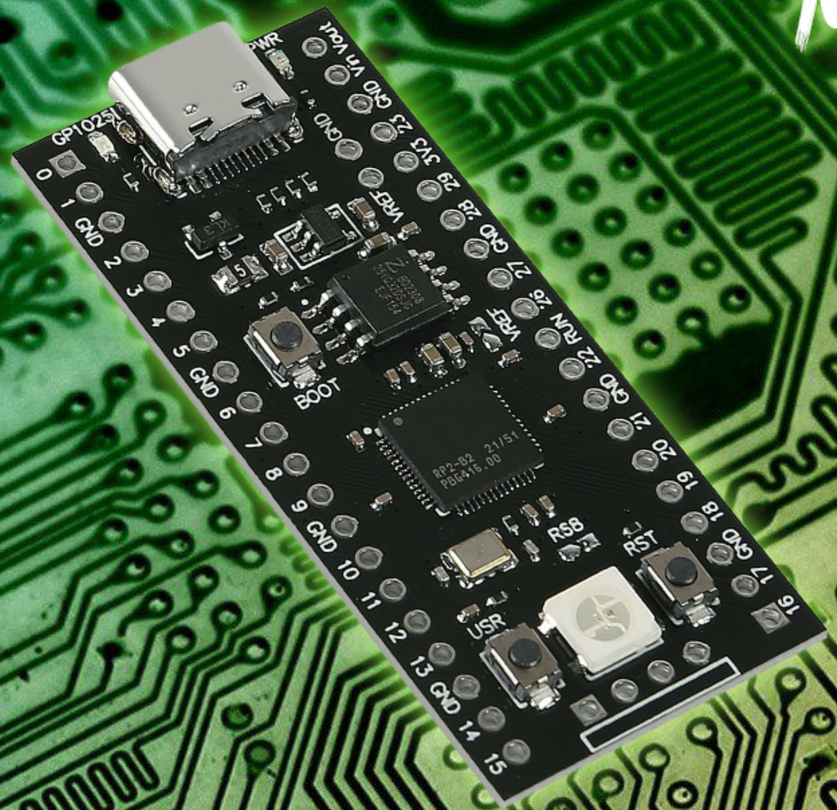
MICROCONTROLLER MASTERY



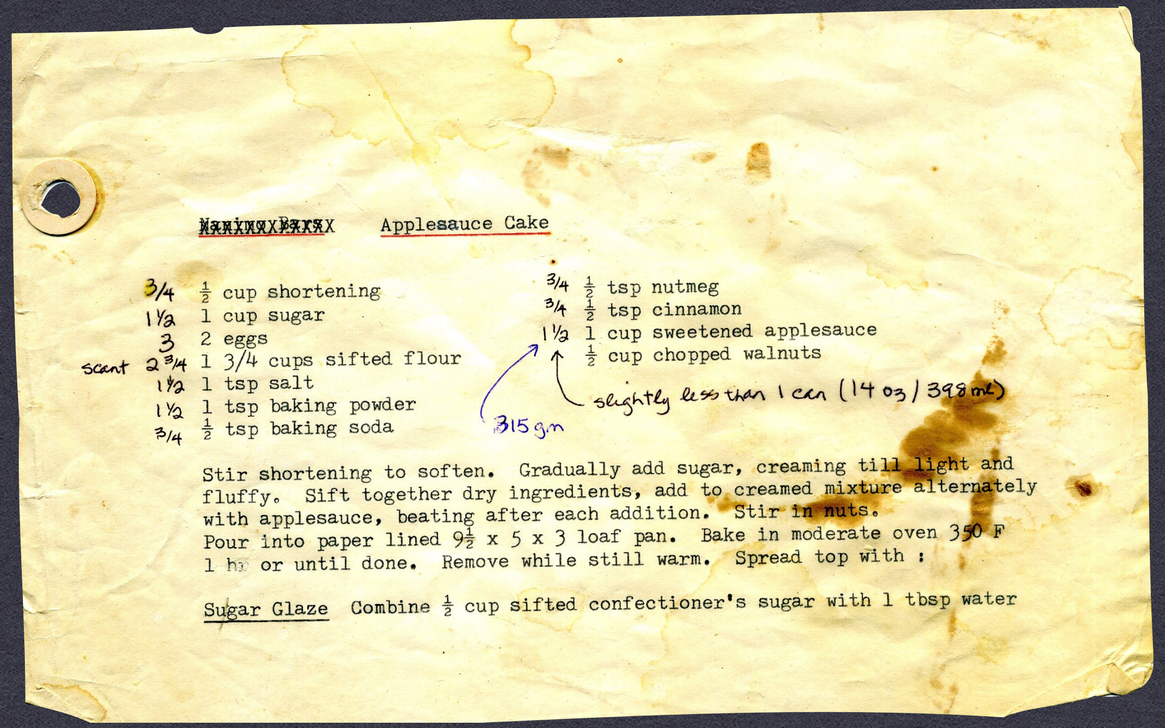
02 DECLARE

WHAT IS PROGRAMMING?

WHAT IS PROGRAMMING?

GIVING A COMPUTER A SERIES OF INSTRUCTIONS TO DO.

THIS CLASS WILL BE PROGRAMMING WITH BLOCK-BASED CODE, WHICH USES “LEGO-LIKE” PIECES TO PROVIDE INSTRUCTIONS.



~~XXXXXXXXXXX~~ Applesauce Cake

3/4 ½ cup shortening
1 1/2 1 cup sugar
3 2 eggs
scant 2 3/4 1 3/4 cups sifted flour
1 1/2 1 tsp salt
1 1/2 1 tsp baking powder
3/4 ½ tsp baking soda

3/4 ½ tsp nutmeg
3/4 ½ tsp cinnamon
1 1/2 1 cup sweetened applesauce
½ cup chopped walnuts

slightly less than 1 can (14 oz / 398 mL)

315 gm

Stir shortening to soften. Gradually add sugar, creaming till light and fluffy. Sift together dry ingredients, add to creamed mixture alternately with applesauce, beating after each addition. Stir in nuts. Pour into paper lined 9½ x 5 x 3 loaf pan. Bake in moderate oven 350 F 1 hr or until done. Remove while still warm. Spread top with :

Sugar Glaze Combine ½ cup sifted confectioner's sugar with 1 tbsp water

WHAT IS PROGRAMMING?

