Flag. Your Target should now move about the screen.

**Final steps: Make the Target Hide, Show, Play a Sound, and Change Score.**

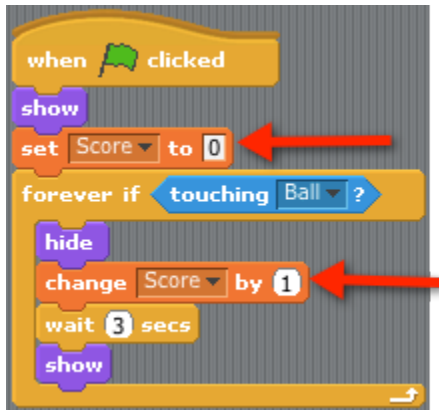
9. Add these scripts to the **Target**. If the target touches the ball then hide for 3 seconds.



10. Click on "Variables". Make a variable called "Score"



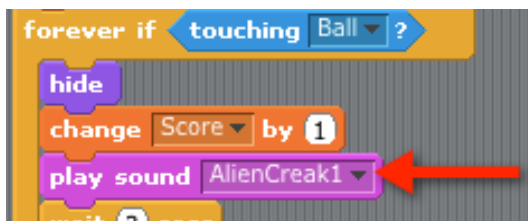
11. To keep score, add these scripts to the **Target**. Put "Set Score to 0" under the "When Green Flag Clicked." Put a "Change Score by 1" inside the "Forever If."



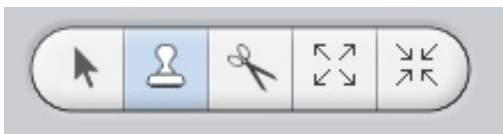
12. Click on the "Sounds" tab Import a new sound



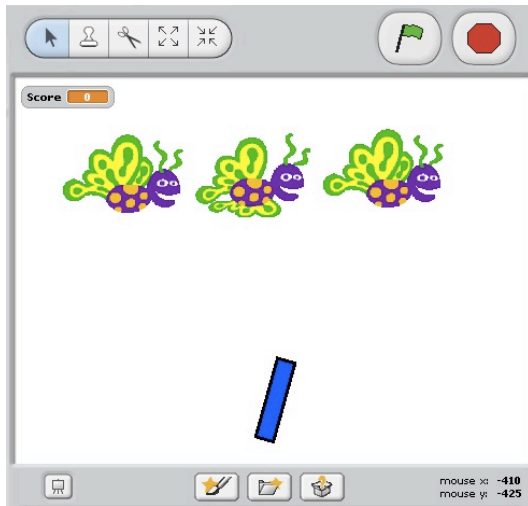
13. Drag the "Play sound" block into the "Forever If."



14. Now we will make more targets to fly around. Click the "Stamp" tool and copy the Target several times. Or you can right-click the sprite and choose Duplicate.



15. Your game should look something like this:



16. To change the background "Stage." (Like importing costumes)

- Click the "Stage" icon
- Click the "Backgrounds" tab. Click "Import."
- Select the desired background.



17. **Good work!** Click the Green Flag and try your game! What else can you add?