

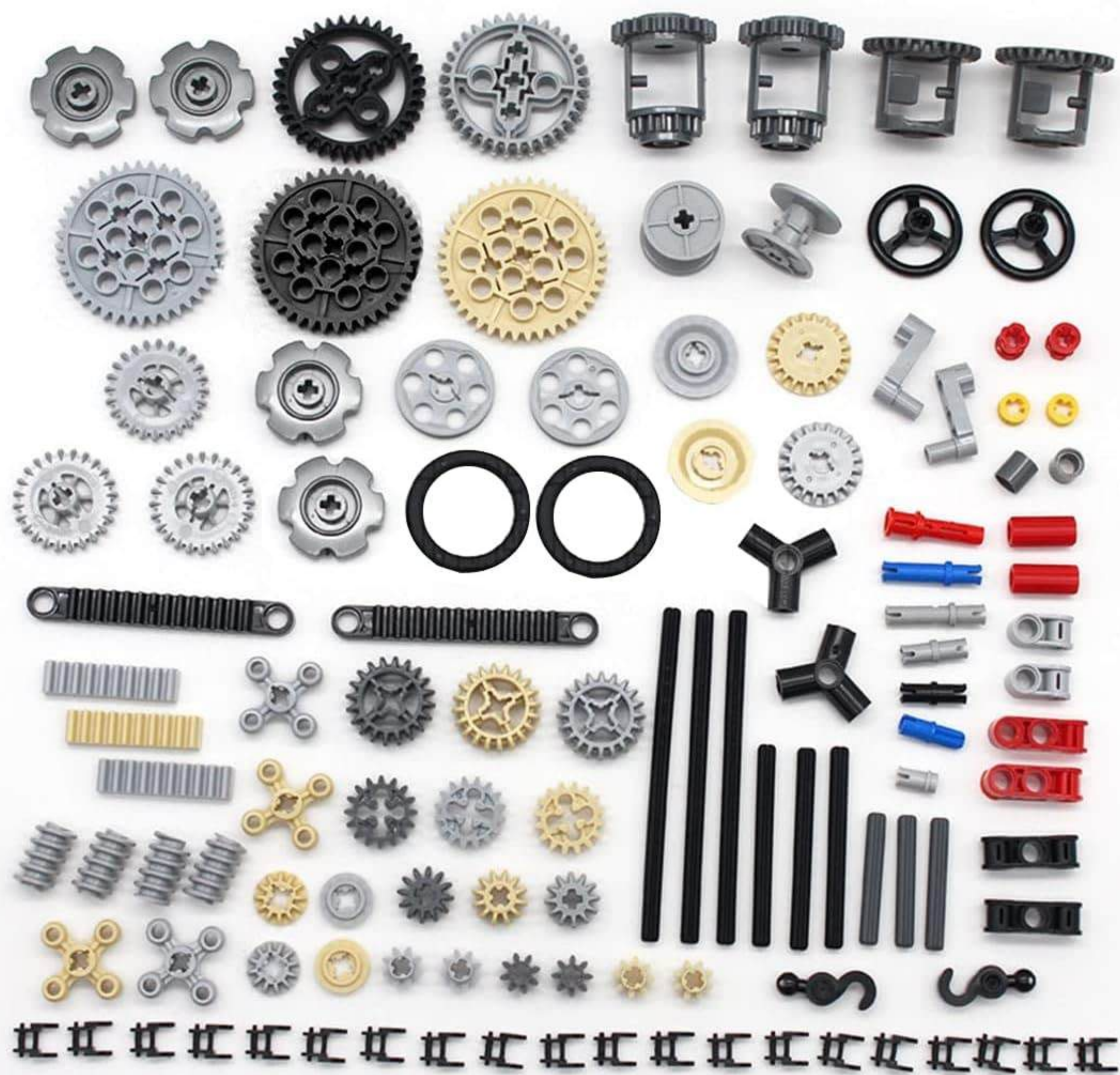


**Michalis
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**08/01/2026
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Bring LEGOs to life

