# Equipment Testing: Electronic Safe Alarm System

Test your light sensor

1. Decide which micro:bit will be inside your safe and make sure it's always the one inside the box. Different micro:bits will have different light readings.

2. Write this program and download it into your micro:bit. When you press button A, the micro:bit will start to execute a LOOP. A loop is a set of commands that the micro:bit will do over and over. You can have a loop repeat a few times, or you can have it go on forever.
The loop in this program will go forever. That's what "while true" means. So this program will continue to display the light level reading even though you only have to press button A once.
WARNING: The first and second numbers displayed can be false readings. Ignore the first two readings.
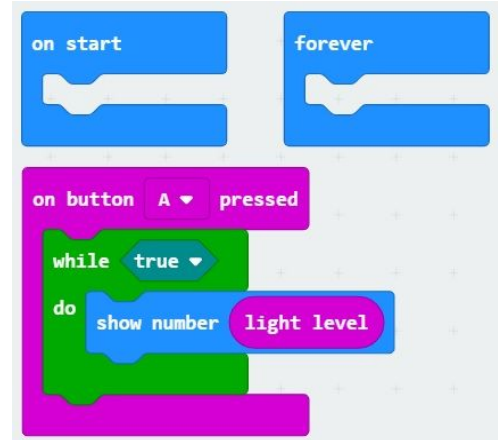

3. Record the light values for the following locations:

| Micro:bit location	Light value
on your desk	
under your desk	
covered by your hand	

Test your radio

1. Your light sensor micro:bit will be your radio "sender". The other micro:bit will be your radio "receiver". Don't get them mixed up! Insert your "receiver" micro:bit into the gator:bit board. Be sure the "Music" switch next to the speaker is ON.

2. With your partner, choose a number between 1 and 255. This is your radio group and you will need to put this number in the "radio set group command" in your program. Don't choose a number other groups might choose, like 1 or 100. What is your number? _____

Music is switched to ON
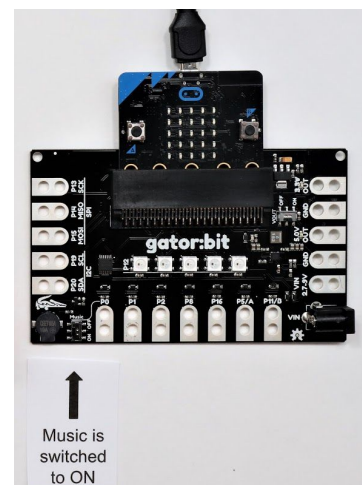
3. Write this program and download it into your "sender" micro:bit. Instead of "hello" choose another short message. Remember to change your radio group number from "1" to the number you chose in step 2. What message did you send? _____
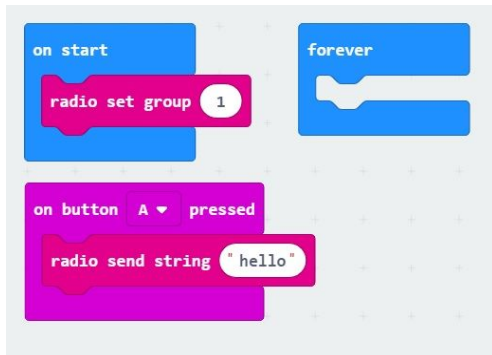

4. Write this program and download it in to your "receiver" micro:bit. You will need to drag "received string" from the "on radio received" block into the "show string" block to replace "hello".
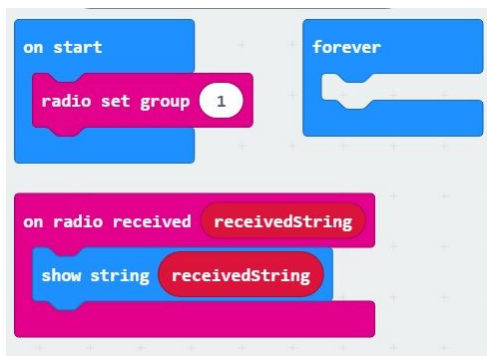
5. Did you partner receive your message? _____ If not, troubleshoot! This needs to work in order for your alarm system to work.

Test your sound

1. The speaker on the gator:bit board will be the alarm in your security system. Test the sound by adding a sound command to the receiver program you just wrote.

2. Did you hear the sound? _____
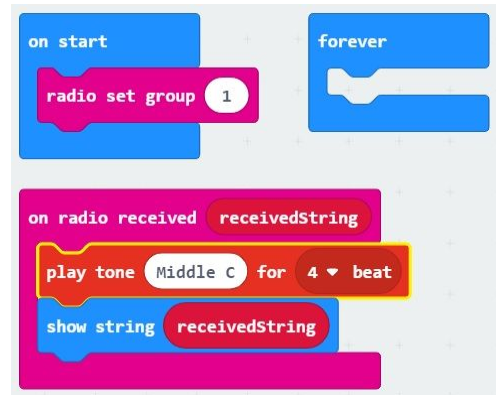
Write your alarm program

To program your alarm system, you'll need to write a different program for each micro:bit. Remember to set the radio group to the same number for each micro:bit.

"Sender" micro:bit (in the safe box)	**"Receiver" micro:bit (in the gator:bit)**

On button A press:
    pause 5 seconds (to allow time to close
        box lid)
    show the light level on the display
    show the light level on the display again
    start a loop ("while TRUE")
        if light value > **X**
            then send message to microbit B
    end the loop
	On message received:
	    Sound alarm

Showing the light level twice on the display before starting your light-level loop avoids the problem of false light readings that can sometimes happen when the micro:bit first starts up. You won't actually see these numbers since you'll be closing your sender into the box during that first 5 seconds.

The light level used in your program should be 10 less than the number you recorded during your testing when the micro:bit was on your desk. In other words, subtract 10 from that number and use the result for **X** in your program.

Test your program, and when it's successful at least three times in a row, show it to your teacher so you can start building your safe-box.