Decisions, Decisions

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So far…

- So far, our code blocks have run one after another.

- This is called *sequence*, and is the natural way computers work.

- What if we need to make decisions?

- Computers can do that, too!

- The most common way is the IF statement or IF block.

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Red Light / Green Light

Algorithm

- Start with the red light turned on.
- If button C on the button pad is pressed:
  - Turn the red light off
  - Turn the green light on.
- If button E is pressed:
  - Turn the green light off
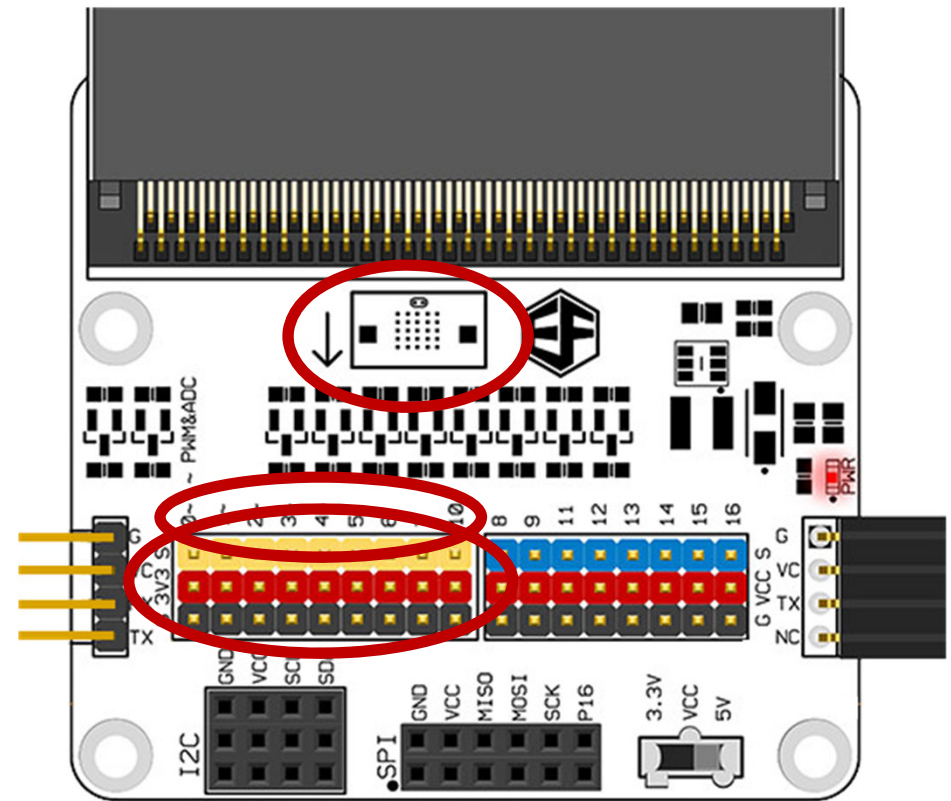 - Turn the red light on.

Assemble Your Equipment

- Break-out board

- Three jumper (connector) wires

- Red and green LEDs

- Pushbuttons
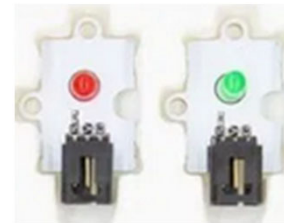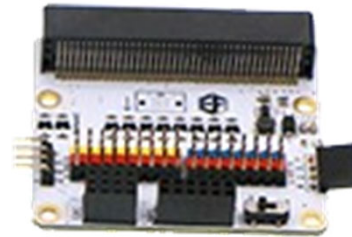
Check Out the Break-out Board

- The pins are numbered.

- The colors match the jumper wires.

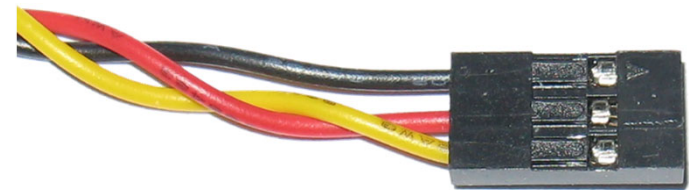- The Micro:Bit plugs in with the LEDs and buttons up. There's a picture.

About Those Jumper Wires

- One end has a clip; the clip goes to a device

- One end is plain; the plain end goes to the Break-out board

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Connect the Devices

- Connect the clip end of one jumper wire to the button block.

- Connect the clip end of another jumper wire to the green LED.

- Connect the clip end of the last jumper wire to the red LED.

