June 2020

Programming 2.0

Music – Week 4

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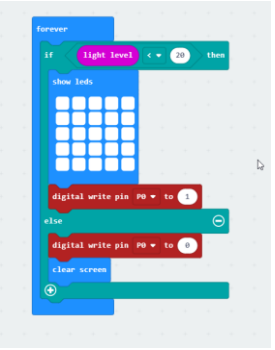
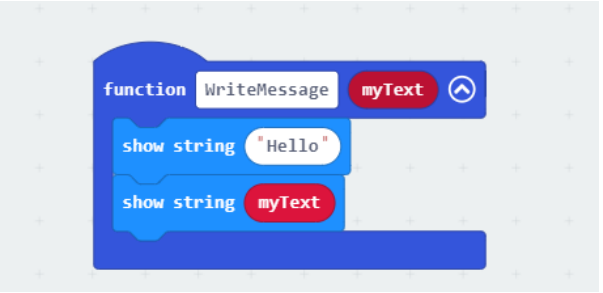
Agenda – Week 3

- Review
- Home work discussion
- Sensors – Temperature
- Sensors – Compass
- Musical Micro:bit
- Review
- Homework – 4

Review – Week 3

- Light sensor – How light sensor works
  - Father's day – Night light for your dad
- Functions
  - Modules of code that accomplish a specific task
  - Allow us to reuse code instead of rewriting it
  - Built-in / System Functions
    - examples – ShowString