- **Actuators**
- **Sensors**
- **Hub/Brain**

Actuators

- Servo / Motor
- Led
- Screen
- Speaker

Sensors

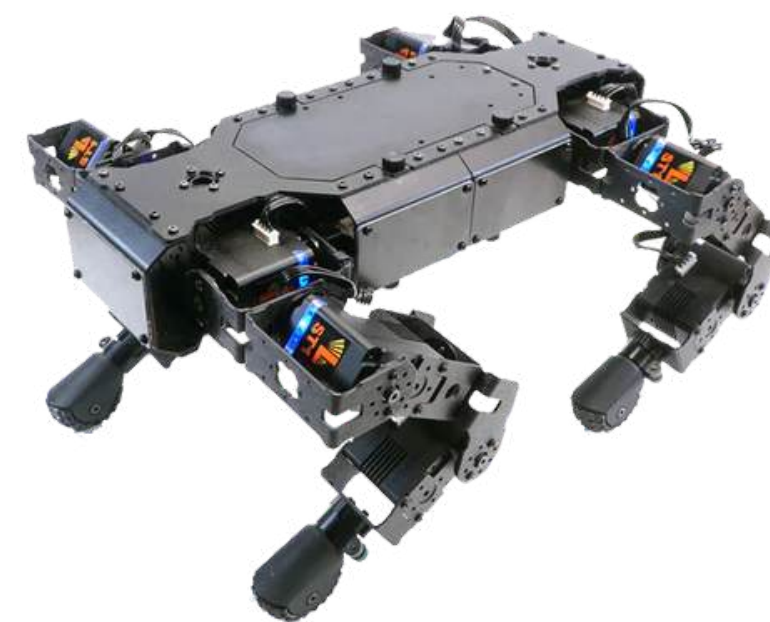
- **Button**
- **Distance**
- **Illuminance**
- **Colour**
- **Gyroscope**
- **Compass**
- **Servo**
- **Camera**
- **Mic**

Hub/Brain

Unit(s) that:

- **Connects**
- **Processes**
- **Stores**
- **Controls**
- **Provides Energy**

Why not use an existing robotic set?

