**Dispersion: Splitting White Light**

Aim: To disperse a beam of white light into the spectrum of colours

Equipment:

* Hodson light box
* Power Pack
* Wide beam slit slide
* Triangular prism

Method:

1. Connect the light box to the power pack.
2. Put the light box light box on the sheet in the place indicated below.
3. Place the wide beam slit slide in the light box and turn on the power pack.
4. Put the triangular prism in the path of the light beam and turn it until the light beam disperses into separate colours.
5. Trace around the triangular prism and mark the light rays using a pencil.
6. Mark the path of individual colours of light within the dispersed beam.

Results:

Put light box here

Discussion:

1. Which colour of light refracts the most? How do you know?
2. Which colour of light refracts the least? How do you know?
3. How would it be possible to recombine the colours that have been separate by the prism?

**What Colour Is It?**

Aim: To investigate the addition of coloured light and explore the behaviour of coloured light filters

Equipment:

* Hodson light box
* Power Pack
* Three primary filters (red, green and blue)
* Three secondary filters (yellow, cyan and magenta)
* White paper

Method:

1. Connect the light box to the power pack.
2. Place the light box on a piece of white paper.
3. Place the red and blue filters in two of the slots at the end of the light box with the mirror flaps.
4. Adjust the mirror flaps so that the two colours of light can overlap on the paper.
5. Record your observations in the tables below.
6. Change the combinations of filters and complete the tables.

Results:

Mixing Primary Colours

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Colour 1** | **Primary Colour 2** | **Primary Colour 3** | **Colour Produced** |
| Red | Blue | None |  |
| Red | Green | None |  |
| Green | Blue | None |  |
| Green | Blue | Red |  |

Mixing Primary and Secondary Colours

|  |  |  |
| --- | --- | --- |
| **Primary Colour** | **Secondary Colour** | **Colour Produced** |
| Red | Cyan |  |
| Blue | Yellow |  |
| Green | Magenta |  |

Discussion:

1. What are the three primary colours of light?
2. What happens when you mix two primary colours together?
3. How is white light produced from primary colours?
4. What are complimentary colours? Give an example of a pair of complimentary colours.
5. The white light produced was probably not quite white, but a little ‘off’. Why might this have happened?

**Viewing Colours through Filtered Light**

Aim: To investigate the effect of coloured light on opaque objects.

Equipment:

* Three primary filters (red, green and blue)
* Three secondary filters (yellow, cyan and magenta)
* Four opaque objects (yellow, red, blue and green)

Method:

1. Choose a coloured surface and a filter.
2. Hold the filter in front of the coloured surface.
3. Record the colour the object looks through the filter.
4. Repeat for different combinations of objects and filters.

Results:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Colour of Filter | Colour of Surface | | | |
| Blue | Green | Red | Yellow |
| Blue |  |  |  |  |
| Green |  |  |  |  |
| Red |  |  |  |  |
| Yellow |  |  |  |  |
| Magenta |  |  |  |  |
| Cyan |  |  |  |  |

Discussion:

1. Why do some surfaces appear black when viewed through a coloured filter?
2. Which colours of light need to shine on a red surface to make it appear:
   1. Red?
   2. Black or very dark?
3. Are there any times when the object appeared quite different to its usual colour?