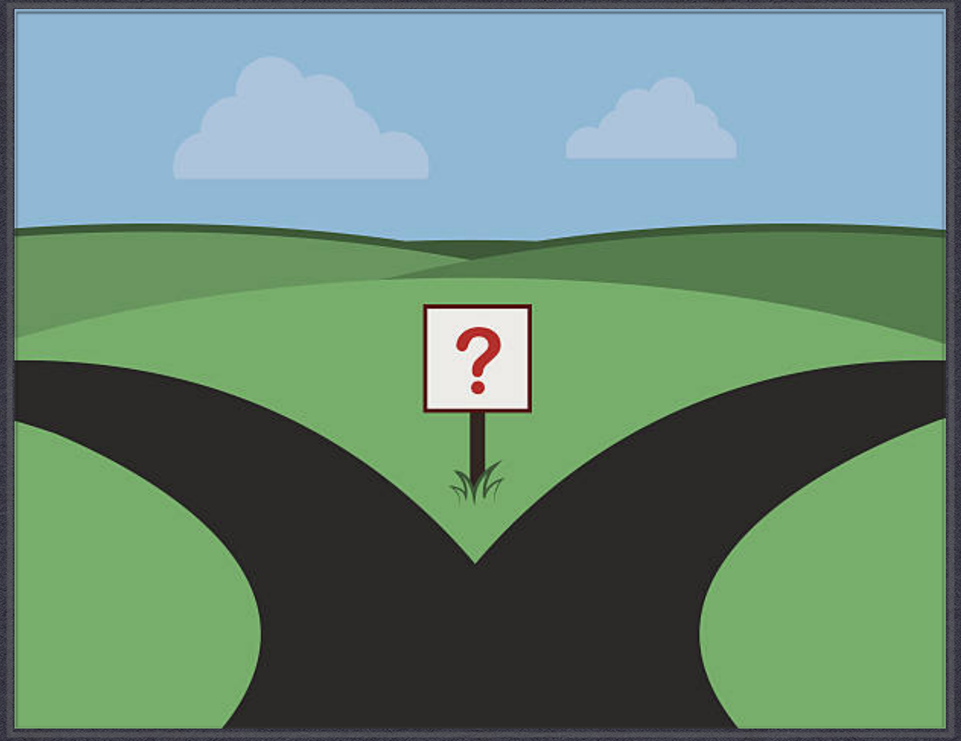
START

EVERY PROGRAM MUST HAVE A PLACE TO BEGIN. IN OUR CASE, IT IS WHEN WE USE THE START BLOCK

WHAT IS PROGRAMMING?

IF STATEMENT

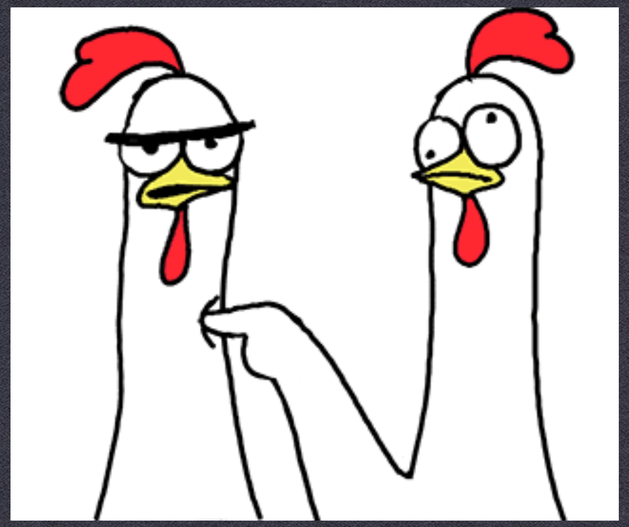
