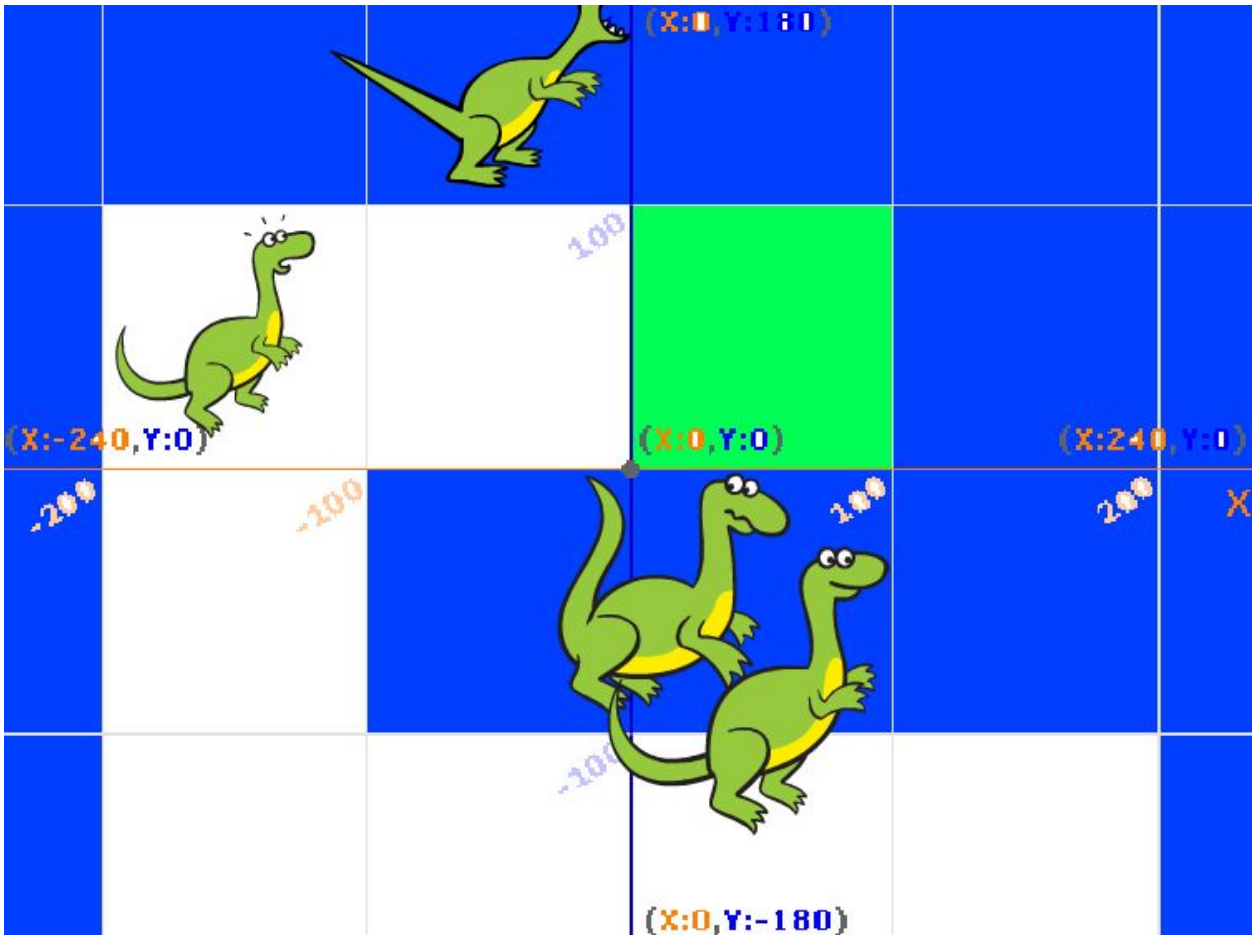
3 Hour Maze Scratch Workshop

Noah Rubin



This example was made by an enthusiastic 2nd grader, Kevin R.

Level 1

A Quick Note:

Hi! My name is Noah Rubin. I created this workshop for beginner "Scratchers" with little to no experience in any programming for motivated kids between the grades 2 and 4. If you find a 1rst or 5th grader who is very excited to be in this workshop, by all means let them do it. My mission is to create a love of programing among young children, and if you can help me accomplish that I will be eternally grateful. As a teacher, it is important to engage the students through any way possible and make it fun. Make sure to give them a piece of information and let them figure out how to apply a concept to their game. You will see this in the following lesson plans. The outcome is not only rewarding for them but is very rewarding for you to see their "Ah Ha!" moment. Make sure that you are very comfortable with the material that you are teaching and any questions that may arise.

Thank you for your help,
Noah Rubin

P.S. Make sure you're having as much fun as the kids are for best results. :)

What Are You Getting Yourself Into?

