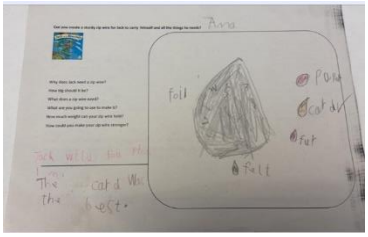
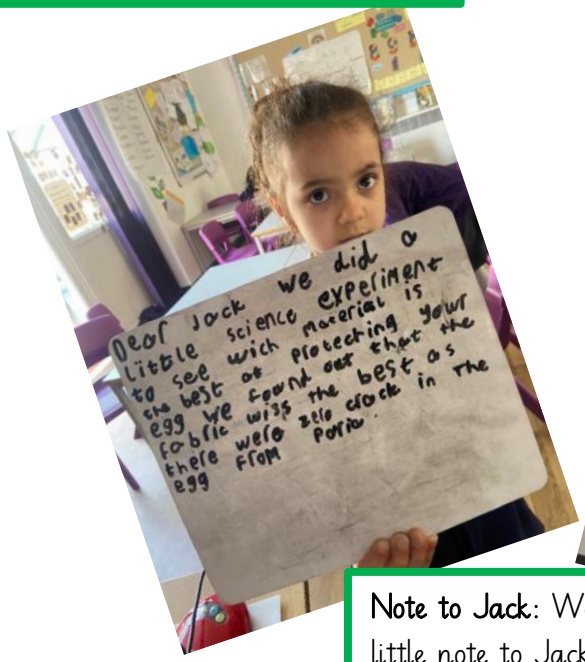
Year 1: How can the golden eggs land safely? (Jack and the Beanstalk STEM challenge)

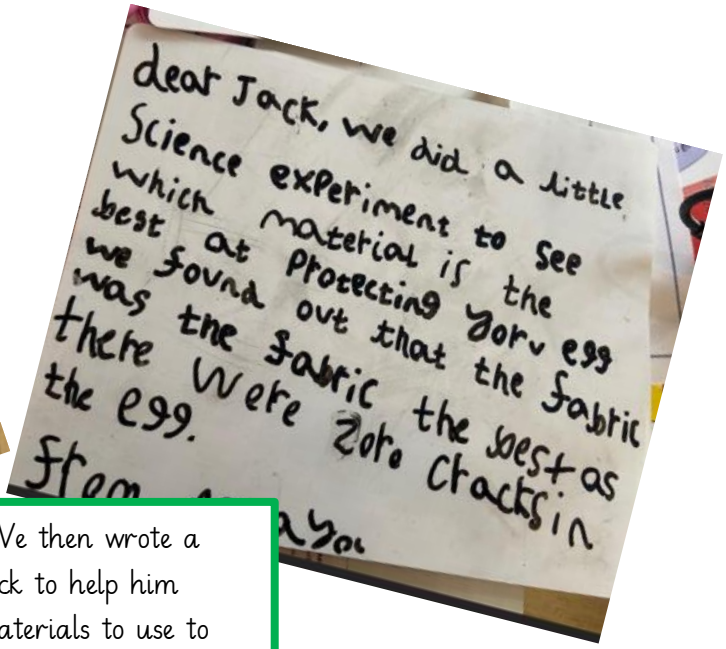
Challenge: We had a STEM challenge of helping Jack to drop the golden eggs down safely and to make sure they did not break!

Experiment: We worked in groups to think about the materials and their properties. We used our science knowledge about materials to help us predict and think which would help the egg to not crack!



Findings: We found out that the best material to keep the golden eggs safe was the fabric Swade material. The organza and paper cracked the egg the most and would not be the best material!





Note to Jack: We then wrote a little note to Jack to help him decide which materials to use to wrap the eggs safely.