A CONDITIONAL BLOCK (ALSO KNOWN AS AN IF STATEMENT) ALLOWS A PROGRAM TO DO SPECIFIC INSTRUCTIONS IF THE CONDITIONS APPLY.



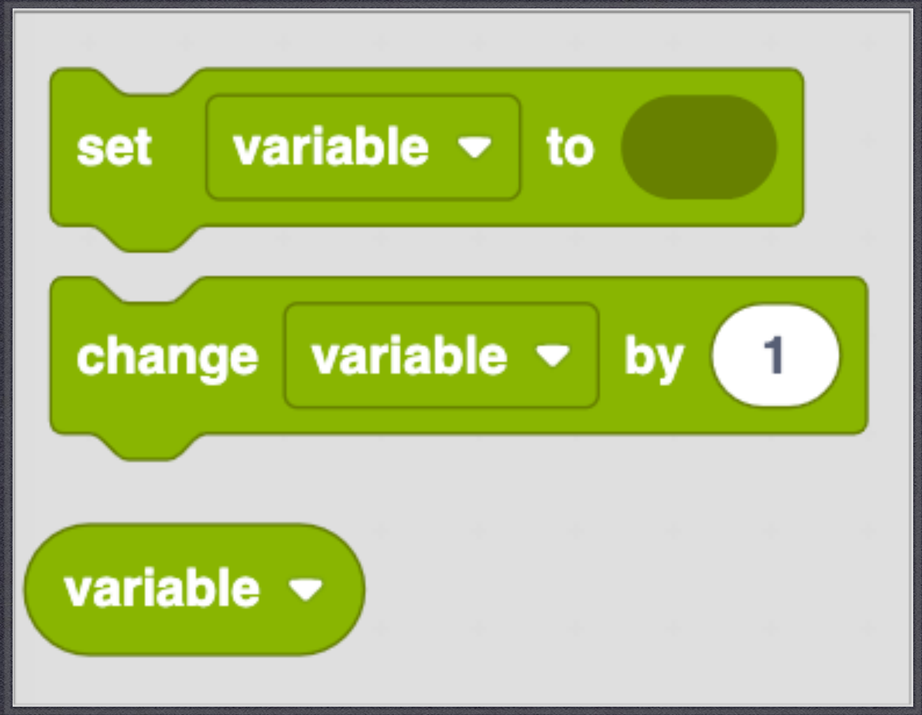
WHAT IS PROGRAMMING?

