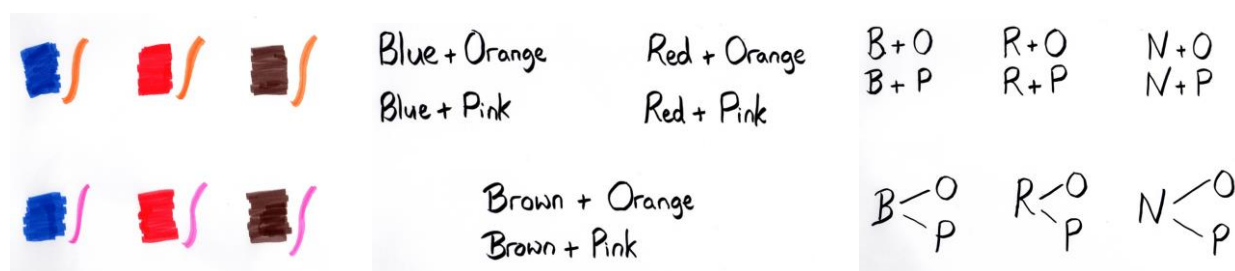


Christmas Wrapping Paper Challenge

This investigation encourages the use of a systematic approach and recording to find all possibilities. It is comprised of 3 possible challenges and is easily adaptable for any age. A video of the challenge is available here: <https://www.youtube.com/watch?v=uwJajHmqt18>

Challenge 1: We're wrapping Christmas presents for friends and have 3 different colours of wrapping paper (blue, red and brown) and 2 colours of ribbon (pink and orange). How many different combinations of paper and ribbon are there?

Children need to find a way of recording the possibilities, to ensure they don't repeat or miss any. Younger children could cut and paste pieces of the paper/ribbon. Children can share their recordings when they have completed Challenge 1, identifying how easy and efficient they are to record and read, and checking for any omissions. Examples of possible recordings to share are shown below.



Challenge 2: Children now have to determine how many combinations there would be if we also had white wrapping paper. They should be encouraged to refine their recording and build upon it to include the new element. They can then share their recording, explaining any improvements they made.

Challenge 3: There are 12 presents to be wrapped, so if each one is to be different, how many colours of paper and ribbon are needed? The results of challenges 1 and 2 can be presented in a chart, as shown below. Children can make a prediction and then test it, recording results in the chart. If they immediately notice the multiplicative link, they can be asked to prove it in a recording.

Paper	Ribbons	Combinations
3	2	6
4	2	8
?	?	12

Extension: Children can investigate how many combinations there would be if there were more colours of ribbon or if different coloured rosettes were also used.

Where appropriate, algebra can be introduced, by first recording the relationship in words as

$$\text{Paper} \times \text{Ribbons} = \text{Combinations}$$

before progressing to

$$P \times R = C \qquad \text{or} \qquad PR = C$$