

3D Modeling Project #1a

COLOR BAR

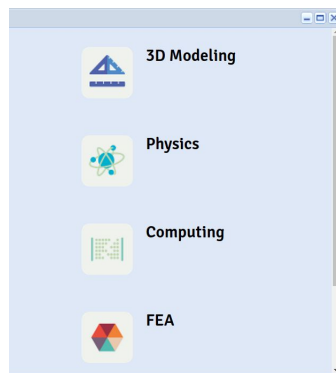
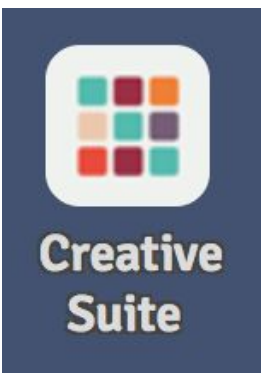
Use **code** to create any **color** you can imagine.

Welcome!

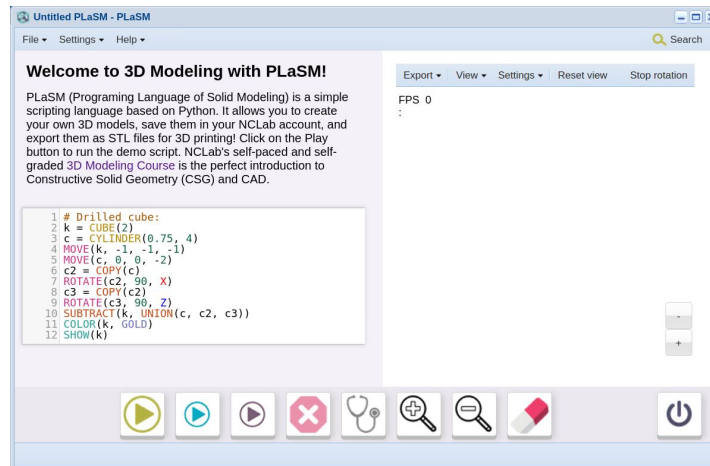
All NCLab 3D modeling projects will use the NCLab **Creative Suite**. Before you can begin your project, you will need to navigate to the **PLaSM CAD** app within the Creative Suite.

To access the Creative Suite:


1. Double-click the **Creative Suite** icon on your NCLab Desktop.
2. Select **3D Modeling**.
3. Open **PLaSM CAD**.

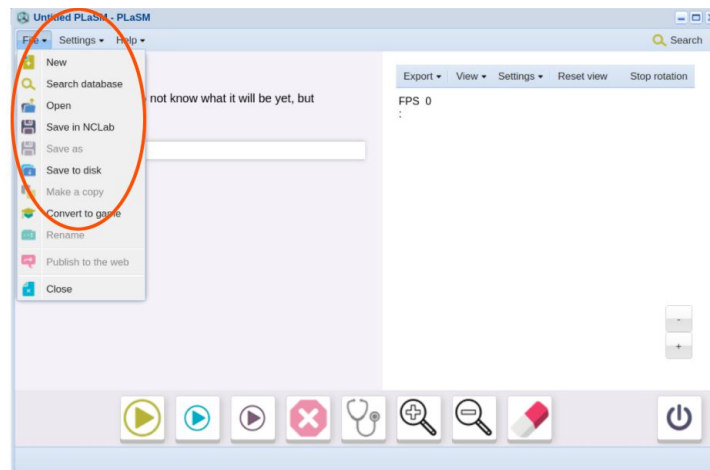


The app will open in a **PLaSM CAD worksheet**.



You can change the introductory text by clicking on it.

Click on the  button to remove the **demo script**:



Click the **File** menu in the upper-left corner, then select **“Save in NCLab”**. Select the folder **3d-course-projects** and give your file a **descriptive title**, **“Project 1”** will work.

Click OK.

Your file will be autosaved as you work, and you are ready to begin your first project.

Project Goal

The goal of your **first project** is to create your own **color bar**. A **color bar** is a useful tool for **organizing and viewing** different colors. Here are a few examples including:

purple,



cyan,



and orange:



You will be able to create any colors you want!

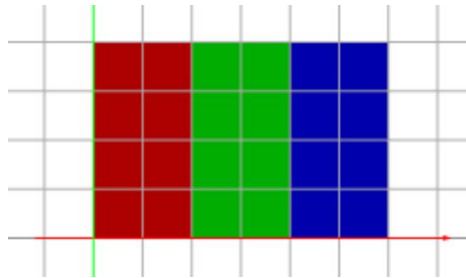
Make a Color Bar

You can use the command `COLORBAR()` to construct your color bar.

