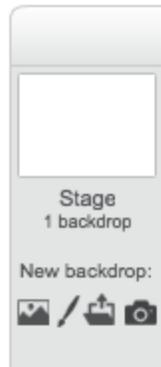


## Lesson 5 - Additional Concepts: Background Images, Custom Blocks, Saving and Combining Projects

### Part I :

To change the background image, notice that there are four icons under “New backdrop” below the stage icon:



These allow you to add a background to the stage in four different ways: choosing one of their stock images, drawing your own image, uploading an image, or taking a picture. We will upload an image.

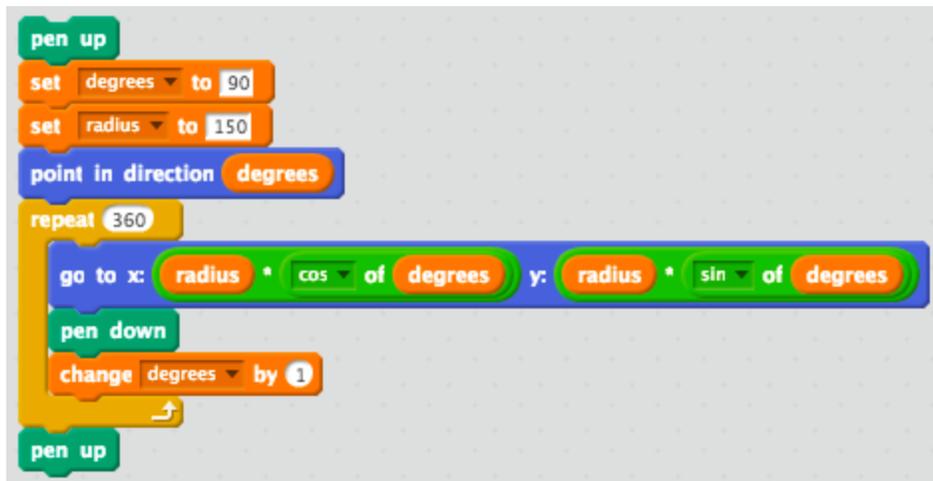
Click the file folder button, and select an image from your computer. You can edit the picture once it is in Scratch. There are different editing options for bitmap and vector images; make sure that vector is selected in the lower right corner.

Resize your image to fit the background by choosing the “Select” tool (it looks like an arrow) in the top right corner and dragging the edges of your image around. This may stretch the image; you will have to decide if you prefer a stretched image or extra white space.

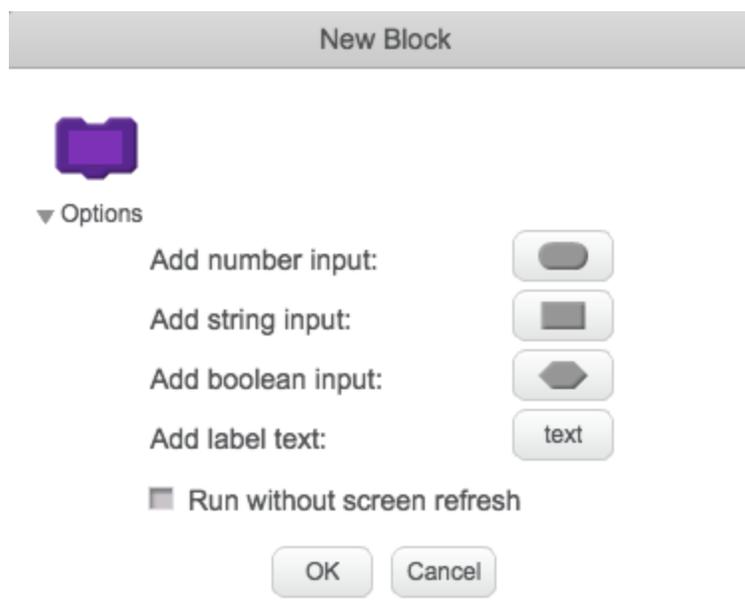
## Part II :

What if you want to use the same code more than once in your program?

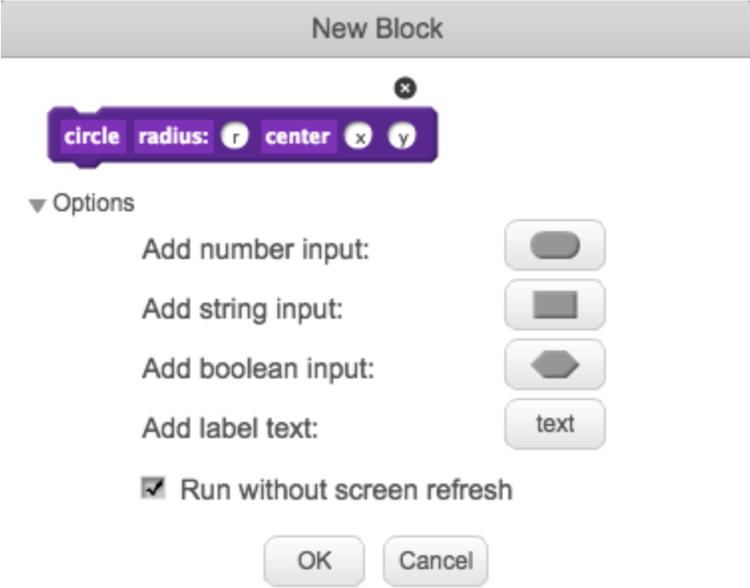
Creating a custom block can help! For instance, let's say we want to make more than one circle on the stage. As we saw previously, this code draws a circle:



