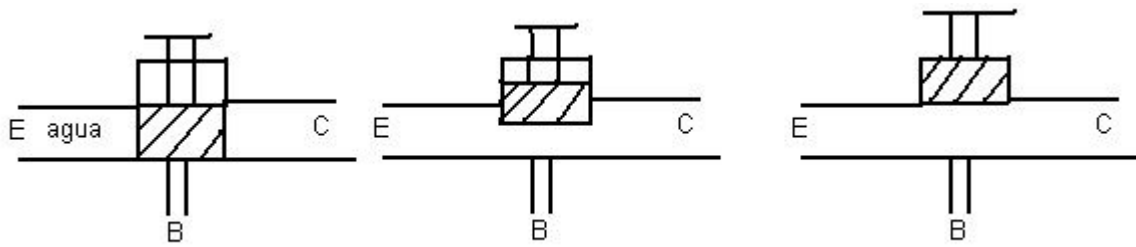


ELECTRONICS BASIC CIRCUITS

Transistor (water analogy)



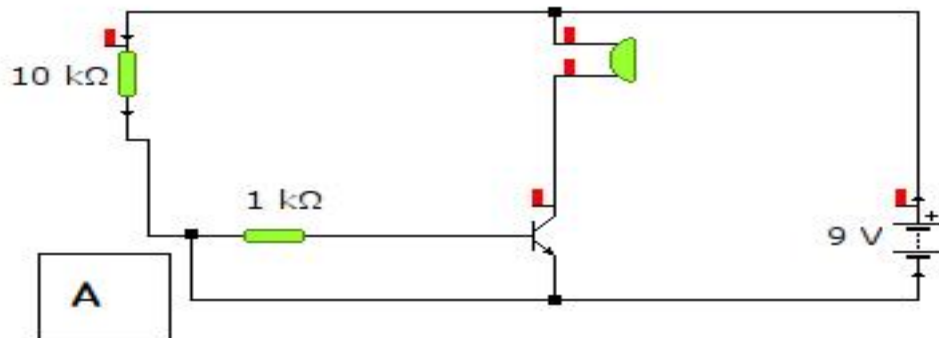
If there is no pressure in B, the water can not go from the collector to the emitter (Cut-off)

If we increase the water pressure, water passes from the collector to the emitter (Direct)

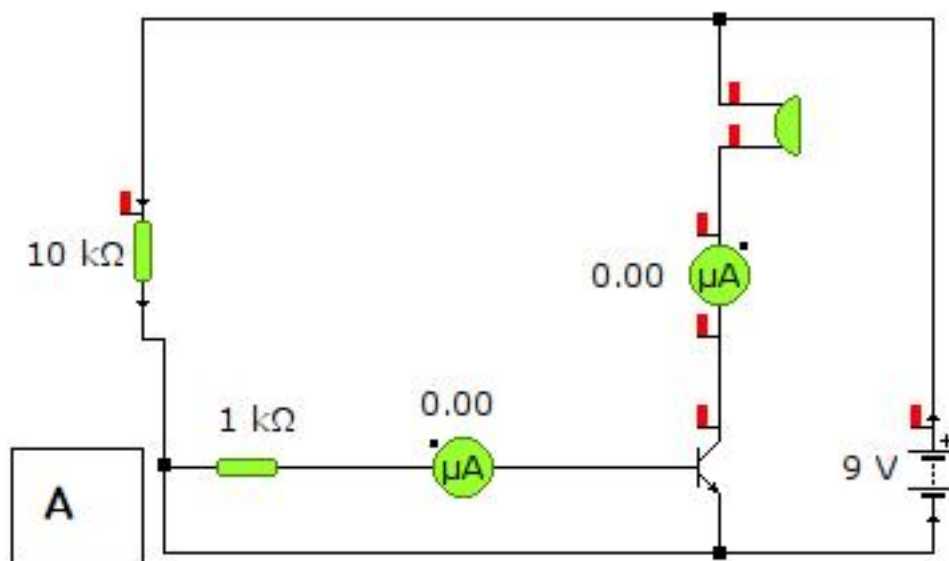
If there is too much pressure in B, all the water goes from the collector to the emitter (Saturation)

