Hack the System

Construction Notes

Breadboard Connections
LED Polarity

Kit Contents

What is a Microcontroller?

"A microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals."

Today's Project

Memory Game

Actual
Breadboard
Schematic

Applications

Household Appliances
Smart Grid
Vending Machine
Industrial
Automotive
Medical

Discrete Components

Input Peripherals
Output Peripherals

Switches
Light Emitting Diodes (LED)

Loudspeaker

Get In Touch With Biomed

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Actual · Breadboard · Schematic
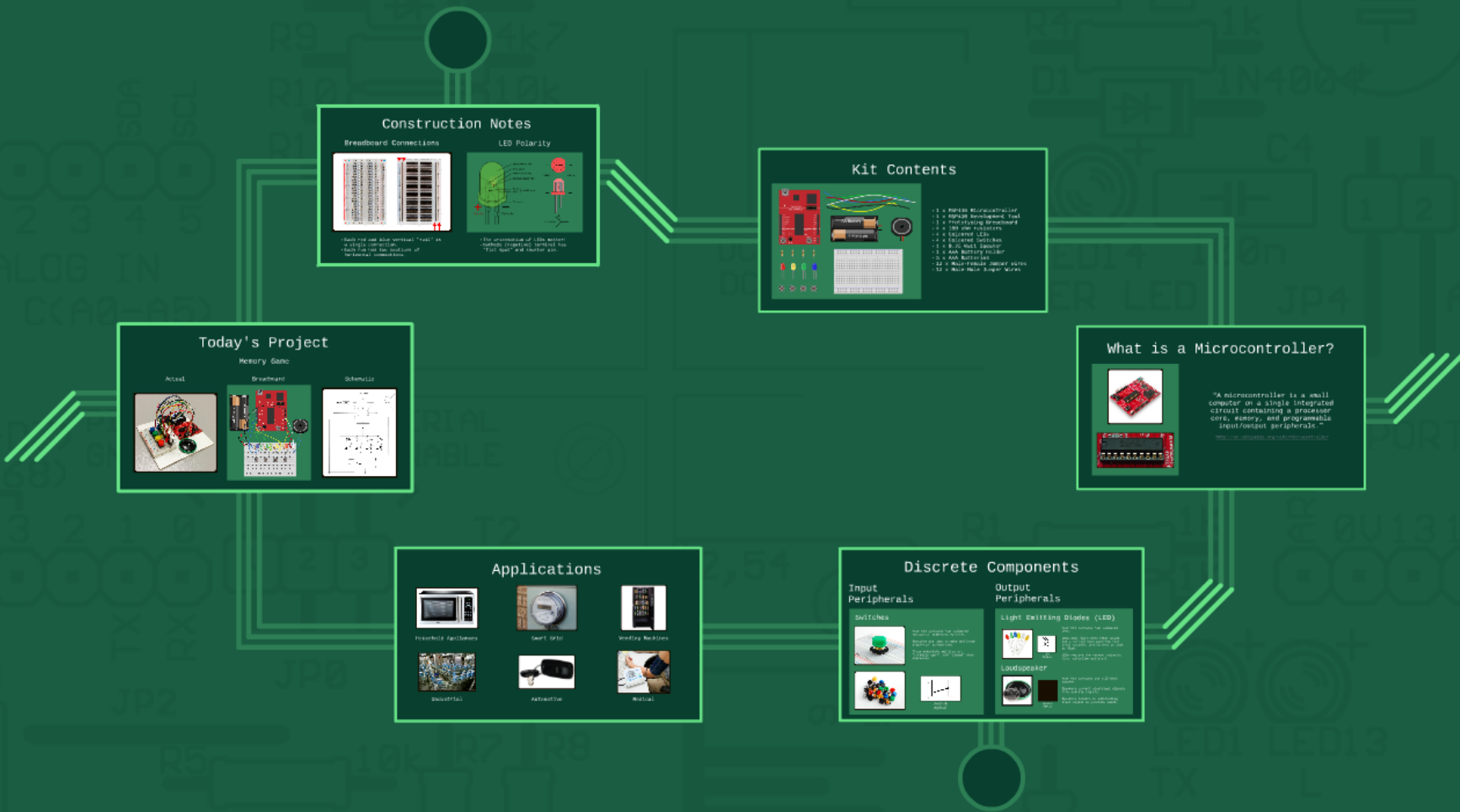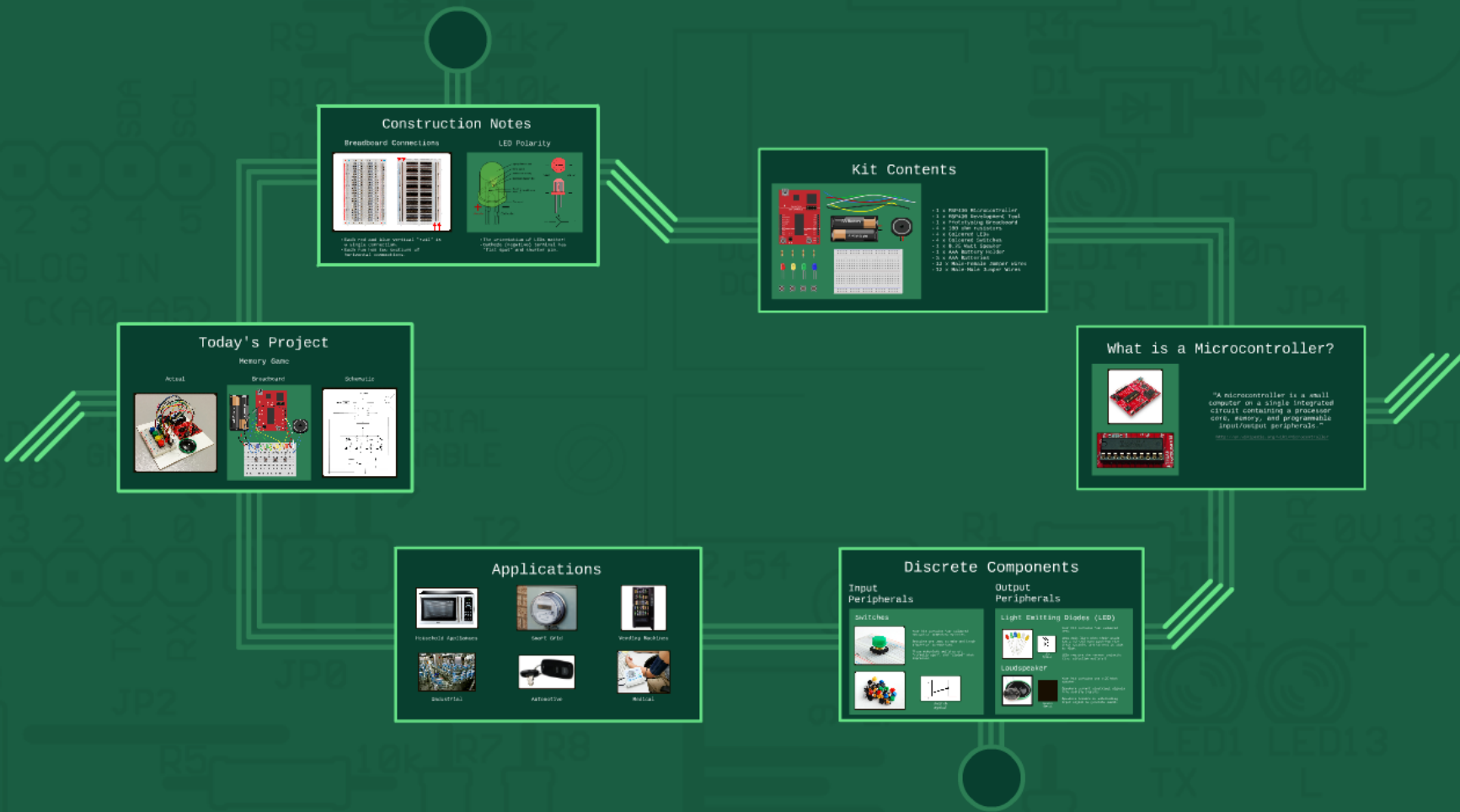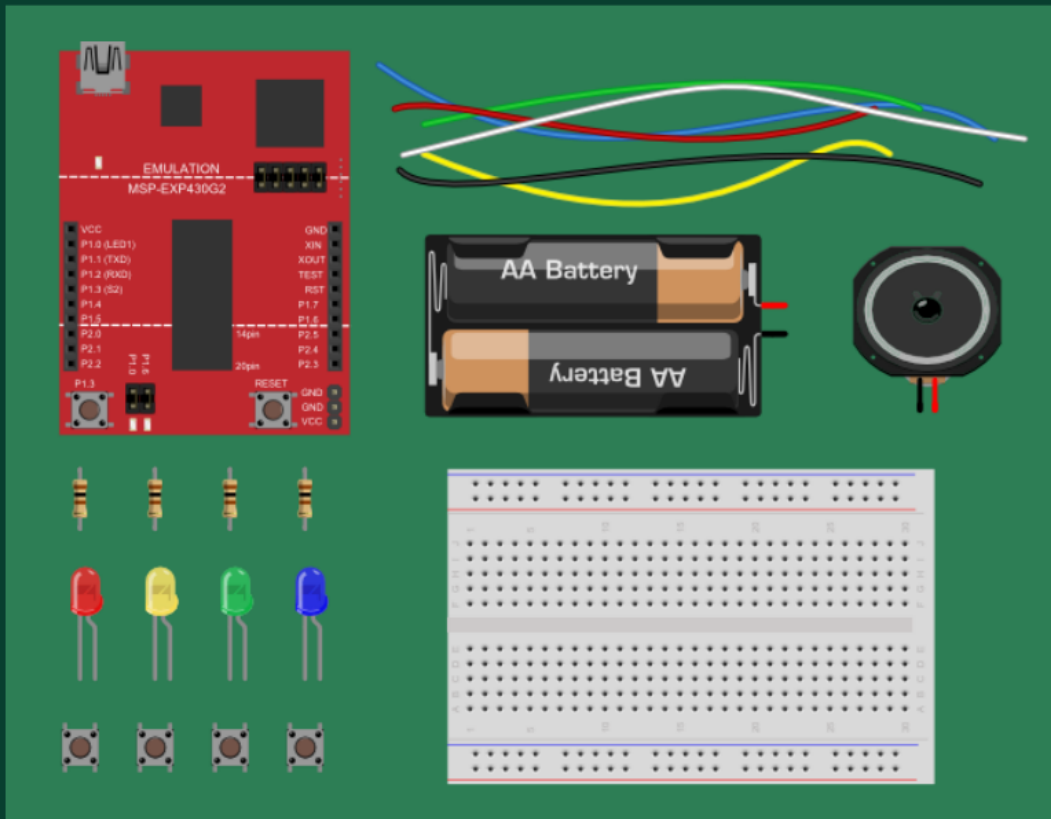
Applications

