

ST THOMAS CE PRIMARY SCHOOL

Visit to the Institute of Ageing and Chronic Disease at the University of Liverpool



STEM Ambassador Hub Merseyside & Cheshire

Context and Overview

Inspiring, educational, awesome, factual, exhilarating, incredible, epic, fab!

These are just some of the ways the children from St Thomas CE Primary School in Lydiate described their visit to the University of Liverpool on 28 November 2017, to take part in the Institute of Ageing and Chronic Disease's 'Junior Science Lab'.

In August 2017, STEM Ambassador, **Valentina Barrera**, approached the Merseyside and Cheshire STEM Ambassador Hub (HUBMC) for support with the facilitation of a school activity. Valentina had been awarded a university public engagement grant for a project that should engage students aged 7-11 years old and that need to take place sometime in the forthcoming Autumn term.

Valentina and her team (which included several other STEM Ambassador volunteers), proposed a project that would include a visit to the University of Liverpool's Institute of Ageing and Chronic Disease (IACD), during which the students would be able to build a giant model of the cardiovascular system, examine microscope tissue slides and tour the laboratories. Prior to the visit, Valentina would visit the students and their teachers at their school to do some introductory, preparatory work for the activity. In addition, art-work produced by the students on the day would be entered into an art exhibition displayed in the Royal Liverpool Hospital.

HUBMC staff were able to link Valentina and her team with **Mark Ward**, Headteacher at St Thomas CE Primary School in Lydiate, and it was agreed that the Y6 students at the school would take part in the activity as the subject matter would best support that year group's Science curriculum. (The Science Programme of Study for Y6 'Animals & Humans states that 'Pupils should be taught to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood:').



In total 21 members of the IACD, 29 school students, three school staff and a school governor took part in the visit with positive experiences reported by all parties.

Visit to the IACD

The theme for the opening session of the students' visit to the IACD was 'The Giant Cardiovascular System' and consisted of demonstrations and hands-on activities to explore the physiology of blood cells and circulation, the eye, and the brain. The students assembled a giant model of the cardiovascular system, designed and built by Valentina and her team. The model consisted of a giant plastic tube, 10m long and 10cm wide, with connected segments, representing blood vessels. Soft toys of different shapes were used to represent red blood cells, neurons and retinal photoreceptors and were used in the model to illustrate how oxygen and nutrients travel around inside the cardiovascular system, reach organs and preserve neural functions.



A short video of the model in action can be seen here: <https://www.youtube.com/watch?v=1YL5qOvB3LU>



By examining real tissue slides under microscopes, the children learned about different changes and pathologies affecting vessels and neural tissue, including clots, haemorrhages and infections.

Through the practical demonstrations, students learned how high blood sugar and diabetes can make retinal vessels leak. The reality of the risk of developing diabetes and retinopathy when blood sugar is too high for too long turned out to be the main take-home message: 18 out of 29 children cited this as at the end of the day as the most interesting thing that they had learned.

After lunch and a visit to the lab, the children took part in an art and craft workshop. They modelled, drew and coloured what they had learned, creating Science-inspired works of art, representing retinal cells, brain sections, eye balls, veins & fibrin clots using polystyrene spheres, coloured paper and pens, plasticine, glitter and plastic slides. They generated beautiful, unique artworks which were then shown in an exhibition in January 2018 in the Royal Liverpool Hospital foyer and campus. The students' creations received a total of 187 winning votes from the visiting public!

Impact on young people

Staff at the IACD collected some basic evaluation data from students before and after their visit to the Department. The information collected showed a positive impact on students' engagement, interest, enjoyment and achievement in STEM subjects.

Prior to their visit, only 32% of students stated that they had met a scientist before and 50% stated that they had visited a university before. This, obviously raised to 100% for both questions after the visit.

	I have met a scientist before (%)	I have visited a university before (%)
Before	32	50
After	100	100

Quotes collected from students after the activities also showed that the experience had a positive impact on students future STEM career aspirations:

**I could work somewhere like this one day.
I really liked the way they showed us what our future could be.
I'm going to be a biologist.**

Prior to the visit, only 54% of students stated that they 'really liked Science'. After the visit, this had risen to 79%.

	I really like science (%)	Science is ok (%)	I don't like science (%)
Before	54	43	4
After	79	21	0

Prior to the visit, only 57% of students stated that they knew a lot about how the human body works. After the visit this had risen to 93%. The engagement with the IACD STEM Ambassadors had made a measurable positive impact on students' Science curriculum understanding and their confidence in their own knowledge.

	I know a lot about how the human body works (%)	I know a bit about how the human body works (%)	I know nothing about how the human body works (%)
Before	57	43	0
After	93	7	0

As part of the evaluation data collected, students expressed their enjoyment of the learning, particularly of the practical experience provided by the STEM Ambassadors in the context of a university department and the resources to which they were able to provide students access.

**It was really good how they didn't just tell us stuff; they showed us it.
We worked out from the microscope which was the good eye and which was the bad eye.
We worked it out ourselves!**

It was good learning about the different parts of the brain and what they do.

The microscopes were really cool. I can't believe they had actual bits of eye!

Impact on educators

Following the visit, teachers expressed deep gratitude for the experience the IACD STEM Ambassadors had provided for their students. From the hospitality offered to the standard of the learning activities provided, the feedback from teachers was overwhelmingly positive.

Valentina stated:

The teachers accompanying the children said our crafting workshop was an amazing opportunity for the children as schools often don't have the tools, time and resources to be involved in creative activities.

In discussion with HUBMC staff following the event, Headteacher at St Thomas, Mark Ward, said:

The visit has been an amazing experience for both staff and students and it has reinforced for us the importance and value of activities that enrich our core curriculum offering.

Impact on STEM Ambassadors

The IACD staff and students involved in the activity very much enjoyed the day and are already talking about organising another event.

Valentina said:

So many of the children told us how much they love science after the event and benefited greatly from an insight into our world. Colleagues are starting to think more about being involved in a school/public engagement activity in the future. The benefits really can work both ways: we all gained so much on the day, and it reminded us once more of the beauty of our work and how important it is to disseminate our knowledge.

I loved seeing the children so excited about learning, so happy to be wearing colourful gloves! They were so creative in crafting models and absolutely wanted to share their work with parents and friends. That spontaneous passion for learning is a unique gift and we, as scientists, have an amazing opportunity to help children retain their unconditioned enthusiasm about learning!

Valentina is due to move on to a new role within the NHS Blood and Transplant department but she already appointed her successor at the IACD for taking the STEM Ambassador work of the department forward and she will be flying the flag for the Programme in her new place of work. We're looking forward to working with a cohort of brand-new recruits!

