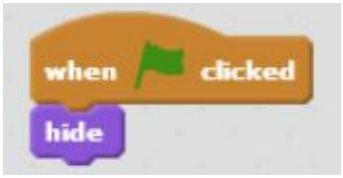
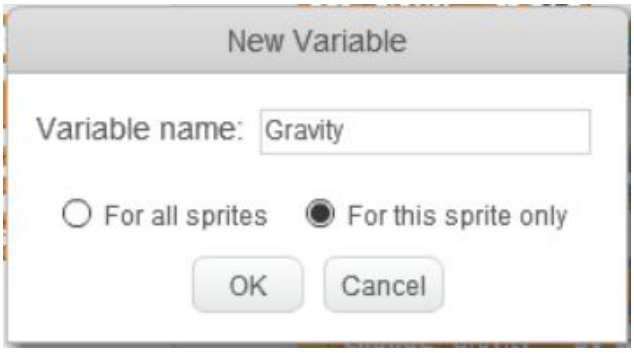
Lesson 5 - Goalazo

1. Create a soccer ball with gravity:
    a. Start a new Scratch program.
    b. Add a background:
        i. Click **Choose a backdrop from library** and select goal1 or goal2 (look under Sports).
    c. Get the Cat sprite into position:
        i. Rename Sprite1 (the cat sprite) to “Cat” by right clicking on it > info > update the name field >click the blue back arrow.
        ii. Add the following code to position the cat:

    d. Add a soccer ball sprite:
        i. Click **Choose sprite from library**.
        ii. Find and select the Ball-Soccer sprite (look under Sports).
    e. Get the ball rolling (figuratively) with the following code added to the ball:



    f. Create Gravity by creating a new variable:
        i. Select the **Data** category under scripts.
        ii. Click **Make a Variable**.
        iii. Name the variable “Gravity” and make sure it is set **For this sprite only**.



        iv. After the variable is created, deselect the checkbox next to it in the **Data** scripts area so it won’t show on the stage.
    g. Give the ball gravity and let the cat kick it with the following code also added to the ball:

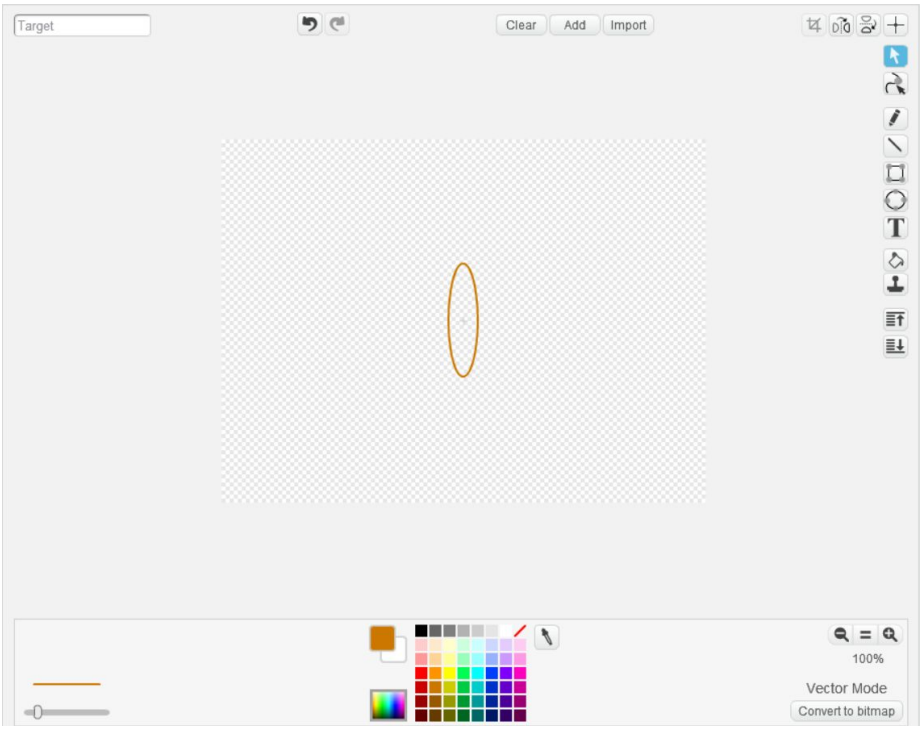
i. Description:
   1. We want the cat to kick the ball when the spacebar is pressed.
   2. Move the ball to the Cat so it can kick it.
   3. Set the Gravity variable to its base value of 12 when the ball is kicked.
   4. We want to see the ball now, so show it.
   5. Repeat until the y position of the ball is at the bottom of the screen:
      a. Increase the x position of the ball so it travels right when kicked.
      b. Change the y position of the ball by the amount currently stored in the Gravity variable.
      c. Decrease the gravity by 2 so the ball travels in an arc.
   6. Hide the ball again when it's done moving.