Connect Devices to Break-Out Board

- Plug the jumper from the red LED into pin 2 of the break-out board. Be careful to match the colors.
- Plug the green LED into pin 1.
- Plug the button pad into pin 0.
- We worked from higher numbers to lower numbers because it's easier to plug things in that way!
- Plug in the Micro:Bit

Everything Assembled
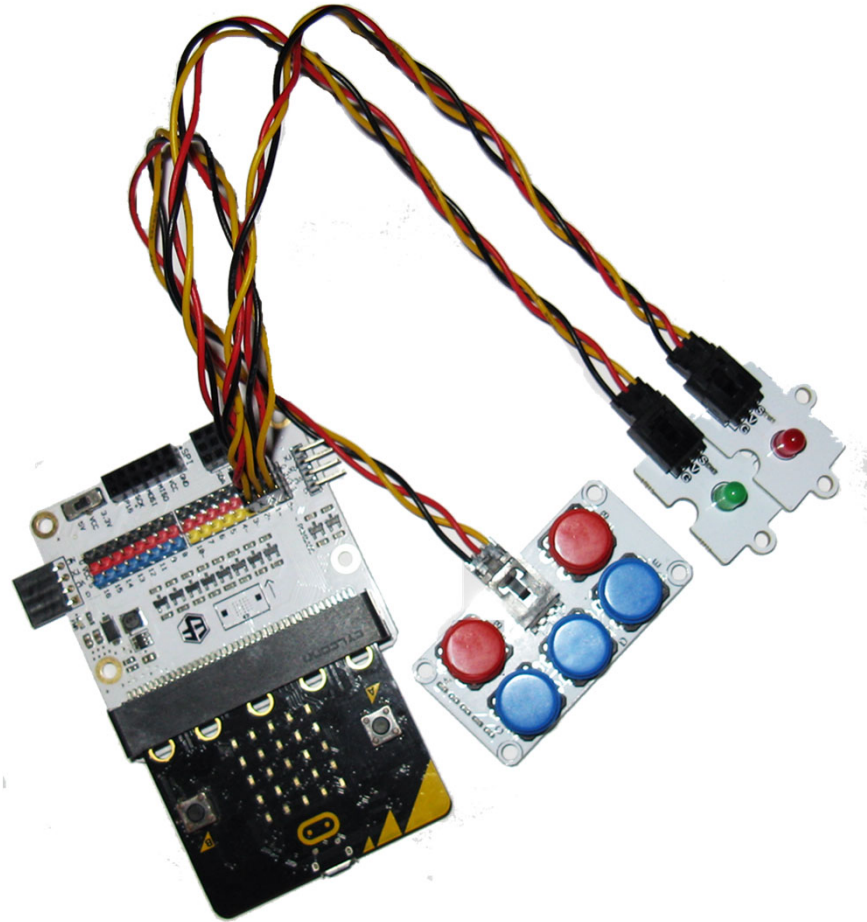
Keeping Track

- We are going to program pins, not devices.

- So, we have to keep track of what is plugged in where!

Device	Pin
Button pad	0
Green LED	1
Red LED	2

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Start a Program

- Go to https://makecode.microbit.org/
- Start a new project
- Name it "redgreen".
- Click
  - Advanced
  - Extensions (scroll down to find it)
  - Select "tinkercademy-tinker-kit"

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Your Screen Looks Like This
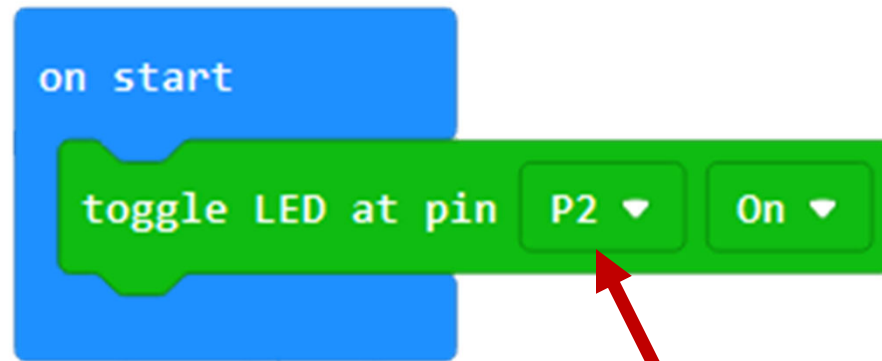

