

LED Basics

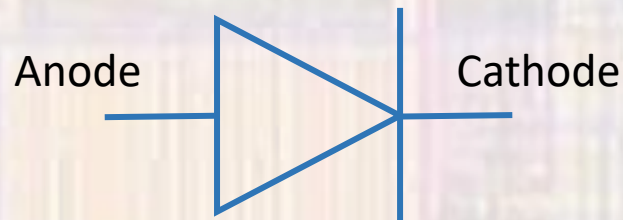
Last updated 6/30/22

LED Basics

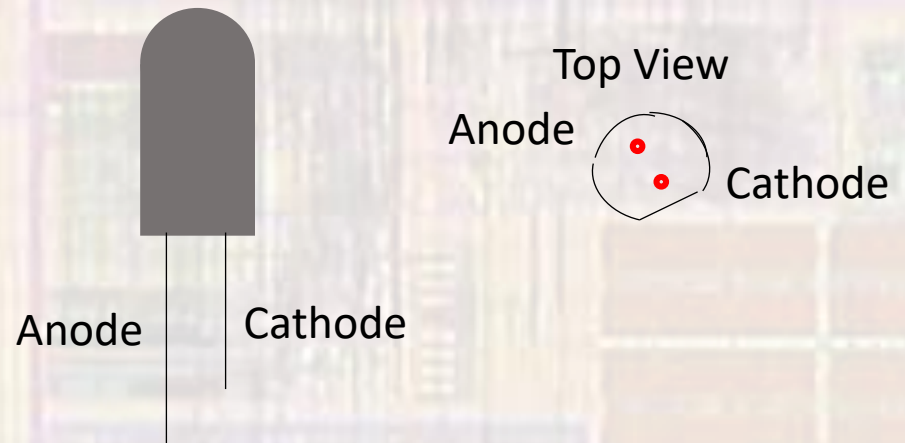
- Light Emitting Diode
 - Light is emitted from special diodes when they are sufficiently **forward biased**
 - No light is emitted if the forward bias (voltage) is below the diode **turn on voltage**
 - No light is emitted if the diode is **reverse biased**
 - Typical LED turn on voltage is 1.6v – 2.4v

LED Basics

- Light Emitting Diode
- Schematic symbol



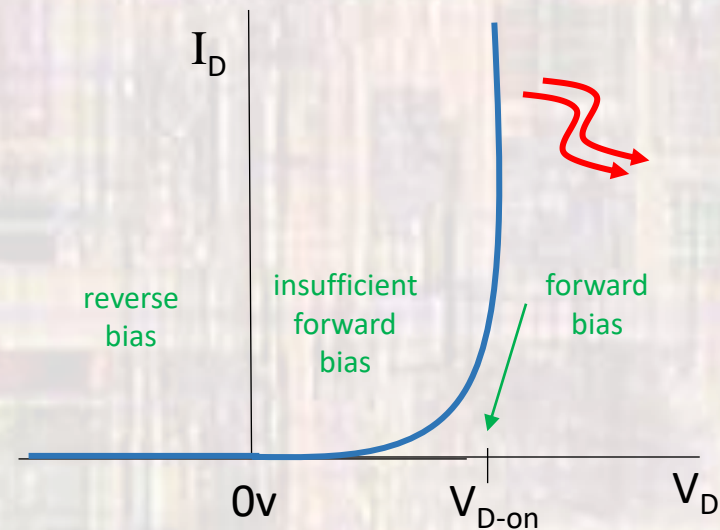
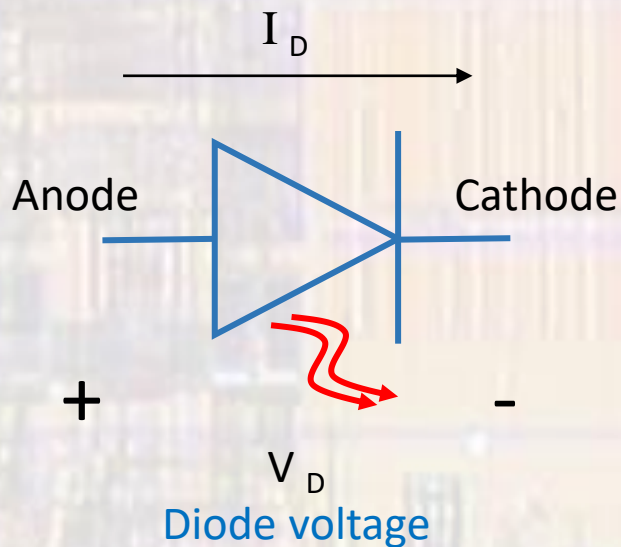
- Physical construction