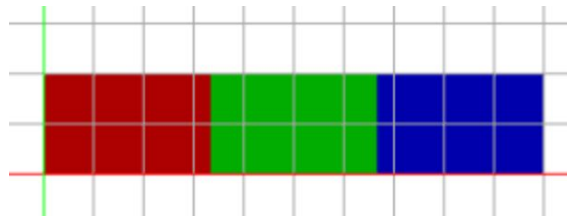
The program below will create a new `color bar` with the colors RED, GREEN, and BLUE. Type the following commands in your code window.

```
1 bar = COLORBAR(6, 4, RED, GREEN, BLUE)
2 SHOW(bar)
```

The program produces a `6x4 color bar` with three colors:



`COLORBAR()` does a lot of work for us. You can modify the `6` and the `4` in the `COLORBAR()` command to alter the `dimensions` of your color bar.



A color bar with a `width of 10` and a `height of 2`.

NCLab provides many predefined color palettes, including `materials` (COPPER, WOOD, ...), `fruits` (BANANA, STRAWBERRY, ...), and `ice cream colors` (MINT, VANILLA, ...).

However, what if you want to define your own color?

In this case, you can create a `custom RGB color`.

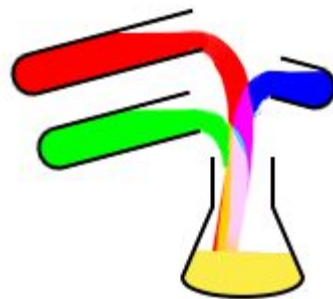
Defining Custom RGB Colors

Computer colors are usually defined using **RGB codes**. RGB is an acronym for **Red, Green, and Blue**. An **RGB code contains three integers** which define the amount of the red, green and blue components in the color.

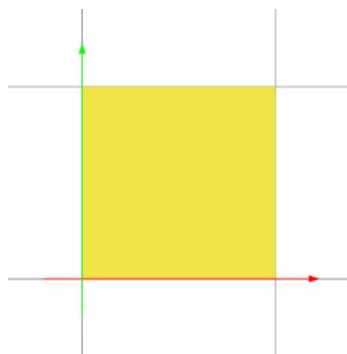
The program below creates a **banana-colored** square with RGB values **[252, 236, 74]**.

```
1 c = SQUARE(1)
2 COLOR(c, [252, 236, 74])
3 SHOW(c)
```

This RGB code defines a color that is composed of **mostly red, some green, and a little bit of blue**.



Once the three primary colors have been mixed together, we get the **banana color**.



Creating Your Color Bar

Now it is time to create your own RGB colors. To do this, type the following commands into your code window. Type these commands precisely as they appear here.

```
1 # Define our colors
2 color1 = [200,0,0]
3 color2 = [0,200,0]
4 color3 = [0,0,200]
5
6 # Create the color bar
7 bar = COLORBAR(6, 4, color1, color2, color3)
8
9 SHOW(bar)
```

This code produces the following color bar:



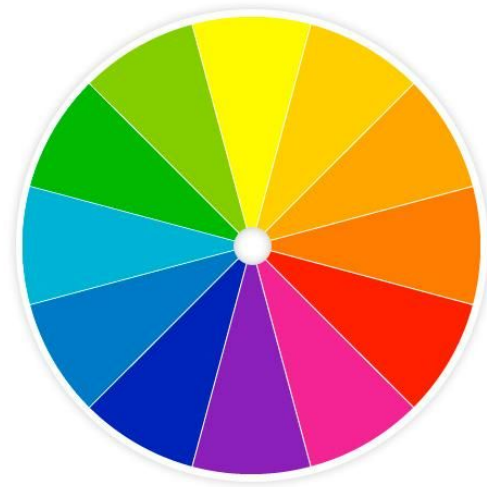
As you can see, this code produces the same colors as before. However, we are now using **RGB codes** in place of the predefined RED, GREEN, and BLUE.

The numbers on line 2, 3, and 4 are the RGB codes that define our colors. There are only two rules for these numbers: there can only be **three numbers**, and the numbers **can not be higher than 255**.

Design Your Own Color Bar

While creating RGB codes for your color bar, consider the following:

- How do lower numbers change the colors?
- What is the difference between the first, second, and third value?
- How might you create more than three colors?



Project Checklist

Your project will be finished when:

1. You have **correctly run the COLORBAR() commands without errors.**
2. You have defined **custom RGB colors** for your color bar.
3. Your program is saved as **Project-1** in the folder **course-3D-projects/**.

For a more thorough explanation of how RGB codes are created in NCLab, watch the following video:

<https://youtu.be/OetdHS3SvVU>