Sensors

- Temperature sensor
- How it works?
  - Video - https://www.youtube.com/watch?v=_T4N8O9xsMA
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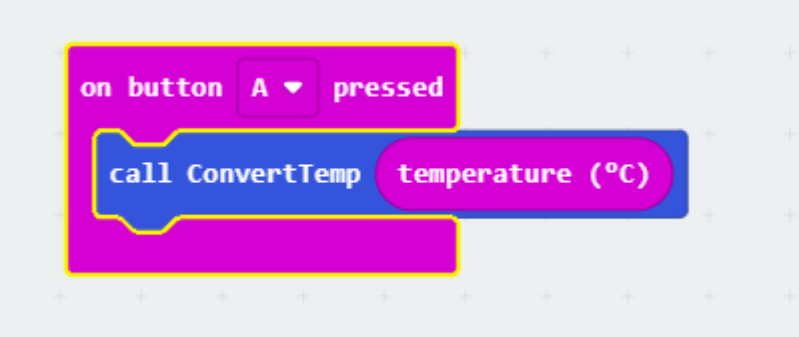
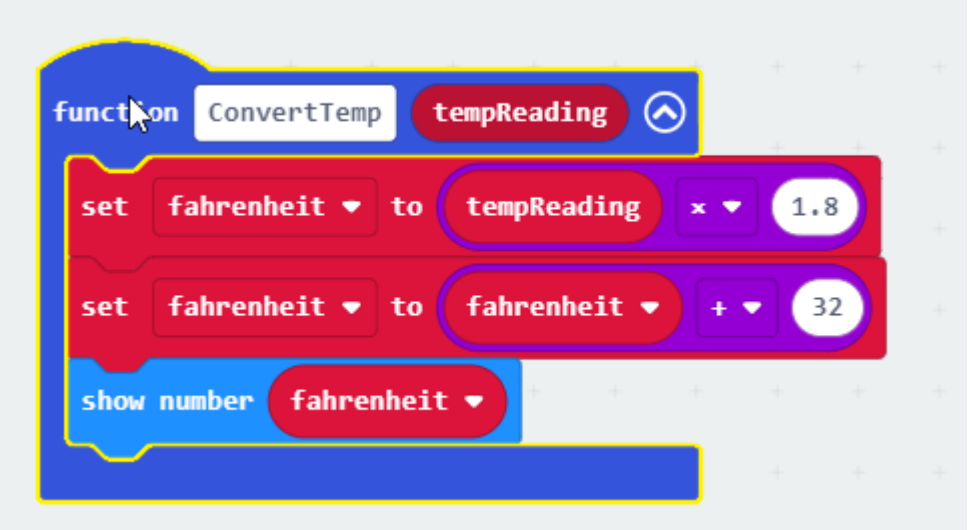
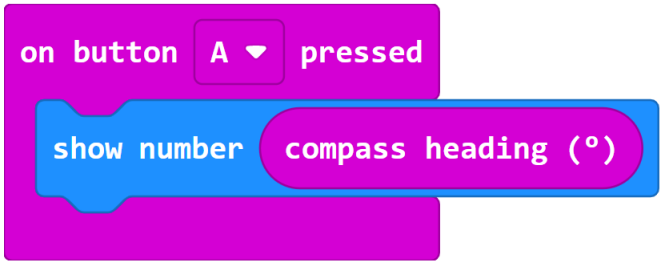
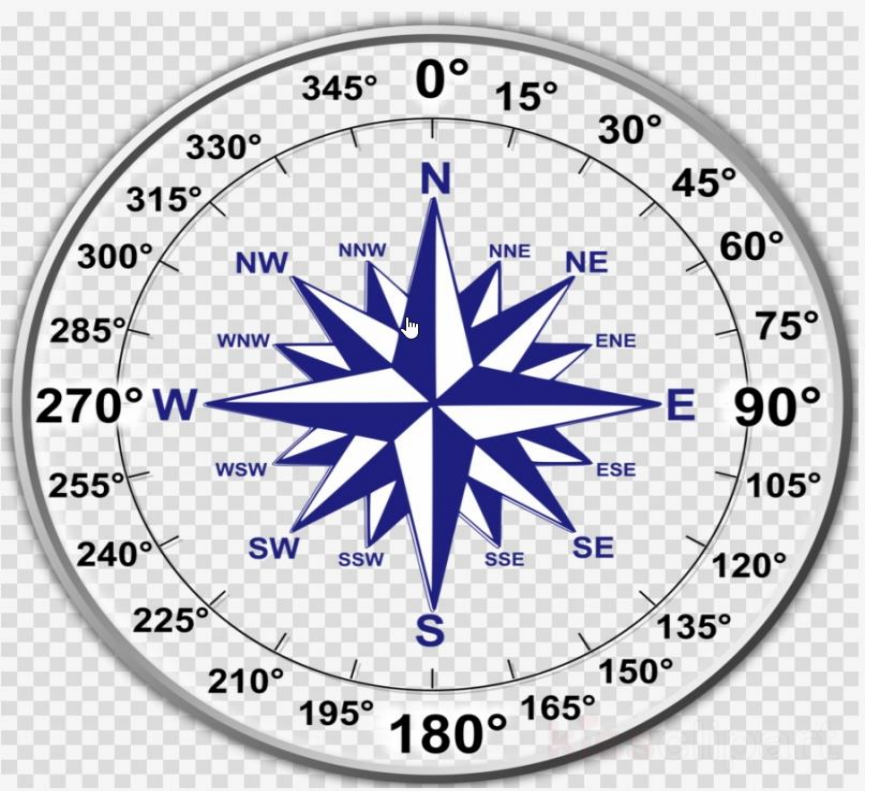




Sensors

- Compass sensor
  - If Reading < 45 → N Or > 315
  - If Reading between 45 & 135 → E
  - If Reading between 135 & 225 → S
  - If Reading < between 225 & 315 → W





Algorithm

- An algorithm is a fancy to-do list for a computer.
- Algorithms take in zero or more inputs and give back one or more outputs.
- A recipe is a good example of an algorithm because it tells you what you need to do step by step. It takes inputs (ingredients) and produces an output (the completed dish).
- Sorting algorithm
  1. Pick up all of the cards.
  2. Pick a card from your hand and look at the color of the card.
  3. If there is already a pile of cards of that color, put this card on that pile.
  4. If there is no pile of cards of that color, make a new pile of just this card color.
  5. If there is still a card in your hand, go back to the second step.
  6. If there is not still a card in your hand, then the cards are sorted.
  7. You are done.

