This resource is part of a suite of materials and activities created to inspire entrants, and support teachers, and parents to enter *maths inside*: a photo competition open to everyone in Scotland. *maths inside*: see different, make connections, celebrate!

In this series of example submission journeys, you can find details of searching, questioning, and discovery of *maths inside* the things and spaces around us! Follow these stories and learn how to catch the beauty of a discovery in a photo, title and commentary (linked activities and resource pack).

Visit mathsinside.com for entry details, further information, and follow us for updates!

Below, this example documents the submission journey for an **First Level (P2–P4)** entry (credits).

Colour Wheel | First Level example submission journey

Making messy mixtures is fun and one of my favourite things to do is paint. I have a paint set with these three colours: red, yellow and blue.

I like mixing the paints together to see what colours I can make. What causes the colours to mix? What causes the colours to not "unmix"? How many different combinations of colours are there? What colours can I make from mixing red, yellow and blue? Where do the other colours come from? I added one squeeze of each colour to see how many colours I could make. I took a photo of these colours and gave it the title

> "Mixing and Matching"

with commentary:

> "I wanted to see how many new colours of paint I could make from mixing red, yellow and blue paints. There were three different combinations – red and yellow, blue and yellow, and blue and red."

What happens when I mix these together? I found that I can make three new colours – orange, green and purple! What colour is the result of mixing red, blue and yellow altogether? I tried this and took the photo below, I added in the brush too to make the photo more interesting. I titled it

> "All Mixed Up"

with commentary:

> "By mixing red, yellow and blue paint, I can make four new colours. Red and yellow makes orange, yellow and blue makes green, and blue and red makes purple. I mixed all of the colours together to see what colour I could make and it was the brown-grey blob in the middle."

Can you think of some more colours that we didn't find yet? I thought of a traffic light, it has an amber middle light. How can I make amber? What combinations of red, yellow and blue make amber? Then I have another idea. I add two squeezes of red paint to one squeeze of blue paint to see what colour I

get. It looks like red-purple, that's not it! Adding two squeezes of yellow to one squeeze of red gives me the amber colour I see on a traffic light. I got it! Why does adding different amounts of each colour produces a different colour? How many new colours can I make? Where else does mixing different amounts give different results? I repeat this for the other colours and have a whole rainbow of different colours now!

I take the photo titled

> "Colour Sums"

with commentary

> "I can only make four new colours when mixing red, yellow and blue equally but when I change the amounts of each paint I can make six new colours! So from the three primary colours, ten new colours can be mixed together. I painted Colour Sums to show how to make six new colours using different amounts of red, yellow and blue."
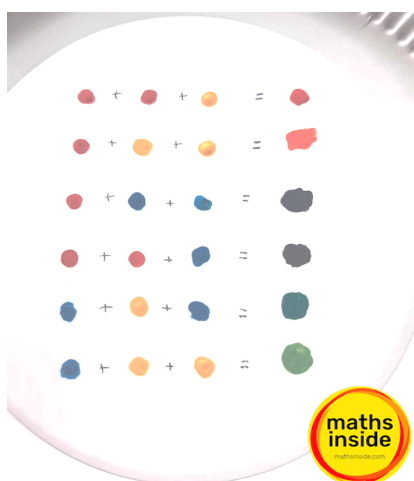
I like these new colours. What is the best way to sort these into a shape where I can show all of the colours together? For my final submission, I come up with a colour circle where each of these colours blends into the next.

I title this photo

> "Colour Wheel"

and added the commentary

> "Adding different coloured paints together makes a mixture that can't be separated. By adding equal parts of red, yellow and blue I can make four new colours, and by changing the amounts of each I can make another six colours! I have painted a wheel of colours that are all created by mixing together different amounts of red, yellow and blue paint. For example, amber is different

> to orange because it is made by adding two squeezes of yellow to one squeeze of red, instead of orange which is one squeeze of each. I did not realise that there was maths inside mixing colours, but I needed to use different amounts of each colour to get my final result."

further things to think about

Could you display these colours in another way? What shape would you choose to organise them? What's your favourite colour? How many squeezes of each colour of paint do you need to make it?

I wonder, where else can you find this idea of mixtures working? What colour could I make if I added three blobs of yellow paint to one blob of red paint? Or three blobs of red paint and one blob of blue? When I mix things, do they always combine into one new thing, like paint does, or can they stay "unmixed"? Where else do you get different results when you mix a different amount of each part? Baking a cake? Pouring a glass of diluting juice?

Open to all ages with prizes in each level. You only need a mobile, the internet & curiosity! Enter maths inside *on your own or as a team, mind to add the maths inside sticker, and submit in one, or in as many categories as you like. The photo should be your own, without changes, and for a chance to win, cannot be shared anywhere else. View the* T&C *for more information, and please do get in touch if you have any questions.*

linked activities and resource pack

Complementing each journey is an example interdisciplinary learning (IDL) activity matched to Curriculum for Excellence experiences and outcomes (Es&Os). Also available are image banks containing images and questions to inspire interdisciplinary investigation and learning. These resources and activities are all available in a downloadable pack.

credits

This suite of resources are the fruit of a collaborative project between undergraduate and postgraduate students from the University of Glasgow — School of Mathematics & Statistics, Education Scotland, and Dr Andrew Wilson (*maths inside* Founder and Director).

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The photos above are credited to Kathleen McGill.