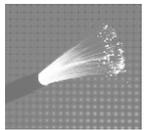


CONFOUNDING COMMUNICATIONS

STUDENT QUICK-START

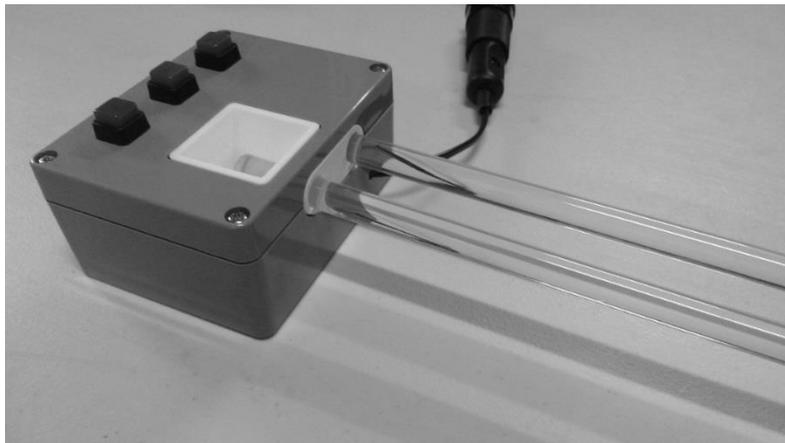


SCENARIO

You are an elite team of spies sent to acquire top secret information from enemy headquarters. Unfortunately, the enemy spy agency is monitoring your communications, so your team will need to send coded messages with this information back to your own headquarters.

AIM

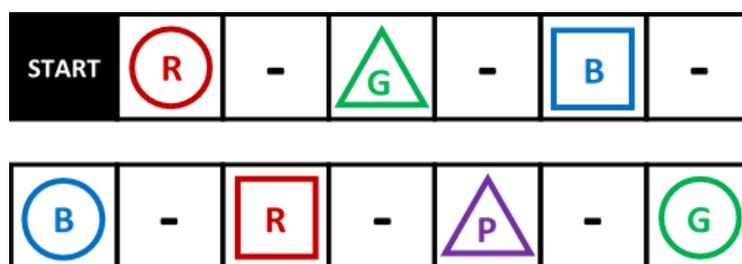
The aim of this half-day activity is to design an efficient code to send messages along fibre optic rods using only pulses of coloured light.



WHAT TO DO

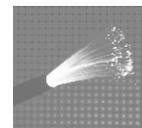
Your team will be given a communications device that consists of two light boxes connected by two fibre optic rods. Each box has three buttons to produce different coloured lights.

Design a code to use the different colours of light to send the "message". The message is represented by a series of rows and squares, similar to the practice message below:



Note: The sample message above is provided in colour on the Challenge day.

You will need decide how to represent each of these symbols contained in the messages. Try not to make the code too complex, as this will take longer to send and be harder to decode accurately. For example, your team could use one pulse of red for the 'R' circle, three pulses of green for the 'G' triangle, and four pulses of blue for the 'B' square, and so on. Your team will need a code for the HYPHEN. You should also consider incorporating a way to acknowledge that the Receivers have understood the Senders message.



Begin by developing a code to transmit all the possible symbols that will be used in the scenario using the practice card supplied. After a while, you will be asked to split your team into two: Senders (who encode and send the message), and Receivers (who receive and decode the message). Each sub-team sits at opposite ends of a table separated by a screen.

When the Event Staff give you the signal to start, the Senders need to send the message using the light boxes. Once the Receivers have decoded the message, put your hand up to indicate that you have finished.

RULES

Teams have a maximum of 10 minutes to send and receive their message.

When each team has finished each scenario you **must** immediately put your hands up and have your time recorded on your score sheet by the Event Staff. One of the Event Staff will then collect and mark your grid.

Receivers and Senders are separated by a curtain. Once the test begins, neither team is permitted to talk, look around the curtain, or use mobile phones and smart watches. **Severe point penalties apply if these rules are broken.**

SCORING

Your team's score is based on the accuracy and speed in transmission of the message.

The first scenario is composed of simple coloured shapes. The second scenario has an increased number of symbols to transmit.

The third, fourth, fifth, and sixth scenarios involve the transmission of alpha-numeric messages.



At the end, return your team's score sheet to the Event Staff

TIPS

- The "Start" square must always be in the top left hand corner.
- It is important that your code allows accurate, quick and easy encoding and decoding. Do not make it too complex!
- Keep colour similarities in mind when you design the code i.e. is blue clearly distinguishable from purple?
- Some things to consider while designing the codes are: different colour combinations, length of light pulses, and time in between light pulses. Receivers can also reply to messages received, so you may want to consider incorporating an error checking system.
- Your team will have the opportunity to practice with the code your team develops before the official tests to make sure there is no confusion.

IF YOU ENJOYED THIS ACTIVITY...

Science and Engineering careers related to this activity include:

- Software Engineer
- Mathematical Modeller
- Computer Systems Engineer
- Scientific Analyst