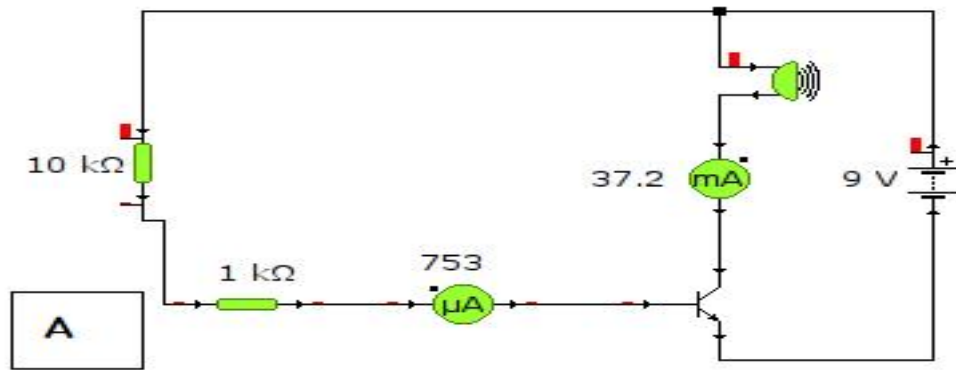
EXAMPLES OF CIRCUITS

Alarm when cutting cable



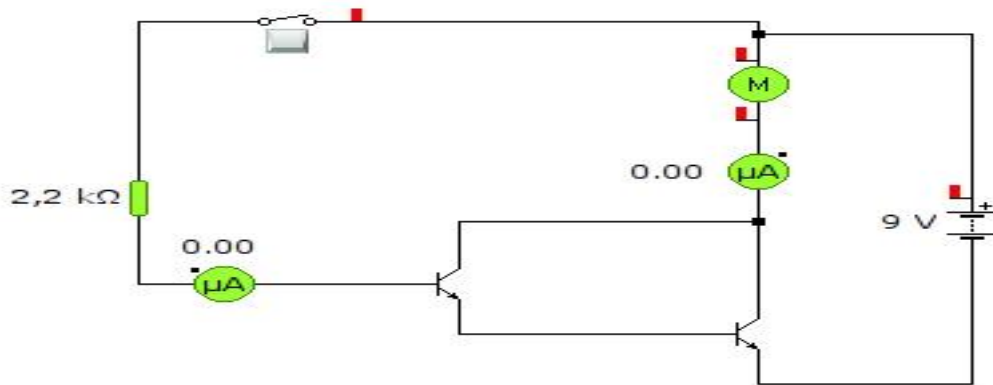
When the electrons reach the bifurcation A, all electrons choose the path without resistance and the intensity on the base is zero (you can find with an ammeter). So there is **no current** in the branch where the buzzer is.



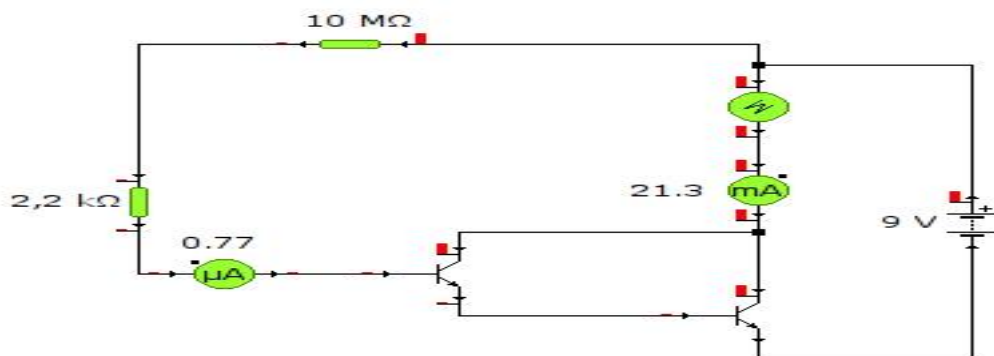


If the thief cut the cable, there is a base current ($753\mu\text{A} = 0,753\text{mA}$) and a collector current of 37.2 mA. (You might know that the gain of the transistor BC108 is 165) .**The buzzer buzzes**

Contact alarm



If anyone touches the switch, the base current is zero, the motor is off (think the reason why).
If someone touches the touch sensors (represented as a switch), hand offers a very high electrical resistance (but not as much as the air which is an excellent insulator) and motor moves

