

COLOUR CUBE

What is Colour cube?

Colour cube is a tool for colour-blind children which helps them independently identify different colouring pencils which they might perceive as similar or the same. Colourblind children commonly perceive either red and green or blue and yellow as similar or the same.

Design Choices

We made our design very simple to use with young children from ages 5 to 13 in mind who may not be able to read or write. Because of this, we have designed a cube with a circular slot where a pencil can be inserted.

Once a pencil is detected in the slot a green LED next to the insert slot will light up indicating that the colour is being detected. Once the colour is detected a speaker will play an audio file corresponding to the colour detected.

How does it work?

Our circuit is controlled using a Teensy 3.2 microcontroller. An LDR is used as a light sensor to detect if a pencil is inserted into the slot; as well as a colour sensor to detect the colour of the pencil. The actuators we are using are a speaker to communicate the colour detected to the user and a green LED to indicate that the colour is being detected. Next to our speaker module, we are using a microSD card module to store the audio files for the speaker output. We have also built a single transistor audio amplifier to increase the output volume of the speaker.