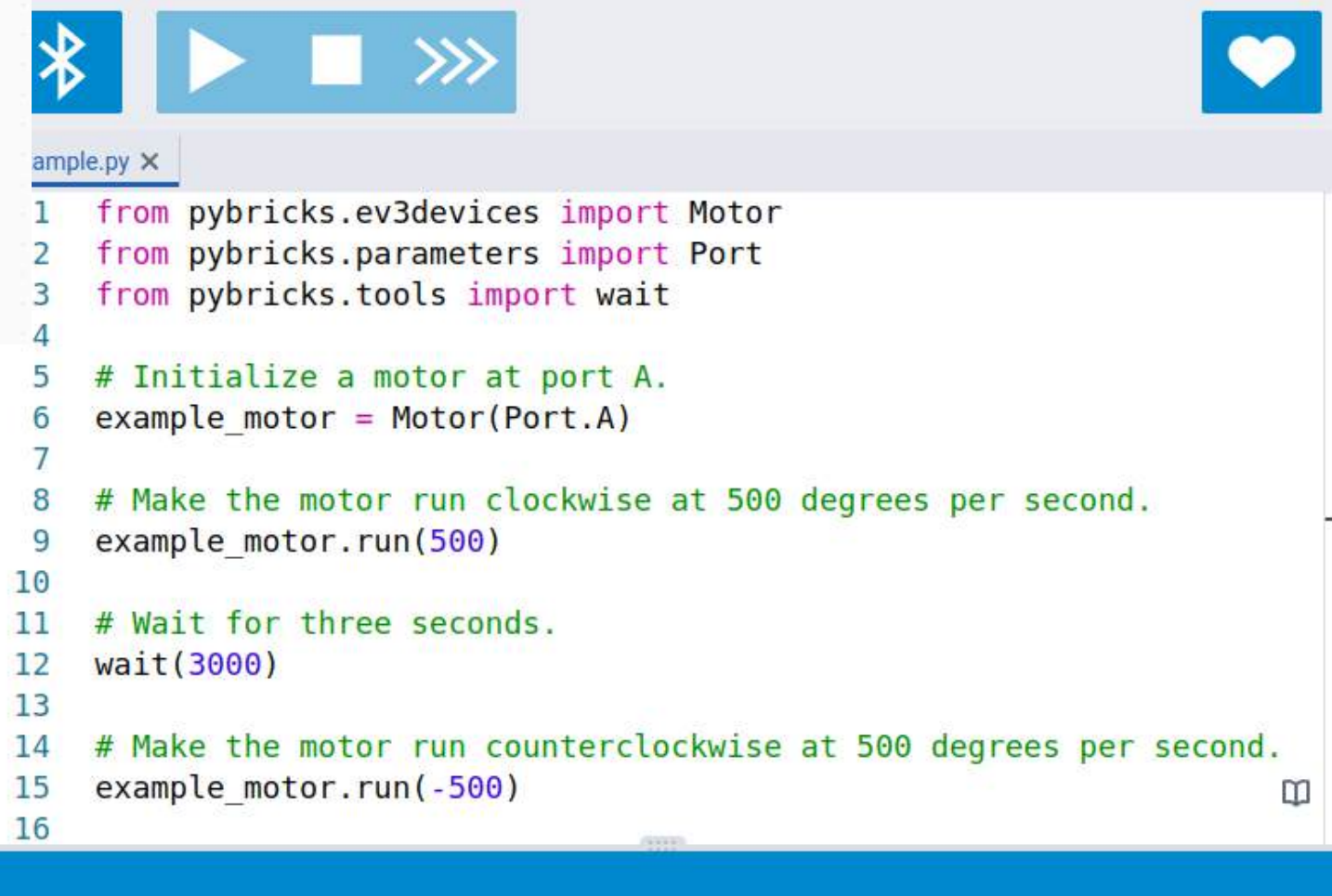