LED Basics

- Light Emitting Diode

- Operation

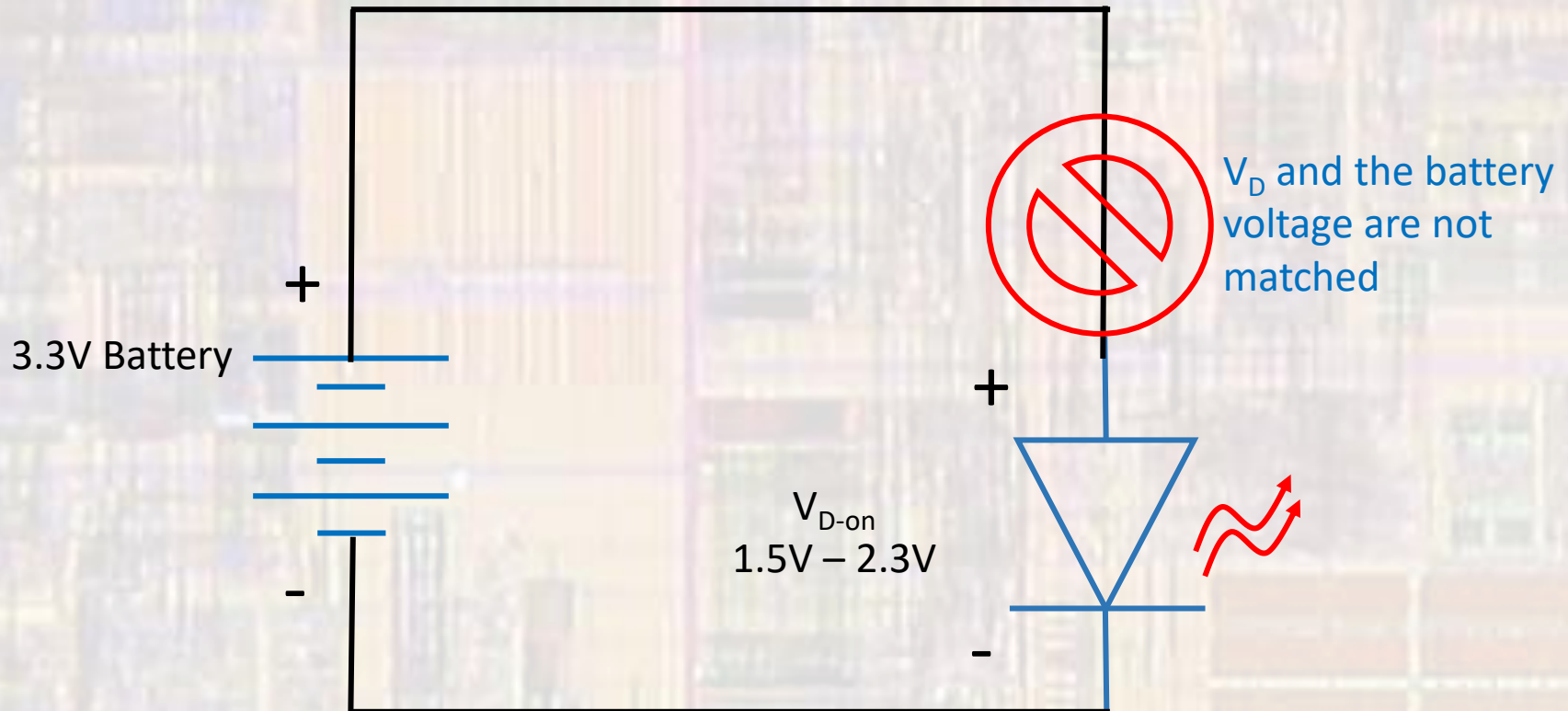


For all practical purposes
 V_D cannot exceed V_{D-on}