Algorithm

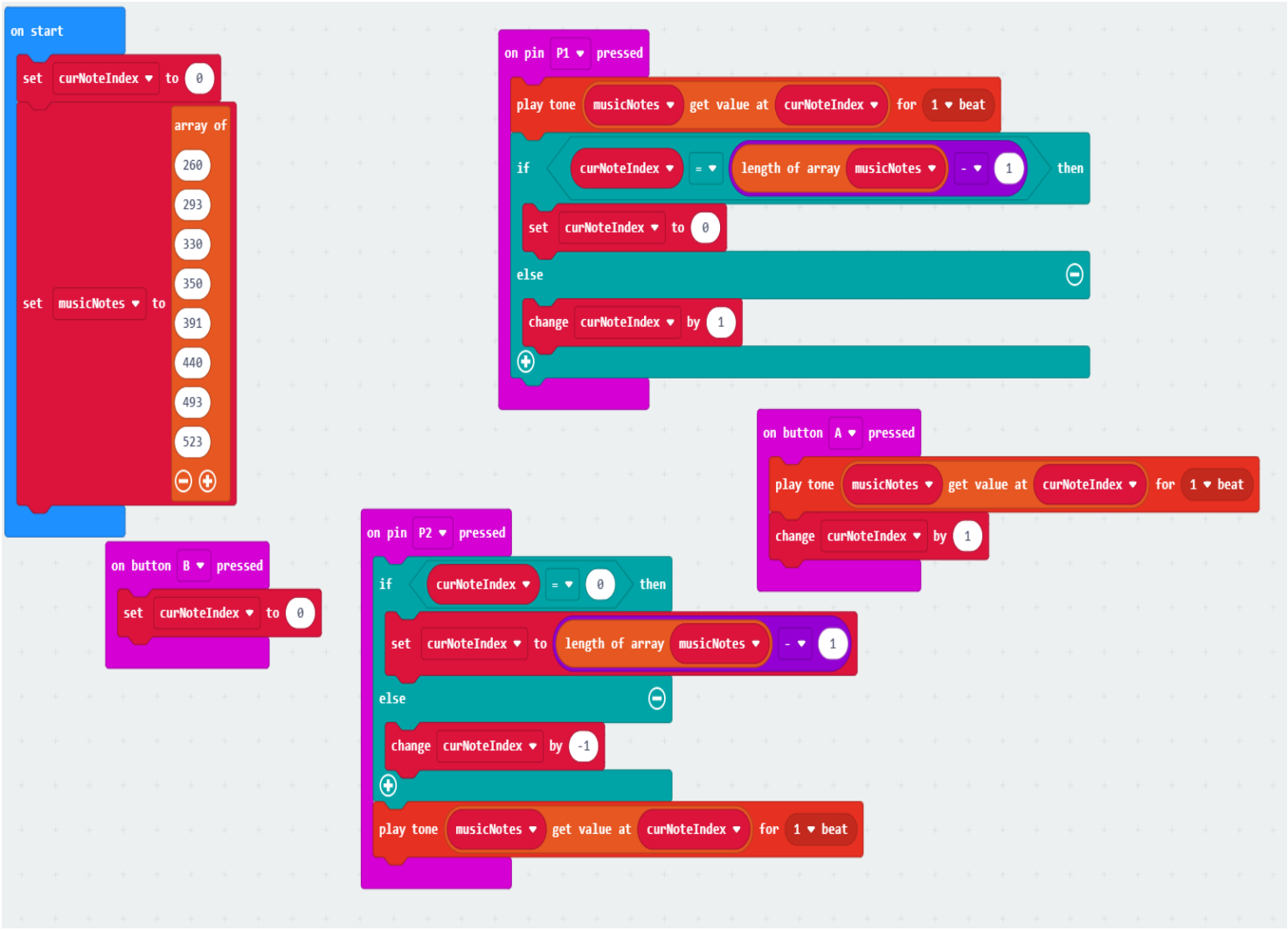
- Clap for four beats, rest for four beats.
- Create a musical phrase to play in the rest gap.
- If you are pointed at, play your musical phrase during the rest.

