Team Challenge

Name_____ Team _____

You will be working at your tables to complete challenges and earn points. Harder tasks are worth more points, but may take longer to complete.

- If everyone at the table completes the challenge at the same time, the table gets an extra point
- If anyone at the table is playing roblox, or is on other irrelevant websites, everyone at the table loses 2 points
- You can be awarded extra points for helping your classmates, finding and sharing cool resources, or boosting your circuit or code from a previous challenge.

	Task	Points	Ms. Ana?
1	Turn on an LED or DC motor (one point each)	1	
2	Measure the voltage across an LED	1	
3	Calculate what value resistor you should use to light an LED that takes 500mA of current at 3.3V?	1	
4	Connect an LED to a button so that the LED is normally off, but turns off when you press the button	1	
5	Connect an LED to a button so that the LED is normally on, but turns off when you press the button	2	
6	Connect a photoresistor in series with the LED	1	*
7	Connect a potentiometer in series with the LED	2	*
8	Visit tinkercad.com and join our classroom: Code: IE3-X63-R1E	1	
9	On tinkercad, create a new circuit design and load an example	2	
10	Modify any tinkercad example circuit	2	
11	Modify any tinkercad example code	3	
12	Build any new circuit using Tinkercad	3	
13	Find an article that talks about the different kinds of motors. As a table, come up with one way you would use each of the following motor types that the others wouldn't work for: brushless/brushed DC motor, stepper motor, servo motor	1 per motor type	
14	Open the Arduino IDE and set your board to Raspberry Pi Pico	2	

15	Load an example sketch and upload to your board	2	
16	Modify the “Blink” example sketch (file>examples>01.Basics>blink) and upload to board	3	
17	Open the Arduino IDE example folder titled “Intro” on https://github.com/ana3177/CodingResources	1	
18	Find an Arduino project online. Read through the code and explain generally what it is doing and how it works	3	
19	Successfully send or recieve data to the serial port	4	
20	Turn on and off an LED by programming a GPIO pin	3	
21	Read sensor values from a GPIO pin	4	
22	Connect a neopixel strip	3	*
23	Connect a device via SPI	5	*
24	Connect a device via I2C	5	*
25	Use the “bootcamp2” demo to program your neopixel strip	6	*
26	Communicate with a device via SPI	6	*
27	Communicate with a device via I2C	6	*
28	Bonus: Do something not listed above. Point values will be based on how you navigate your resources to find information and how well you are able to understand what you’re doing	∞	*

Useful websites:
https://electrocredible.com/raspberry-pi-pico-w-pinout-guide-diagrams/