LED Basics

- Light Emitting Diode

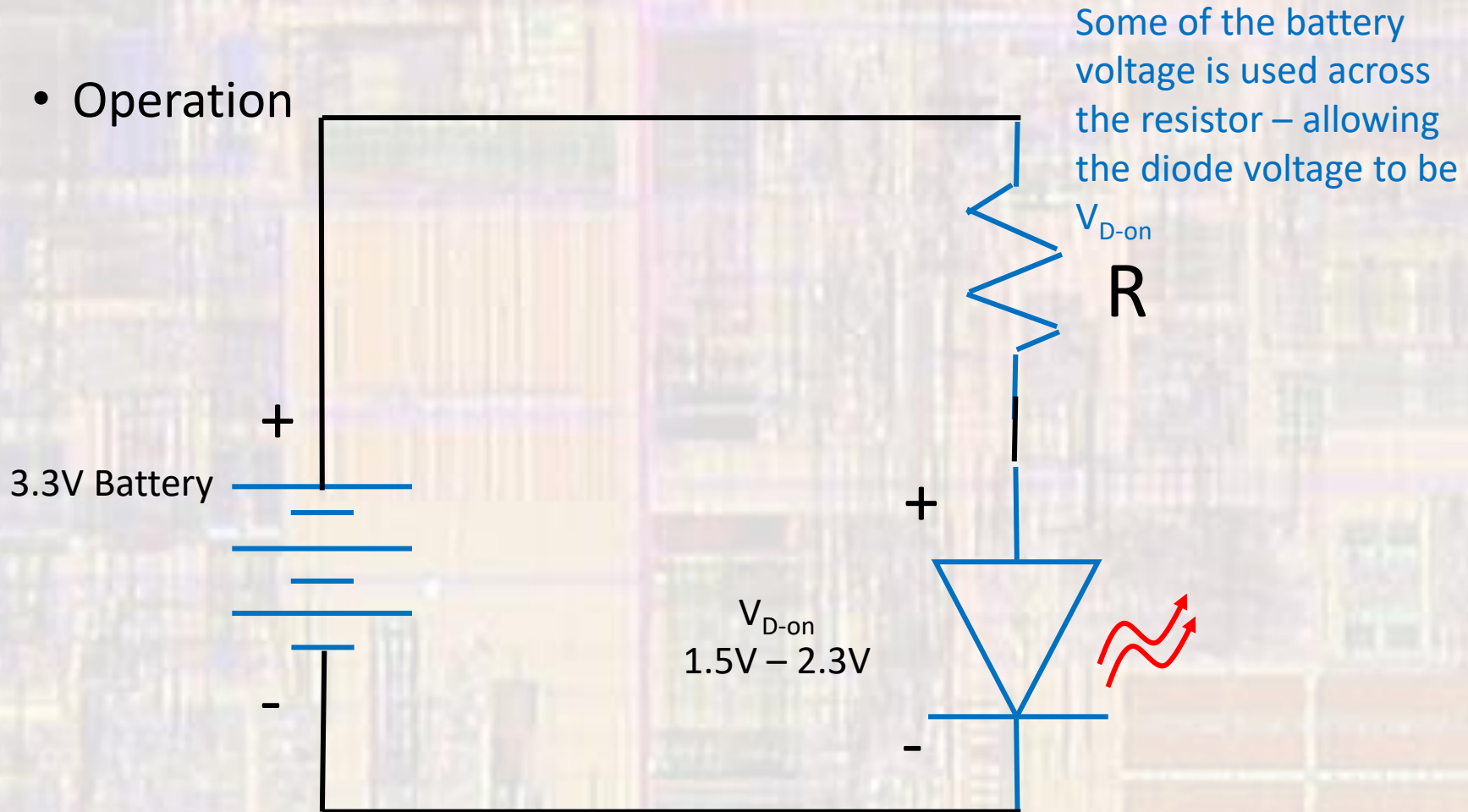
- Operation



LED Basics

- Light Emitting Diode

