Idea Generation Workshop

Idea Generation with LittleBits

- Demonstrate
- Explore
- Design challenge
- Iterate
- Demo & share
- Deconstruct, sort, store

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vanslooten.com/littlebits

This presentation

Demonstrate

How does it work?

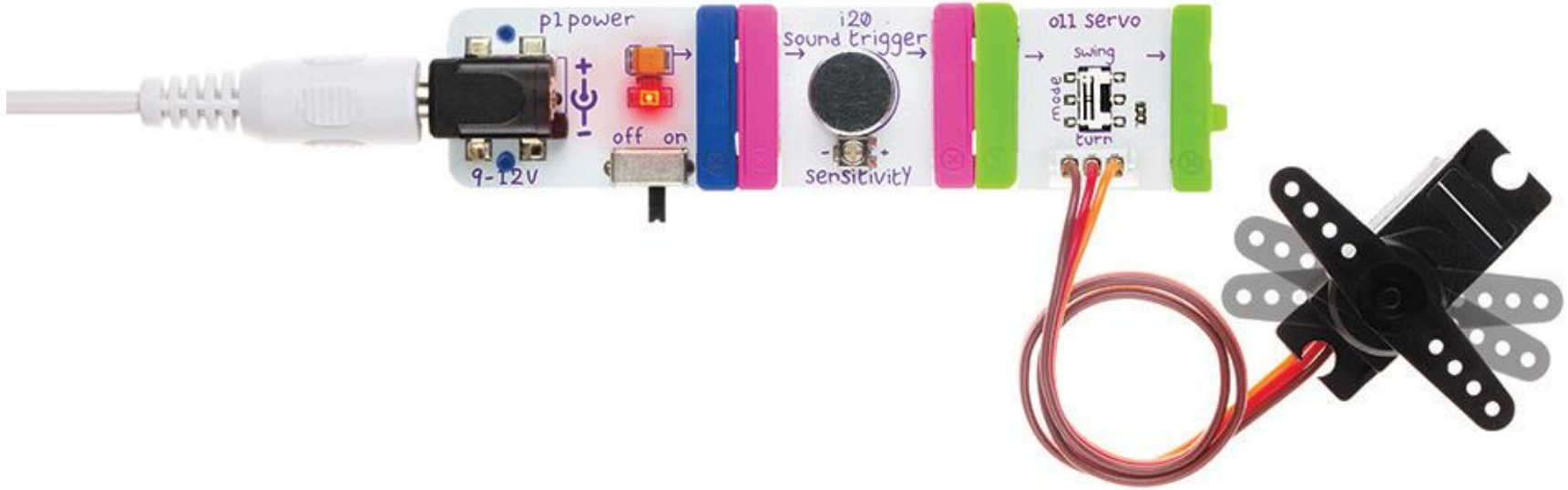
The Color Code

- **POWER** is needed in every circuit and is the start of all your creations.
- **INPUT** Bits add control to the circuit, through information provided from you and/or the environment, and send signals to the Bits that follow.
- **OUTPUT** Bits complete an action or a task (eg.: light, buzz, move). These are the Bits that "*do* something".
- **WIRE** Bits expand the circuit's reach and change direction. Use the wire Bits to help place Bits exactly where you want, especially if embedding inside a structure. Some orange Bits also add a level of complexity and programmability to the circuit.

How does it work?

- Order is Important

Power Bits always come first and input Bits only affect the Bits that come after them.



Demonstrate

How does it work?

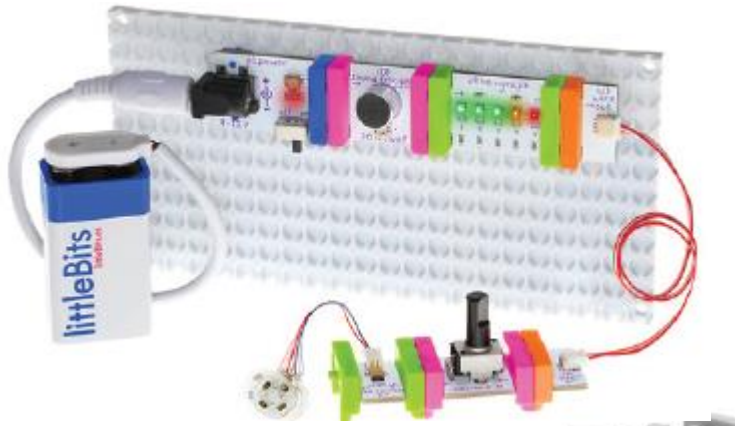
- What's in the kit?
- How do I use a Bit?