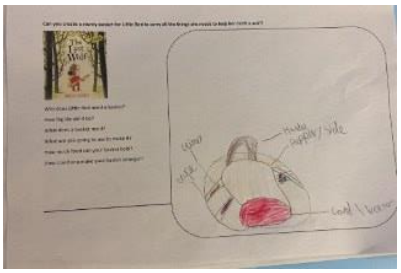
Year 2: Can you create a strong and robust basket for Little Red ? (Little Red -Mini Grey STEM challenge)

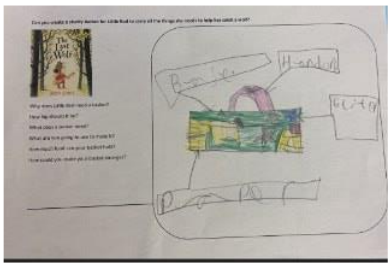
Challenge: We had been reading about Little Red by Mini Grey in Year 2. Little Red wrote a letter, asking for Year 2's help and of course we had to help her! The big bad wolf had clawed through her basket and Little Red needed a stronger basket to to withstand the wolf's claws and for heavy items to go in for Little Red's journey through the woods. Children worked in groups, and each had a role to play, researcher, designer, engineer, scientist (tester), writer, and presenter.

Expert: We needed help and **Chris an engineer from Rolls Royce**, told us what skills were needed in his job and how we could use some of those skills to help us with our mission today.

Findings: Into the woods we went with our baskets. We tested them out by going over and under things to make sure the baskets were strong and did not break. Some of us realised our handle needed to be stronger so we changed the material it was made out of.

Design: We worked in groups to research the different properties of materials and used this knowledge to create designs of our baskets.





Note to Chris the Engineer: We then wrote a little reflection about what we learnt and which material was the most suitable to create a basket from.

Year 3: Can you create a strong and robust basket for Little Red ? (Billy Goats Gruff STEM challenge)

Challenge: We read the story of Billy Goat Gruff and then we had a STEM problem to solve. Our challenge was to think of a solution as to how to get the Billy Goats across the river as the Troll had damaged their wooden bridge.

Findings: We found out that foil was a good material as we covered up our cardboard to make it stronger and waterproof.

Expert: Wendy Cheung the Engineer

Wendy gave us some clues about her job as an engineer and how she needs to make sure planes are built for all weather conditions. Therefore, she has to really think about the materials and yes that's perfect for our challenge as we needed her expertise and knowledge about how to think like an engineer when you are building a boat. We learnt lots about her job and it inspired some of us to become engineers too!

Design: We worked in groups to research the different properties of materials and used this knowledge of year 2 materials and KS1 of floating and sinking.

We worked in small groups in our stem lab and we first had to plan and think carefully of all the steps we needed to complete as a team.
From Wendy we learnt that we needed to think about properties of materials and our knowledge of sinking and floating which we learnt in KS1. Wendy helped us even more with her diagrams thorough our teams call about 'buoyancy' and 'water resistance'.
We broke down the jobs and we each had a special role, like one was a 'designer', 'researcher', 'constructor', 'tester', and 'recorder'. Then we got to engineer our boat.

Presented our findings to Wendy Engineer: We then presented our designs and results to Wendy. We also told her how we had to improve our designs as we were testing the boats out.

Year 4: How can we trap Gingerbread man? (Gingerbread man STEM challenge)

Challenge: The old women and old man are frankly fed up and had asked Year 4 if they could use their engineering skills to create a trap to catch the forever running Gingerbread man!

Expert: The children had to work in small groups and each person had a role!
Group:
Engineer: The designer who is trying to create a visual representation of how the trap will work.
Scientist: The scientist who will test out the strength of the trap.
Photographer: The artist who will capture each step of the way.
Writer: The scribe, who ensures they are documenting each step of the way!
Maker: The builders, who will be using all the above roles information to create the planned trap.

Design: We worked in groups to research the different properties of materials and used this knowledge of year 2 materials and KS1 of floating and sinking.