h. SAVE and RUN.

2. Add a target for the cat to kick at in the goal:
   a. Create the target sprite:
      i. Click **Paint new sprite**.
      ii. Rename it to "Target" by following the same instructions as renaming the Cat above.
      iii. Click the **Convert to vector** button in the lower right corner of the canvas.
         1. Vector mode lets you draw with shapes instead of pixels, so you can edit the shapes you draw after drawing them.
      iv. Select the **Ellipse** button (right side of the canvas), make sure it's not filled (bottom left of canvas), and pick a color for your target (bottom of canvas).
      v. Click and drag in the canvas to draw a tall narrow circle about an inch tall.
         1. You can resize it too, since we're drawing with vectors.

vi. Center the target in the canvas by dragging it or by selecting the **Set costume center** button (top right of canvas) then clicking the center of your target ellipse.

vii. The target should look something like this:



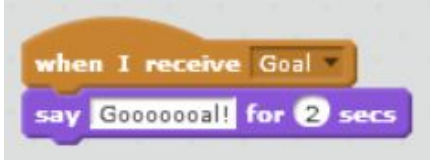
b. Now, in the Scripts tab, add the following code to make it a moving target:

i. Description:

1. When the game is started, repeat forever: Glide the target to a random position between x-coordinates 120 - 155 and y-coordinates -65 - 45.
2. You can increase or decrease the speed of the movement by changing the secs field of the glide script.

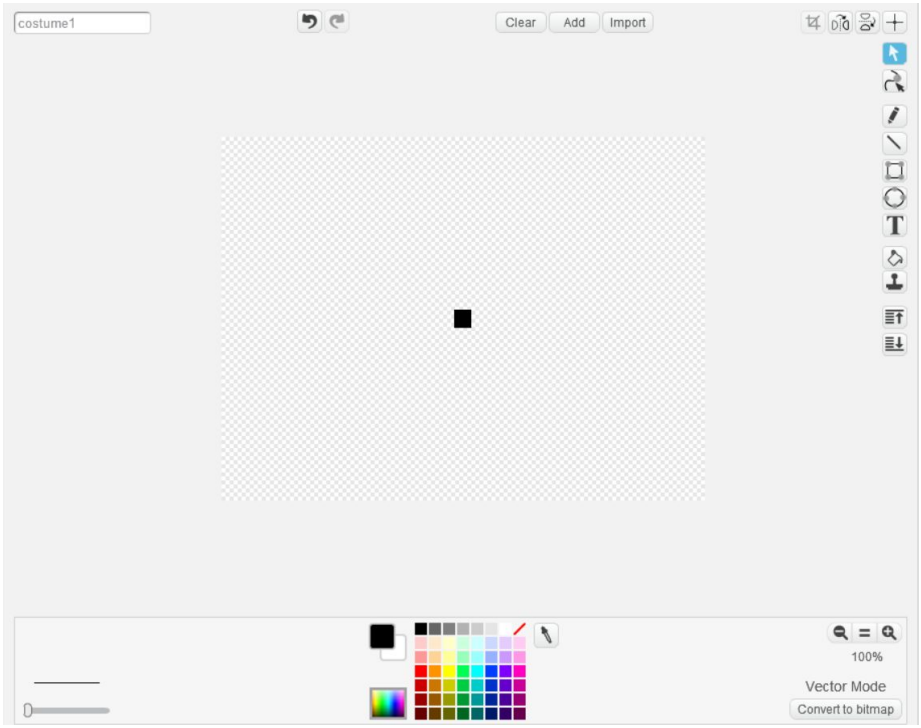
c. Now add the following code to make it more exciting when we score a goal:

i. You'll have to create a new message called "Goal" to broadcast by using the dropdown menu in the **broadcast** code snippet.

