

## FifeX LED Array™

### Use of Kit

The FifeX LED Array™ helps users explore colour as a specific wavelength of light, and aid in the discussion of the principles of light and colour.

### Kit Contents

Documentation  
1 x FifeX LED Array™  
1 x 5V 1A DC power supply

### Operating Instructions

1. Unpack box and remove all protective films
2. Take FifeX LED Array™ out of box and plug in DC power
3. Slide the switch to 'On'

### Experiments

1. Use a diffraction grating to view the first order fringes.
  - a. With the lines of the grating vertical, estimate the displacement of the first order fringes.
  - b. The angle  $\theta$  subtended by the first order fringe at the grating can be derived from trigonometry
  - c. If the fringe displacement is  $x$  and the grating is  $2m$  from the source then  $\tan \theta = x/2$ . The wavelength can then be derived from  $\lambda = d \sin \theta$
2. Use a multimeter to measure the forward voltage across each of the LEDs
  - a. Using the answers to part 1 and the forward voltage, plot a graph of forward voltage versus frequency ( $c=f \lambda$ )
  - b. Determine the gradient of the graph to obtain a value for Planks Constant,  $h$ .

### Online Support

Further information on experiments can be found at <http://www.fifex.co.uk/flaonline.htm>

### Safety

1. The FifeX LED Array™ must only be used with the supplied voltage regulator. If this is lost or suspected damaged in any way, contact your supplier immediately.
2. When working in ambient light levels that are below the norm, extra caution must be taken. FifeX accepts no responsibility for damage or personal injury caused by using this product in an environment that is unsafe.
3. The FifeX LED Array™ should always be turned off when not in use.
4. FifeX Ltd accept no responsibility for injury or damage caused by the misuse of the FifeX LED Array™

**All LEDs on this product are ultra bright. Extra caution must be taken. Do not look directly at a LED from close range. Do not stare at a LED source**

### **Troubleshooting**

#### **If one or more LED's fail:**

1. Switch off DC supply immediately
2. Check that the DC supply is connected correctly.
3. Switch on the DC supply
4. If this has not solved the problem, turn DC supply off again and contact your supplier.

### **Acknowledgements:**

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