# Geometrical Patterns with Scratch

1. Open a new Scratch project
2. Delete the Cat Sprite
3. Click on the Stage and fill it with a solid color of your choice (black looks great)
4. Add a new Sprite from the library of Sprites
5. Make sure you are clicked on this Sprite
6. Click on Data, Make a Variable, Name it Steps, apply it to all Sprites and then click OK
7. Add the following script to this Sprite:

```
when [green flag] clicked
forever
    set pen color to [ ]
    clear
    pen up
    go to x: 0 y: 0
    pen down
    point in direction 90
    set steps to 10
    repeat until < touching edge ? >
        wait .2 secs
        move steps steps
        turn ↻ 90 degrees
        change steps by 5
```

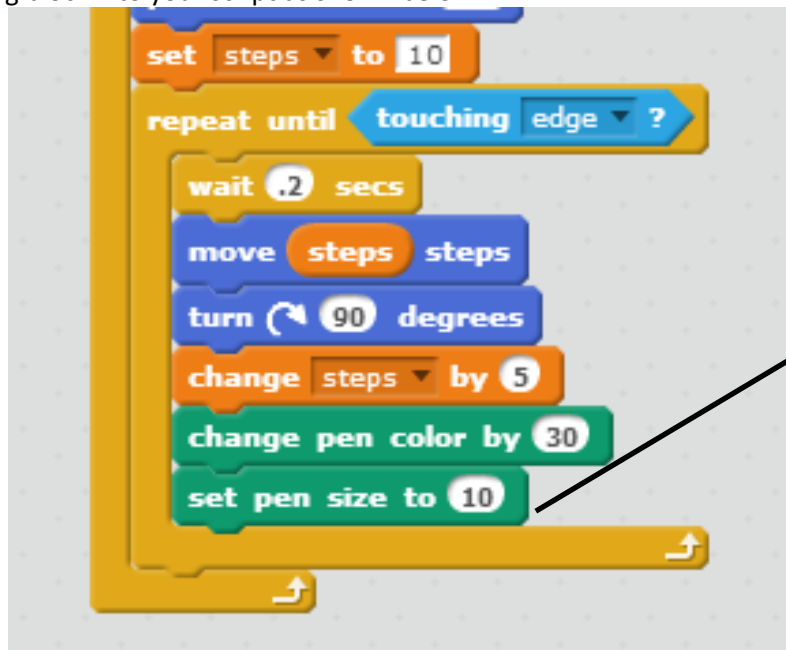8. Run the Script by clicking on the Green Flag.
   What shape did you just create? _____

Let's change the pen and see what happens.

9. Insert the following block into your script as shown below:

> Insert this block
> (It is a Pen Block)
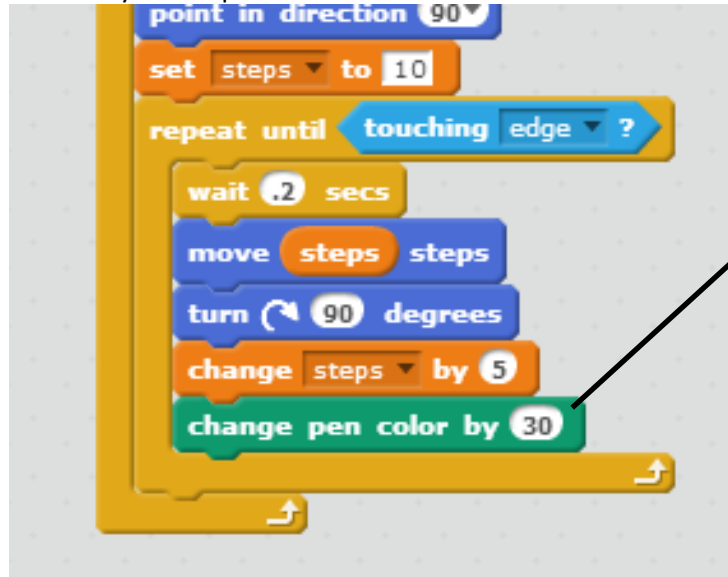
10. Run the script and see what happens.

11. Insert the following block into your script as shown below:

> Insert this block
> (It is a Pen Block)

12. Run the script and see what happens.

Let's make some geometrical changes and see what happens:

13. Click in the turn ↺ 90 degrees and **change it to 45 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done. **What shape does this create?**
   _____

14. **Now change it to 60 degrees.** Run the Script by clicking on the Green Flag. Hit the Stop button when done.
   What shape does this create? _____

15. **Now change it to 70 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done.
What shape does this create? _____

16. **Now change it to 80 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done.
What shape does this create? _____

17. **Now change it to 120 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done.
What shape does this create? _____

18. **Now change it to 190 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done.
What shape does this create? _____

19. **Now change it to 200 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done.
What shape does this create? _____

20. **Now change it to 210 degrees**. Run the Script by clicking on the Green Flag. Hit the Stop button when done.
What shape does this create? _____

Extended Thinking

21. Experiment with the blocks to **create a circle**. What block(s) did you change? Please list the exact block change(s) below: