



Beautiful Bacteria:

Science, art and SEND

What happens when a Natural History Museum, a museum learning team, an exhibition of cutting-edge bacterial research science, a puppet maker, a research scientist and students from a special academy come together? Miranda Millward, Arts Engagement Officer, Gardens, Libraries and Museums at the University of Oxford, describes the learning that took place

Seven hundred and fifty thousand people visit the Oxford University Museum of Natural History (OUMNH) each year. The purpose-built, intricately designed and crafted building reflects many aspects of the extensive natural history collections it houses. Between October 2018 and May 2019 there was a new addition to the vaulted glass roof – Luke Jerram’s inflatable E.coli artwork, suspended from the ceiling and pointing towards the *Bacterial World: The Untold Story of Bacteria*, which was a temporary exhibition on the first floor.

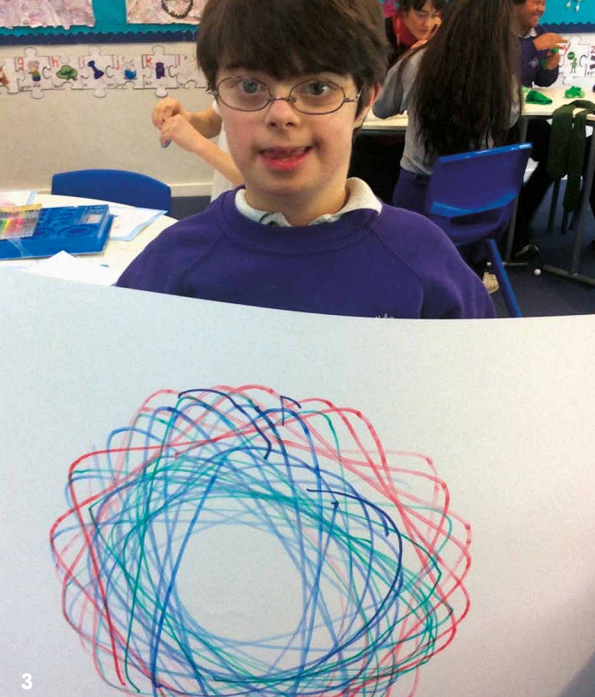
The museum’s exhibition team secured additional funding from Biotechnology Biological Sciences Research Council (BBSRC) in order to enhance the *Bacterial World* exhibition. This allowed for the installation of the E. coli artwork and a science-art engagement project. The project entailed museum staff and pupils from a local special academy, working with artist and costume maker Georgina Davy on a puppet-making project. The funding covered all costs of materials, artist time and travel expenses.

The Oxford University Gardens, Libraries and Museums, which includes the OUMNH, has for the past two years been developing an in-depth partnership with The Iffley Academy using the Arts Council England’s Artsmark programme as a framework. The academy is for children and young people up to the age of 18 who have complex special educational needs and disabilities. All partnership work is co-constructed between teaching staff and learning officers, and tailored to meet the needs of all learners within the teaching group, with all students working towards Arts Award qualifications as part of the project.

The exhibition’s microscopic bacterial subject matter provided plenty of creative potential. Shapes such as spirals, corkscrews, rods and spheres were evident, along with rotating hair-like flagella (or threads) and the retractable pili (hairs) that act as grappling hooks. Our focussed work enabled students to think about the bacteria as ‘superheroes’ with individual characters and characteristics.

To help students understand further, Dr Francis Colles, a microbiology researcher from the University of Oxford, visited the school. Wearing her white lab coat, Francis answered lots of questions and also discussed how important bacteria are in our everyday lives. Meeting Francis helped prepare students for visiting the exhibition where they met a curator who guided them through the exhibits and answered lots more questions. Class teacher Rachel Kempe believes this part of the project ‘gave us a great platform to reinforce good hygiene and the importance of washing hands. We did a great science experiment to see bacteria growing on bread and that really helped the students understand the normally hidden world of bacteria!’

Students then went to work with puppet maker Georgina Davy for two days. Georgina created a



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set of designs and some tactile, colourful mood boards based on the students’ ideas. Georgina considered how to engage all the students using a range of activities and materials. During each workshop there was a carousel of activities for students with techniques such as Japanese shibori dyeing, fringing, finger knitting, pom-pom making and felting.

Working in groups, students created characterful faces made of clay for the bacteria puppets using Japanese Noh masks as inspiration. They were enthusiastic to hear about the different types of puppets Georgina had made in the past and were delighted when Wilfred the life-sized post-box puppet came to visit. ‘Georgina was phenomenal to work with,’ said Rachel. ‘Her ideas, techniques and the final outcomes exceeded all expectations. The students found her calming and captivating, as well as enjoying exploring her previous work.’

Back in her studio Georgina worked on large-scale puppet structures made of hose pipes onto which the textile pieces students made would be mounted. Students were delighted when the three large colourful puppets returned to school completed. They spent a morning being puppeteers, learning how to work together and move the puppets around in small groups. Georgina says of the experience: ‘The students’ enthusiasm for learning was inspiring. I was blown away by their individual artistic talents and fantastic imaginations, in particular their highly

detailed bacteria designs, and their love for puppets and puppetry’.

In order to celebrate the project with a wide audience, the OUMNH team curated an exhibition of students work in the Community Case on the ground floor of the museum. Mood boards, textile samples, petri dishes containing students’ illustrations, and Georgina’s puppet designs were displayed. The class visited the museum for a celebration breakfast and were able to look at the Community Case. They were then treated to a behind the scenes tour to see some of the treasures of the museum.

The puppets also performed to the public one Saturday morning in the museum, choreographed by an enthusiastic team of adult volunteers. The puppets wiggled, twisted and shook around the display cases, accompanied by percussion music which even visitors joined in with. The puppets now live permanently at Iffley Academy and are enjoyed by staff, students, parents and visitors at the school.

Working with students with complex SEND for the first time can be a daunting experience for museum staff. Learning for staff in this project consisted of ensuring planning was done thoroughly in conjunction with the class teacher, who has a high level of detailed knowledge of every child. They anticipated sensory issues which can be common when handling art materials such as clay and then took action to mitigate issues, e.g. providing gloves. Again, simple actions such as opening the museum half

an hour early enabled the group to settle in when it was quiet before other visitors arrived.

The project allowed museum staff to meet students and staff from Iffley a number of times, enabling a real relationship to develop. Tom Procter Legg (head teacher) and Debbie Nicholson (lead practitioner for SEND) delivered SEND-specific training to the GLAM Learning Team to help make staff aware of the challenges young people with SEND have and strategies that support students’ needs when visiting cultural venues.

All ten students who took part in the project achieved their Arts Award Discover – it was a great privilege to look through their portfolios and explore all their hard work. Key learning for students fell into a number of areas: in addition to developing art skills, students worked together, which promoted their teamwork skills, whilst the art and science subject matter promoted cross-curricular learning. Students also met new people and explored a new cultural venue, enhancing their diverse cultural and social capital. Students’ confidence grew with each workshop and museum visit, and they experienced a great sense of pride in seeing their final work exhibited at the museum. ■

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1 (*E coli* 4) *E. coli* by Luke Jerram on display as part of the OUMNH *Bacterial World* exhibition. The artwork was created in collaboration with researchers from the University of Sheffield.

2 Museum volunteers and education staff perform with the bacteria puppets in the Museum of Natural History.

3 Student with a large Spirograph drawing as preparation for puppet making.

4 Student creating a textile segment for a puppet.

5 The Beautiful Bacteria display in the Museum of Natural History, displaying students’ work alongside Georgina’s mood boards and images of the final puppets.