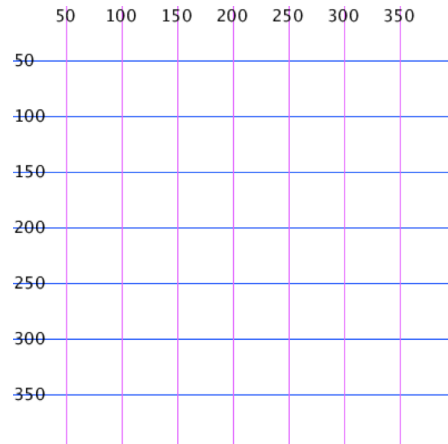# Circle Puzzles!

Z. Wood & J. Wilcox

Today we will focus on writing a computer program to re-create a sample shape. Our goal is to practice controlling where ellipses draw using code to make a complete picture! To help with this puzzle, you will be given a starting program which creates a sketch (400 by 400) that draws a grid using lines each of which are 50 pixels apart:
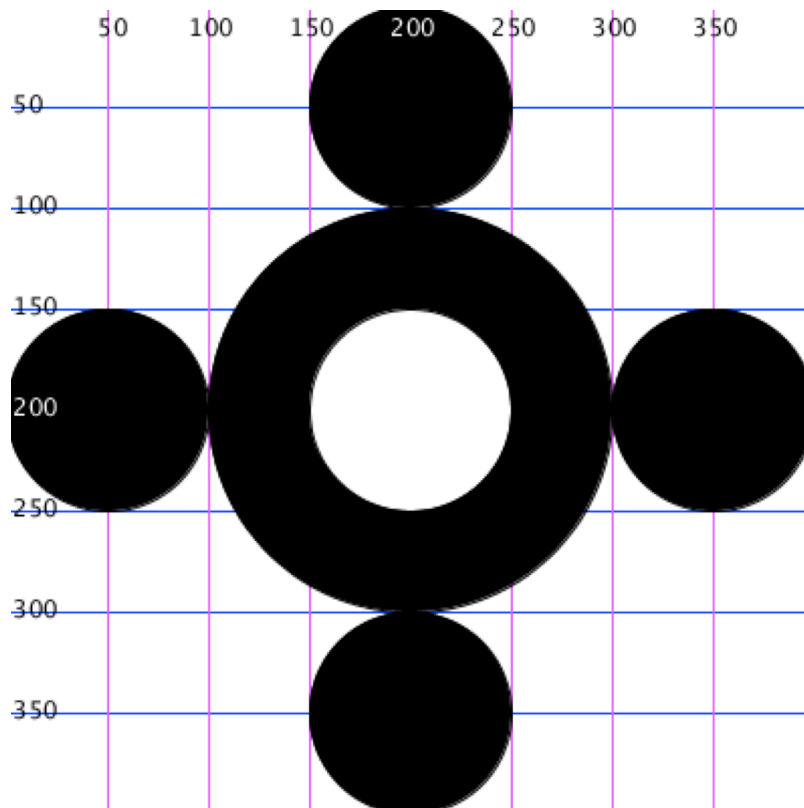

Starting Code	**How to get the starting code.**

size(400, 400);
 background(255);
 	
 //the horizontal lines
 stroke(0, 0, 255);
 line(0, 50, width, 50);
 line(0, 100, width, 100);
 line(0, 150, width, 150);
 line(0, 200, width, 200);
 line(0, 250, width, 250);
 line(0, 300, width, 300);
 line(0, 350, width, 350);
 //the vertical lines
 stroke(255, 0, 255);
 line(50, 0, 50, height);
 line(100, 0, 100, height);
 line(150, 0, 150, height);
 line(200, 0, 200, height);
 line(250, 0, 250, height);
 line(300, 0, 300, height);
 line(350, 0, 350, height);
	Enter Zoe Wood Cal Poly into a search. Here is the URL http://users.csc.calpoly.edu/~zwood/
	
	 Towards the bottom of the page, click on <u>outreach</u>
	
	 Find Work with 5th Grade, Peabody Charter School 2018/9
	
	 Find <u>Base Code for Grid</u>
	
	 <u>To Copy and Paste (shortcuts for chromebook given)</u>
	
	 Click anywhere on the whitespace on the page with the code.
	 Press cntrl and a to select all (words will highlight blue)
	 Press cntrl and c to copy
	 Go to your coding page and press cntrl and v to paste