Forever

IF I am pointed at **then**

ELSE

Micro:bit – Fruity Music Notes

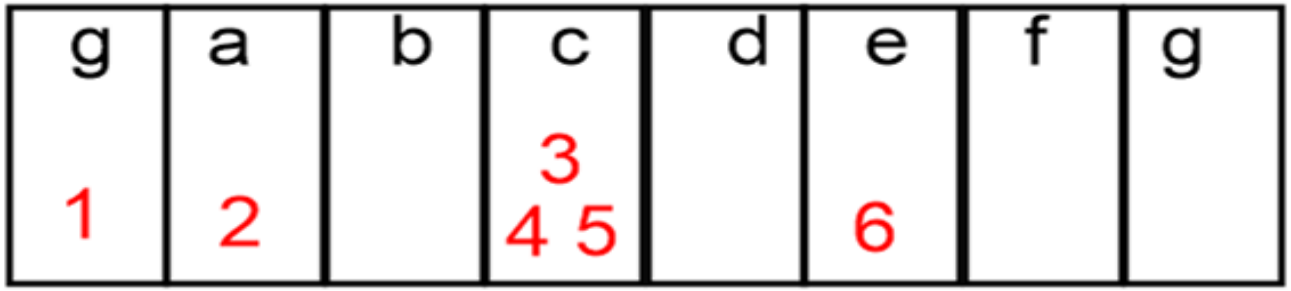


Note	Frequency
C	261
D	297
E	330
F	350
G	392
A	440
B	493
C (next octave)	524

Musical Micro:bit

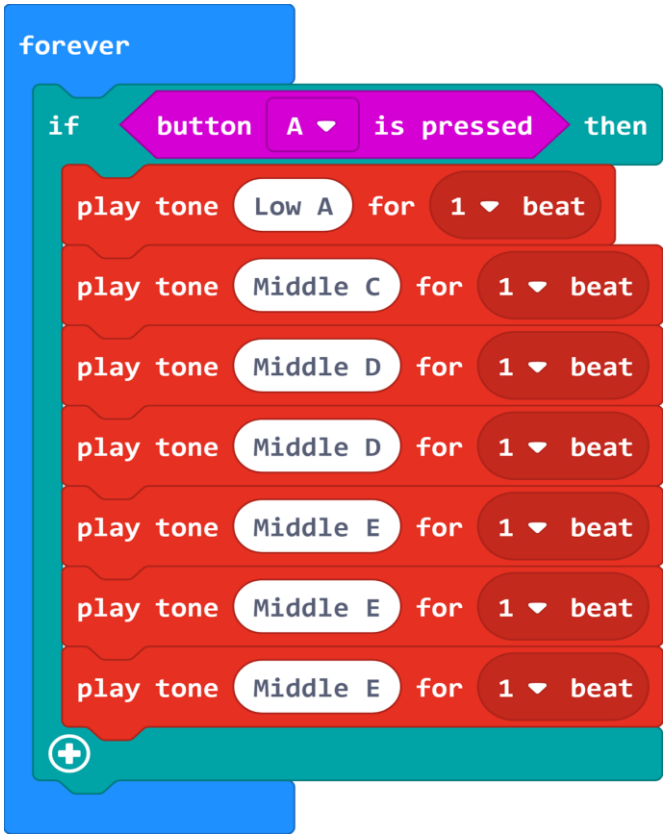
- Create three musical phrases:
  - Each phrase should have 4-6 notes.
  - Each phrase should have a maximum of 4 unique notes.
  - Each phrase should have a repeating note.
  - At least one phrase should be ascending.
  - At least one phrase should be descending.

