Build a Traffic Light in SAM Space:

**Project – Build a Traffic Light**

01. Drag a Button onto the canvas from the sleeping blocks section

02. Drag on a Toggle

03. Connect the Button to the Toggle

04. Drag on an Interval block and connect the Toggle to it

05. Add a Counter after the Interval

06. Drag on 3 Compare blocks and set them to “=1”; “=2”; “=3”

07. Drag on three Color blocks; set them to red, yellow, and green

08. Connect the red to the “=1” Compare block, the yellow to “=2” and green to “=3”

09. Test your system

**Debug It! Reset the Counter.**

10. Go into the counter, reset it, and set the range to be from “1-3’ rather than “0-100”

11. Test your system

Discuss with your partner how this type of system should be improved upon before applied in the real world.
Build a Traffic Light in Workbench:
Go to edu.workbench.com
At the top right, click on “Create” then “New Blockly Program”

**Project – Build a Traffic Light**

01. Pair an RGB LED and Button

02. Under the **Button: Actions menu**, find the “when Button is pressed” block

03. Drag it on to the canvas

04. Under the **Loops menu**, find “repeat forever do” block and drag it into the “when Button is pressed block”

05. Under **RGB LED: Actions Menu**, drag on “set RGB Light LED color to” block

06. Under the **General**, drag on the “wait for ___ seconds” block and connect to the “set RGB Light LED color to” block

07. Duplicate the code two more times

08. Set the first color to **green**, the next to **yellow**, and the last to **red**.

Run your program to test it—how can we debug it?
Build a Car Controller in SAM Space:

*Project – Build a Remote-Controlled Car*

01. Drag a **Light Sensor**, **RGB LED**, and 2 **DC Motors** onto the canvas

02. Add a **Compare** block to the canvas

03. Connect the **Light Sensor** to the **Compare** block and set it to “<10”

04. Connect from the **Compare > DC Motors > RGB LED**

05. Assemble the car: attach the wheels to the motors, place the motors in the yellow chassis, put the roller ball on the bottom of the car and place the LED in the front

06. Cover the **Light Sensor** to test the car

*Debug it! How can we make the car move forward?*

07. Go into the settings on one **DC Motor** to change it to “counter-clockwise”

08. Test your system

*If time, try steering with the Car Controller block!*
Build a Car Controller in Workbench:
Go to edu.workbench.com
At the top right, click on “Create” then “New Blockly Program”

Project – Build a Car Controller—To Go

01 Pair a Slider, Button, and 2 DC Motors

02 Under the Button: Events menu, find the “when button is pressed” block; drag it on to the canvas

03 Under the Logic menu, find the “if-do-else” block and snap it into the teal block

04 Under the Logic menu, find the { [ ] < [ ] } comparator block; snap it into the “if-do-else” block

05 In the Slider: Values menu find the “get Slider value” block and plug it into the left comparison slot; set “≤”

06 In the Math menu, find the number block and plug it into the right comparison slot; set it to 50

07 In the DC Motor: Actions menu, grab the “set DC Motor speed to []” block and put 2 in the “do” slot, and 2 in the “else” slot

09 Set the speeds according to the diagram

Run your program to test it

To stop the car: Under the Button: Events menu, find the “when button is pressed” block

11 Change the “pressed” to “released”

In the DC Motor: Actions menu, drag the set “DC Motor motor speed to []” block and drop them in the block; change the second block from “DC Motor” to “DC Motor 2”