TODO: Re-create each of the shapes below. For each of these, you need to think about how to make the ellipse draw where you want it to go (use the grid lines to help you!) and you need to think about command order to solve the puzzle (remember that if you have the computer draw two ellipses with the same center point, the first ellipse will be underneath the second ellipse).
Recall that the ellipse command is:
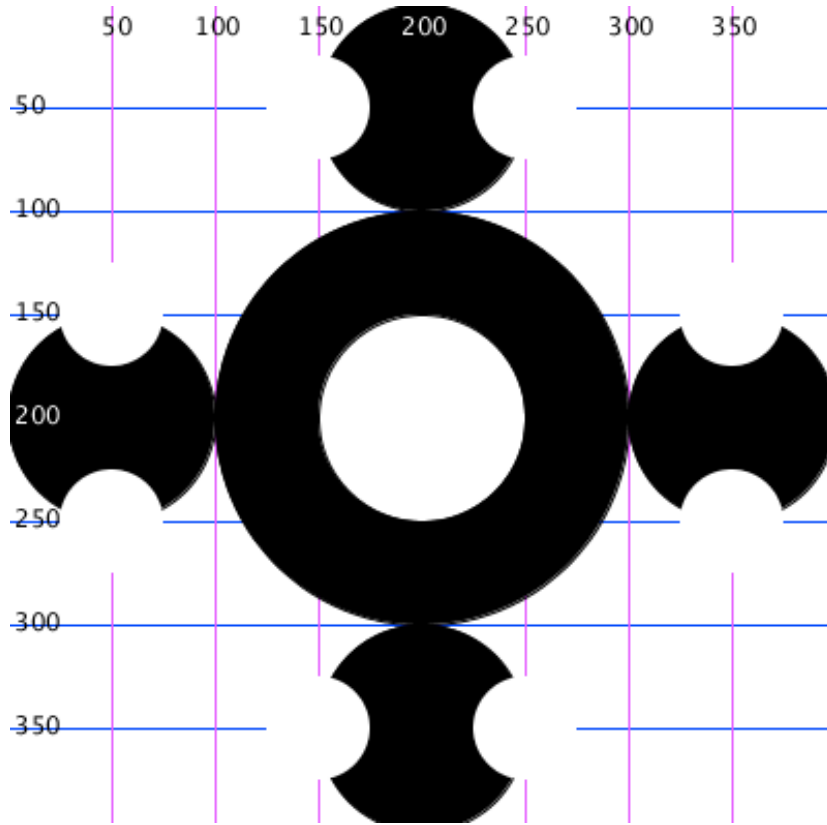 *ellipse (x, y, width, height);*