Read the module description card that comes with each Bit, or read online

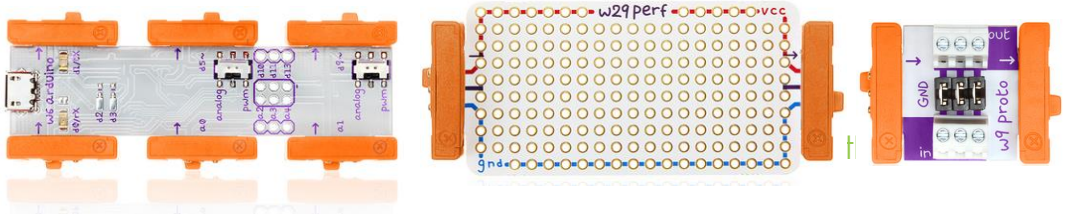
(click each card to view description +example)

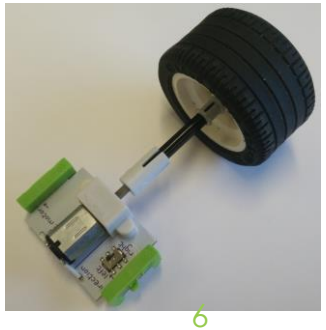
Connect & interface

- Lego (Mindstorms)
- Electronic components
  - Arduino
  - Proto & perf modules
- Internet
  - CloudBit (use IFTTT)
- Anything conductive
  - Makey Makey, tips&tricks, more