In this workshop you will teach a group of three to five students in grades 2 - 4. At the end of the workshop, each student will have created their own personal maze game complete with keyboard controls, colors, and enemies. In order to teach this class you must commit to spending much more time than just the 3 hour class itself. You will need to learn these curriculums like the back of your hand, so to start, open a new scratch project and skim through the lesson plans and create the project for yourself. This will help you understand and get to know the curriculum. For an experienced "Scratcher" this shouldn't take long. Next, you will have to set up a Scratch account for each of your students. Make the username generic such as namegrade (noah8) or namelastinitialgrade (noahr8) ect. and make the password generic as well, venueyear (yac2016) or venuecity (yacboca). Connect them to your email account. Make sure to create a spreadsheet using Exel or Google Sheets with the name, username, and password of each student. Each lesson has a condensed lesson plan and an in depth lesson plan. Bring a copy of the condensed lesson plan but you should more or less know what you have to do. The in depth lesson plan has information on how to teach the lesson, what challenges you and your students will face, as well as much more. If you have any questions you can email me at noahgidon@gmail.com or rubinn@dkja.net.

Hour 1, Introduction:
Condensed:

Bring this condensed version of the lesson plan to the class as a guide but read and study the in depth lesson plan before you get there and use the details from that in this condensed guide.

1. Introduce yourself and get to know the kids.
2. Introduce Scratch in the 3 sections and other main parts. Translate long, "confusing" words into easy to understand ones.
3. Ask them to try moving their cat. It won't work because we didn't tell it to do anything when you press the keys!
4. Give them this code:
    a. Right arrow (Events)
    b. Point In Direction 90 (Motion)
    c. Move 10 steps (Motion)
5. Act it out read it like a sentence and explain it.
6. Get them to do the other 3 directions.
7. Go to the stage's backdrops and get the XY grid. Paint bucket one square as your end square.
8. See if you can use the end block as an end block! Does your character say you win? No...
9. Walk through If Then examples
10. Forever Loop
11. Code
    a. when the Flag is Clicked (Events)
    b. Forever (Control)
    c. If (Control) touching color □ (Sensing) then
    d. Say "you win" for 2 secs. (Looks)

In depth:

1. Introduce yourself! Get to know the kids for a couple of minutes and make them excited about being able to make their own game. See if any of them have any Scratch experience, if they do you may want to use challenge cards for them later on.
2. Introduce them to Scratch. Try your hardest to make Scratch accounts for them in advance with a username such as namegrade and a generic password like venueyear. If you can, set up the game before you get to the first class in order to speed up the class (steps 3, 9, and 10).
3. Create a new project and name it "My first game" in the top right hand corner.
4. Introduce them to the setup of Scratch. Put complicated words into kid-friendly words like this: This is the stage, it's where you will play your game. This is your sprite, he will be your character, we can tell him what to do by dragging command blocks in from here onto our scripts area, coding area... Ask them if they know what the word code means. Code = Instructions. Make sure to include small, but major things too like the green flag. Make sure they understand the layout of Scratch before moving on, but don't spend too much time explaining or you may bore them.
5. Ask them to try and move their cat with the arrow keys, they will see that their cat doesn't want to move! Ask why. It is because we haven't told him to do anything! Engrane into their head that their game will be doing exactly what it is told to do, nothing more nothing less (even if it's not doing the right thing that's what you told it to do) at any point you can.
6. Tell them to drag in this code and snap it together:

a. Right arrow key pressed(control) Press the little triangle to change the key
b. Point in direction 90(motion) Press the little triangle to change direction
c. Move 10 steps(motion)

7. Explain that you can read the code like a sentence, when the right arrow key is pressed, point in direction 90, and then move ten steps. Go to the middle of the room and act this out so that they understand every piece of the code and why they need it.
8. Ask them to do Up, Down, and Left alone. They will want your help but encourage them to do it alone by believing in them. Say things like, "I know you can do it!"
9. Is their cat going upside down? To change this tell them to click on their cat directly under the stage (the icon) and then click the i. They can then change the settings of their cat. Use the rotation style setting and switch it to left-right.
10. Now tell them to click on the stage's icon under the stage and then go to backdrops on the top right hand side of the scripts area. Ask them to click on the picture frame to access a library of backgrounds make sure that they all go down to the last one and pick the coordinate plane. Explain that this is the easiest one to customize and that's why we are using it. Steps 9 and 10 can be done in advance for them (if you have time, it is a great thing to do, see step 2).
11. Use the paint bucket tool to color in ONE square in a color, this will be their ending square of their maze. If they mess up just change the color of the paint to white and color it in or press the back arrow above the editing area, NOT the browser.

12. Go back to our character's scripts by clicking on him in the left hand corner of the screen and then changing back to scripts from costumes from the top right hand corner.
13. See if their character will say you win when it touches the square! It doesn't because you didn't tell him to do anything when he touches the square.
14. Explain what an if then statement is. Use an example, If I jump in a pool then I will get wet ask them for examples.
15. See if they can figure out the application of if my character touches the square, then it will say you win.
16. Then tell them that an if then statement only asks the question one time, in order to keep asking the question we will use a forever loop.
17. Now add in this code:
    a. when the Flag is clicked (Events)
    b. Forever (Control)
    c. If (Control) in the gap put touching color ▢ (Sensing) click on the box and then on your color square to make it go [Important: make sure the If goes inside the forever]
    d. Say "You win!" For 2 secs (Looks) [Important: make sure the say goes inside the if]
18. Ask them to read it like a sentence. Stress that once the code gets to the bottom it goes right back up to the top because of the forever loop. Make sure to let them know that the Green Flag starts your game

Hour 2:
Condensed:

Bring this condensed version of the lesson plan to the class as a guide but read and study the in depth lesson plan before you get there and use the details from that in this condensed guide.

