

# Potential Dividers

Physics

Splitting a voltage, and using sensors in a divider.

**The output voltage is the supply times the ratio of the output resistor to the total resistance.**

$$V_{out} = V_{in} \times R_2 / (R_1 + R_2)$$

**Two equal resistors**

**Half the supply**

**Thermistor in the divider** **Output varies with temperature**

Temperature sensor.

**LDR in the divider**

**Output varies with light**

Light sensor.

## THE COMMON MISTAKE

✗ **Ignoring the load connected to the output**

✓ **The load is in parallel with  $R_2$**

Connecting a low-resistance load changes the effective  $R_2$  and the output voltage falls below the calculated value.

A thermistor's resistance falls as temperature rises. Which way the output moves depends on which side of the divider it is on.