Christmas Tree Pixel Art in Google Sheets With Changing Lights!

Overview:

This project will utilize Google Sheets to create a pixel art Christmas Tree. In addition to some formatting basics, such as resizing column widths and using fill color, a couple of spreadsheet "magic tricks" will be used to create lights that can change color.
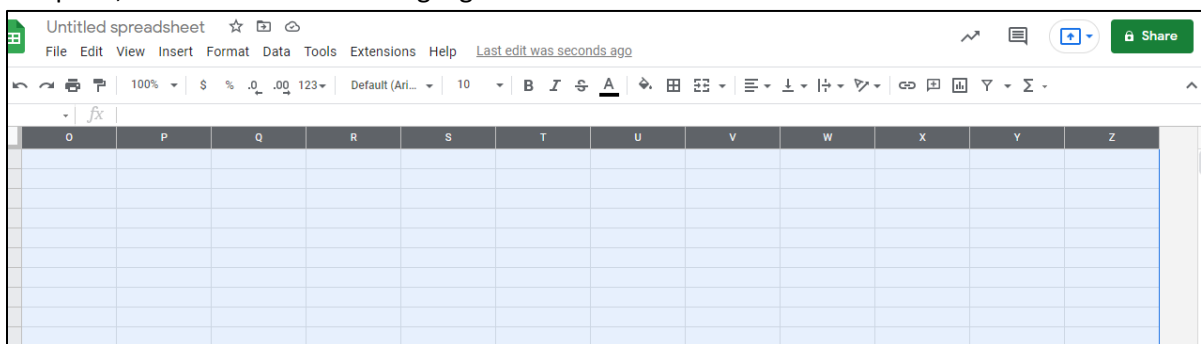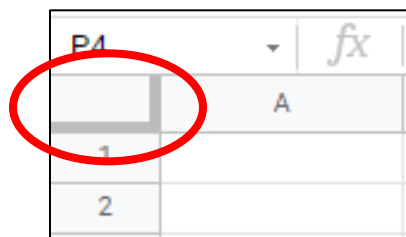
Objectives:

Students will learn to:

- Change column widths in bulk
- Select non-adjacent cells
- Change fill color
- Use the randbetween function
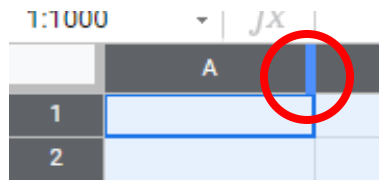- Use conditional formatting based on value

Directions:

1. Create a new Google Sheets spreadsheet.

2. We'll be treating the individual cells of the spreadsheet as **pixels**. A pixel is the smallest unit of color in a picture. Since pixels are generally square in shape and the cells of a spreadsheet are rectangular by default, the next step is to change the width of all columns.

   a. Highlight all columns by clicking on the column header "A" and dragging through the last column, "Z". When complete, all columns should be highlighted as shown below:
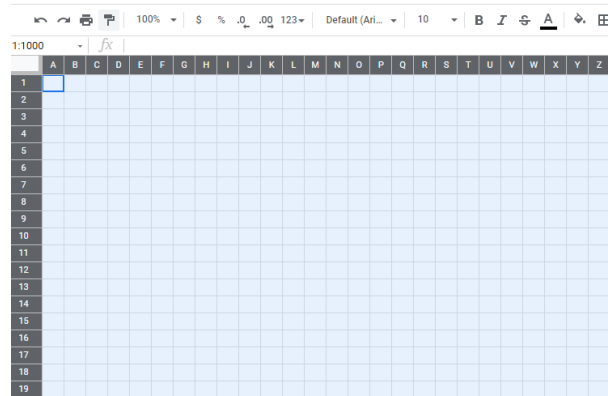

   b. Alternately, you can use the "select all" option by clicking on the area to the left of column A header and above row 1, shown below:

c. When all columns are selected, resize the columns to be about square shaped by dragging the border between column heading A and column heading B. Shown below:

d. After you've resized all of your columns to be more square, the spreadsheet will look similar to this:
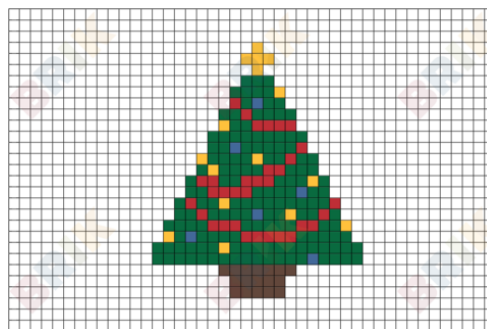

3. Next, use your fill color icon tool to begin creating your Christmas tree. Select each cell or range of cells and change the fill color to green. The fill option tool is below:

a. Use the fill tool to create a tree that looks something like the ones pictured below. Don't worry too much about the "lights" just yet, but feel free to color them in to match the picture.

