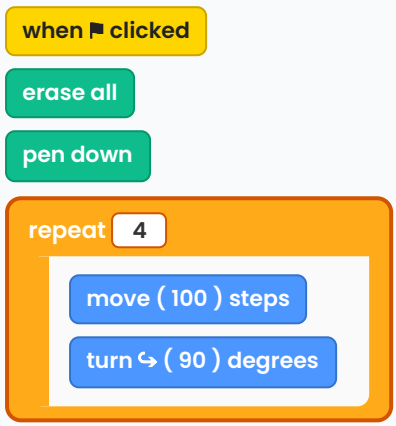
Student Name: ..... **Date:** .....

Activity 1.1: Draw a Perfect Square Algorithm

Look at the Scratch Pen script. When the pen is down, the sprite leaves a colored trail as it moves!



- How many sides does this shape have?
  Answer: [ ] sides
- Total degrees turned: 4 × 90° =
  Answer: [ ]°
- What shape is drawn?
  Answer: [ ]

Activity 1.2: Equilateral Triangle Turn Angle

To draw any closed polygon, the sprite must turn a full 360° circle! Calculate the turn angle for a 3-sided triangle.

📐 **The Magic Rule: Turn Angle = 360° ÷ Number of Sides**

For an equilateral triangle (3 sides):

360° ÷ 3 = [ ] degrees

Fill in the blank Scratch block: `turn ↻ (  ) degrees`

Activity 1.3: Pen Tool Command Match-up

Match each Scratch Pen extension block to what it does on the stage.

1. pen down	A. Lifts pen so moving leaves no line
2. pen up	B. Clears all drawing lines from stage
3. erase all	C. Puts pen on paper to start drawing

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Activity 2.1: Master Polygon Angle Chart

Calculate the exterior turn angle for each regular geometric polygon using `360 ÷ Sides`.

Polygon Shape	Repeat Count (Sides)	Formula (360 ÷ Sides)	Turn Angle
▲ Triangle	repeat 3	360 ÷ 3	**120°**
■ Square	repeat 4	360 ÷ 4	**90°**
⬠ Pentagon	repeat 5	360 ÷ 5	**[ ]°**
⬡ Hexagon	repeat 6	360 ÷ 6	**[ ]°**

Activity 2.2: Generative Spiral Art Algorithm

*If you turn **91 degrees** instead of 90 degrees while slowly growing each line, what happens?*

Because 91° is slightly more than a square's 90° corner, the lines twist on every lap! It creates a mesmerizing rainbow spiral geometric pattern.

This technique is known in computer science as:
Answer: [ ] Generative Art [ ] Typo error

Activity 2.3: Debug the Open Square Bug

Alex ran his square script, but the four lines did not close into a box! Find the bug in his turn angle.

```
repeat 4
  move 80 steps
  turn ↪ 80 degrees <-- Bug!
```

How do we fix the angle?

A square requires four corners of:
Correct Angle = [ ] degrees