littlebits.cc/tips-tricks/tips-tricks-littlebits-lego

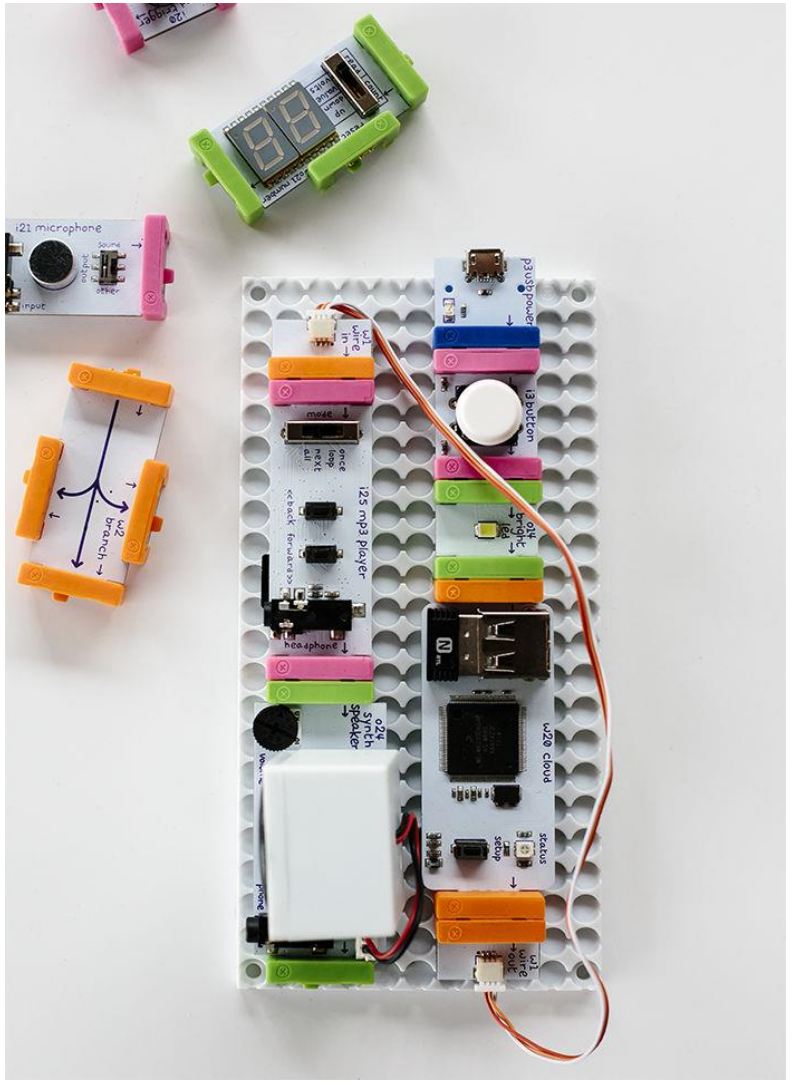




Mount & connect

- Boards
- Shoes
  - Wear, glue, attach
- Wires
  - Fork, Branch, Split
- Wireless
  - Wireless transmitter & receiver

littleBits.cc/wireless-modules-tips-tricks



Add logic

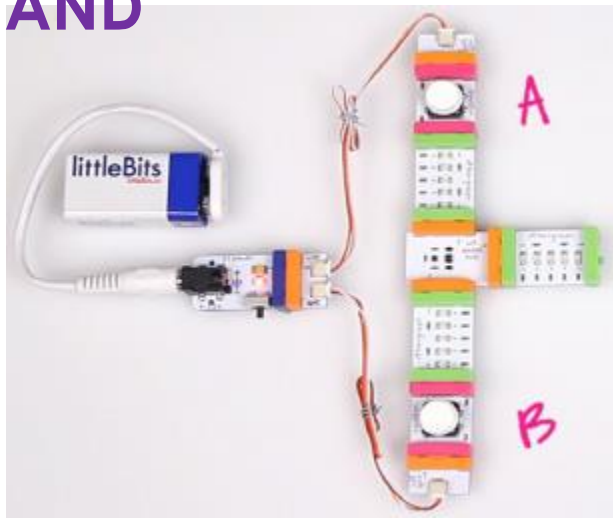
- AND/OR/XOR/NOR/NAND/ Inverter
  - Logic 'operators'
- Latch = *toggle*:
  - Gets signal: turn on
  - Gets another signal: turn off