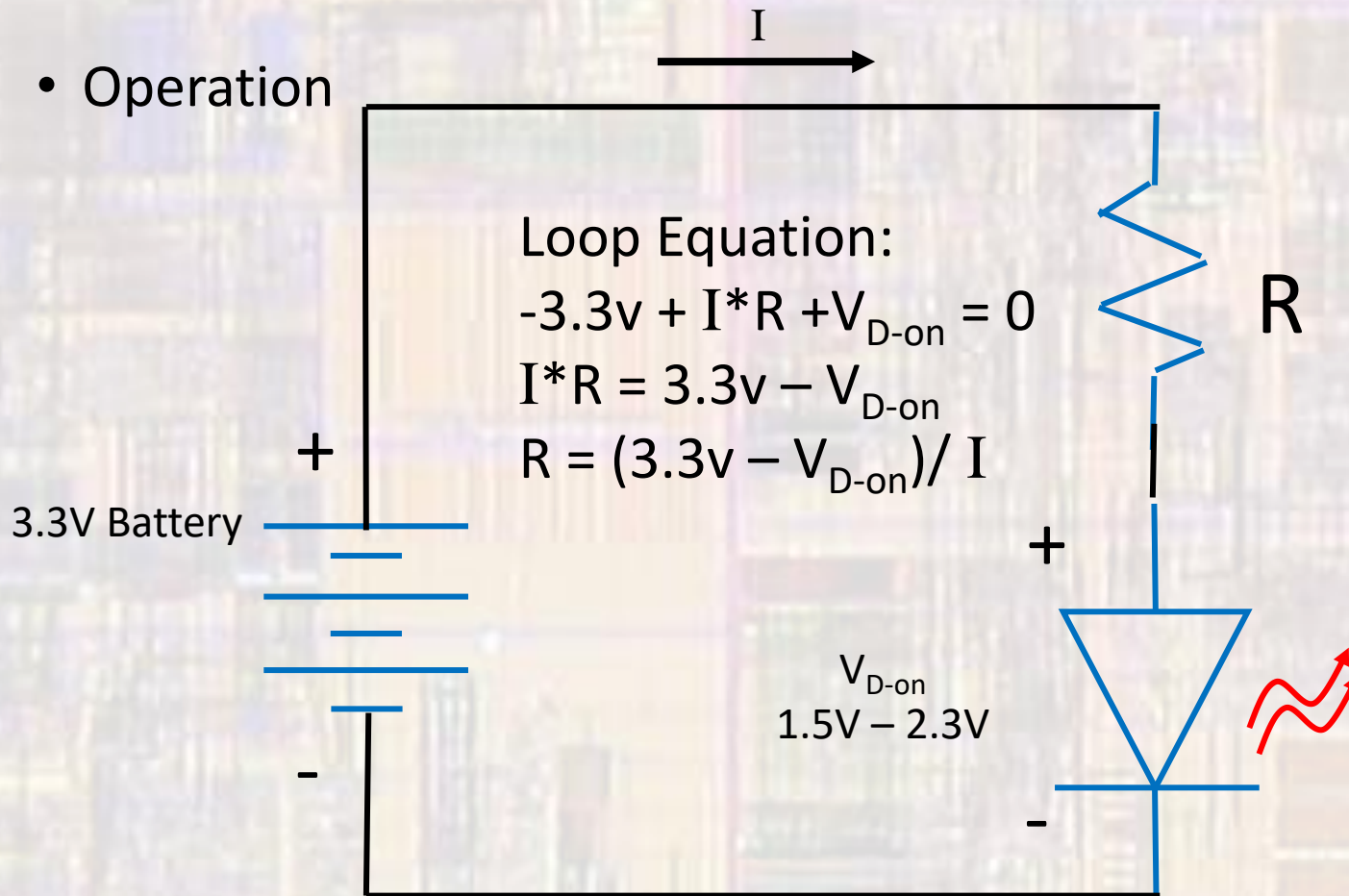
- Operation



LED Basics

- Light Emitting Diode

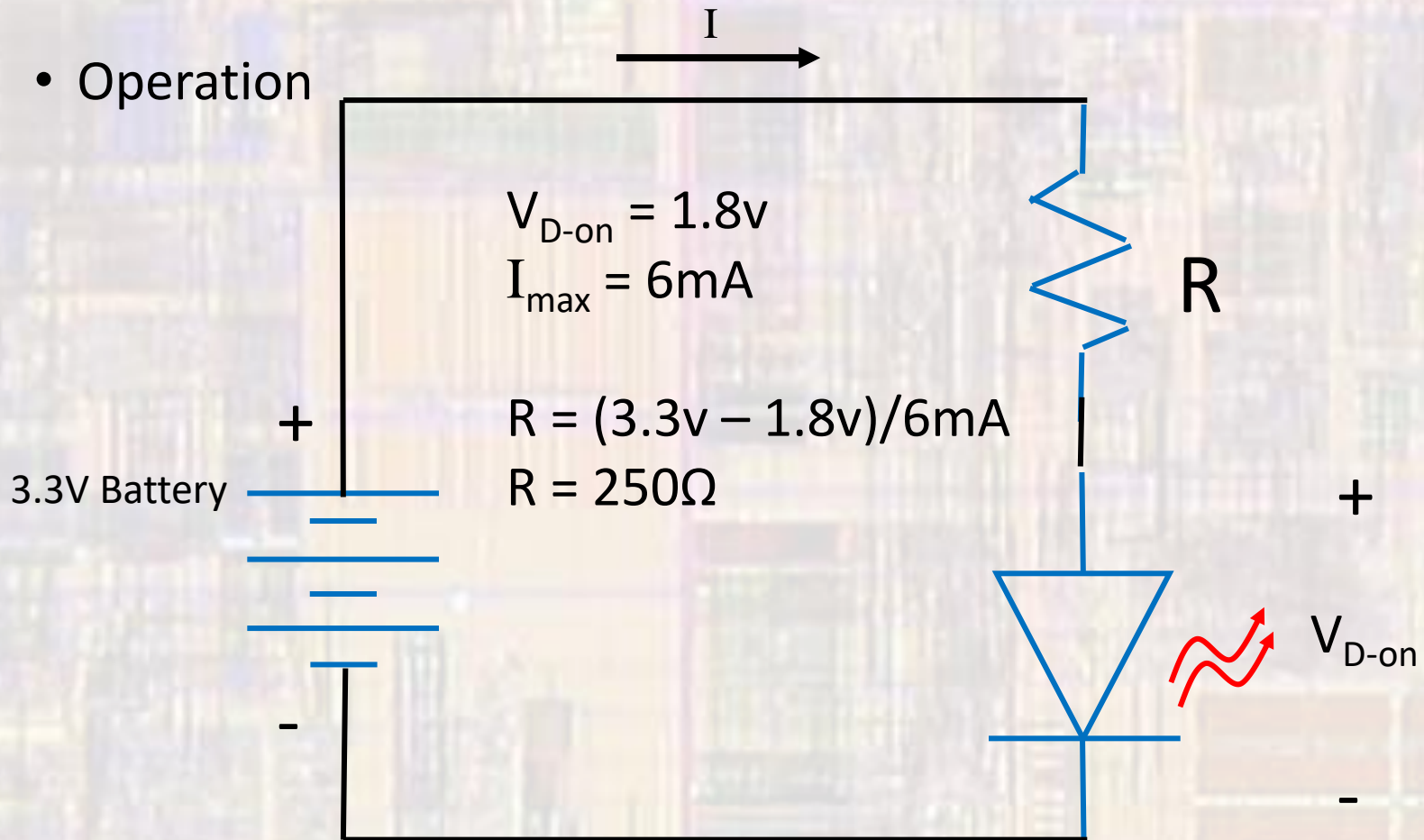
- Operation