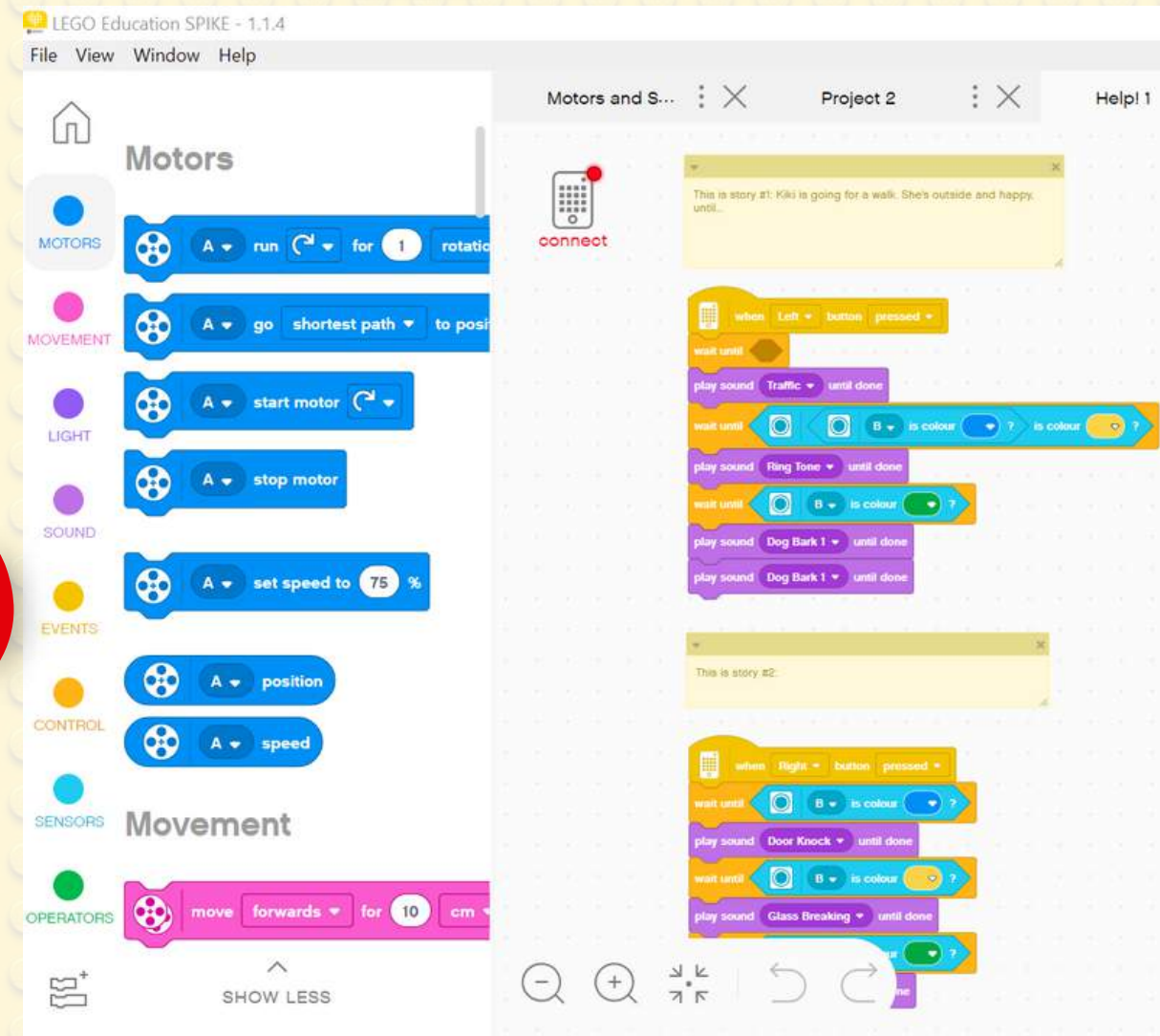