To re-use this code more than once in a project, go to More Blocks and click on . This opens the custom block dialog. Click on the triangle next to Options, and it will look like this:



First, name the custom block “circle” by typing in the square box inside the purple shape. Then, we need to add the parameters of a circle - the radius and the x and y coordinates of the center. Add a label for the radius, followed by a number input, then a label for the center and a number input each for the x and y coordinates. It will look like this:

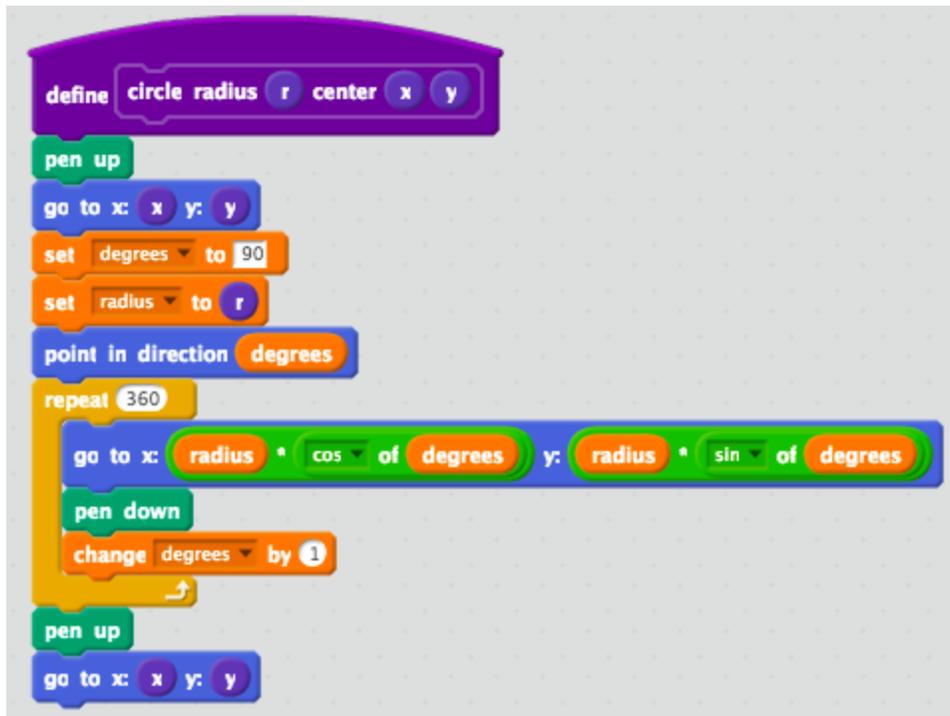


Selecting “Run without screen refresh” means the code will run entirely and then update the screen. Any drawing will take place “instantly.” This will make your program run faster, but may not be as interesting to watch and is more processor-intensive. It is up to you to determine which way works better for your project.



Once you press “OK,” a ‘hat’ block will appear:

Now add in the circle code:



```
define circle radius r center x y
  pen up
  go to x: x y: y
  set degrees to 90
  set radius to r
  point in direction degrees
  repeat 360
    go to x: radius * cos of degrees y: radius * sin of degrees
    pen down
    change degrees by 1
  pen up
  go to x: x y: y
```

You can now use this block of code by going to “more blocks” and using the new “circle” block: . The radius and center all default to 1, but you can change them to draw any circle you like.

### Hint

Choosing the pen color can be a hassle. This custom block allows you to choose RGB values instead of the usual way:

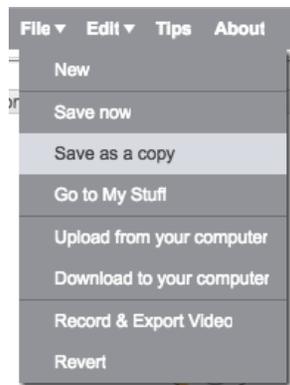


```
define Set Pen Color to red: r green: g blue: b opacity: opacity
  set pen color to r * 65536 + g * 256 + b + opacity * 16777216
```

## Part III :

Always remember to save your project! Scratch automatically saves it on occasion, but save it manually too. You can tell if your project is saved if it says “Saved” in the top right corner of the screen. If it says “Save Now,” consider clicking it to save your work.

If you make big changes, you may do something that causes your code to fail in unexpected ways. Going back to the previous version can sometimes be advantageous. Before big changes it is helpful to save a copy of your work:



## Right Clicking

Right clicking on various things can open ‘secret’ menus that can be very helpful. Here are a few:

- When you right click on the stage, you can save a jpeg of it.
- When you right click script blocks, you can:
  - Duplicate that block
  - Add a comment (very helpful for remembering what it is supposed to do)
  - View help about the block
- If you have more than one variable defined, right clicking on one lets you change it to any of your variables.
- When you right click on math functions, you can switch between them.
- When you right click the definition of a custom block (its “hat” block), you can re-open its custom block dialog window

### Combining your Projects

When combining projects it may make sense to create a new sprite and have one sprite draw each project. This makes the code look tidier, and the computer will not bog down if you have a lot of things for just the one sprite to draw.

### The Backpack

If you need to move pieces of code from one project to another, drag them into the backpack below the scripts area. You can then drag them up from there into your other projects. Beware when doing this: you must drag any custom blocks included in the script BEFORE dragging the script, as the program does not do this for you. Any custom variables ARE created for you, but also be aware of conflicting variable names.

### Further Exploration

Can you make a sprite that draws a circle, and then creates another one to do the same? Explore using clones...

<https://en.scratch-wiki.info/wiki/Cloning>



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