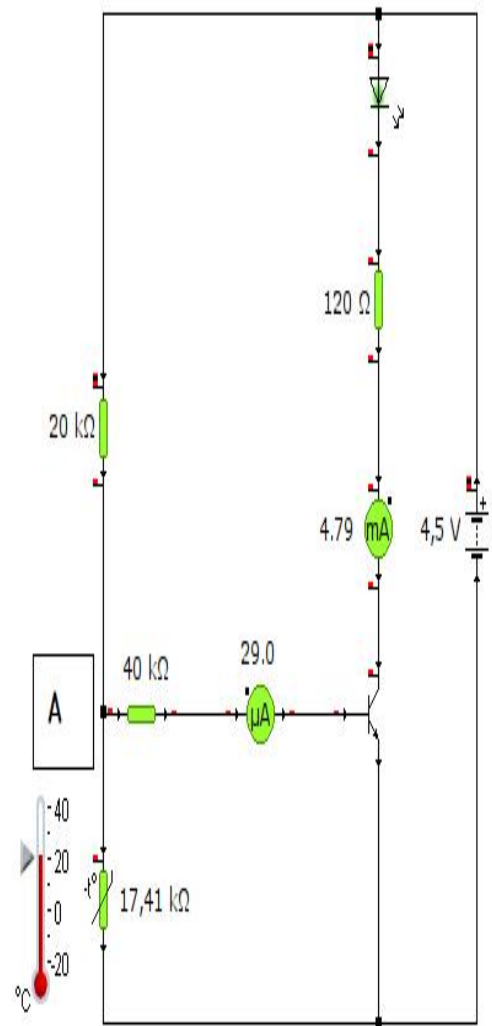
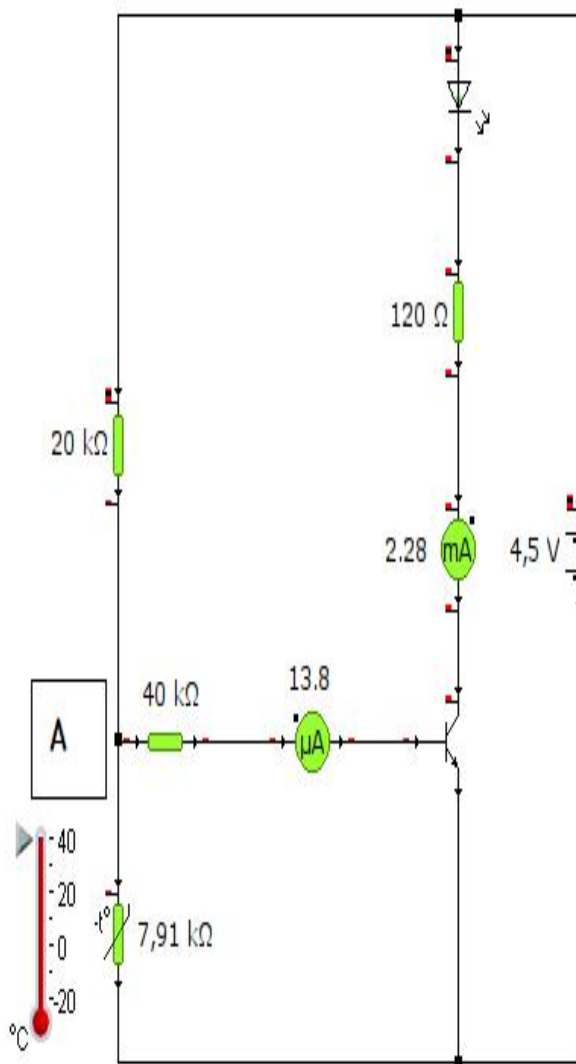