littlebits.cc/lessons/introduction-to-logic

ADDITIONAL FILES

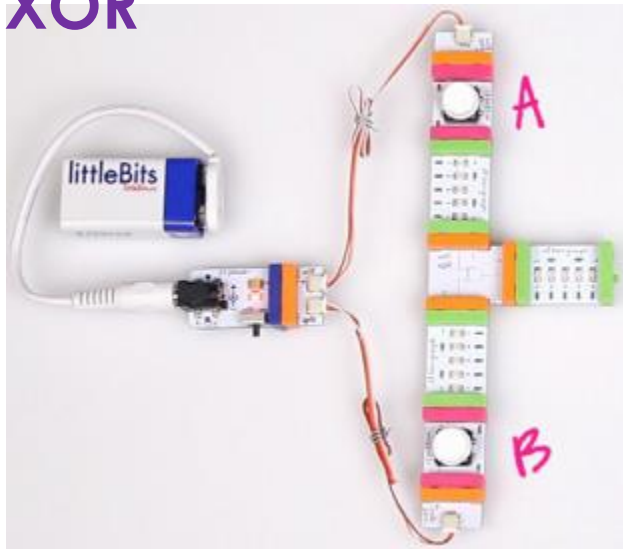
- Full Logic Lesson
- Pre and Post Test

AND



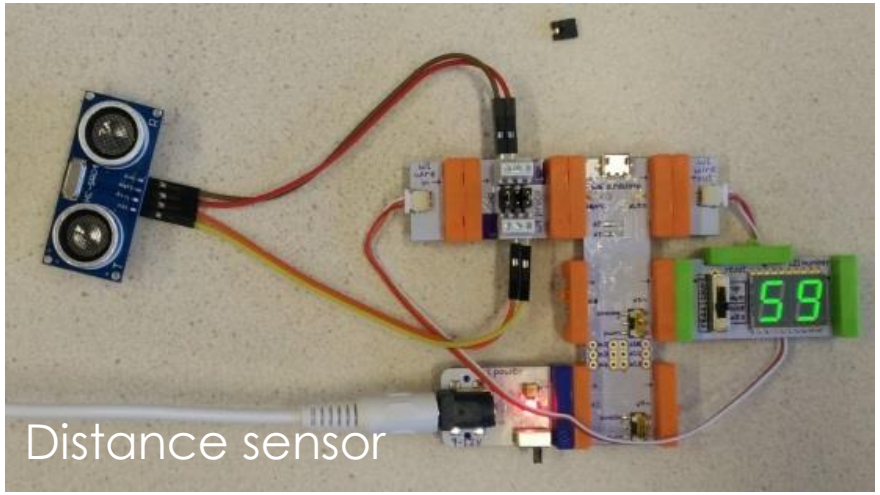
INPUT A	INPUT B	OUTPUT
0	0	0
1	0	0
0	1	0
1	1	1