EXTREME TIME SAVER: You can select many cells within your sheet **by holding the CTRL button while you select** the cells. After many cells are selected, you can change the fill color of them all at once.
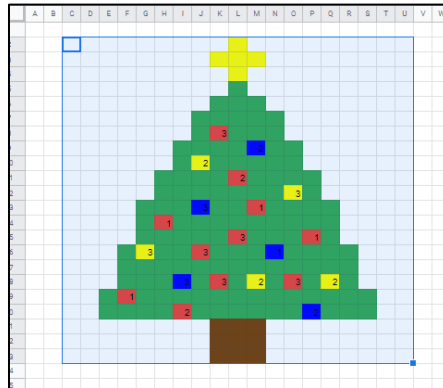
4. Now that you've created a tree using square pixels and the fill color tool, we can apply some spreadsheet "magic tricks" to make the lights change color. **Click on each of the "not green" cells and type the following formula**:

=randbetween(1,3)

The randbetween function picks a random number in the range of the two numbers inside parenthesis. In this case, you'll get numbers from 1 to 3. Your creation might look something like this:
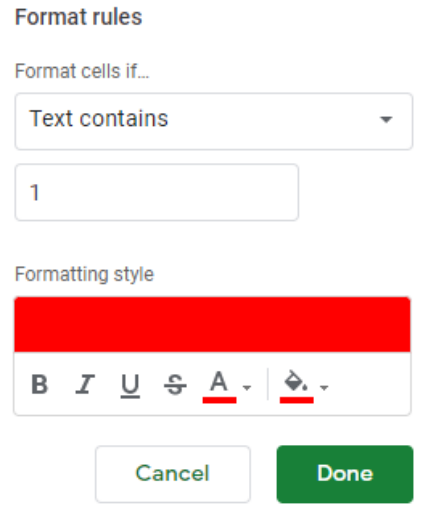

5. Next, we'll use a trick called ***conditional formatting*** to make the color of the random number pixels be based on the random number contained within that cell.
    a. Highlight/select the entire "tree" area as shown below:

    b. From the **FORMAT** menu, pick **CONDTIONAL FORMATTING**.

c. Change the format rule to Format Cells if TEXT CONTAINS and use a value of 1. Adjust the format of the fill color to red and text color to red. This will look like the image below:

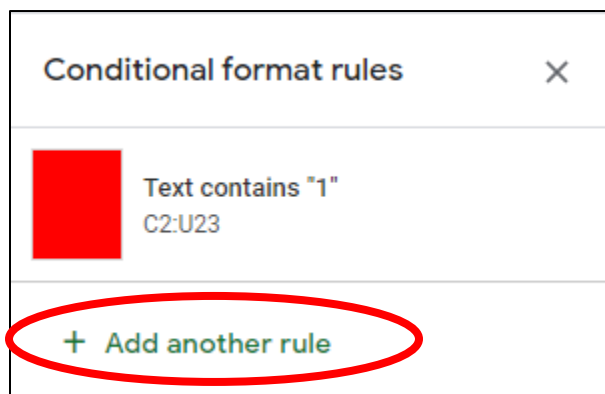The effect of this will be that all cells with a random value of 1 will have a red fill and the number inside will appear hidden since it will also be red. Click DONE.
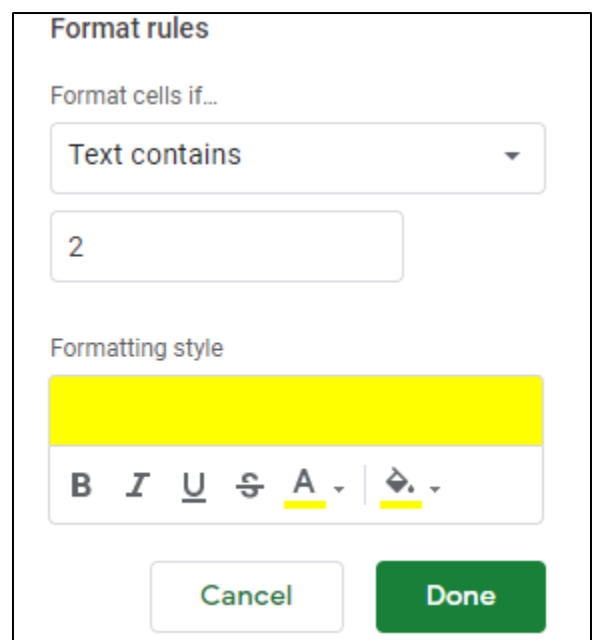
d. Use "Add another rule" as shown below to repeat for cells with a random number of 2.

e. Add another rule to create a third rule for random values of 3 to turn blue.

6. Once you've set your conditional formatting rules, the lights should appear a random color of red, yellow, or blue. Feel free to adjust your colors to something you prefer!

7. The randbetween function will regenerate new random numbers every time the values in the spreadsheet change. To test this, click on an empty cell and type anything and hit ENTER!

Other Fun Ideas:

- You can also set your spreadsheet to regenerate random numbers every minute so you don't have to make changes to your spreadsheet in to change the lighting. Here's how:
    - Go to the FILE menu and choose SETTINGS.
    - Pick the CALCULATION tab
    - Change the RECALCULATION setting to "on change and every minute".

- The randbetween function is a fun one to use. Some ideas:
    - Create a "dice" rolling simulation that rolls a die with values between 1 and 6
        - Or…create two dice and add them together with a formula
    - You can create game characters with statistics that are random, like
        - Running backs with speed, "hands", durability, etc. for a football game
        - Wizards, fighters, etc. for a RPG with attributes like strength, hit points, magic power…etc.