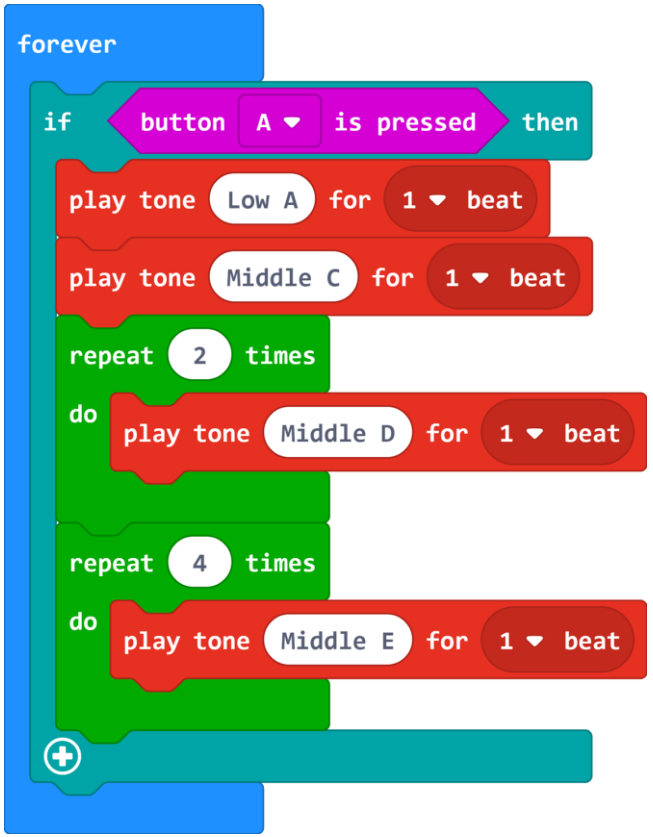
- Write an algorithm for each phrase for someone who cannot read music.
  - This musical phrase is ascending.
  - This musical phrase contains six notes.
  - This musical phrase contains four unique notes.
  - This musical phrase repeats note c three times.



Reading programs

- What statements can you make about this program?
- Which blocks have/haven't we used before?
- Which computing concepts are being used?
- How could you improve this program?

