

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](https://mathsinside.com) for entry details, further information, and follow us for updates!

Below, this example documents the submission journey for an **Senior Phase (S4–S6)** entry ([credits](#)).

## Travel Constraints | Senior Phase example submission journey

Sometimes I get out of bed late in the morning and have to choose a quicker route to get to school! When I travel to another city I always look for the cheapest option. What can I expect the journey time to be when I choose the cheapest mode of transport available? What can I expect it to cost if I choose the fastest mode of transport I can find? How are these journeys the same? When are they different? When do they use the same route? When is it possible to compromise and get the “best of both worlds”? I looked at some websites online to get a feel for this. Hikers map out their routes in advance so they are confident that the path they take is not too steep and will get them to the summit in time. Families will want to buy as much food as they require on their weekly shop for as low a price as possible. Can you think of more everyday problems where different restrictions or constraints compete with each other?

What is the quickest route to get to from one place to another? What is the cheapest route? Can you find a compromise and get a route that is both quick enough and cheap enough? What other situations have competing features or constraints? When else are choices constrained and compromises necessary?

This is a photograph of some coins and a pocket watch resting upon numerous train tickets. I chose to take this picture to represent travel choices and time constraints.



Since this is an entry to the *maths inside* photo competition and I've already added the sticker, it needs two more things: a title, and commentary. What title can you give the photo? What can you write in a commentary? What part of this photo could you choose to highlight? Why did you choose this particular part? What is interesting about it? How could you describe what's happening, and why?

I titled my photo

"Time and Money"

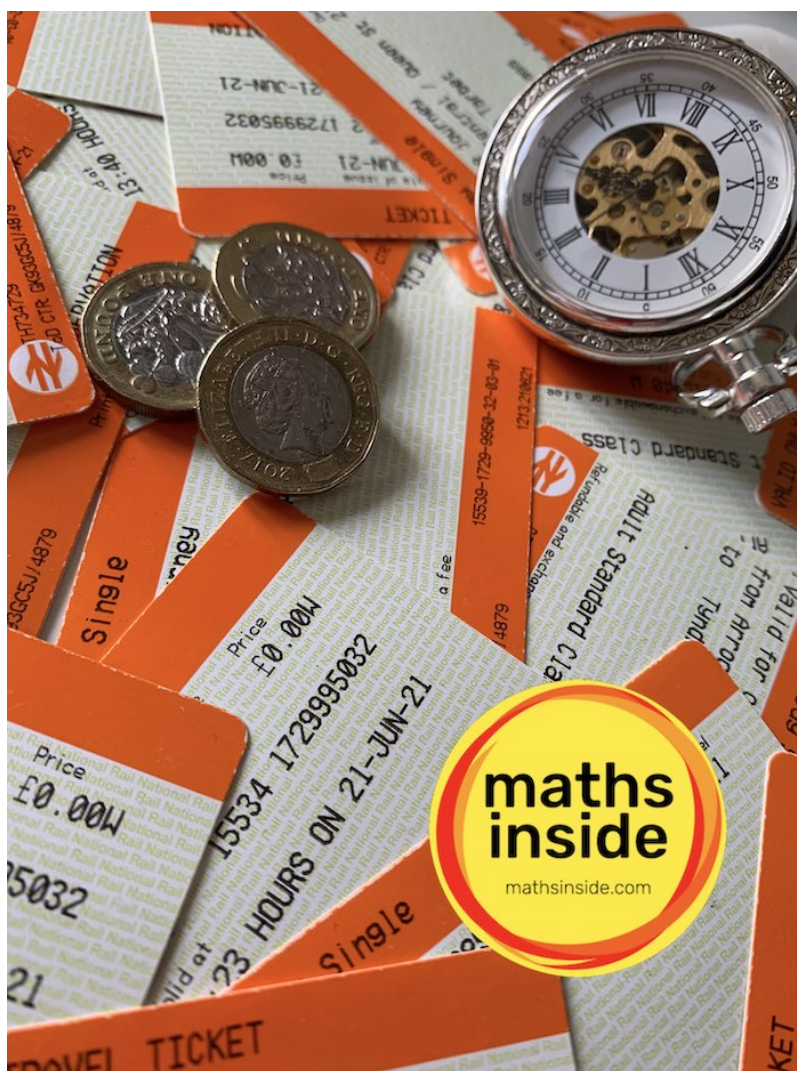
and gave it the commentary

"We see a pocket watch and some pocket change resting upon lots of train tickets, which shows how important they are to a journey."

What do you think of this photo? Is it aesthetically pleasing or interesting? To take it, I scattered 25 tickets on my desk and placed the watch and coins on top and took the picture from an angle. The

maths inside competition is a photo competition after all, so in order to make this a better entry, we should take a better photograph! I think I can give it a more meaningful commentary too.

What can make this a better photograph? What is the important information to convey to the viewer? How can you make the subject clear? Why is it interesting? An important consideration in making this a better photograph is framing. At present, it is hard to tell what the subject is because the main subjects, the “constraints” are not in the centre of the photograph. One idea would be to change the angle of the photograph and bring the items closer to draw the viewers eyes back to the main subjects. What focus, lighting and contrast make the photograph more visually interesting? Can you think of any other settings we could adjust in taking the photo? I thought about all this and took the photograph below which I think is a lot better.



What can we do to make the title capture the point of the entry? What issues are there with it at present? How would you address these? I decided to change the title to



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“Travel Constraints”

which I feel gives a more direct idea of the subject of the entry.

How about the commentary? What would you change here? What issues are there with it at present? How would you address these? What differences do you notice between the first and second picture? How would we make the new focus apparent to a reader? I chose to change my commentary to

“When we plan a journey, we often want to minimise the total cost and journey time. In minimising one of these factors, we are constrained in how much we can control the other. If we want to minimise cost, we would normally expect our trip to take a bit longer, or have more changeovers. In minimising journey time, transport companies capitalise on this and charge more for faster services. In practise it is not practical to expect to be able to minimise both of these factors, but we can certainly try!”

Do you see how this commentary develops upon the first one? What stands out about the differences between the two? Does it make the maths inside clear?

I like my commentary, but I feel the photo doesn’t capture the emotion of travel and choosing a route. This is another important consideration in making this a better photograph that speaks to the viewer. I was in the new Queen Street Station in Glasgow with a friend and shot her making choices in front of the departures and arrivals board. Her head over to one side, quizzically, the green and red lights together with the departure information capture better for me the constraints we had and the choices we made on that journey!



**further things to think about**

Now it is your turn to give it a go! Where have you spotted maths inside your life? Can you give it a title, take a photograph and add a sticker, and write a commentary that describes the maths you have discovered? Good luck!

*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 Jordan Baillie, and [Ross Sneddon](#).