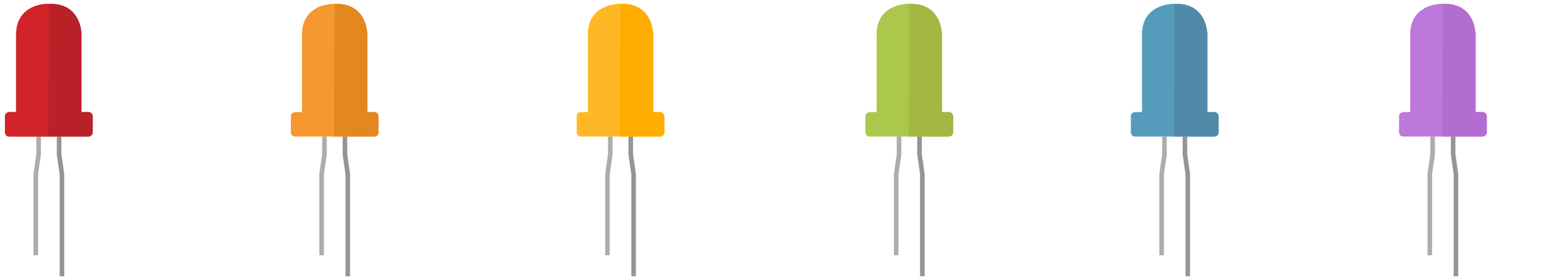
How do LED lights work?

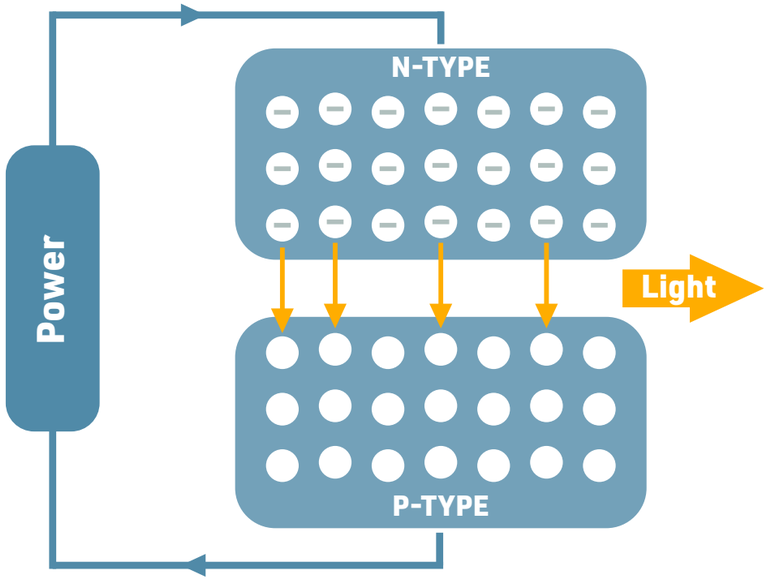


Red	Orange	Yellow	Green	Blue	Violet
GaAsP	GaAsP	GaAsP	GaP	InGaN	InGaN
AlGaInP	AlGaInP	AlGaInP	GaN	AlGaN	AlGaN
GaP	GaP	GaP	InGaN	ZnSe	GaN

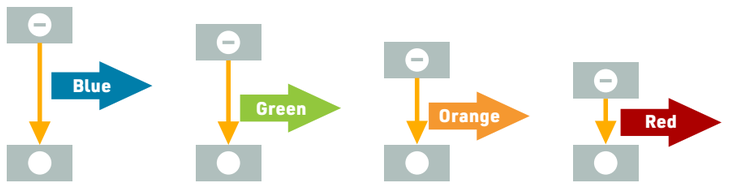
How do LEDs work?

Light emitting diodes (LEDs) use semiconducting materials to produce light and colour. Many of the materials used are based on gallium, such as gallium phosphide (GaP) and gallium nitride (GaN).

Layers of the semiconductor are "doped" with impurities. This creates an n-type layer, which has electrons spare, and a p-type layer, which has electron "holes". When a current is applied, electrons from the n-type layer combine with the "holes" in the p-type layer. When the electrons fall into these holes, they release energy in the form of visible light.



How are different colours produced?



Using different semiconducting materials, and "doping" them with different types and amounts of impurities, can produce different colours. This affects the energy gap between the n-type and p-type layers, varying the wavelength of light produced when a current passes through the LED. Blue LEDs can also be coated with a yellow phosphor to make different colours.