Discrete Components

Input Peripherals · Output Peripherals

Get In Touch With Biomed

Kit Contents

- 1 x MSP430 Microcontroller
- 1 x MSP430 Development Tool
- 1 x Prototyping Breadboard
- 4 x 100 ohm resistors
- 4 x Coloured LEDs
- 4 x Coloured Switches
- 1 x 0.25 Watt Speaker
- 1 x AAA Battery Holder
- 3 x AAA Batteries
- 12 x Male-Female Jumper Wires
- 12 x Male-Male Jumper Wires

What is a Microcontroller?

"A microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals."

http://en.wikipedia.org/wiki/Microcontroller

File Edit Sketch Tools Help

Memory_Game §

```cpp
void loop()
{
    // ------------------------------- Gameplay ------------------------------- //

  // Play the game sequence
  for (int j=0; j<=game_level; j++)
  {
    play(sequence[j], game_speed);
  }

  // Get input sequence from the user
  for (int i=0; i<=game_level; i++)
  {
    while(1)
    {
      if (digitalRead(BUTTON_1) == LOW)
      {
        player_input[i] = 1;
        play(1, input_speed);
        break;
      }
      else if (digitalRead(BUTTON_2) == LOW)
      {
        player_input[i] = 2;
        play(2,input_speed);
        break;
      }
      else if (digitalRead(BUTTON_3) == LOW)
      {
        player_input[i] = 3;
        play(3,input_speed);
        break;
      }
      else if (digitalRead(BUTTON_4) == LOW)
      {
        player_input[i] = 4;
        play(4,input_speed);
        break;
      }
```

LaunchPad w/ msp430g2231 (1MHz) on COM1

Discrete Components
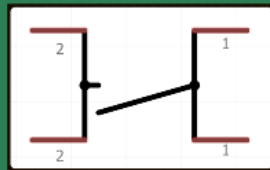
Input Peripherals

Switches
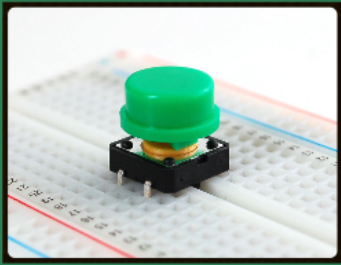
Your kit contains four coloured mechanical momentary switches.