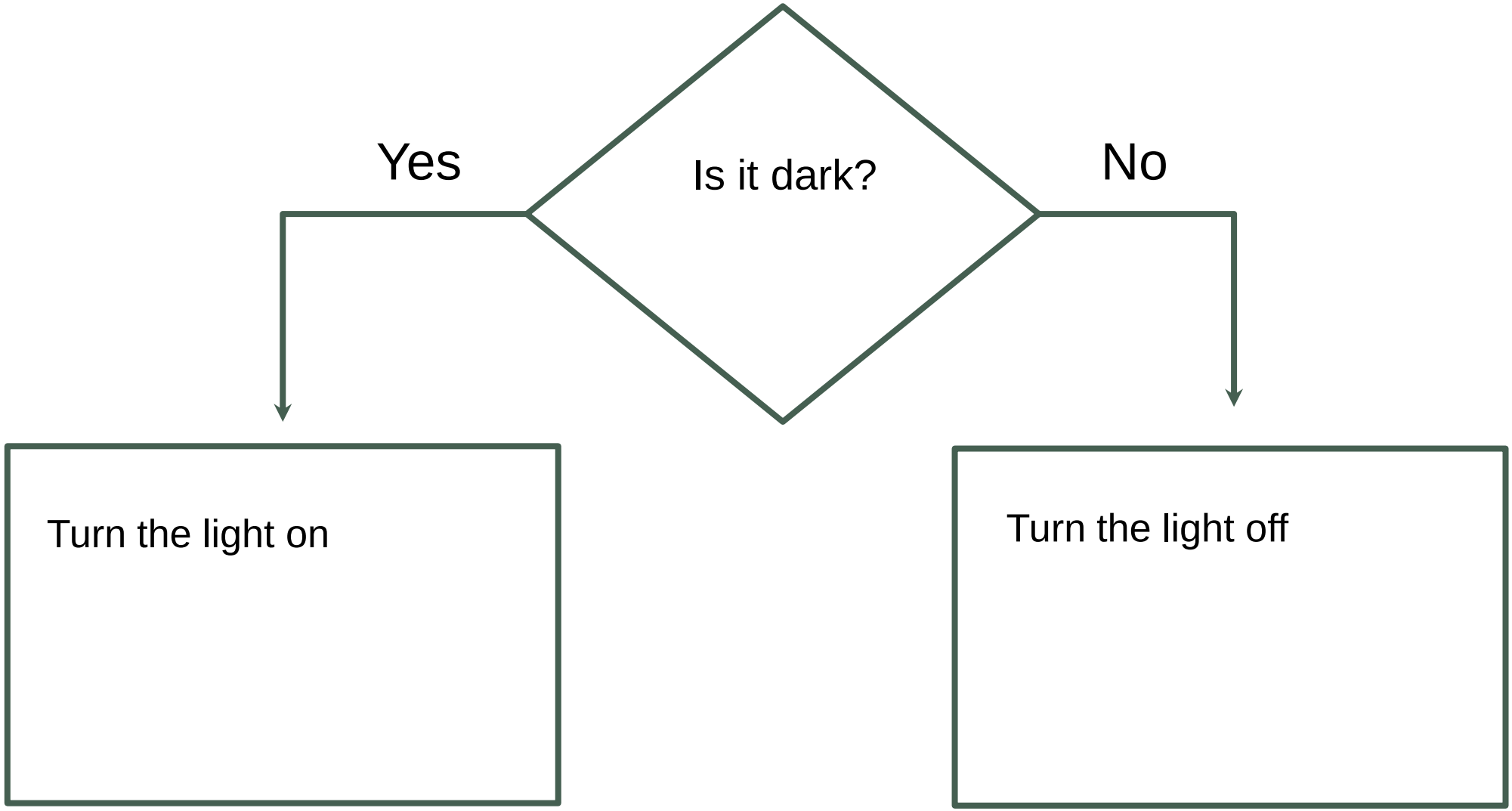




Review

- Home work – Week 4
  - Complete the Compass project
  - Create your own music beats – Play melody
- Sensors
- Musical micro:bit
- How do they collect the data?
- Sensors