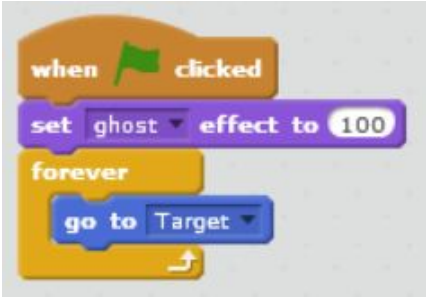


ii. Description: when the Goal message is received, display a word bubble from this sprite saying “Goooooooal!” for 2 seconds.

d. Create a hitbox to detect if the target was hit:
   i. Click **Paint new sprite**.
   ii. Rename it to “Hitbox” by following the same instructions as renaming the Cat above.
   iii. Click the **Convert to vector** button in the lower right corner of the canvas.
   iv. Select the **Rectangle** button (right side of the canvas).
   v. Click and drag in the canvas to draw a small square that’s about the size of your mouse cursor arrow.
   vi. Center the hitbox in the canvas by dragging it or by selecting the **Set costume center** button (top right of canvas) then clicking the center of your hitbox square.
   vii. The hitbox should look something like this:



e. Attach the hitbox to the target with the following code:



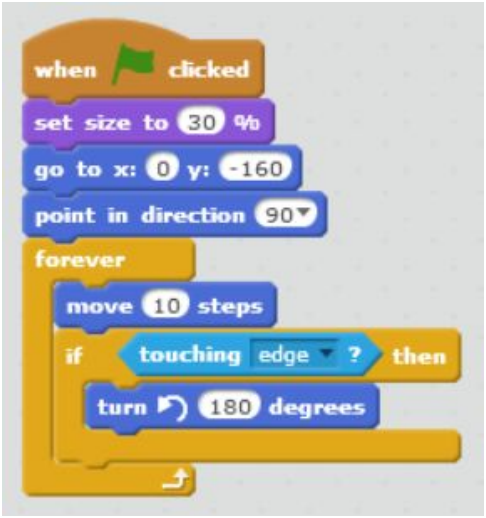
   i. Description:

1. When the game starts, make the hitbox invisible by setting it's ghost effect to 100.
2. Stay in the center of the target forever.

f. SAVE and RUN

3. You may have noticed our Cat's kicking ability is limited, so let's change that:
   a. Add a line sprite for a kick power bar:
      i. Click **Choose sprite from library**.
      ii. Find and select the Line sprite (look under Things and scroll a little more than half way down).
      iii. I like to change the color to green to match the button we're about to add: go to the Costumes tab of the Line > Select **Color a shape** (right side of canvas) > pick a green color > click the Line in the canvas.
      iv. Now add the following code to set the position of the line at the bottom of the screen:

   b. Add a button sprite to finish the kick power bar:
      i. Click **Choose sprite from library**.
      ii. Find and select the Button1 sprite (look under Things).
      iii. Add the following code to make the button slide along the power bar:



1. Description:
   a. When the game starts, set the size to 30% of the original button, position on the Line, and point towards the right.
   b. Repeat forever:
      i. Move towards the direction the button is pointing.

ii. If the button touches the edge of the screen, then reverse directions to start moving the other way down the power bar.

c. Now let's make the kick power change with the position of the button on the power bar:
   i. Add the following code to the soccer ball sprite:
      1. The code will go in the **When space key pressed** block between the **set Gravity to** and **show** code snippets.