Switches are used to make and break electrical connections.
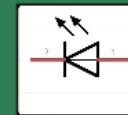
These momentary switches are "normally open", and "closed" when depressed.

Switch
Symbol

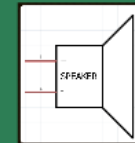## Output Peripherals

Light Emitting Diodes (LED)

LED
Symbol

Your kit contains four coloured LEDs.

LEDs emit light when their anode has a voltage more positive than their cathode, and current is able to flow.

LEDs require the correct polarity (i.e. direction matters!)

Loudspeaker

Speaker
Symbol

Your kit contains one 0.25 Watt speaker.

Speakers convert electrical signals into audible signals.

Speakers require an alternating input signal to generate sound.

Applications

Household Appliances

Smart Grid

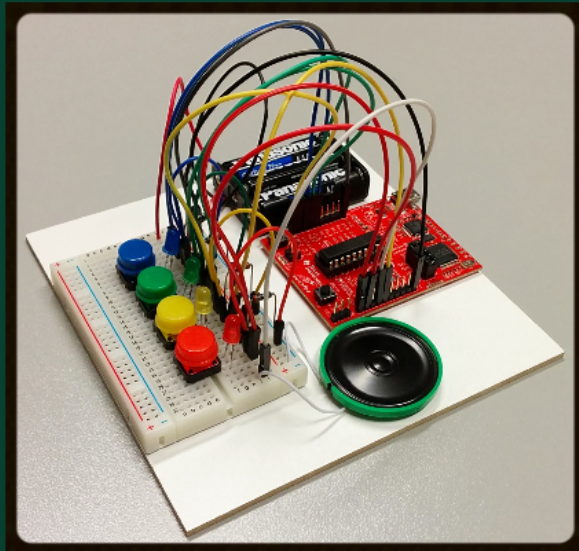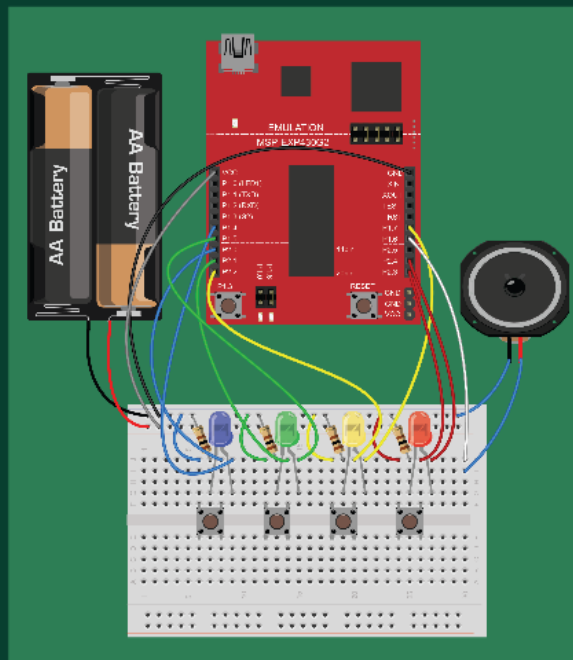Vending Machines