Puzzle 1 (intro level):
This shape requires that you add 6 ellipse commands. You may choose their colors but keep to 2 colors (in the examples you see black for the outside and white for the inside being used). You could start by filling in the values for the grid lines on this paper. Make the five black circles first and finish with the white circle (remember that it is ok to change to two other colors instead of black and white).
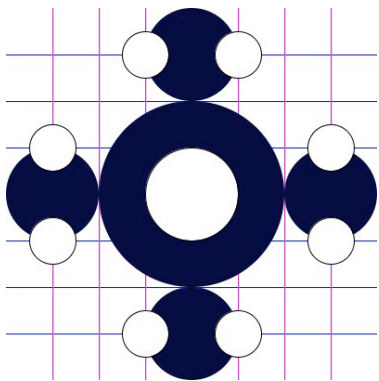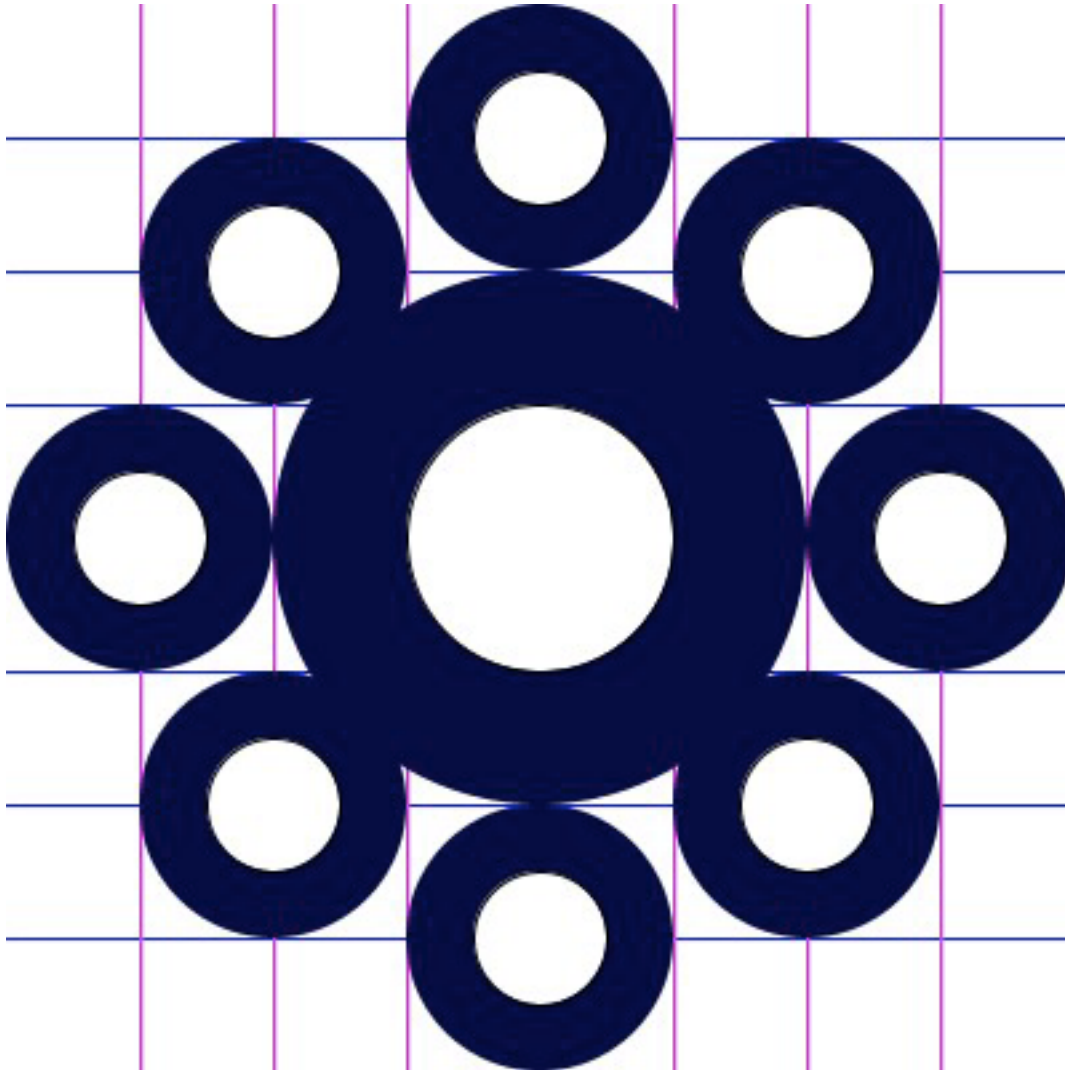
Puzzle 2 (middle level):

This shape requires that you add 8 ellipse commands to the puzzle you just completed.

Hint: look at the image below...there is a command called *noStroke();* that will stop the outside line from being drawn around the ellipse. Without the line *noStroke();* , your picture probably looks like the one below.

Puzzle 3 (level-up): This shape is made up of 18 ellipse commands. You just need to add 4 of the medium sized ellipses to Puzzle 2 and then move the smaller ellipses into the correct positions.

<u>Challenge</u>: Create your own circle puzzle to challenge a friend! What image can you design? Use a maximum of 20 ellipses in your image. Stick to height and width being multiples of 50 (50, 100, 150, 200…). However, the height and width of one ellipse CAN be different. For example, one of your ellipses could be…

ellipse (100, 150, 150, 100);

//notes for teacher

It is helpful to reiterate multiple times that each puzzle is just built on the previous puzzle. There is no need for the students to erase their code and start over each time.

Another way to get to the coding page on Zoe's site is by putting 'wilcox peabody processing' into a google search.

One of the most common mistakes that students will make is they will grab the lesson (circle puzzles) instead of the code for the grid (base code for grid)

By this lesson, it can be helpful to find a way for the students to save the code they are writing. We have been using a folder that the students create on their google drive.