Project 9 – Graphing resistance

1. Start Scratch or open a new project and make sure your picoboard is connected.

2. Click on the stage and edit its costume. Using the paint bucket, color the entire stage.

3. Click on the *paint new sprite* icon. Draw a thin, straight line horizontally across the entire editor screen. Draw thin, straight vertical line upward starting at the left end of the horizontal line. The sprite should look like an x,y coordinate graph. Click *OK* and rename the sprite.

4. Position the line sprite so that is at y = 0. Enlarge the line until the horizontal line is almost the width of the stage.

5. Delete the cat sprite. Import a new sprite. Be sure to rename the sprite.

6. Position the new sprite over the intersection of the vertical and horizontal lines of the first sprite (line sprite). Make sure the center of this sprite is positioned at y = 0.

7. Make sure your new sprite (not the line sprite) is selected. Drag a start hat onto the scripts area.

8. Select *make a variable* and label it "Trial". Make sure it is for all sprites.

9. Drop the *set Trial to 1* block below the start block.   You may need to change the value to indicate 1.

10. Add a *repeat until* ◯ loop. In the conditional block, add the Boolean operator, □>□. In the first box, from the Motions block palette, place the reporter *x position*. In the second box, place the x value for the right end of horizontal line. (Hint: if you place your mouse pointer over the end of the line, the x-y coordinates will be shown to below the stage.) This stops the program when the sprite gets to the end of the horizontal line.

11. Drag the *pen down* and *set pen size to 4* inside the repeat loop.

12. Next, you need to move the sprite to the point that correlates to the resistance reading from the pico board. Inside the loop, drop the Motion block *go to x:*□ *y:*□ . With each trial, the sprite need to move along the x axis. Using the Boolean operator, □+□, put the reporter *x position* in the first box and 10 in the second box.
    Drag *resistance-A sensor value* into the box for y.

13. Add *say resistance-A sensor value* and *change Trial by 1* blocks.

14. To slow down the program, add *wait 0.5 secs*.

15. Finally, you need a script to reset the stage. Drag a second start hat into the scripts area. Make sure the start input is different. (If the first starts using the green flag, the second should start with the space key.)

16. Add the following blocks: *clear, pen up, set Trial to 0,* and *go to x:☐ y:☐* . The x and y values should be the intersection point of the horizontal and vertical lines. (Hint: the y value should be 0).

Question: Why should the y value be 0?