🎨 HTML5 Canvas Quick Reference

1. The Canvas Coordinate System

Everything on the canvas is placed using (x, y) coordinates.

- **The Origin (0, 0)** is the **Top-Left** corner.
- **X increases** as you move **Right**.
- **Y increases** as you move **Down**.

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2. Picking Your Tools (Styles)

Think of these as choosing your paint and brush thickness *before* you start drawing.

Function	What it does	Example
ctx.fillStyle	Sets the inner color	ctx.fillStyle = "red";
ctx.strokeStyle	Sets the outline color	ctx.strokeStyle = "black";
ctx.lineWidth	Sets how thick lines are	ctx.lineWidth = 5;

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3. Basic Shapes & Paths

Function	Purpose	Logic
fillRect(x, y, w, h)	Draw solid box	(startX, startY, width, height)
beginPath()	New Shape	Call this to "reset" your pen
moveTo(x, y)	Lift & Move	Moves pen without drawing
lineTo(x, y)	Draw Line	Draws from current spot to (x, y)
arc(x, y, r, s, e)	Circles/Suns	(x, y, radius, startAngle, endAngle)
fill()	Paint Inside	Fills the path you just traced
stroke()	Paint Outline	Outlines the path you just traced

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4. Transformations & Loops

Used for your **for loop** requirement. These functions move the "paper" rather than the "pen."

- **ctx.save()**: Takes a "snapshot" of the current canvas state (position, color, etc.).
- **ctx.translate(x, y)**: Moves the (0,0) origin to a new location.
- **ctx.restore()**: Returns to the last saved "snapshot." Always use this after a loop or translation!

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5. Writing Text

- **ctx.font = "size family"**: Sets the size and font style (e.g., "24px Arial").
- **ctx.fillText("text", x, y)**: Writes solid text on the canvas at the given coordinates.

💡 Important Concept: Closing the Gap

When students draw a triangle for a roof, they might notice the lines don't automatically connect back to the start.

- **For ctx.fill()**: The computer is smart! It will automatically "close" the shape with an invisible line to fill it with color.
- **For ctx.stroke()**: The computer will **not** automatically draw the last line. To make a perfect triangle outline, they must use **ctx.closePath()** or draw a final lineTo back to their starting (x, y).

💡 Pro-Tip: The "Order of Operations"

Remind students that the Canvas draws in layers. Whatever code is at the **bottom** of their script will appear **on top** of everything else. Draw the sky and ground first, then the house! Would you like me to help you draft the **"Common Mistakes/Debugging"** section for them?