LOOPS

A LOOP PROVIDES A WAY TO REPEAT A TASK MULTIPLE TIMES, GENERALLY HAVING A CONDITION TO STOP THE LOOP.



WHAT IS PROGRAMMING?



VARIABLES

PROVIDE A PLACE TO PUT CHANGING DATA.

IN OUR BLOCK PROGRAMMING LANGUAGE, WE HAVE A WAY TO SET, CHANGE, AND USE THE VARIABLE.

WHAT IS PROGRAMMING?

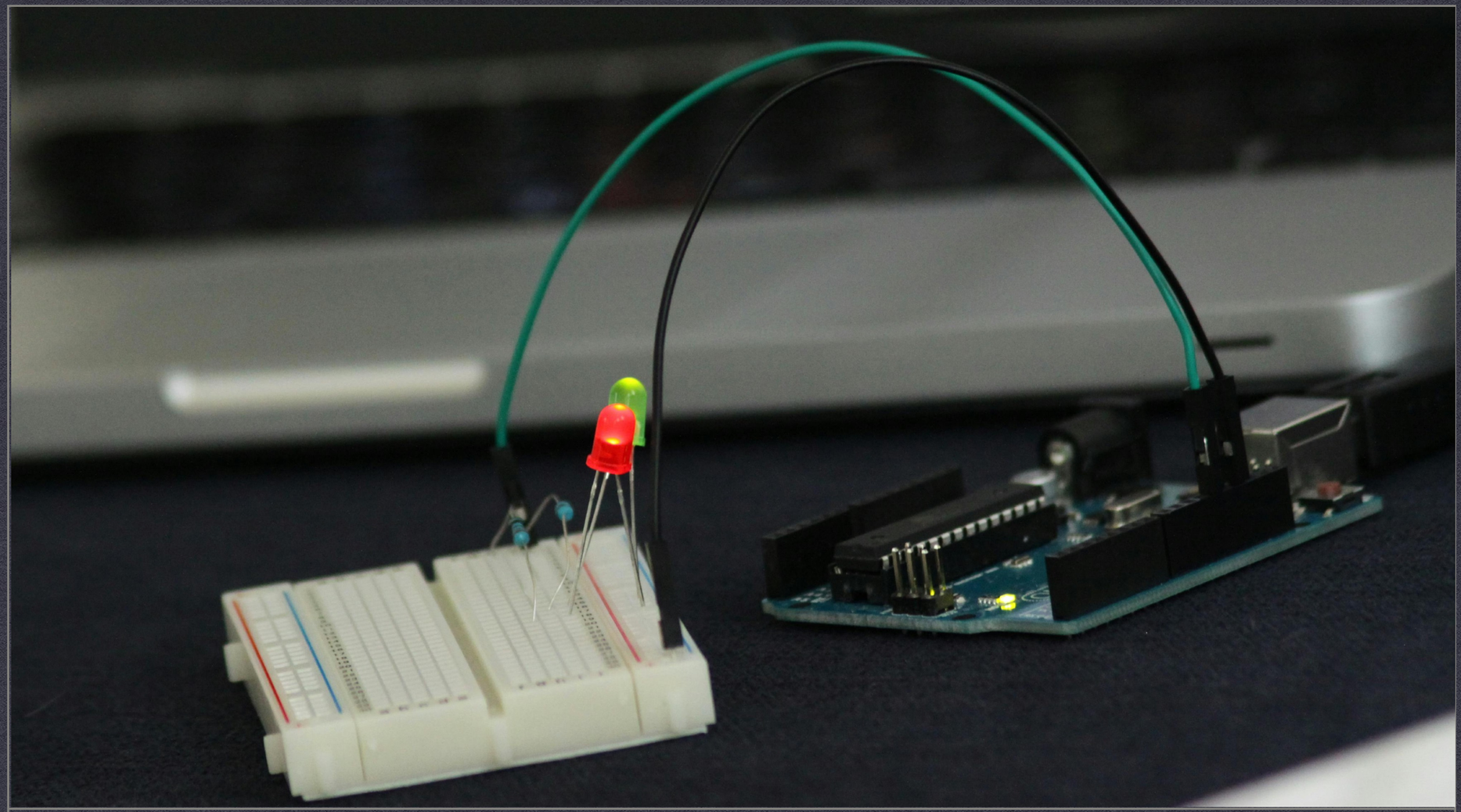
SETTING A PIN

ON A MICROCONTROLLER, SETTING A PIN MEANS TO SEND OUT POWER (TURN ON) OR NOT (TURN OFF)

WHAT IS PROGRAMMING?

WAITING

ALSO KNOWN AS A DELAY OR “SLEEPING.”
IN PROGRAMMING, HAVING A WAY TO MAKE THE COMPUTER WAIT IS IMPORTANT FOR SOME PROCESSES.



