Sit somewhere new!

Find the 82Ω resistors in your kit (gray-red-black).
Pull out both switches and an LED.

Unwrap your medium or large breadboard.
ENGR 40M, Lecture 6:
Switches, logic, and truth tables

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By the end of today, you should be able to:

- Use a **breadboard** to make circuit connections.
- Given a circuit with **switches**, write the **truth table**, and vice versa.
- Draw a **state diagram** for a simple system.
Switches make or break an electrical connection

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<thead>
<tr>
<th>One pole</th>
<th>One throw</th>
<th>Two throws</th>
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<tbody>
<tr>
<td>SPST</td>
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<td>SPDT</td>
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<tr>
<td>DPST</td>
<td></td>
<td>DPDT</td>
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</tbody>
</table>
You can **test connectivity** using the **resistance setting** on your multimeter.

You have a **DPDT switch** in your kit. Figure out which pins correspond to which numbers on the schematic.
Breaking break:

Switches
Breadboards are designed for connecting electrical stuff together. They're *internally connected* along the orange lines below.
Breaking break 2:
Breadboards!
Let's connect up an LED:

The flat side (and the short lead) mark the negative side (cathode) of the LED.

Flat side

Shorter lead

82Ω

4.5V

Flat side

+ - Shorter lead
Now team up with the person next to you, and build a two-switch circuit that turns the LED on when **both switches are pressed**.

Modify your circuit to that the LED turns on when **either switch is pressed**.

**Challenge:** Make the LED turn on when one or the other - but not both - of the switches is pressed.
Build a circuit using your limit switch so that the LED turns on when the switch is pressed.

Modify the circuit so that the LED is normally on and turns off when the switch is pressed.

Once you get it working, help your classmates out!
Truth tables
Draw a truth table describing when the LED lights up, as a function of A, B, and C.

Use "0" for open, and "1" for closed.
Designing the useless box
Breaking break 3:
Carbon monoxide detector