IRWiN Science Education

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Resistance Subsitution Box

Code: ERS8050

Resistance	1Ω to 999,999Ω in 1Ω steps
Resistor Power Rating	600mW each at 70oC
Resistor Tolerance	+/- 1%
Temperature coefficient	100ppm/oC (1-9Ω) 50ppm/oC (10Ω+)
Maximum switching current	150mA @ 250V ac/dc
Maximum Voltage	250V
	A potential divider may be created by employing the unswitched 1K resistor.

Please Note: DO NOT EXCEED RESISTOR POWER RATING

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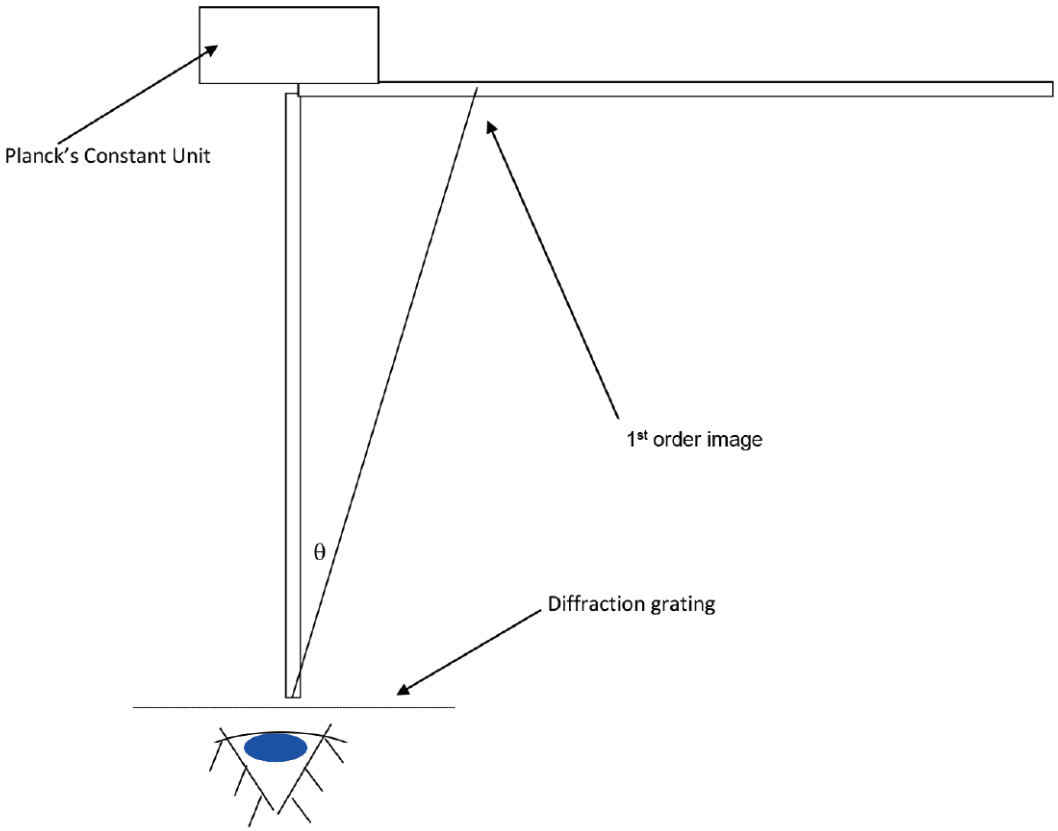

Using the diffraction grating, view the LEDs from the end of the metre rule as shown
Get a partner with a retort stand to move along the perpendicular metre rule until the retort stand is in the position where, say, the red end of the partial spectrum formed by the red LED is– this point is labelled "1st order image" on the diagram. You now need to work out the angle. This may be done by using a protractor set at the end of the ruler (where your eye was) and sighting along it to the clamp stand. Alternatively the angle may be calculated by trigonometry. It should also be possible to view the 2nd order spectrum and apply the formula below.

Using the formula n≒=dSin¬ the wavelength of the red light may be calculated. d is the diffraction grating spacing = 1 = 2x10-6m (this is calculated for a 500lines/mm grating), n is the order of the image (in this case 1).
500,000
The experiment may be repeated for the other five LEDs.

It is often useful to cover the wavelength markings on the unit with black tape so that it is a genuine experiment!