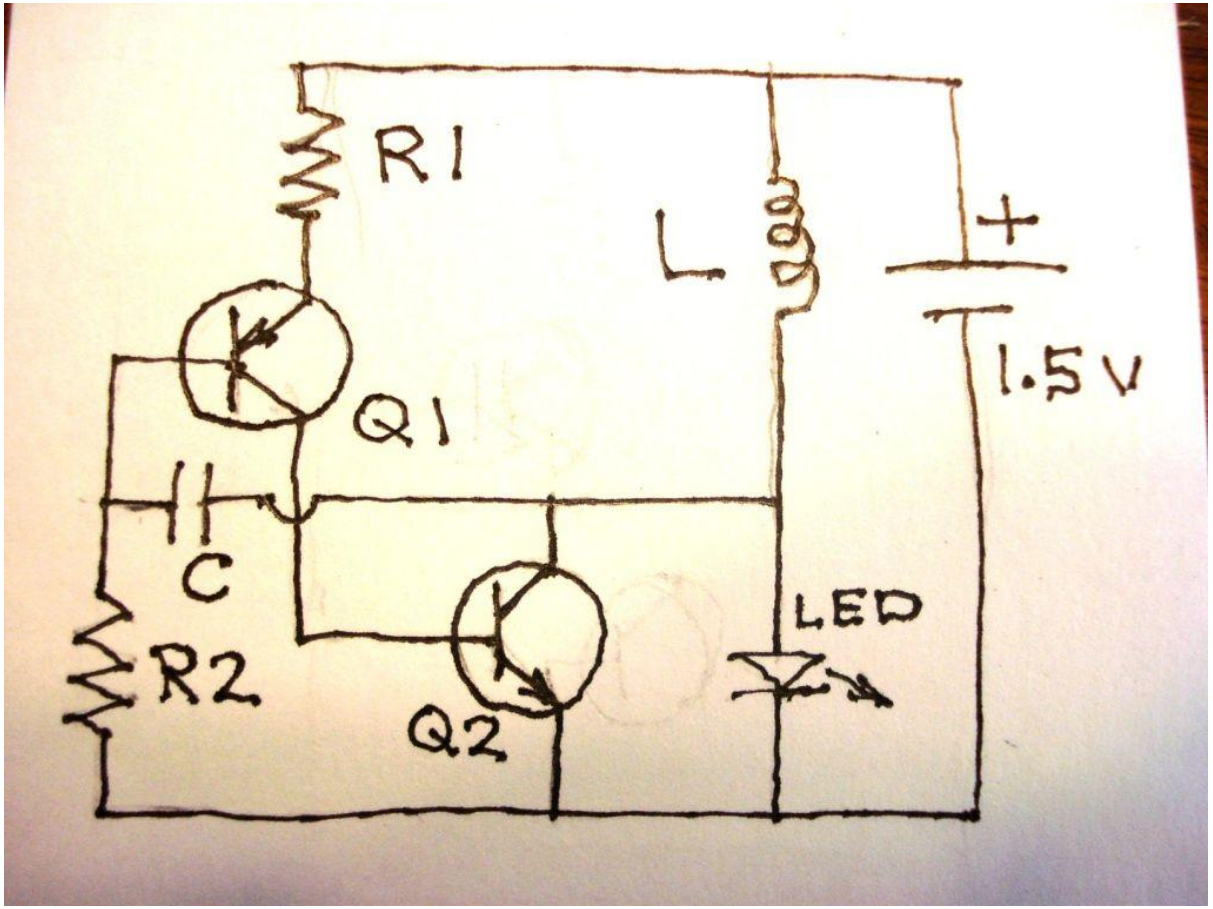
# How to light a LED

Workshop on Joule-thief circuit

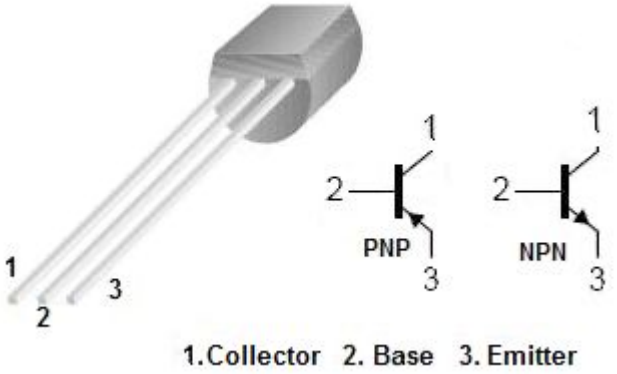
# 1. The Circuit

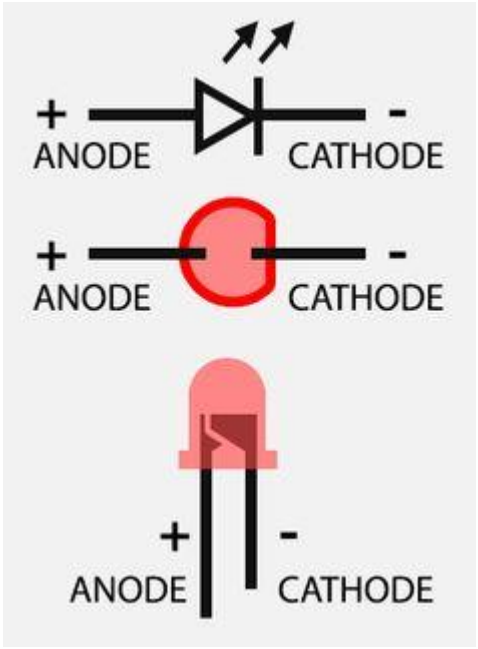



http://www.instructables.com/id/Joule-Thief-no-IC-and-no-Transformer/

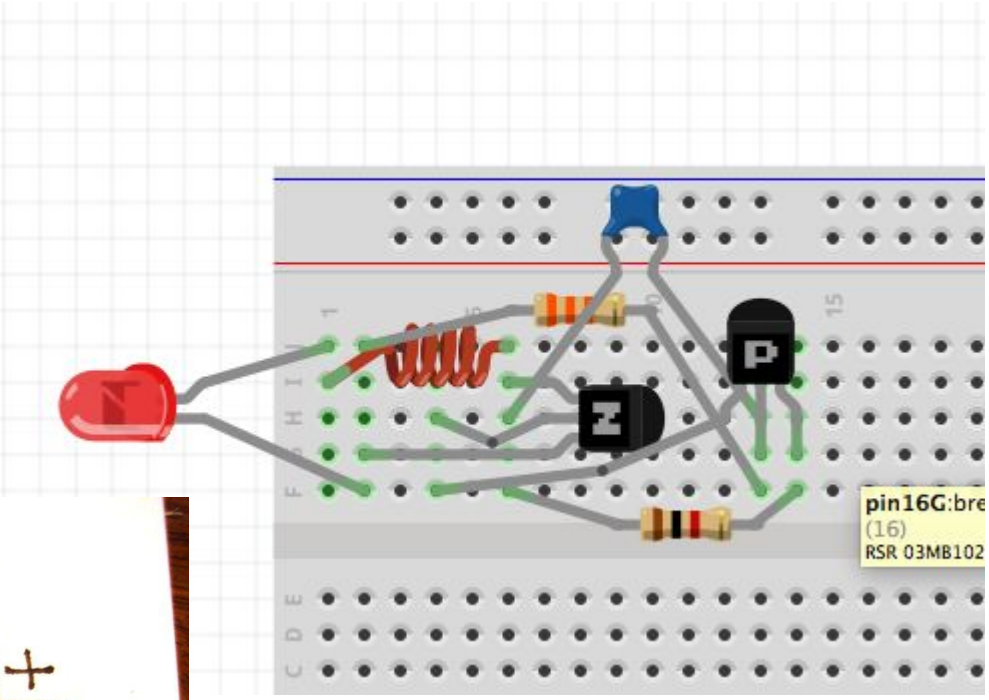
# 2. Identify parts

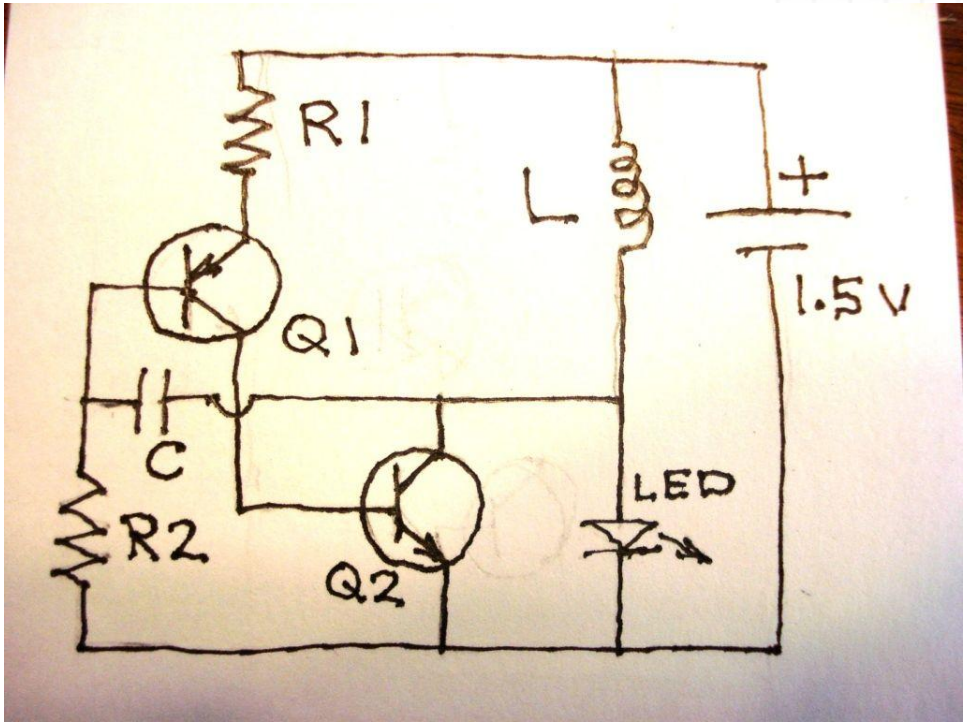
- R1 resistor 1K (BRK/G)
- R2 resistor 33K (OOO/G)
- C1 capacitor 1 nF
- Q1 BC557 PNP transistor
- Q2 BC457 NPN transistor
- L1 330 microH inductor (OOR/G)
- D1 LED diode
- BAT 1,5 V AAA battery



# 3. Begin assembly



# How it works?!

*"Ohm's Law" for an inductor*

$$v = L\frac{di}{dt}$$

Where,

$v$ = Instantaneous voltage across the inductor

$L$ = Inductance in Henrys

$\frac{di}{dt}$ = Instantaneous rate of current change (amps per second)