Industrial

Automotive

Medical

Today's Project
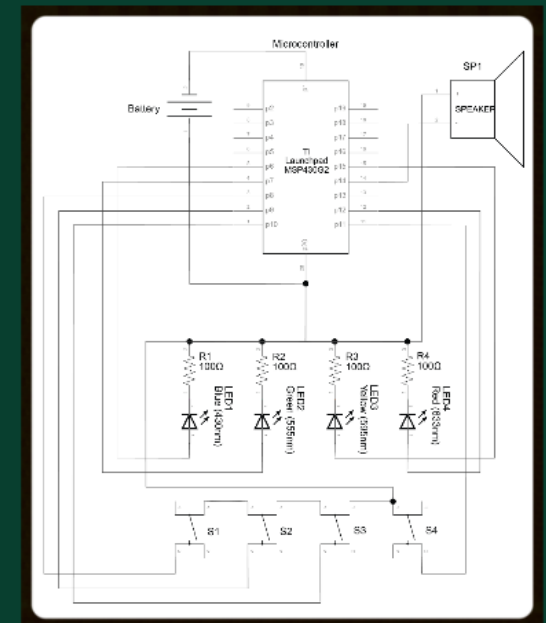
Memory Game
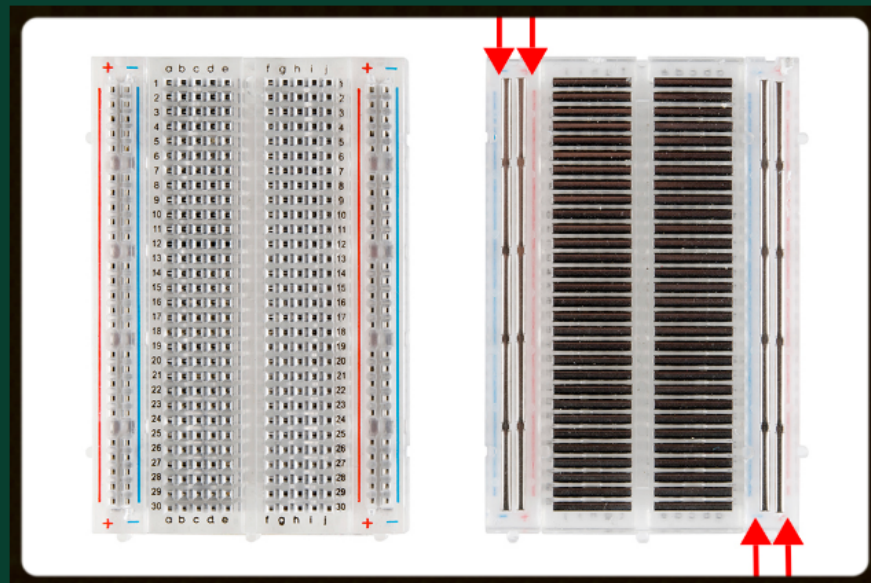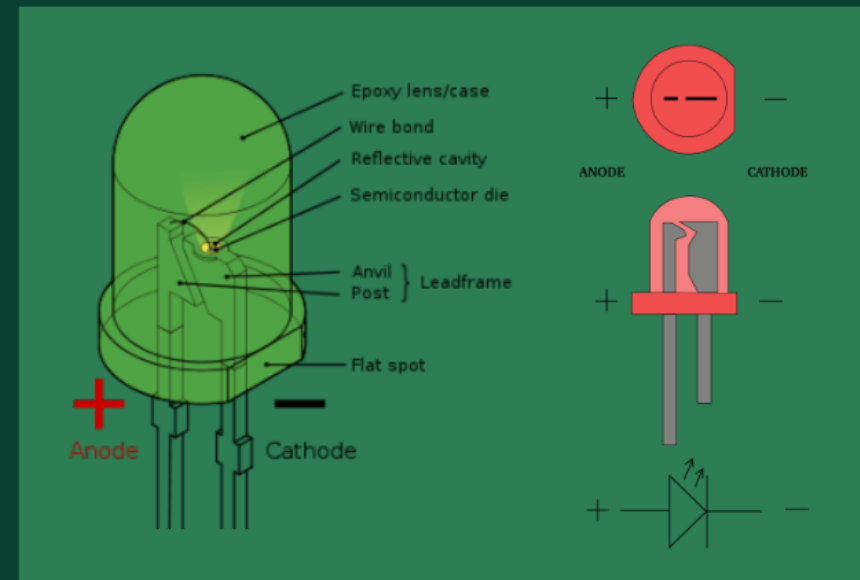
Actual

Breadboard

Schematic

Construction Notes

Breadboard Connections

- Each red and blue vertical "rail" is a single connection.
- Each row has two sections of horizontal connections.

LED Polarity

- The orientation of LEDs matter!
- Cathode (negative) terminal has "flat spot" and shorter pin.