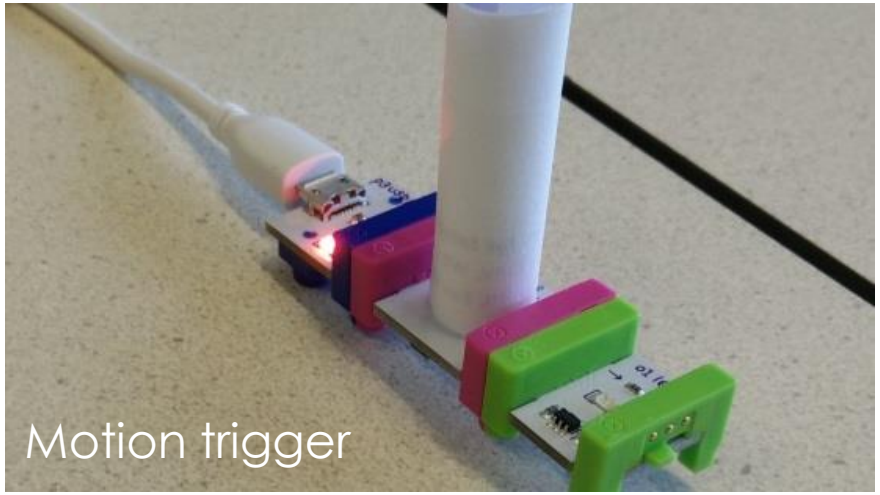
XOR

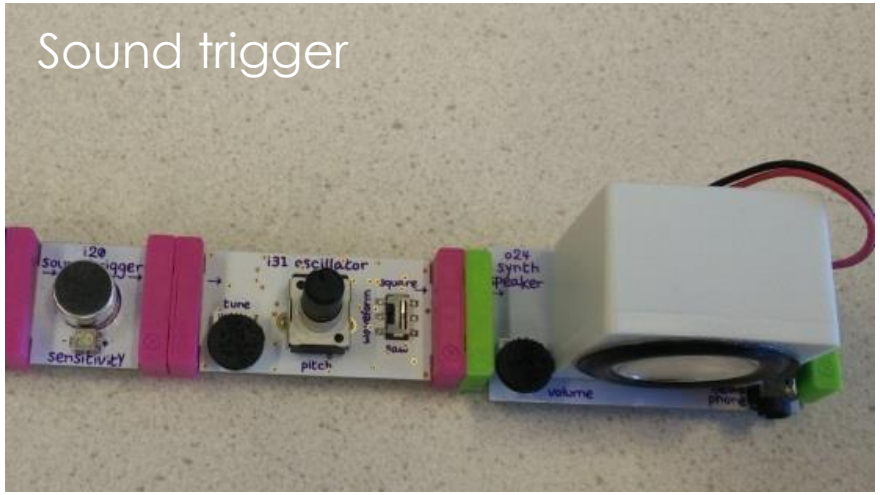


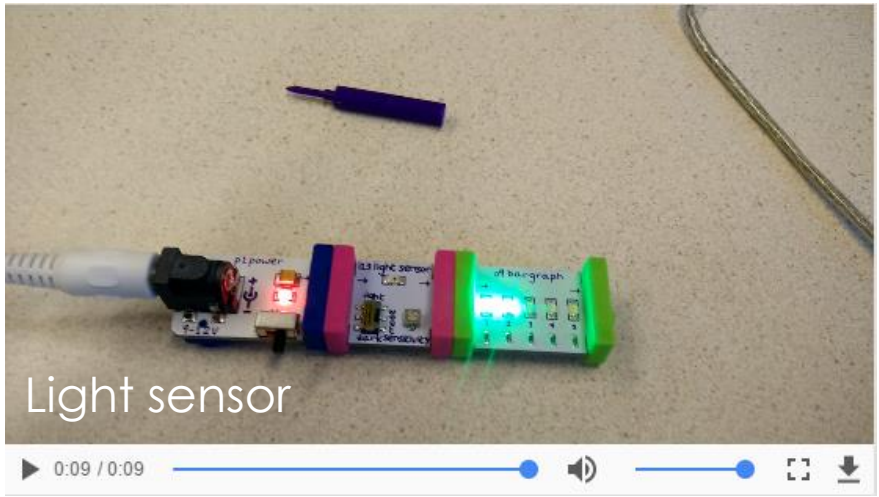
INPUT A	INPUT B	OUTPUT
0	0	0
1	0	1
0	1	1
1	1	0

Interaction Examples



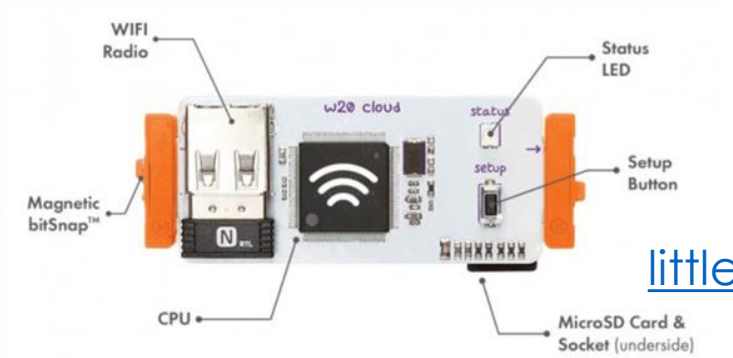






- More @ vanslooten.com/littlebits

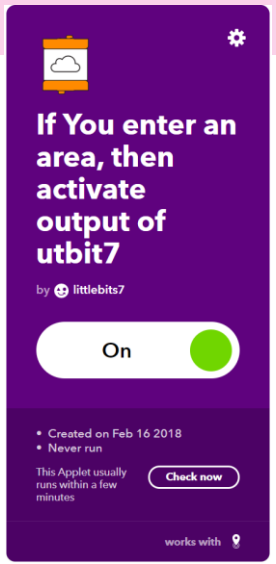
CloudBit



littlebits.cc/bits/cloudbit

littlebits.cc/tips-tricks/tips-tricks-the-cloudbit-ifttt

- Problem: does not work on EDUROAM (or any of the university's Wifi networks)
- Trick: use laptop or phone as a hotspot ----------→ `Hotspot: mspot`
  `Password: ********`
- Connect CloudBit to this hotspot; login at: control.littlebitscloud.cc
  `Email: littlebits@vanslooten.com`
  `Password: ********`
- Create test circuit
- Use **IF** **T**his **T**hen **T**hat: IFTTT:
- Example: Location Channels trigger when you enter or exit an area
  IF you enter a certain area, THEN activate littleBits circuit [i.e. play an mp3 file]