LED Basics

- Light Emitting Diode

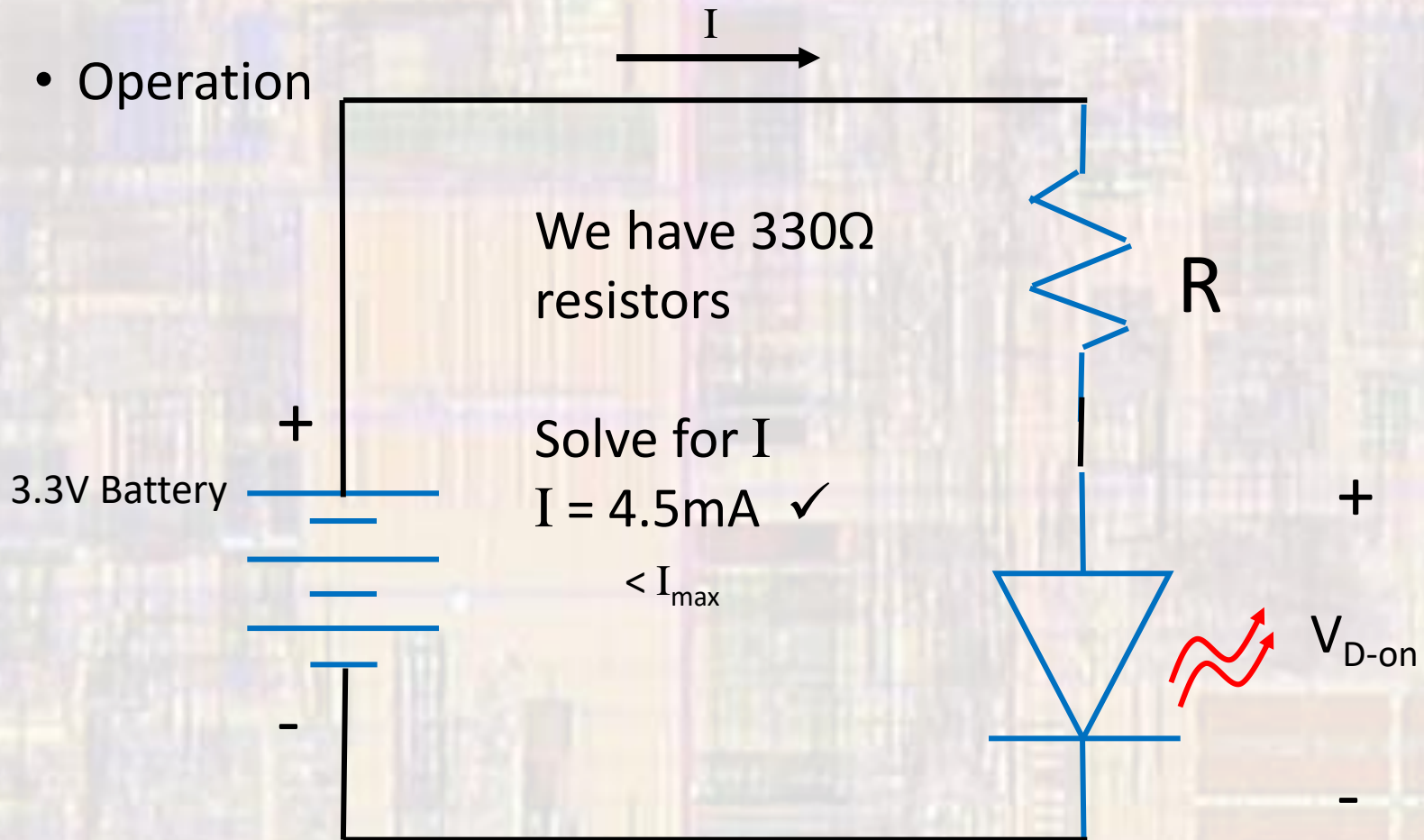
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LED Basics

