

National Museums Scotland cares for collections of national and international importance. In 2016 we opened 10 new galleries showcasing the museum's collections in decorative art, design, fashion, science and technology. Mini Engineers was one of a range of new programmes developed alongside the galleries. It encourages nursery-P1 (3-5 year olds) and families with under 5s to get hands-on with core engineering concepts inspired by the museum's collection.

SUMMARY

The session puts learners in the role of museum engineers who are needed to help fix a broken clock. With the help of the nursery rhyme 'Hickory Dickory Dock' and a helpful mouse engineer toy, two members of the museum's Enabler team tell the story of a broken clock, and ask the group to help fix it. Adult helpers are actively encouraged to take part in both logistics and exploring the concepts with their school/family group. The session contains three practical activities exploring basic engineering concepts:

1. Catapults linked to levers
2. Cogs and gears which children can fit together
3. Nuts and bolts that children can use to build anything they like

After each activity participants come together as a larger group to see how the mechanics they have explored resolve all the issues the clock has, until it is eventually fixed.

For school groups, the workshop is followed by a visit to our beautiful Ritchie Clock which has exposed internal mechanisms. As they leave, learners are then encouraged to see how the basic engineering principles they explored in the workshop can be seen throughout the museum and in their everyday lives.



AIMS AND GOALS

For our organisation

- To provide experiences that encourage early years visitors to get hands-on with practical engineering concepts at an early age
- To enable visitors to make connections between practical activities and the stories told in our new Science & Technology galleries and engineering in everyday life
- To encourage more visits from families with under 5s by developing a high quality, fun, hands-on STEM session

For our audience

- To develop a session which would be suitable for families as well as schools/nurseries
- To provide teachers with a session which ties in with government objectives in Scotland to increase the engagement of early years pupils with science and STEM
- To encourage the development of team working, problem-solving and listening in participants as well as increasing understanding of engineering
- To provide opportunities for parents and children to explore/play together

OUTCOMES

For our organisation

A key ongoing objective is to link museum objects to practical engineering skills and feedback suggests this is achieved. Initially the workshop was limited to small numbers (15-20 children) which allowed the facilitators to engage with all children individually, but numbers have been increased for the next academic year to account for larger school and nursery groups. The piloting process highlighted some durability issues with the kit, which were resolved by using more robust equipment.

For our audience

Feedback has been very positive from parents and carers, who felt the workshop encouraged their children to engage with science and engineering. Parents requested similar sessions for age 0-2s and 2-3s and wanted them to take place more regularly. There was a high level of recall of key terms used in the workshop and parents liked that the workshop was practical and hands-on. Most activities for under 5s at the museum involve crafts, therefore parents were pleasantly surprised by the hands-on, interactive format of the workshop.

A nursery teacher commented that 'they loved the opportunities to play and make things using the cogs and woodwork tools eg bolts and nuts. The lever experiment was a smash hit too.'



LESSONS LEARNT

- You can run similar sessions for families and schools, by changing the focus slightly to bring in elements of the curriculum for the school groups
- Early years sessions work best when you break down the content into manageable chunks of hands-on activities
- Allowing time in sessions for free play and choice during practical activities is very important for this age group. It also allows families to play together in a structured environment.
- Early years children can learn new engineering/science terms quickly and start to apply them to their everyday lives, especially when linked to familiar things in their lives, eg objects they might play with or see at home, such as a clock
- Using a well-known nursery rhyme as a base for the workshop allowed us to use something that the participants were familiar with and then introduce activities that contained easy to grasp concepts, which built on what they could see in front of them and what they already knew

TOP TIP

Short and focussed activities, with a purpose that links to a central story is an effective way to engage early years family and school groups with STEM activities and topics.

BUDGET

Development costs including the purchase of reusable and bespoke equipment which was tweaked by in-house staff. As all of the kit is reusable, the only ongoing cost is for breakages or to increase the number of participants, which is relatively low cost.

The first year (2016-2017) was delivered for free as it was initially funded as part of an HLF programme. In 2017-2018 the workshop fee is £35 per school group, which is our standard fee for schools sessions to cover resources and staff costs.

FUNDING

The development of the project was part of a larger Heritage Lottery Funded grant linked to the development of the new galleries. The grant covered the purchase all of the reusable kits.

FURTHER INFORMATION

Visit our schools pages to find out more about our sessions for early years pupils: nms.ac.uk/schools

This case study was written by Clare Meakin, Science Engagement Manager and Sarah Cowie, Learning Officer at the National Museums of Scotland.

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