Cold detector

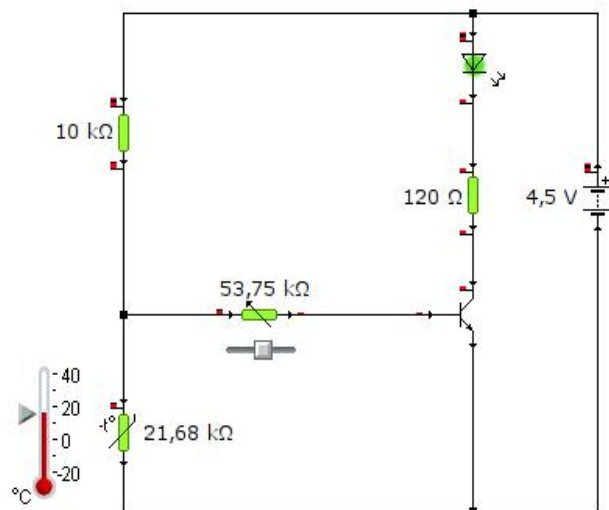
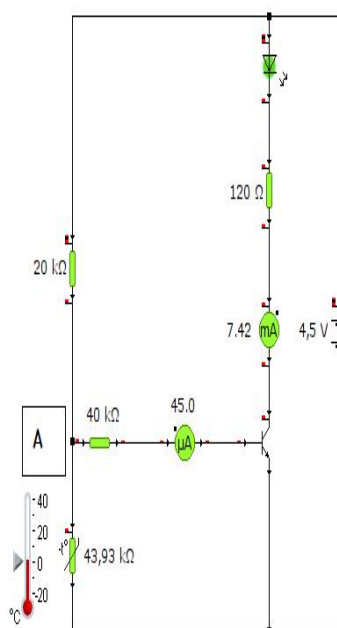
We see the circuit at 40°C (NTC that we chose has a value of almost 8k)

There is a very small current at the base, so there is a small current in the collector, but not enough to turn on the LED

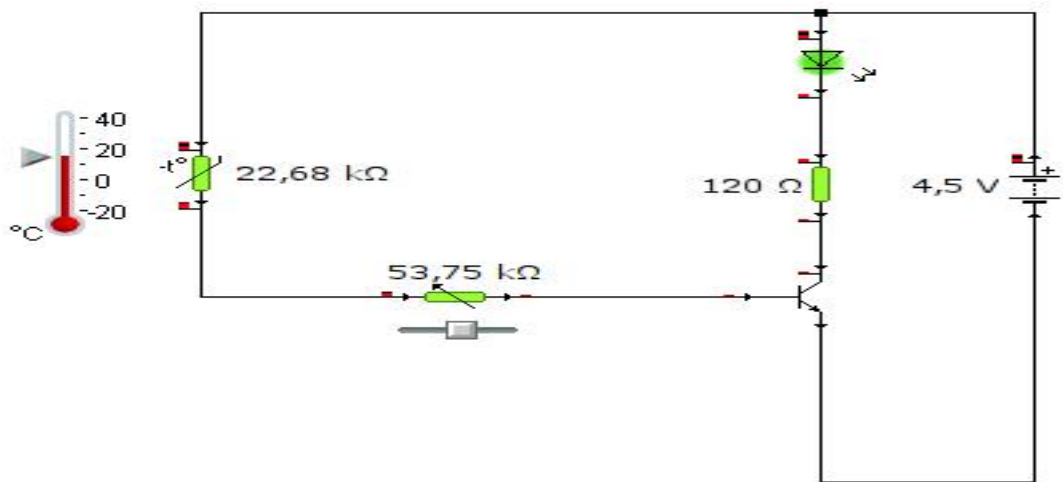
At 40 degrees Celcius the LED does not light up. At 20 degrees the LED begins to light but weakly



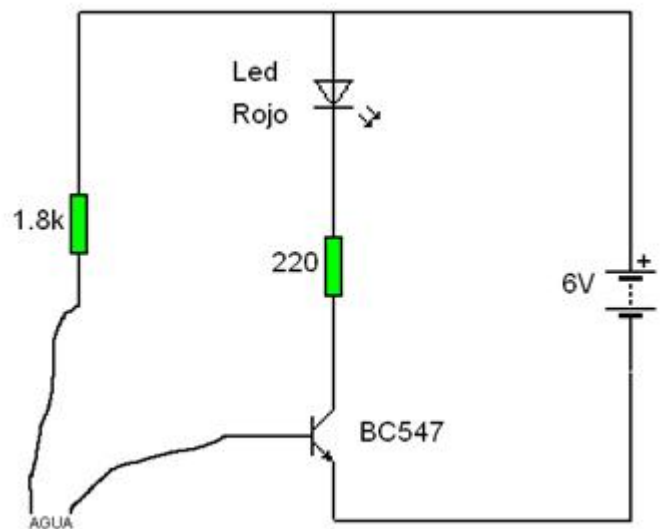
At 0 degrees Celcius, the LED does light up . To regulate when it detects the cold, use a variable resistor