PROJECT

PROGRAMMING THE MICROCONTROLLER

LAB 2

MATERIALS LAB KIT

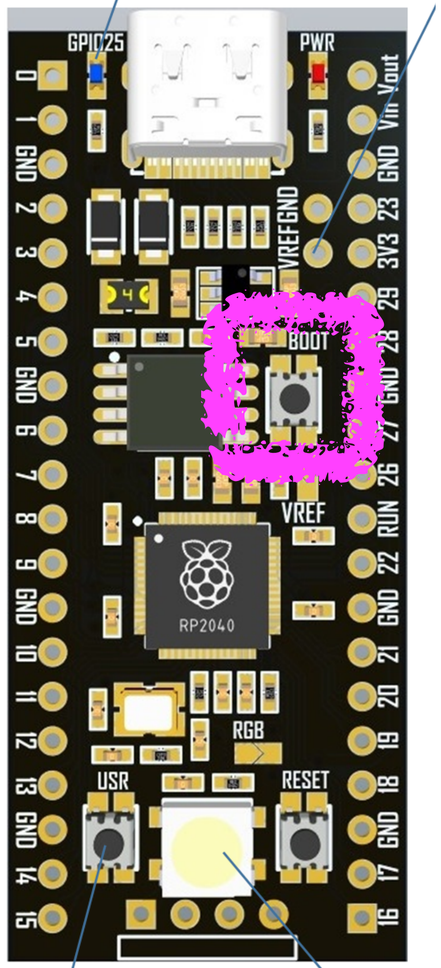
TASK

TURN OFF BATTERY PACK

DO NOT TURN IT ON FOR THIS PROJECT

STEP 1

MATERIALS BATTERY PACK



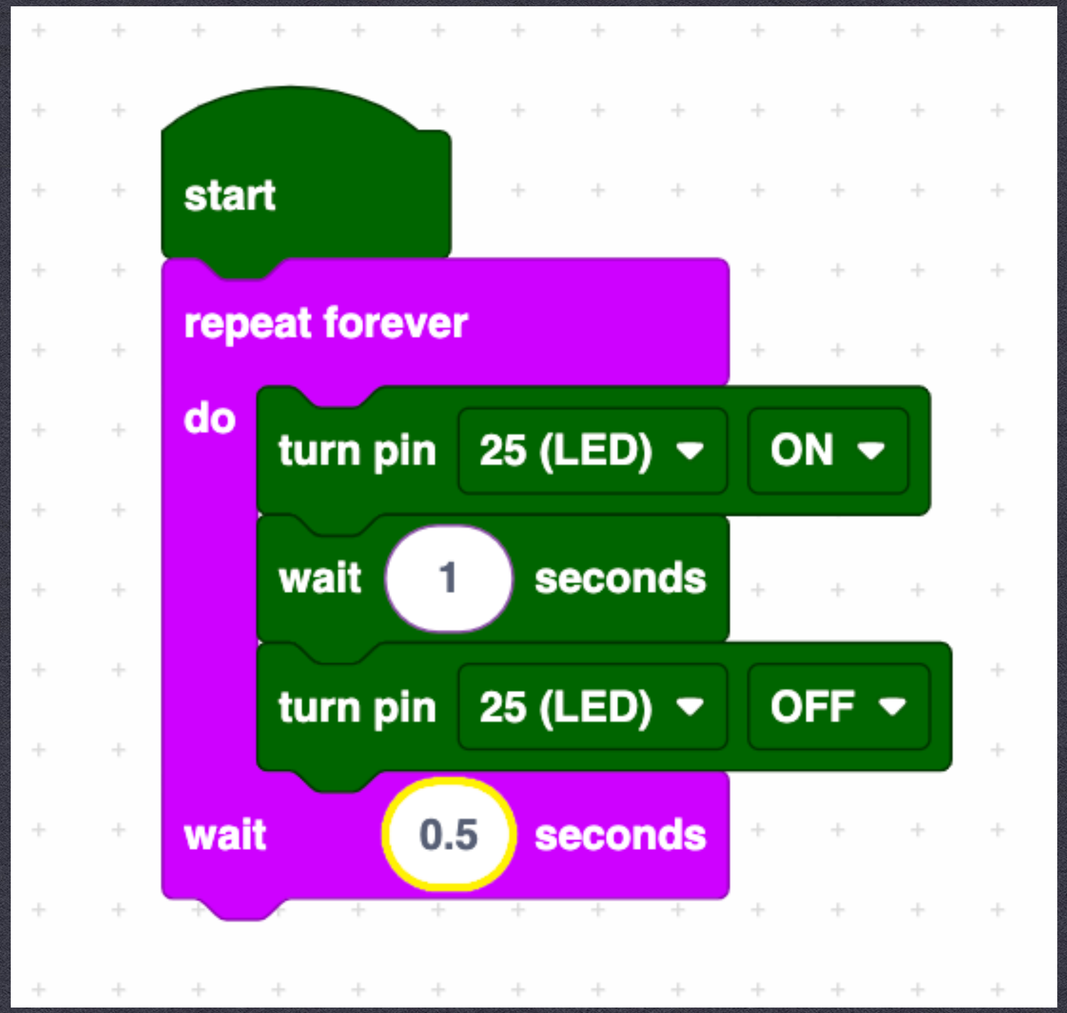
TASK

HOLD DOWN BOOT BUTTON WHILE PLUGGING IN

YOU CAN LET GO AFTER THE UNIT IS PLUGGED-IN

STEP 2

MATERIALS MICROCONTROLLER / USB CABLE



TASK

REPLICATE THIS PROGRAM IN PIPER

ALL THE BLOCKS WILL BE IN THE “CHIP” AREA EXCEPT FOR REPEAT WHICH WILL BE IN THE “LOOPS”