Flowchart



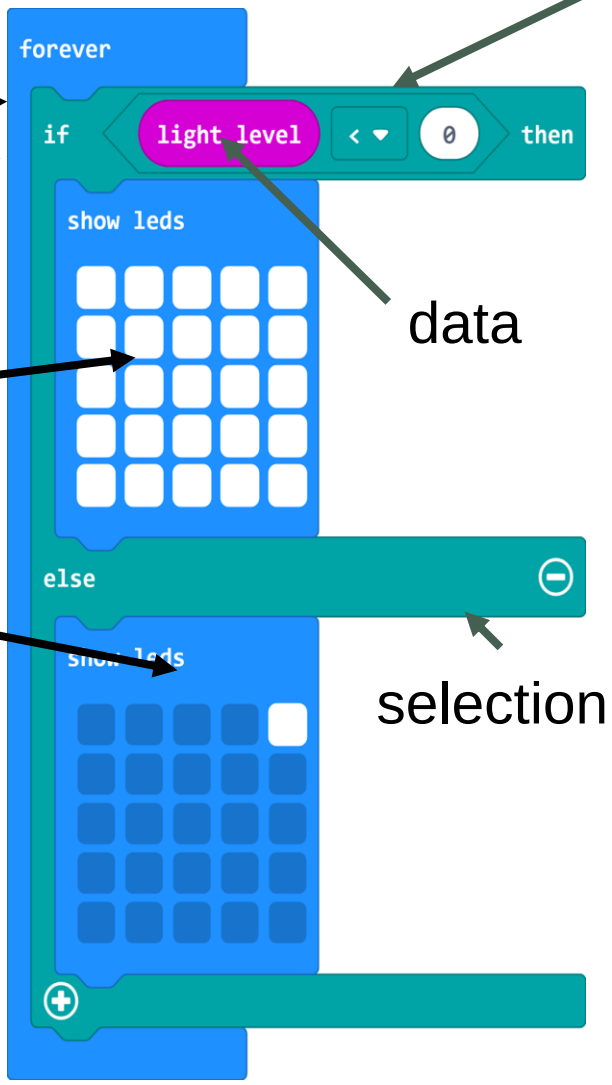
Algorithms and Programs

FOREVER

IF it is dark

THEN turn light on

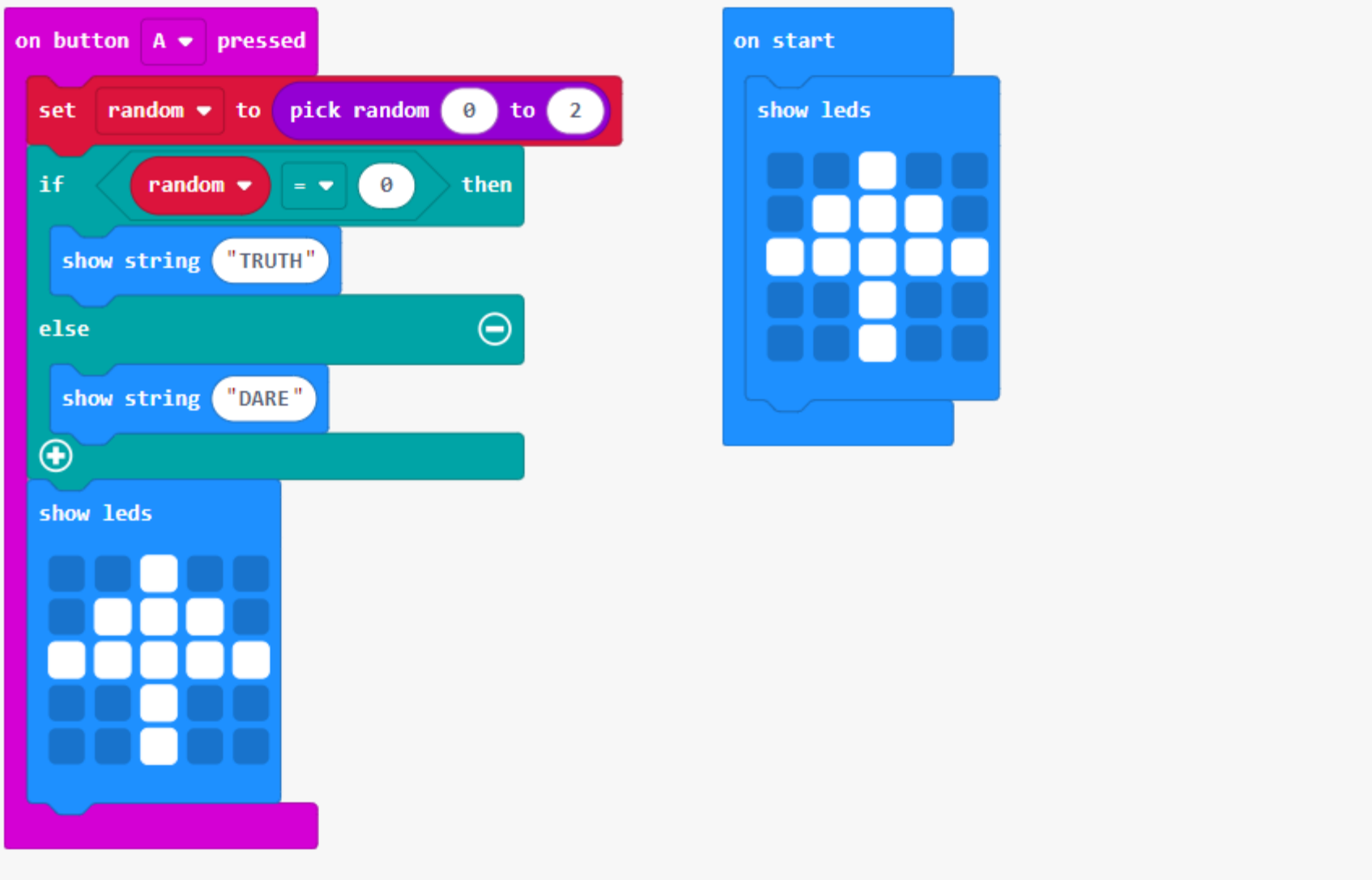
ELSE turn light off



References

+ Micro:bit Educational Foundation microbit.org

Truth/Dare


on button A pressed
set random to pick random 0 to 2
if random = 0 then
show string "TRUTH"
else
show string "DARE"
show leds
on start
show leds