1. Review!
2. Paint in the maze in the Stage's Backdrops
3. Can you play your maze? The walls don't work!
4. Add the 2nd if statement
    a. If (Control) touching color ▢ (Sensing)
    b. Say "Ouch!"
5. Explain the starting position with a Go To X: Y: (Motion) block. Add it in just after the flag is clicked event so our character goes there at the start of the game
6. Also add the Go To X: Y: (Motion) on the second if statement after the say so if we touch the wall we go back to the start.
7. Add more colors if there is time.

In Depth:

1. Review! Go over the pieces of code that they did the last time. Ask them what this means why do we need this. What does it do, get everyone involved.
2. Tell them to go back into their stage's backdrops and think of a starting position for their character and then bucket in a maze to get from their to their ending square ask them to use a totally different color than before. If they mess up just change the color of the paint to white and color it in.
3. Now go back to the character's scripts and see if you can go through the maze! Why doesn't it work? You can go right through the walls! Because we didn't tell it to do anything.
4. Add another if under the other if statement.
    a. If(control) touching color ▢ (Sensing) then
    b. Say "Ouch!" (Looks)
5. Now show them the Go To X: Y: (Motion) block we can use this block to jump to any position on the stage. Drag the character to the starting position and the coordinates will change! Drag in the Go To block right after the when the flag is clicked so it only happens once, when we start the game we go to the start position.
6. Then add in the same block after you say ouch in the second if so that if you touch the wall you go back to the start.
7. If there is time they can add more colors and more if statements.

Hour 3, Next Steps:
Condensed:

Bring this condensed version of the lesson plan to the class as a guide but read and study the in depth lesson plan before you get there and use the details from that in this condensed guide.

1. Tell the students that we will be taking the next steps in our games, making them harder, more personal ect.
2. Review!
3. Change character by going into costumes and then new costume the furry head guy. Choose one. You may have to change his size.
4. Add enemies, under the stage, click the furry head guy next to new sprite
5. Introduce glide
6. Put in setup code:
    a. when the Flag is Clicked(control)
    b. Go To X Y-start position(motion)
7. Ask what can be used to repeat something over and over again
8. Add in a forever
9. Glide to the 2nd position Glide to the 1rst position
10. Play the game, the enemy is friendly, why?
11. we need to add an If statement see if they can figure this out:
    a. If(control) touching Sprite 2(sensing) then
    b. Say "ouch!" for 2 secs(looks)
    c. Go To X Y(motion)
12. Add more enemies alone and/or play each others games in fullscreen by using the fullscreen button above the stage that looks like a square with 4 corners around it.

In Depth:

1. Tell your students that we are going to take the next and final steps to make our game harder, more fun, and more personal.
2. First we are going to review! Review all the code up until now by asking them what it means, if they can't get it, explain it to them.
3. Now we are going to change our character! Tell them to go to costumes and click on the furry head guy under new costume.
4. Choose one but also have in mind what your enemy might be.
5. Explain that nothing has changed but what the character looks like, you may need to change the starting location or size with the resize tools at the top right hand corner of the stage.
6. Once the character fits in the maze, explain to them what glide does. Glide is a motion block and glides your character for however many seconds to an X Y position. We will use this for our enemies to glide back and forth.
7. First we have to create an enemy though, go to the New Sprite furry head guy on the bottom right hand part of the stage and choose one. Some have more than one costume.
8. Tell them that their code hasn't disappeared we are just programming the enemy.
9. We will use a When The Flag is Clicked (Control) to start him gliding when the flag is clicked.
10. Ask them what block we need to go to a start position- Go To X: Y: (Motion) add in the coordinates of your sprite they can be found in the top left hand corner of the scripts area.
11. Make sure they have this code
    a. When The Flag is Clicked (Control)
    b. Go To X: Y: (Motion)

12. What block can we use to repeat something over and over again? Forever Loop!
13. Drag it in from control and then bring in the glide block from motion.
14. Tell them that they have to move their character to their second position by dragging their player and then check the coordinates of that spot.
15. Change the X Y to those coordinates with the glide block.
16. Now just tell them to add another glide block with the start coordinates.
17. Play your game! You will find that the "enemy" is friendly! How can we change that?
18. we just have to add another if statement! Take them back into the character by clicking on its icon under the stage and then add an if statement under the 2nd one.
19. Ask them and see if they can figure it out!
20. Here it is:
    a. If (Control) touching Sprite 2 (Sensing) then
    b. Say "ouch!" for 2 secs(looks)
    c. Go To X Y-start position(motion)
21. If there is time ask them to add more enemies and play each others games in fullscreen by clicking the fullscreen button above and to the left of the stage (next to the title) .