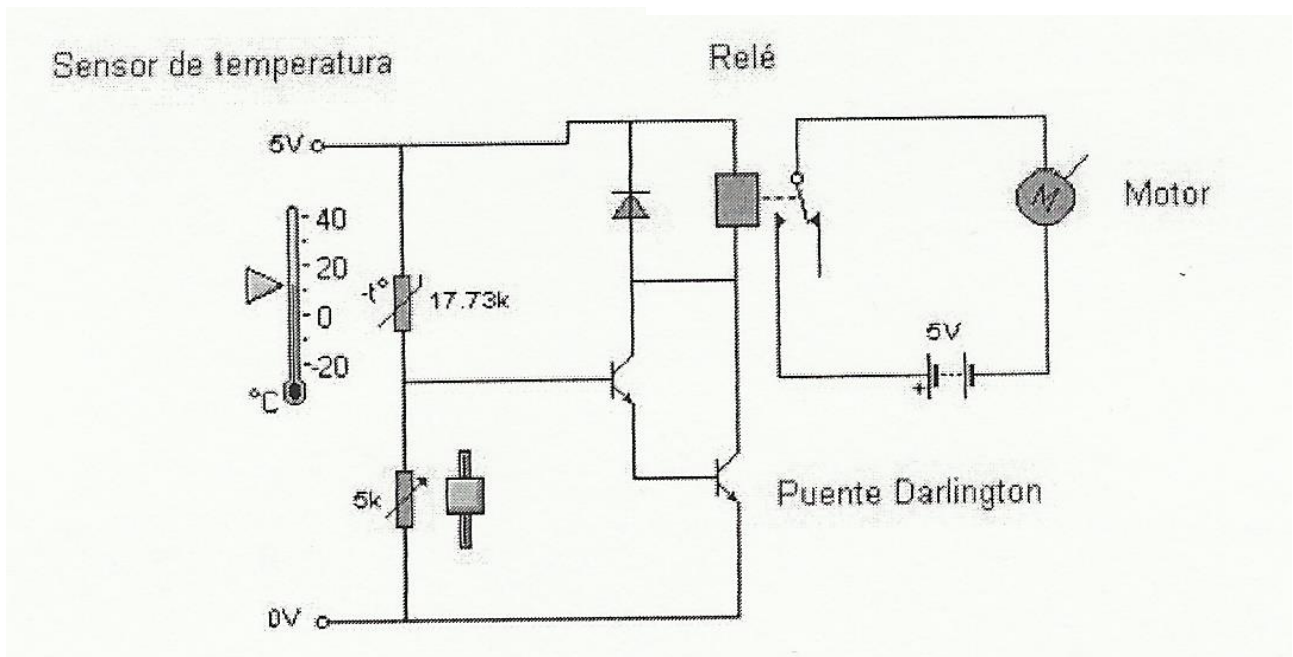
Do you understand this circuit?
Heat detector



Moisture detector

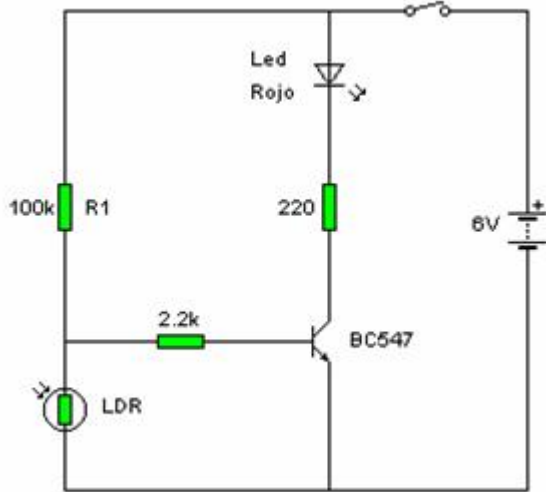


Temperature sensor



An LDR is a resistance that depends on the light
 With light, the resistance is small (400 ohms) and in the dark, is near infinity (several million ohms). With these data, analyzes the following circuits

Darkness sensor



Light sensor