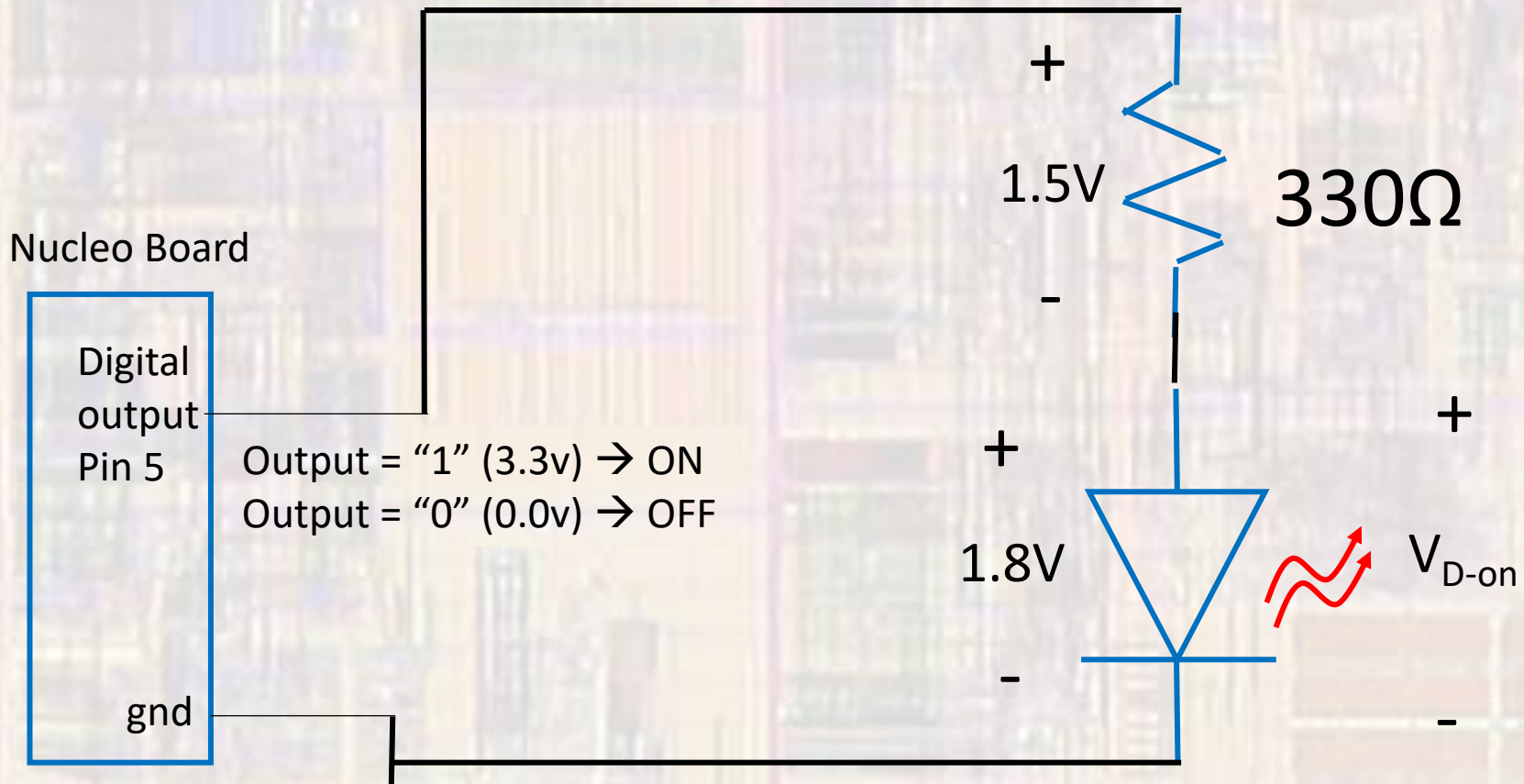
- Light Emitting Diode

- Operation



LED Basics

- Light Emitting Diode
- Use our output pin instead of the battery

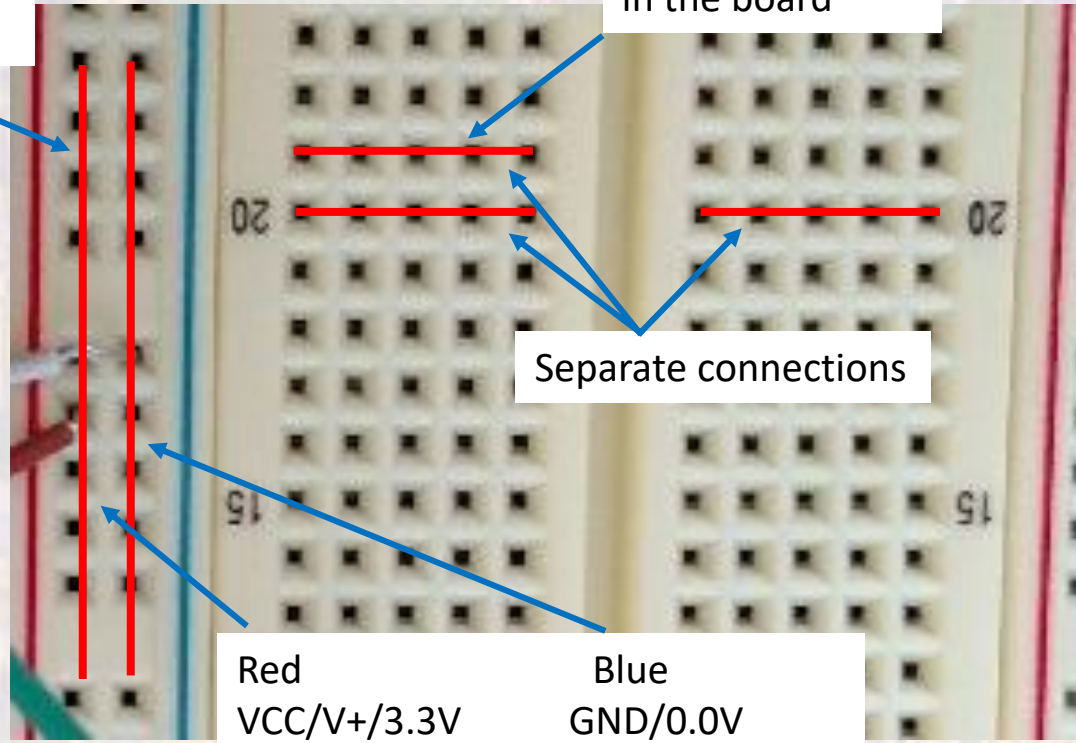


LED Basics

- Breadboard (protoboard) basics
 - Sockets are shorted together inside the board

