



Pipes and Poo Initial R&D 2024: internal evaluation report

Pipes and Poo, our first project developed from inception to work outdoors as well as indoors, underwent initial development between April and July 2024, with support from Z-arts, the National Festival of Making, the Royal Society of Chemistry, Backstage Trust and the Granada Foundation. **Please watch this [trailer](#).**

A team of **fifteen diverse artists** took part, collaborating closely with **four chemical scientists** including Professor Siddharth Patwardhan, our lead scientific advisor. An estimated **676 children** enthusiastically took part in workshops, interactive installations and game-shows, plus **373 grown-ups** (teachers, parents, and passers-by).

A total of 1049 people engaged in Manchester, Morecambe, Oldham and Burnley.



"The children were all really engaged, laughing and enjoying learning in such a fun way"

"Brilliant session, thank you very much"

"Children were engaged throughout. The passion and activities were amazing."

"We really enjoyed the event. It was interactive, engaging and thought provoking. All of my children participated and were entertained throughout. Thank you for a wonderful afternoon."

Teacher and parent feedback

"Creative team full of creativity and enthusiasm, exceeding my experience / imagination"

Scientific advisor feedback

Schools: Morecambe Bay Primary School (59% Pupil Premium) received an hour-long hands-on workshop per class, followed by a live Zoom Q&A with three chemical scientists. St Philip's, Manchester (34% Pupil Premium level) attended a work-in-progress sharing of the interactive game-show. **238 participants in total.**

"Loved the germ battle, even reluctant learners got involved. Opportunities for all levels of need."

Teacher feedback, Morecambe Bay Primary School





Families: Oldham Gallery and Z-arts, Manchester hosted half-term workshops; Z-arts also hosted a family work-in-progress sharing of the more developed game-show and installation. Hulme Is Where the Art Is festival hosted an outdoor test of our interactive installation (c.200 participants) whilst the National Festival of Making, Blackburn, hosted two days of the installation plus four game-show performances. **811 participants and audience members.**



Positive Engagement

Feedback forms at all our workshops and the two Z-arts sharings asked teachers and carers to score on a 0-100 scale how much they agreed or disagreed with various statements. Averaging feedback from these forms gave a 99% score for “we would come to something like this again”, and 95% for “it was absorbing and held their attention”. Children agreed, with 94% saying that they had “some” or “lots” of fun during our sessions - 73% said “lots”!

Photos: Toni-Dee Paul leading Oldham Gallery workshop; Hannah Goudie-Hunter and teams playing “Spend a Penny” at Z-arts family sharing.

Widening Horizons: reaching under-represented audiences and participants



Thanks to our funders, we were able to offer all our workshops and sharings free of charge. This was vital, as the project was designed to reach those who face the most barriers to STEAM engagement.

Family activities all took place in local authorities who rank in the worst 10%

nationally, as measured by the Government's 2019 Indices of Multiple Deprivation. Previous research from the National Festival of Making indicates that 32% of their audiences are from ethnic minorities. Schools we engaged had a disproportionate number of children eligible for Pupil Premium (national average 24%, compared to Morecambe's 59% and St Philip's 34%). This means their parents receive certain benefits, and indicates very high levels of local deprivation. Children at Morecambe Bay were majority white working class, whilst St Philip's pupils were more ethnically diverse: 33% of the children who attended our session had English as an Additional Language (national average for primary schools is 19.5%).



Feedback from parents and teachers: 93% average score for "it gave the children the opportunity to access activities they would otherwise not have been able to access", and 93% for "it felt relevant to the children", indicating we were able to tailor the activities appropriately to our diverse audiences.



Photos: Stu Bowden leading a chemistry experiment in Oldham; Ebony Feare performing; Morecambe Bay School workshop in action.

Increasing Knowledge and Aspiration



Teachers and parents gave us an average score of 95% for “it helped [children] to understand something new about the world”. Many adults also learned something from our sessions: we scored an average of 84% for “I personally learned something new”.

We asked children “would you like to be a chemical scientist when you are older?” at three points: at the start of the workshop, at the end, and after our live Zoom Q&A with real chemical scientists.

The workshop alone produced an increase of 34% in girls saying they might be interested in a career in the chemical sciences.

But the biggest impact came from meeting real chemical scientists: after the Zoom Q&A, 84% of children said they might be interested in this career path - up from only 20% before the workshop.

Challenges

It was very tricky for artists to deliver Professor Patwardhan’s “Nano-Dirt” activity involving filtering food colour through sand and charcoal. Only after Siddharth had joined us in person and given hands-on training were any of the team able to make the activity work - exposing the limitations of learning laboratory skills via Zoom!

Our prototype sewage system model was hugely popular with children: but this caused challenges, as the filtration system was unable to cope with the quantity of fake poo flushed down our toilets, meaning the team had to

constantly refill with clean water - not as sustainable as we had hoped. We plan to do more work on the system when finishing the project, hopefully next year.

Due to scheduling issues we weren’t able to re-visit Morecambe Bay Primary School to offer a work-in-progress sharing - we hope to do this next year as part of finishing the show.

Photo: Toni-Dee Paul delivering the Nano-Dirt filtration activity at Oldham Gallery.

Learning, Legacy, and Next Steps

100% of the artists involved strongly agreed that they had learned something new, and 75% of scientists agreed or strongly agreed that they had.

“It wasn't as scary as I thought it would be” *Scientist feedback*

The whole team was fascinated to discover how invisible the world of water is to most people. The very idea that our houses are linked by the sewage system, and that chemical scientists are involved in cleaning our water, were big ideas for most people. The installation is so engaging that there is the potential to allow for several layers of engagement: simple but educational fun for younger children, more detailed displays and the chance for one-to-one conversation delving further into the science for older participants. We will be exploring this further during our next design and development stage.

Sasha Borisova
Scientist



ARUP

Two out of four of the scientists involved had never worked with primary aged children before, and appreciated the training the team were able to offer in tailoring their communication to this age group. Three out of four agreed afterwards that “I now feel more confident in engaging children of primary school age with my work”.

We are currently developing plans for the next stage of work, spring / summer 2025.

Watch this space!

With enormous thanks to our funders and supporters!

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