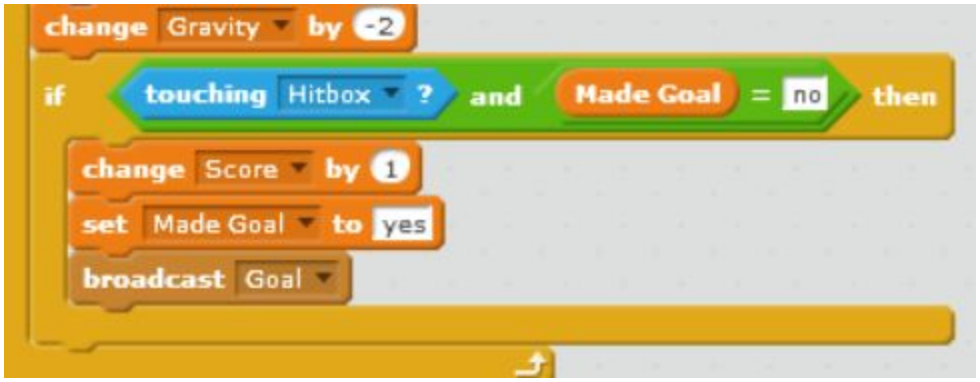
      2. Description:
         a. We're going to add to the base value of the Gravity variable when the space bar is clicked.
         b. The amount we add to the gravity variable is determined by the x position of Button1 as it moves back and forth along the power bar.
         c. We make sure the value is always positive by adding 160 to the x position.
         d. We modify the value to a reasonable amount by dividing by 20 (so the Cat doesn't always kick the ball too far).

d. SAVE and RUN

4. Now that we can kick the ball at the target, let's score some goals:
   a. Add the following **set** code snippet to soccer ball sprite:
      i. Create a Made Goal variable:
         1. Select the **Data** category under scripts.
         2. Click **Make a Variable**.
         3. Name the variable "Made Goal" and make sure it is set **For this sprite only**.
         4. After the variable is created, deselect the checkbox next to it in the **Data** scripts area so it won't show on the stage.
      ii. Add the code to the top of the existing **when space key pressed** code block.

      iii. Description: we haven't scored a goal yet when the ball is clicked, so set the value to "no" (this is known as a boolean value, which only has 2 states: either yes/no, 1/0, true/false, etc.).

b. Next add the following code to the same **when space key pressed** code block:
    i. Create a Score variable:
        1. Select the **Data** category under scripts.
        2. Click **Make a Variable**.
        3. Name the variable “Score” and set it **For all sprites.**
    ii. The code will go inside the **forever** loop, but at the very bottom under the **change Gravity by** snippet.



    iii. Description:
        1. If the ball touches the Hitbox and we haven’t already scored on this shot, then:
            a. Increase the score by 1.
            b. Set Made Goal to “yes” so the score won’t increase any more on this shot.
            c. Broadcast the Goal message so other sprites can act.

c. SAVE and RUN

5. Let’s add the final touches:
    a. Let’s add a game over screen:
        i. Create the sprite:
            1. Click **Paint new sprite**.
            2. Select the **Text** tool in the costumes area.
            3. Change the color of the text with the color pallet at the bottom of the screen.
            4. Now click in the paint area and type “Game Over.”
            5. Center the text by selecting the **Set costume center** button (top right corner) and clicking in the center of the text.
    b. Now add the following code to the game over screen:
        i. You’ll have to create a Timer variable:
            1. Select the **Data** category under scripts.
            2. Click **Make a Variable**.
            3. Name the variable “Timer” and set it **For all sprites.**

ii. Description:
    1. When the game is started, hide the game over screen, center its position, double the size, reset the score to 0, and set the timer to 30.
    2. Repeat forever:
        a. Wait one second and decrease the timer by the same amount.
        b. If the timer is less than 1 second (0 seconds), then show the game over screen and stop the game.

6. SAVE and PLAY!!! We're done!
    a. Other ideas:
        i. Add sounds for when the ball is kicked and when there's a goal.
        ii. Give your Cat controls so it can move around.
        iii. Add a start screen with instructions for the game.