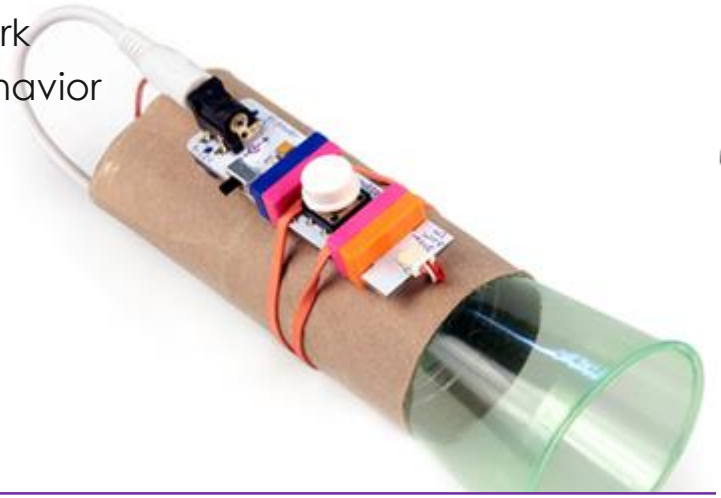


utbit4, utbit5: defect
utbit3: output is defect

Explore

Try it yourself

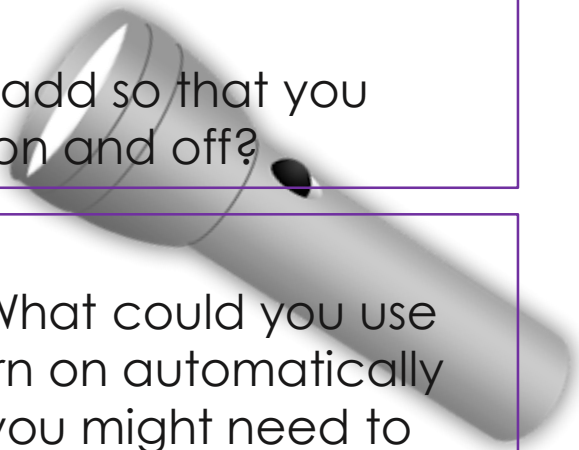
- Assemble a project
  - Make it work
  - Alter its behavior



More challenges

- Build an mp3 player, add extra functions, eg. a remote
- Create a people-counter which counts the number of people that pass by it
- Try these Interaction Examples

Challenge #1
Create a light, then turn it into a flashlight: You don't want the light to be on all the time or the battery will run out.
What input Bit would you add so that you could turn your flashlight on and off?



Challenge #2
Now let's make it smart: What could you use to make your flashlight turn on automatically when it gets dark? (Hint: you might need to change the settings of the Bit you add)

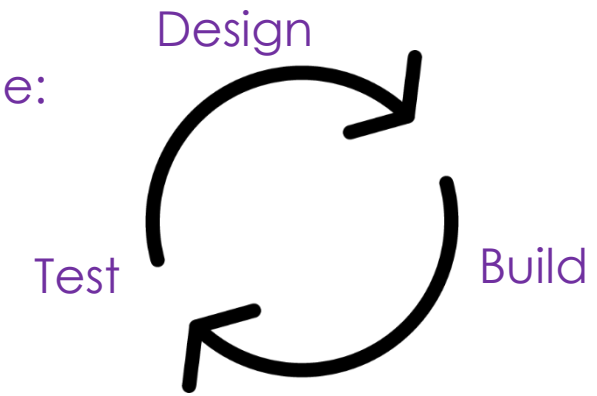
Challenge #3
What other ways could you use this same circuit? If we put our circuit in a box, what would we need to change so that the light turns on whenever we open the box?

