

THE CHEMISTRY OF LED LIGHTS

LED lights come in a full range of colours – this graphic takes a closer look at the chemistry behind how their light and varied hues are achieved.



RED

GaAsP

AlGaInP

GaP

ORANGE

GaAsP

AlGaInP

GaP

YELLOW

GaAsP

AlGaInP

GaP

GREEN

GaP

GaN

InGaN

BLUE

InGaN

AlGaIn

ZnSe

VIOLET

InGaN

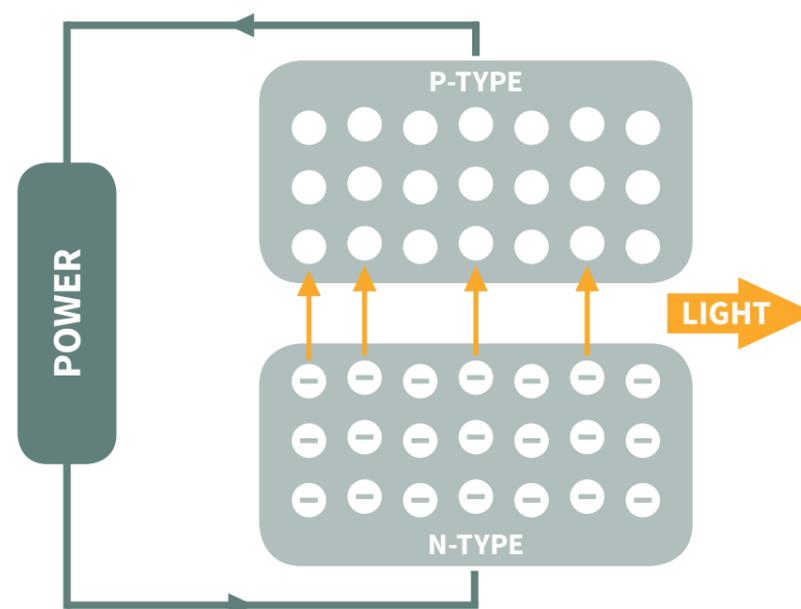
AlGaIn

GaN

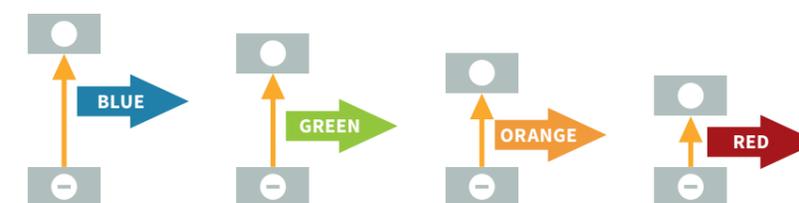
HOW DO LEDS WORK?

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 MADE?



A variety of colours are made possible by the use of different semiconducting materials, and "doping" them with different types and amounts of impurities. This affects the energy gap between the n-type and p-type layers, affecting the wavelength of light produced when a current passes through the LED.