We worked in small groups in our stem lab and we first had to plan and think carefully of all the steps we needed to complete as a team.
From Wendy we learnt that we needed to think about properties of materials and our knowledge of sinking and floating which we learnt in KS1. Wendy helped us even more with her diagrams thorough our teams call about 'buoyancy' and 'water resistance'.
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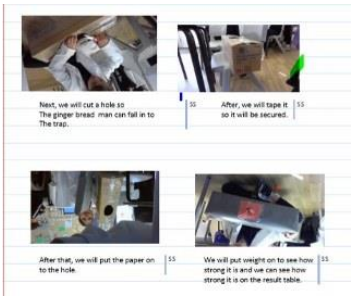


Findings: We found out that we needed to make sure that the trap was heavy and didn't break easily.

Presented our findings to Wendy
Engineer: We then presented our designs and results to Wendy. We also told her how we had to improve our designs as we were testing the boats out.

Year 5: Which material is the best for Goldilocks bed? (Goldilocks STEM challenge)

Challenge: The old women and old man are frankly fed up and had asked Year 4 if they could use their engineering skills to create a trap to catch the forever running Gingerbread man! Year 5 children were tasked with creating the best bed to hold the different amounts of 'weight' of the three bears. The children worked as part of a group to create the best bed, thinking about the different materials (variable) and the different amount of weights (variable) held by the bed. They worked in a group with various roles, writer, researcher, scientist, engineer, designer and photographer.

Expert: The children had to work in small groups and each person had a role!
Group:
Engineer: The designer who is trying to create a visual representation of how the trap will work.
Scientist: The scientist who will test out the strength of the trap.
Photographer: The artist who will capture each step of the way.
Writer: The scribe, who ensures they are documenting each step of the way!
Maker: The builders, who will be using all the above roles information to create the planned trap.

Design:

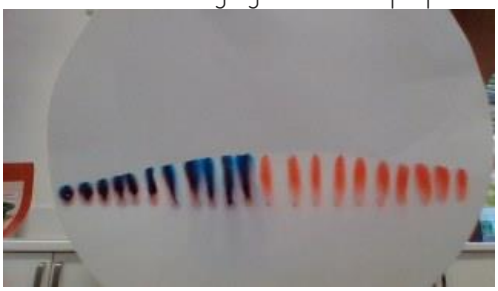
The children worked in groups and used their skills builder communication, leadership and teamwork to come up with designs of the bed.

Findings: Each group found out which material was most durable and could withstand the different weight which showed the success of their bed designs. The groups recorded their results following their working scientifically working skills. They ensured that they carried out a fair test.

Year 6: Is it magic or is it science? (Harry Potter STEM challenge)

Challenge: Year 6 were set the task to answer the question is it magic or is it science? Some Year 6 pupils really enjoyed reading Harry potter, so the challenge was based around looking at some of the 'magic' that occurs in stories. Here is the reflection of the science challenge day from one Y6 pupil. Here is a Year 6 pupils account:

During our initial experiment, we had to draw some colourful, circular shapes on a specific piece of paper known as; 'filtered paper'. At first, it seemed quite strange to be inserting circles on a piece of paper however, we then proceeded to dunk our paper in lukewarm water. This resulted in the colours to separate it seemed very satisfying and fascinating! Here is a sentence, which I wrote to describe the experiment, 'In this experiment, I noticed that the purple transformed into a light pink and the dark blue is becoming light blue and purple.'.



For our next discoveries, we listened to 3 videos, (from the jolly James Corden alongside Professor Robert Winston) which expanded 6H's knowledge on the effects of different -sometimes poisonous- gasses such as, nitrogen, oxygen hydrogen and also liquid nitrogen. We learnt that these three substances (oxygen, hydrogen and nitrogen) are extremely harmful and that these chemicals can have a large impact.

Finally, the pupils, who had created their 'flying' cars earlier at home, went outside and tried making their cars move by pumping air into them (this was done by the teacher) and measured the distance with metres. We also had the choice of naming our cars, which was also enjoyable. Some cars didn't move at all: the cause of this could have been because of the material of the tyres or the structure of the vehicle. Whereas, the children who hadn't designed a car, received the chance to produce a potion in honour of Harry Potter -and science-! This task was also entertaining.