STEP 3

MATERIALS MICROCONTROLLER / COMPUTER

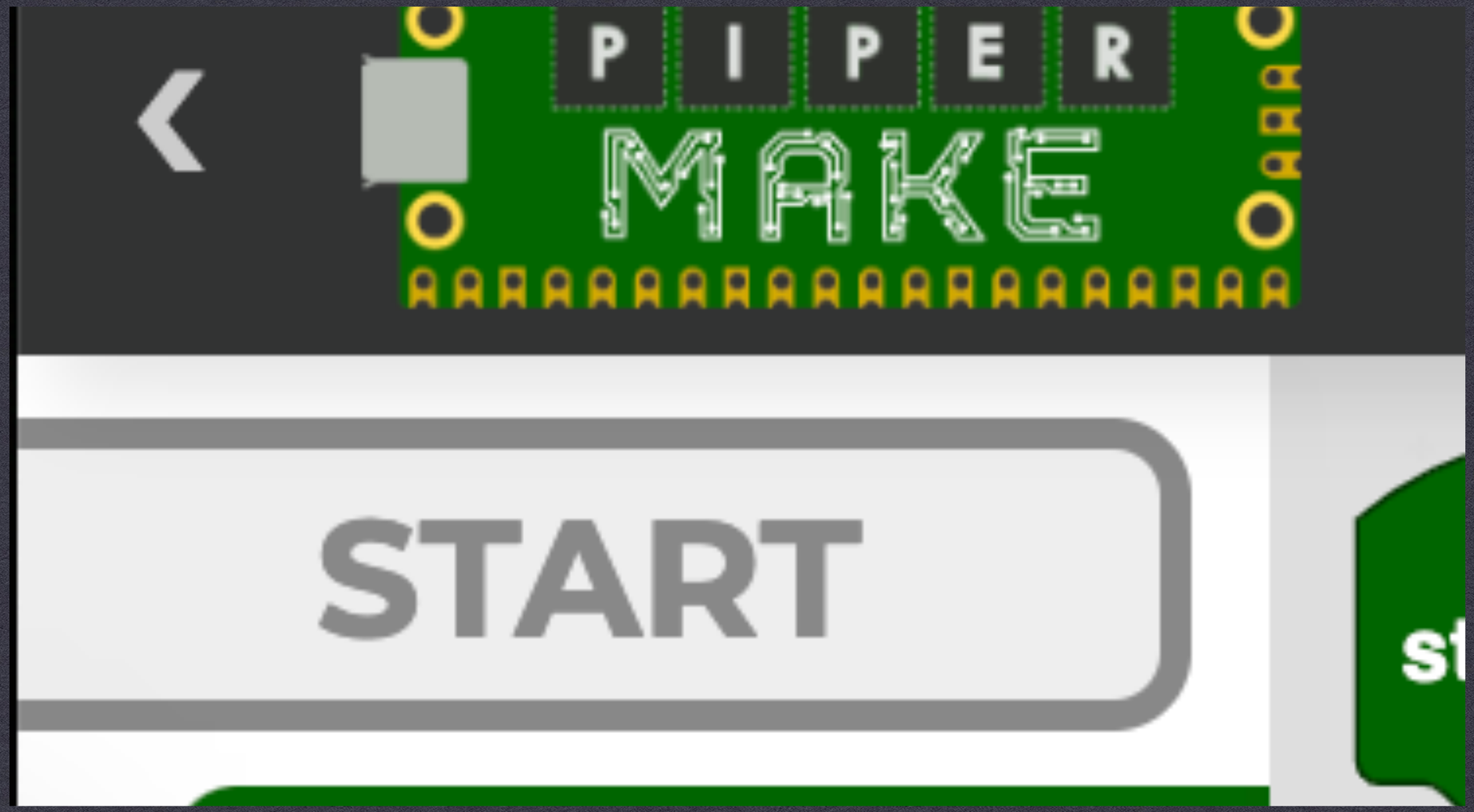
TASK

CLICK “CONNECT” ON PIPER

IN THE LOWER LEFT CORNER

STEP 4

MATERIALS MICROCONTROLLER / COMPUTER



TASK

CLICK “START” ON PIPER

IN THE UPPER LEFT CORNER

STEP 5

MATERIALS MICROCONTROLLER / COMPUTER

TASK

WAIT AND SEE WHAT
(IF THERE IS NOT A RESPONSE, ASK FOR HELP)

STEP 6

MATERIALS MICROCONTROLLER / COMPUTER