

Scratch Variables & Loops: Spirograph

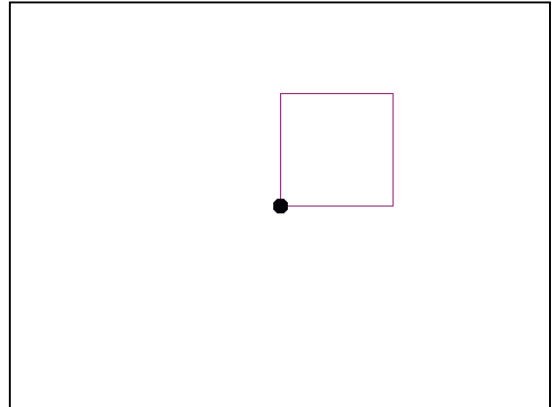
Name: _____ Period: _____

Design

Now that you've learned how to use variables, now we're going to learn how to **design** a program based on what we see.

1. Go to your Scratch folder and make a copy of **pen2.sb** and call it **pen3.sb**. Open the file and ensure the code looks like that shown below. Set your variables so that your script draws a square like the one at the right.

```
when clicked
  set pen color to purple
  go to x: x y: y
  point in direction 90
  pen down
  clear
  repeat times
    move move steps
    turn 360 / times degrees
    change pen color by color
```



What did you set your variables to?

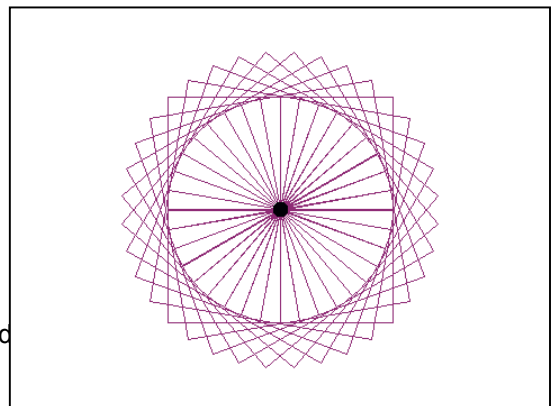
X =

Y =

times =

move =

2. Our goal is to draw this more complicated picture on the right. What are some of the things we might need to know to draw this?



Scratch Variables & Loops: Spirograph

- A. What control statement will be helpful in reproducing this picture?

- B. How many times is the square reproduced? Add a variable called *duplicates* to represent this amount.

- C. How many degrees are in a circle?

- D. How many degrees does the sprite rotate between drawing each square? (Hint, there is a relationship between the answer and B. and C.)

- E. So how can we get this done... Well It turns out you can put a loop inside a loop! Then change your code so it looks like this

```
set pen color to purple
go to x: x y: y
point in direction 90
pen down
clear
repeat _____ (see question B )
  turn ____ / _____ (see question D)
  repeat times
    move move steps
    turn 360/times degrees
    change pen color by color
```

Get your Program working, Save it as pen3.sb (or Spirograph) and have it signed off!

Pretty clever, huh?