Session 2 Extension Activity: Draw Artwork with the Pen

Apply what you know about x and y coordinates to draw art with the pen:

- **Part One** - draw a square
- **Part Two** - stamp a design
- **Part Three** - sketch a drawing
- **Part Four** - create artistic designs

**Part One – Draw a Square**

Drawing in Scratch is like doing a dot-to-dot puzzle. To draw a picture, build a script that puts the pen down at the first dot. Then move the pen from one dot to next. Try it!

Form a plan. What are the x and y coordinates for each dot?

```
<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>-50</td>
<td>50</td>
</tr>
<tr>
<td>-50</td>
<td>-50</td>
</tr>
<tr>
<td>50</td>
<td>-50</td>
</tr>
</tbody>
</table>
```

Count across for x. Count up or down for y.

1. Start a new project. Name it **square**.
2. Pick a drawing tool.
3. Resize it to make it small.
5. Click Add Extension. Select Pen.
6. Build the script.

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**Study the script to get ideas:**

- **When** [clicked]
- **when** [clicked]
- **when** [clicked]
- **when** [clicked]
- **when** [clicked]

- **When** Go start to draw.
- **Go** to the first dot.
- **Put** the pen down to draw.
- **Draw** from one dot to another.
- **See** the square for 3 seconds.
- **Erase** the square.

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You need to clear the canvas.

If you do not erase it, the square will stay forever on the stage.
Part Two – Stamp a Design

You can add stamps onto the stage using a sprite. Use the `wait` block to slow down the action. This will let you see each stamp added to the stage one at a time.

Add stamps to the stage.

Form a plan. Pick four places you want to add a stamp.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>100</td>
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<tr>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

1. Start a new project. Name it `stamp`.
2. Pick a stamp.
3. Delete Sprite 1.
4. Click Add Extension. Select Pen.
5. Build the script.

You can add to the start of a script. This will remove any previous drawings.

Study the script to get ideas:

When click Go start to draw.
Erase all drawings.
Go to a spot on the stage.
Add a stamp.
Wait for 1 second.
Go to another spot on the stage.
Add another stamp.
Wait for 1 second.
Keep moving from one spot to another to add stamps.
Part Three – Sketch a Drawing

Drawing a picture in Scratch is like doing a dot-to-dot puzzle. In a dot-to-dot, each dot is numbered. A line joins one dot to the next. The lines form a picture.

Use your skills to make your own picture. Pick a suggestion or come up with your own idea.

- triangle
- house
- zig zag line
- rectangle
- letter
- My idea: ____________________________

Sketch your idea for a drawing in the space below. Circle the "dot" at the end of each line.
List the x and y values for each "dot" in the order they should be drawn.

```
<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
```

TIP: Write `pen up` after a "dot" or x y value that should not have a line drawn to the next "dot" or x y value in the list.

1. Start a new project. Name it `sketch`.
2. Pick a drawing tool:  
3. Delete Sprite 1.
4. Click Add Extension. Select Pen.
5. Build your script using Pen blocks:
   - `erase all` erase all drawings
   - `pen down` lower the pen to draw
   - `set pen color to` set the ink color
   - `set pen size to` set the line width
   - `pen up` lift the pen to stop drawing

How to draw the letter T.
Study the script to get ideas:

```
when [clicked] is clicked
  erase all
go to x: 100 y: 100
  pen down
  pen up
  set pen color to red
  set pen size to 2
  pen up
  go to x: 0 y: 100
  pen down
  pen up
  go to x: 50 y: 0
  pen down
  pen up
  go to x: 0 y: 100
```

Erase all drawings.
Go to the starting point.
Put the `pen down` to draw.
Draw the top line.
Pick the `pen up` to stop drawing.
Go to the middle of the line.
Put the `pen down` to draw.
Draw a line down.
Pick the `pen up` at the end.
**Part Four – Create Artistic Designs**

Use the Repeat and Pen blocks to create a fancy design from squares.

1. **Start a new project. Name it art.**
2. **Pick a drawing tool.**
   - Click the Costumes tab. Try the tip to edit the drawing tool.
3. **Delete Sprite 1.**
4. **Click Add Extension.** Select Pen.

5. **Build the script to draw a square.**
   - Add blocks to edit the script:
     - set the pen color
     - set the line width
     - slow the action with wait blocks

6. **Add a repeat and block to the script to draw many squares.**
   - A circle is 360 degrees. Edit the blocks to try these combinations:
     - 6 repeats of 60 degree turns
     - 10 repeats of 36 degree turns
     - 15 repeats of 24 degree turns
     - 24 repeats of 15 degree turns

7. **Add the blocks below to the script to make a fancy design using squares.**
   - **Want to draw even more squares?**
     - Right click. Select Duplicate.
     - Add the blocks to the script.
     - Edit the pen color.
     - Move a smaller number of steps.