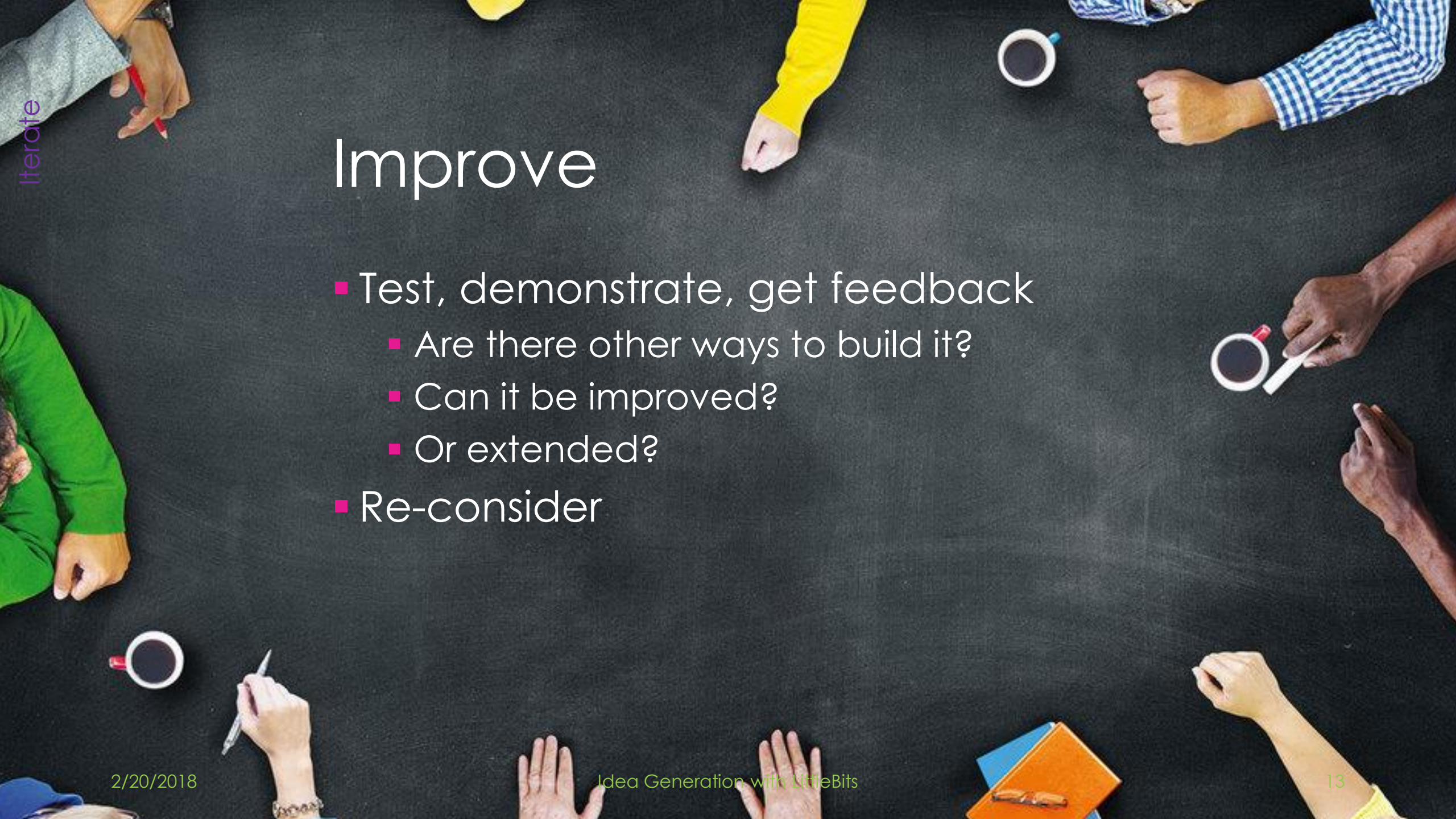
ProLibrary
littlebits.cc/kits/pro-library#inside

Idea Generation:

- Design: brainstorm (plan, sketch)
- Build
- Test/validate your idea's

In a short-time:





Improve

- Test, demonstrate, get feedback
  - Are there other ways to build it?
  - Can it be improved?
  - Or extended?
- Re-consider

Before you break up…

Gather evidence for design process: *Idea Generation* is an important step

- Record a video, take pictures
- Document
  - Take notes of important steps

➢Share with your group!

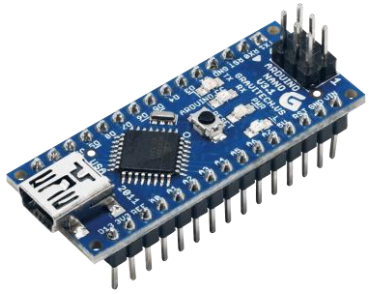
vanslooten.com/littlebits

View presentation

Borrow materials?

- LittleBits kits (8)

- Additional:
  - Lego Mindstorms
  - Small electronics kit
  - Arduino's (Uno, Leonardo, Nano)
  - Blue bean



ProLibrary

littlebits.cc/kits/pro-library#inside

Help… how-to…?

- Website: vanslooten.com/littlebits

View this presentation, examples etc.

How to make sound?

- Littlebits.cc/tips-tricks

- Google