Build & Program

Programming

- Visually
- Language(s)
- Directly



Used @

- **Education**
- **Competitions**
 - **FIRST LEGO League (FLL)**
 - **World Robot Olympiad (WRO)**
 - **RoboCup Junior**
 - **RoboFest**
- **Prototyping**
- **Self-learning**

Mindstorms (retired)

- Powerful
- Open ifaces & com protocols
- Many sensors
- 3 generations
 - RCX ('98-'03)
 - NXT 1.0 & 2.0 ('06-'10)
 - EV-3 ('13-'22)



Mindstorms NXT

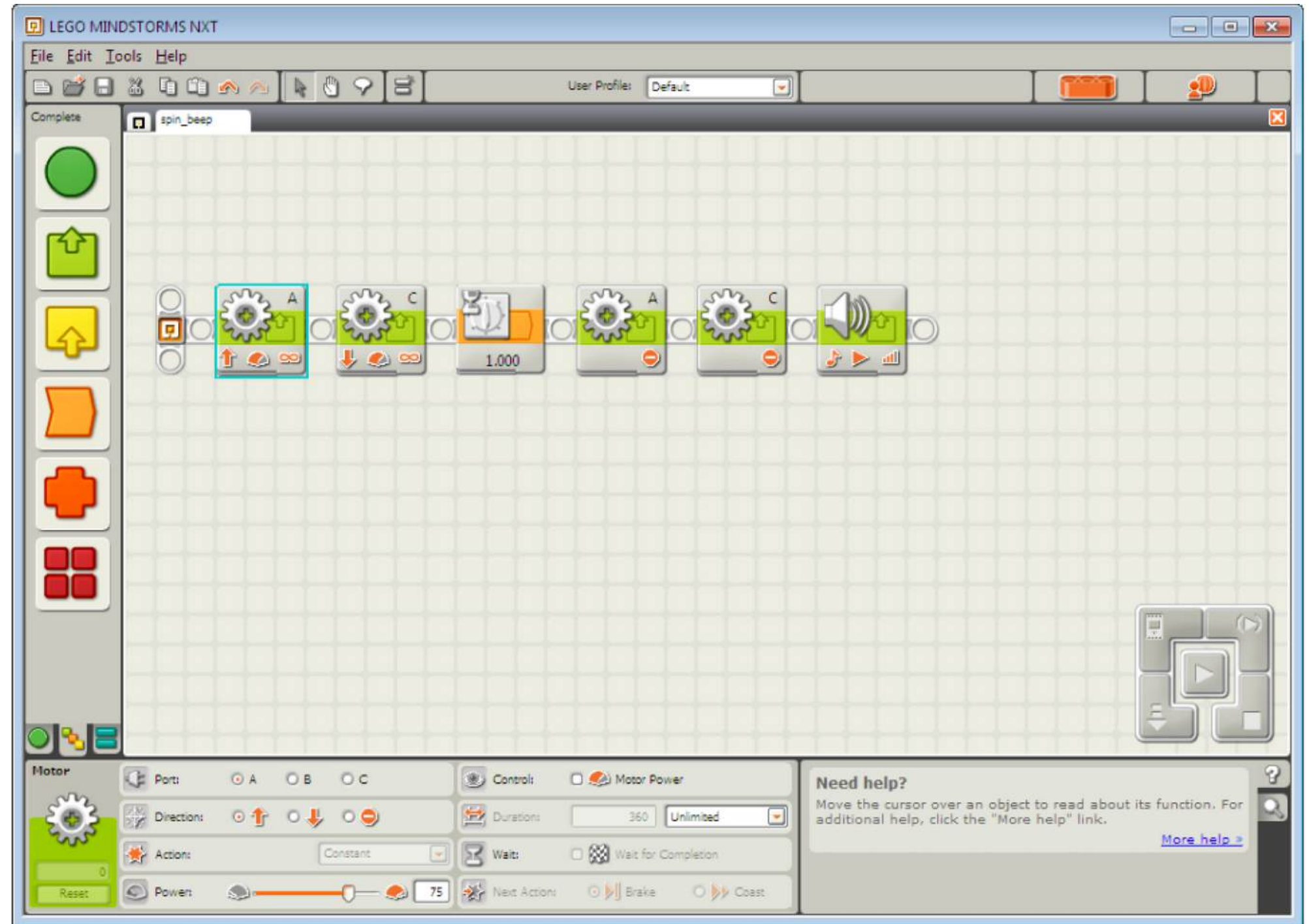


Mindstorms NXT

- Distance (U/S)
- Brightness
- Color
- Mic
- Bluetooth
- Gyro
- Compass
- PIR
- Camera
- Kit

Mindstorms NXT

- Visual (default)
- Python
- NXC (C like)
- leJOS (Java like)
- MATLAB integration
- Assembly
-

