

# **FifeX Colour Mixer Demonstration**

-Arranged by Fergus Walker-

## **Introduction**

The FifeX colour mixer is a useful piece of demonstration equipment to help pupils learn about mixing colours and understand why objects are different colours.

## **Apparatus**

1. Your FifeX colour mixer kit.
2. Various coloured objects.
3. A sheet of tracing paper.

## **Getting Started**

1. I unpacked the box and checked everything was there.
2. I plugged power into the FifeX colour Mixer Control Box but left it switched off.
3. I connected the FifeX Colour mixer Stand to the FifeX Colour Mixer Control Box using the connector.
4. I checked that all three control knobs on the FifeX Colour were turned fully anti-clockwise.
5. I switched on the DC supply.
6. With everything plugged in, I set it up as follows. For this setup I used screen 1, which is solid black with a hole cut out of the middle.



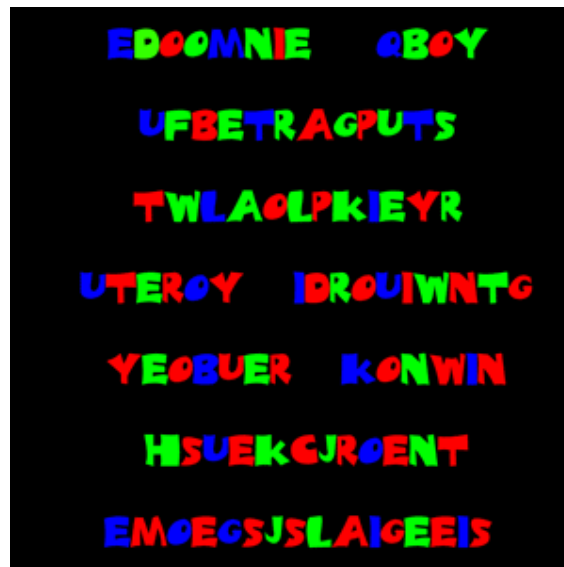
*Alignment can easily be changed for better image quality*

7. The control box has two settings, outer and inner which provide two different ways of displaying the mixed colours. I started with them on 'outer'.
8. I changed the brightness of the LEDs using the control box, which gave me a good pattern for the secondary colours and a white in the middle.



9. I switched to screen 2 (see image on left) to show another interesting pattern that is similar to the subtractive colour mixing pattern. This is made by using shadows rather than real subtractive mixing.
10. I then switched back to screen 1 and put a piece of tracing paper over the small hole on the black screen. At this point, I found it was best to move the switch to 'inner' and I dimmed the lights (the room must be completely black). I found a mug with red writing on it as well as other colours - I put this between the screen and the wall. When I turned the red knob to zero the writing became black, however the other decorations on the mug remained. The red writing is red because it absorbs green and blue light but reflects the red. Therefore when the red light was turned off, nothing was being reflected so the writing appeared black.

This led to my idea of using black paper and coloured text to write a secret message, as shown below. If you shine different coloured lights on this you can work out the message.



### Note to Teacher

Some pupils may not be familiar with this sort of colour mixing. They may have already been shown how to mix colours using the primary colours of paint (cyan, magenta and yellow). The two ways of colour mixing are different because in paint colour mixing, the more colours you add the darker the colour becomes. This is called subtractive colour mixing.

The difference in this experiment is that here we are using light which follows additive colour mixing. The more colours you add the lighter the colour gets. This is shown when all the colours together create white. More information on colour mixing can be found in my other document called 'An Introduction to Colour Mixing'.