Shorted together in the board

Shorted together in the board

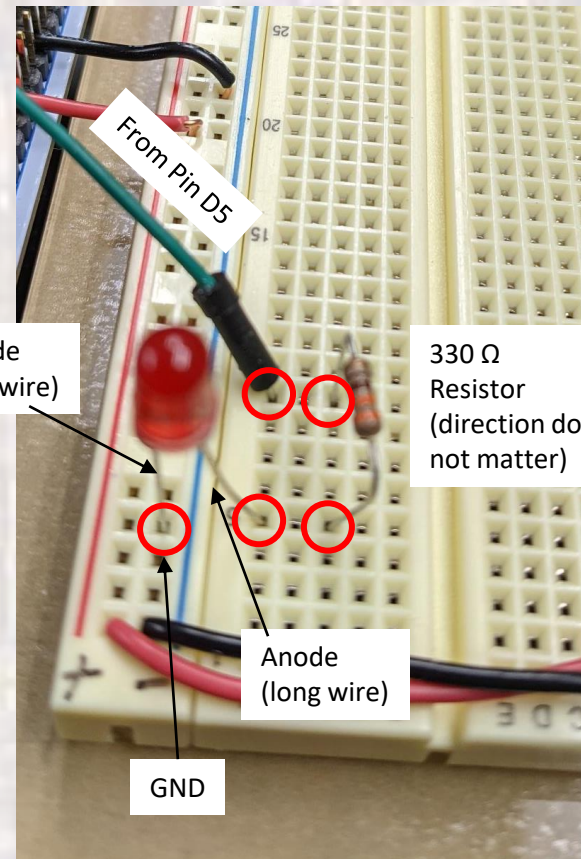
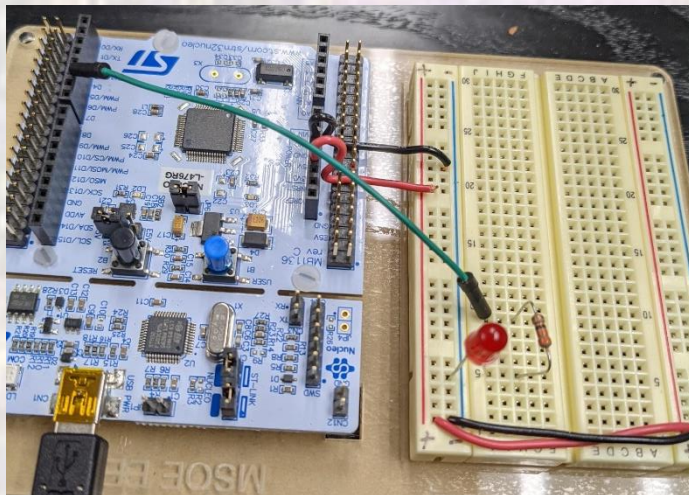
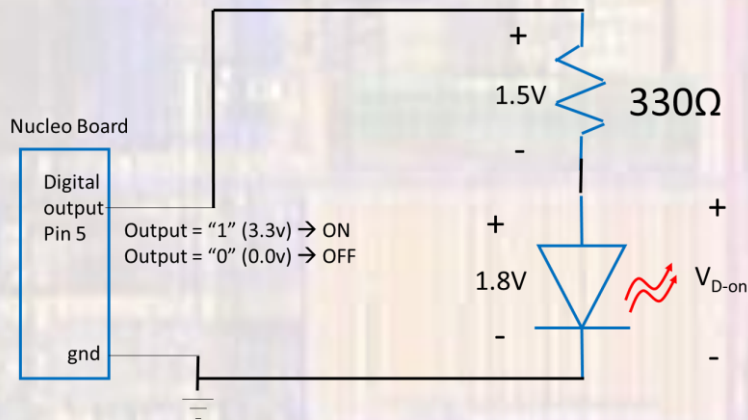


Separate connections

Red VCC/V+/3.3V Blue GND/0.0V
Assuming you wired up your board according to the instructions