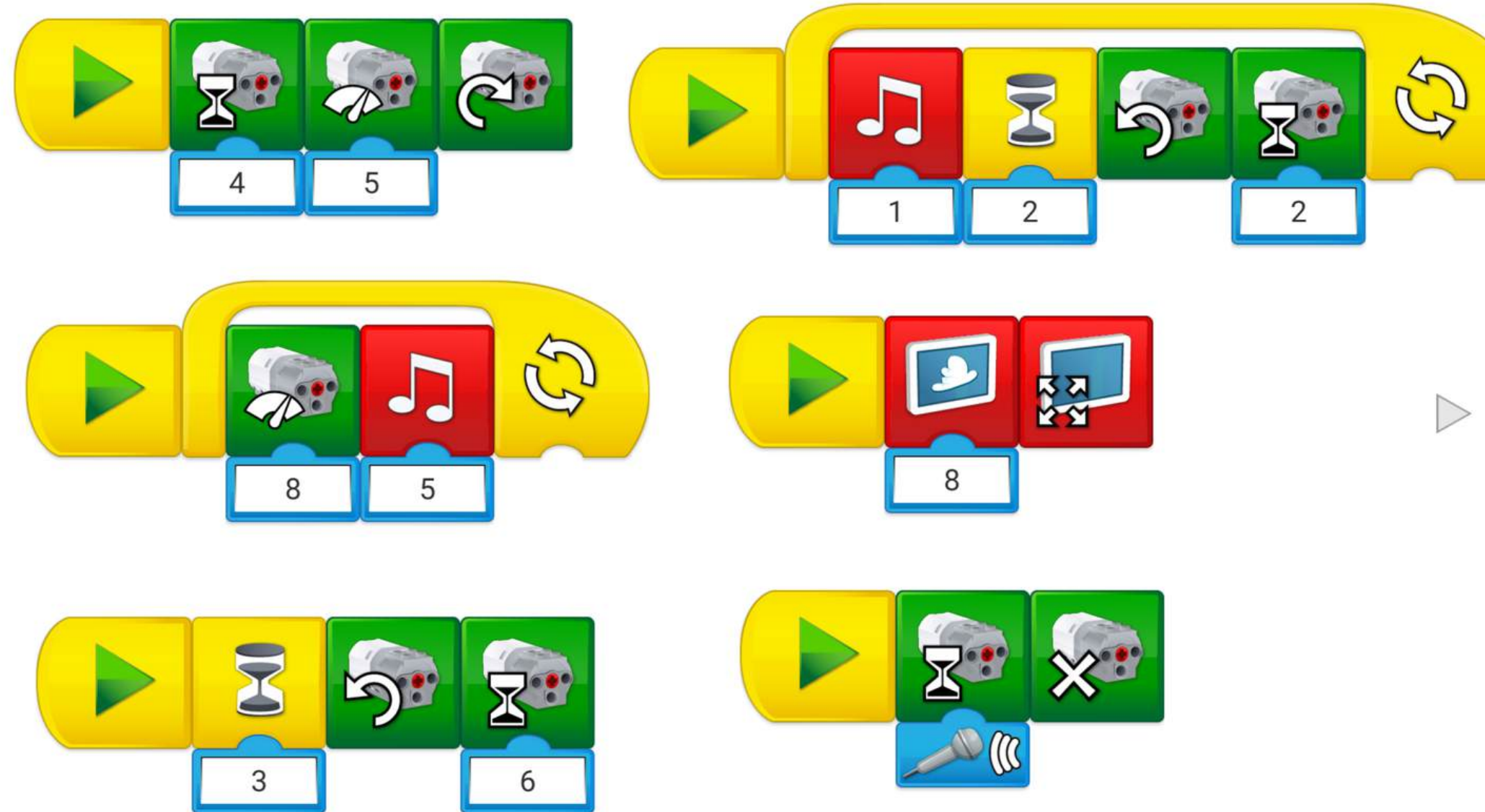


WeDo (retired)

- Entry level
- Visual Programming
- Simple hardware
- STEM oriented
- 2 versions
 - 1.0 ('09-'17)
 - 2.0 ('16-'21)



WeDo



Spike

- Powerful
- Multiple sets
- Education-first
- Many sensors
- Visual
- Python
- '20-...



Spike Essential



Spike Prime



Spike

LEGO Education SPIKE - 2.0.4

File Help

Duplo Train Clo... X

Connect

Motors

- MOTORS
 - A → run for 1 rotations
- MOVEMENT
 - A → go shortest path to position
- LIGHT
 - A → start motor
 - A → stop motor
- SOUND
 - A → set speed to 75 %
- EVENTS
 - A → position
 - A → speed

Movement

- SENSORS
 - move up for 10 cm
- OPERATORS
 - start moving up
- VARIABLES
 - move right 30 for 10 cm
- MY BLOCKS
 - start moving right 30
 - stop moving
 - set movement speed to 50 %
 - set movement motors to A+B
 - set 1 motor rotation to 17.5 cm

Light

- M1 → turn on for 2 s

when program starts

- set direction to 0
- set light to 0
- M1 → turn on
- E → light up

when tapped

- if A → speed > 1 then
 - start sound Train Breaks
 - A → stop motor
 - M1 → turn on
- else
 - start sound Train Start
 - if direction = 0 then
 - A → set speed to 15 %
 - A → start motor
 - M1 → turn on
 - else
 - A → set speed to 15 %
 - A → start motor
 - M1 → turn on
- wait 1 seconds

C → when color is green

- start sound Train Breaks
- if direction = 1 then
 - set direction to 0
 - A → set speed to 15 %
 - A → start motor
 - M1 → turn on
- else
 - set direction to 1
 - A → set speed to 15 %
 - A → start motor
 - M1 → turn on
- wait 1 seconds

C → when color is blue

- start sound Train Signal 1
- A → stop motor
- set volume to 100 %
- M1 → turn on
- wait 1 seconds
- M1 → turn on
- wait 1 seconds
- M1 → turn on
- wait 1 seconds
- start sound Train Start
- if direction = 0 then
 - A → set speed to 15 %
 - A → start motor
 - M1 → turn on
- else
 - A → set speed to 15 %
 - A → start motor
 - M1 → turn on
- wait 1 seconds

C → when color is black

- start sound Train Whistle
- if light = 0 then
 - set light to 1
 - E → light up
- else
 - set light to 0
 - E → light up
- wait 1 seconds

C → when color is red

- start sound Train Breaks
- A → stop motor
- M1 → turn on
- wait 1 seconds

Variables

- direction 0
- light 0

SPIKE™ Prime

Mindstorms Robot Inventor

- **Powerful**
- **Based on Spike**
- **Program & control**
- **Retired ('20-'22)**



DEMO
TIME

Benefits

- **STEM oriented**
- **One-stop app**
- **Build - Program - Refine**
- **Different levels**
- **Resources**
- **Collaborative work**
- **Learn by doing**
- **Creativity w/o limits**

THANK YOU

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