



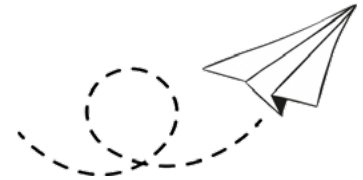
THE STEM TIMES

The Newsletter for all things STEM
at Magna Academy Poole

Issue 3 | June 2021

The Great Paper Aeroplane Challenge

by
Mrs Bleeze



If you think engines are the key to making a plane fly, you would be wrong. Things can fly quite happily without engines as gliders (planes with no engines), paper planes, and indeed gliding birds readily show us. While the engines move a plane forward, it is the wings that move it upwards. For The Great Paper Aeroplane Challenge, students were tasked with achieving two goals; firstly, to design a paper aeroplane that will fly a long distance and secondly, an aeroplane that will glide for a long time.

Students read up on the physics behind how planes fly. They made and tested their own paper aeroplane designs. The winner for each challenge were as follows:

Distance flown: Oliver Chapman • Nathan Hill • Sophie Musial

Time in air: Jayden Hirsh • Oliver Chapman • Kobe Edwards

All participants received a certificate of participation and the winners received additional House Points.



L-R: Sophie, Kobe, Nathan, Jayden, Oliver

Oliver Chapman
tells us:

"In junior school I would always go to breakfast club in the mornings and we were in the main hall which was very spacious and had no breeze so it was perfect for paper aeroplanes. From here I kept fiddling and altering the classic paper aeroplane design and then by chance I came up with the x-wing design.

This design reduces the plane's shadow so reduces drag but the folded wing creates increased surface for more lift therefore seeming like the perfect design for a distance competition in the windy outdoors."

British Science Week | by Mrs Bleeze

British Science Week is a ten-day celebration of science, technology, engineering and Maths that took place between 5-14 March 2021. During British Science week, we introduced students to daily case studies to challenge stereotypes surrounding science, technology and engineering and to show students the variety of STEM related careers out there.

"Forgery is on the rise and it's estimated that nearly half a trillion dollars' worth of counterfeit products are sold every year. Not only can this damage the reputation of a company as fake products are often low quality, but they can be harmful.

This is particularly true if the product, such as a disposable respirator used by front line health care workers—is designed to protect the wearer from hazards. The new-to-the-world testing system developed by 3M analytical specialists Dr Paola Ciselli, Ian Clarkson, Damien Latron and Dr Jonathan Wilson is a sophisticated method of scanning products to analyse their unique make-up."



"Krystina is a Chartered Engineer and STEM Ambassador who works as a Senior Flight Systems Engineer at BAE Systems. She studied Aerospace Systems Engineering at university, after being inspired by an air show when she was in school, becoming the first engineer in her family. During the first lockdown, Krystina set up her own business, AviateHer, selling accessories to promote diversity in engineering. She has since expanded her range of products to include various careers in STEM. Part of the proceeds from each accessory goes towards charities working to improve diversity in STEM."

Year 10 STEM Potential Programme | by Mrs Bleeze

Imperial College London STEM Potential is a multi-year programme of activities and support for young people, developed to help them to discover the wide range of subjects within STEM studies and to aid their progression to university. During their time on the programme, students will attend around five days of events each academic year at ICL South Kensington Campus, including subject focused sessions, university preparation workshops, taster events and lectures.

We are delighted that Yamen Abiad was offered a place on this programme!



Yamen tells us:

"In the first session, I enjoyed the lessons as I met like-minded people with the same passion for science and maths while reinforcing topics such as the rate of photosynthesis, I-V characteristics graphs and the reasons for their shape as well as building a small scale thermostat that uses a light dependent resistor to change the pitch.

The second session was about revising GCSE topics with the STEM ambassadors. I chose chemistry and we went over electrolysis as well as doing past paper questions specifically on this topic. I think it was very educational as it answered any queries I had on this topic and reinforced my previous knowledge as well as providing me with new information."

Coding is becoming one of the most in-demand skills across industries. Apart from companies in the technology sector, there are an increasing number of businesses relying on computer code. Jobs that require a high level of programming knowledge are growing faster than the market average and careers that require coding skills include information technology (IT) workers, data analysts, artists, designers, engineers and scientists. (<https://www.fastcompany.com/3060883/why-coding-is-the-job-skill-of-the-future-for-everyone>)

We gave STEM Club students an encoded text to decipher. They could use any method of their choice, whether through frequency analysis or general logic and the students performed brilliantly!

Seb Wakenshaw tells us:



"At the start, this was a challenging task as I had very little knowledge about how to decode text. I had made several attempts before I finally found a solution. However, once I found the correct method it was easy to understand.

To begin with the decoding, I would look through, and replace any single letter words, which should decode to either 'a' or 'i'. Afterwards, I substituted these into other places in the encrypted text that were filled by the same letters. (For example, if "g" in the code was "a", then I would replace all the letters "g" with an "a").

I then moved onto the most common two- or three-letter words, which could be: "and", "the" and "it". Next, I would look for any words that are almost complete and try to figure out which letters needed replacing. By using this method, I was able to use a process of elimination and find completed words within the text.

Eventually, all of the words were de-coded and I was able to make sense of the sentences they created."

Year 10 Coding Challenge

by Mrs Bleeze

Emily Chislett tells us:

"At the start, I was looking for the letters used most (in the code), and replaced them with vowels (e.g a, e, i, o, u).

Then I looked for letters grouped in pairs (groups of 2) so I could create words such as by, to and as.

After I moved onto three letter words, I was able to carry on decoding the message successfully."



With enrichment restarting, the science department is offering the following after school activities:

Thursday: **STEM Club (3-4pm, G91)**
Wednesday: **Medical Mavericks (3-4pm, G91)**

Please use the [Google Form](#) on the [academy website](#) to sign up.