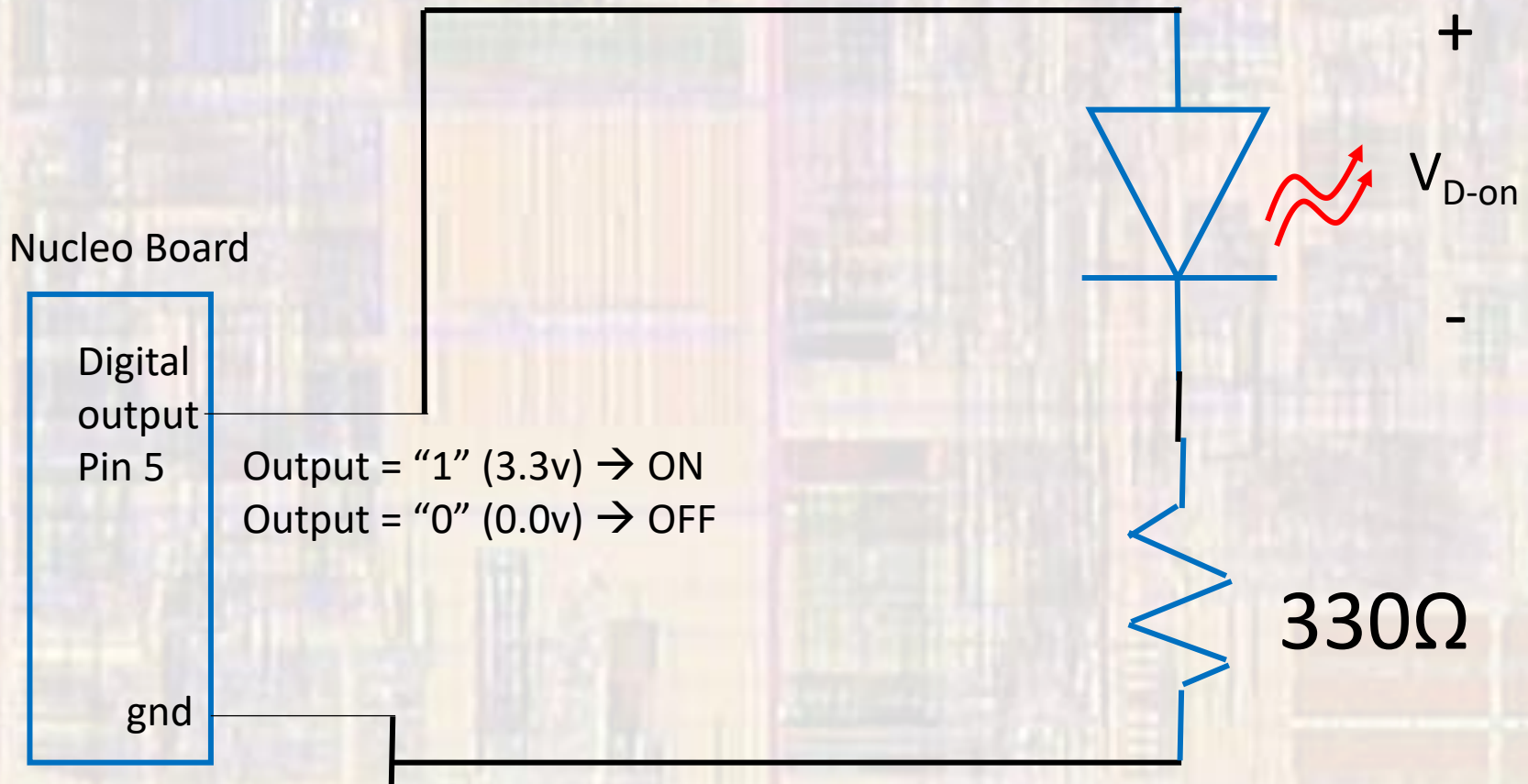
LED Basics

- Light Emitting Diode
 - Use our output pin instead of the battery



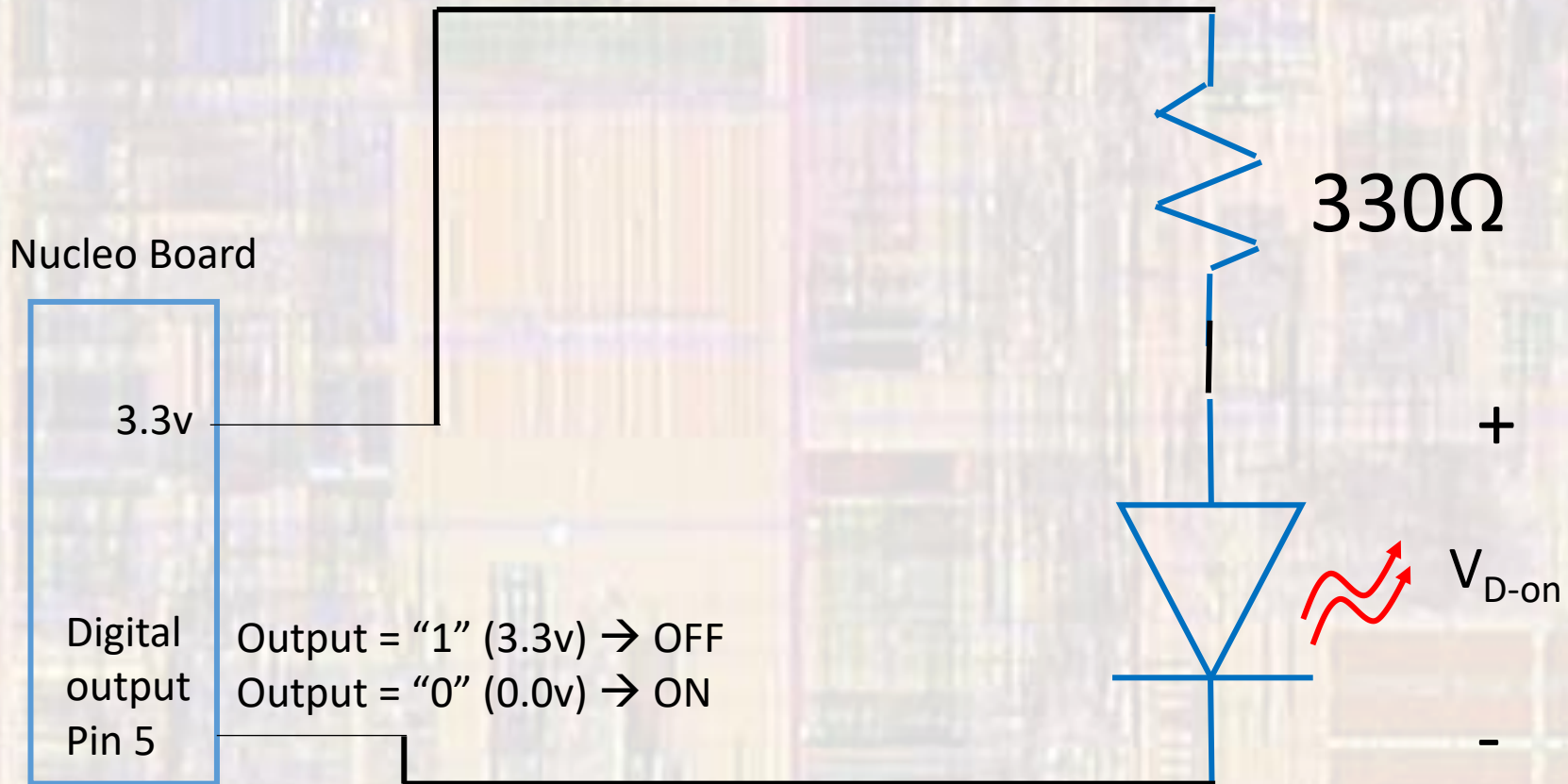
LED Basics

- Light Emitting Diode
 - Alternate hookup A – change order of Resistor and diode



LED Basics

- Light Emitting Diode
 - Alternate hookup B – change to positive reference



LED Basics

- Light Emitting Diode
 - Alternate hookup C – change to positive reference AND swap order of resistor and diode

