Integrating Computing Across the Curriculum

Maze Game Lesson Plan

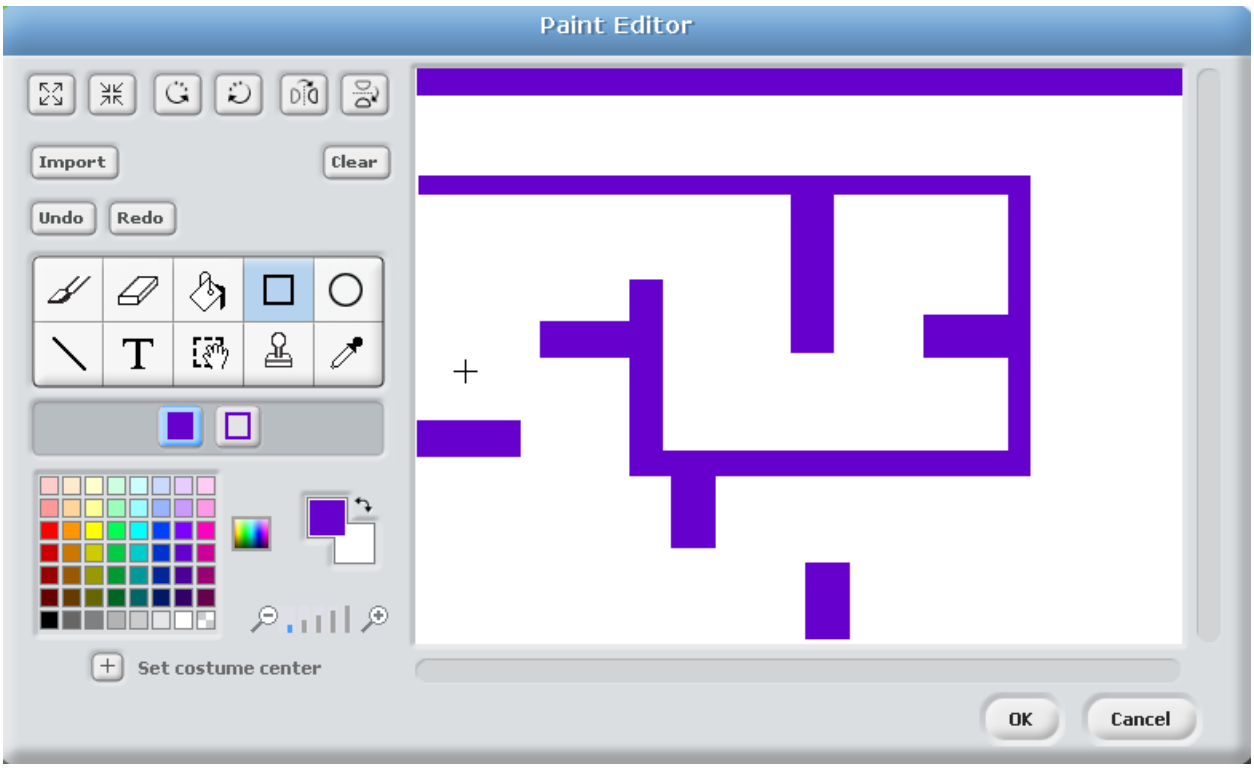
Introduction:

We will be programming a maze game in Scratch. The main goal of this game is to program your sprite to be able to navigate through a maze that you have created.

Building Your Maze:

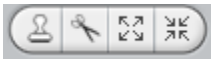
In Scratch, click "Stage" area and then click the "Backgrounds" tab. Under the area where it says "background1" click "Edit".

Using the Rectangle Tool in the Paint Editor, create the walls of your maze. Your maze could look similar to this:



Shrinking Your Sprite:

To be able to navigate through the maze, your sprite needs to be small enough to fit in between your walls. To accomplish this, find the four buttons at the top of the screen, which look like this:



The last button is the "shrink sprite" tool; and the one that we need. Once the button is clicked, hover over your sprite and continue to click him until the desired size is reached. Now move your sprite to the beginning of your maze. Program the sprite to go to the beginning of your maze when the green flag is clicked. (Hint – remember that x- and y-coordinates are used to specify exact locations.)

Movement:

We would like our cat to move when the arrow keys are pressed.

When the right arrow key is pressed we can point the Sprite in a certain direction and move ten steps.

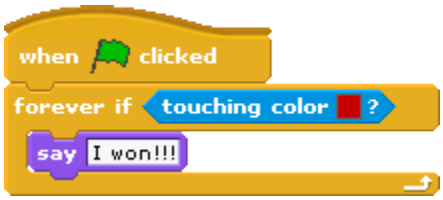
Program your sprite to move in the corresponding direction (left, up, and down) when the arrow keys on the keyboard are pressed.

Sensing:

Now we would like our sprite to move between our walls without touching them. To do this we can use the light blue blocks called "Sensing". When the green flag is clicked, continuously (forever) if our cat is touching the color of our walls, then he needs to go to the beginning of our maze. Program your sprite to do this.

End of Maze:

Once your sprite has successfully navigated the maze, we would like a special message to pop up. First mark the area where the end of your maze will be. To do this, go back to your "Backgrounds" tab and click the "Edit" button. Next, draw a different colored square where the end should be. Now, go back to the scripts of your cat and program him to say a special message when he is touching the ending color of your maze.



EXTENSION – Time Dependent

For the students that complete their maze early, you can challenge them to figure out how to add extensions to their projects, such as sounds, obstacles, and lives. Be sure to provide skill-level

Obstacles:

To make our maze a bit more difficult to navigate, we can add obstacles. One way to do this is by adding another Sprite and programming him to block a path in our maze. We can accomplish this by having this Sprite constantly glide from one x, y coordinate to another x, y coordinate.

Lives:

One last thing we can add is lives. If our cat hits a wall and goes back to the beginning, he loses one life out of three. To do this we need to use the Variable blocks (dark orange). Click in that area and select "Make a variable". When the prompt comes up to title your variable, call it "Lives" and more blocks should appear. When we start the game, we want to set our cat's lives to three. If our cat hits a wall, we want to change our lives by -1. You will need to modify the existing script for when the sprite touches the walls of your maze. If our lives equal zero, we can switch to a "Game Over" background. You will have to use broadcast and when I receive. The when the stage receives the broadcast, the background should change. Program all of the above.