Raise your hand when you're there.
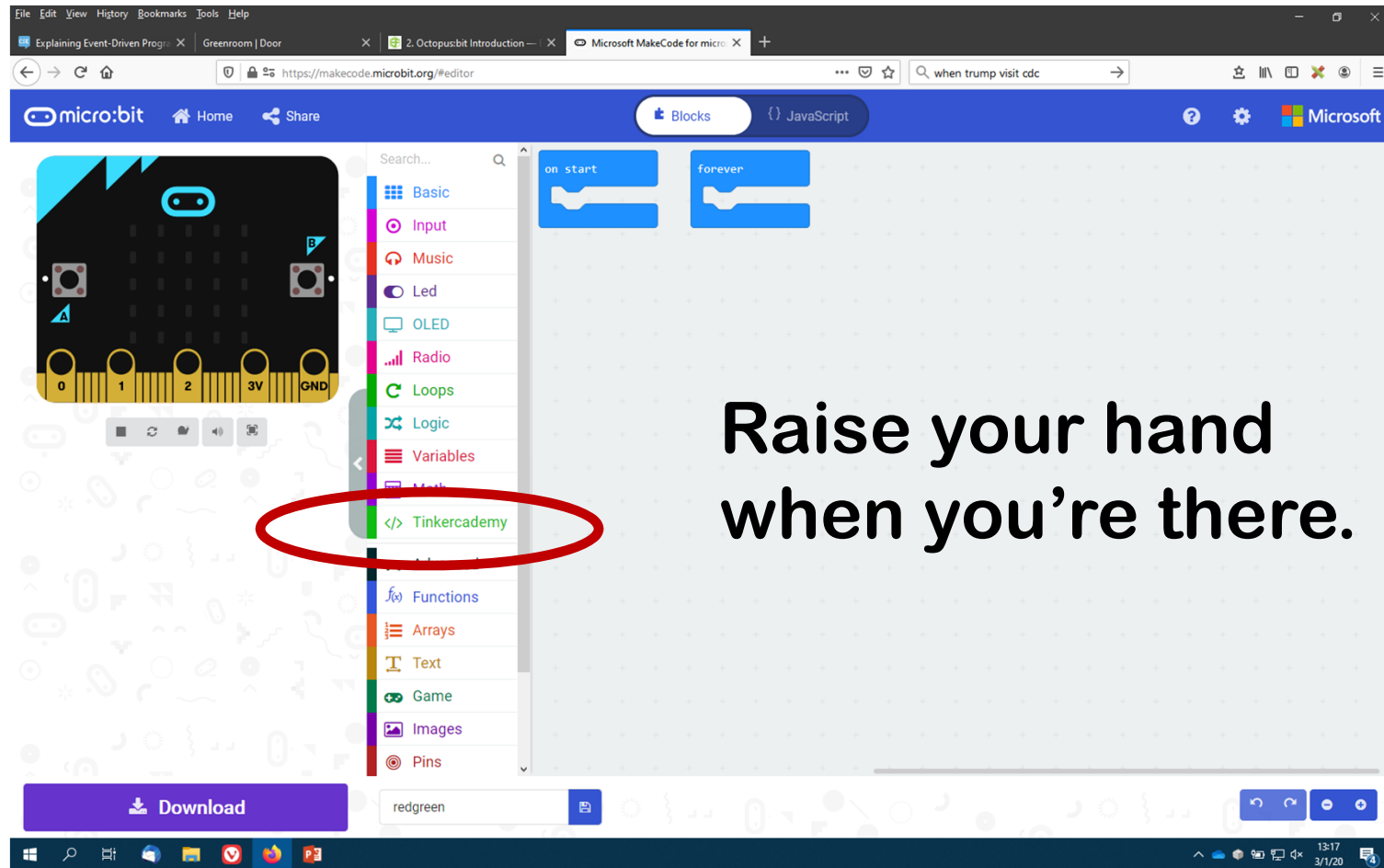
Reminder: Our Algorithm

Algorithm

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- If button C on the button pad is pressed:
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  - Turn the green light on.
- If button E is pressed:
  - Turn the green light off
  - Turn the red light on.

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Start with Red LED On

on start

toggle LED at pin P2 ▼ On ▼

The red LED
is on Pin 2.

forever

Button C Changes to Green

on start
toggle LED at pin P2 ▾ On ▾

Selection

forever
if key C ▾ is pressed on ADKeyboard at pin P0 ▾ then
toggle LED at pin P1 ▾ On ▾
toggle LED at pin P2 ▾ Off ▾

Button C

Green on Red off

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Thought Challenges

- What happens if button C is *not* pressed?
- What if the green LED is already on?

Programming Challenge:
What About Button E?

What Have We Learned?

- Computers naturally do one thing after another.
- "One thing after another" is called *sequence*.
- Programming languages allow us to program decisions.
- Programming decisions is called *selection.*
- Today we used an IF block for selection.

Pack Everything Up

- Unplug the Micro:Bit from the Break-out board; unplug the USB.

- Unplug the jumper wires from the break-out board by pulling straight up *on the connector*. Don't pull on the wires!

- Unplug jumper wires from devices by pressing the tab and pulling on the connector. You may have to push hard.

- Put everything away.

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