

Glaitness Primary construction



Rationale

The main purpose for the construction project was to engage all learners using a practical, skills-based approach.

With the building site for the nursery expansion right outside the classroom, Paige Archibald (P4 class teacher at Glaitness Primary, Orkney) considered how to turn this from a potentially noisy distraction to a vehicle for engaging STEM teaching and learning experiences. It was a hands-on, experiential cross-curricular learning opportunity incorporating literacy, numeracy, and DYW.

Overview

The teacher contacted Colin Nisbet, Orkney's Education Support Officer for STEM, to seek advice and support around resources and training available.

Colin provided an overview of resources including KAPLA blocks for building and MakeDo cardboard toolkits.

The teacher contacted Callum Murdoch, Orkney Builders Contracts Manager, to arrange sector-led workshops and class input to bring the topic to life for her class.

The school borrowed a 1000 block KAPLA crate, allowing the class to explore through play building towers, creating/copying designs and undertaking other small-scale challenges.

During this three-week loan period, representatives from Orkney Builders visited the class and used the KAPLA to highlight and demonstrate the importance of building upon a solid foundation and creating strong joins. Pupils were challenged to construct a creative marble run using the information, hints and tips they had received from the professionals.



Who is this for?

This case study will be of interest to primary practitioners who are considering approaches to introducing and developing tool use within the classroom and exploring local business input.

What does it cost?

Orkney schools can utilise their own toolkit and workbench, as well as borrow the centrally held OIC KAPLA crate if needed. Schools outwith the area will need to investigate the cost of blocks or availability to borrow.

Orkney Builders is keen to engage with schools and are happy to support a range of topics including 'an introduction to practical tool use', 'general construction', and 'energy efficient homes'. Other firms may have similar outreach principles.

Where can I find out more?

For further details please contact Colin Nisbet - Orkney Islands Council (OIC) Education Support Officer: STEM.

colinwilliam.nisbet@glow.orkneyschools.org.uk

Colin ran an introductory session using MakeDo cardboard construction tools where pupils gained experience in using a saw and screwdriver. Pupils were set a challenge to plan and design a 3-dimensional junk animal with at least one moving part. Different strategies were adopted by the different groups with some keen to go on straight away with tools without much pre planning on paper, whilst others chose to plan more meticulously. All groups successfully produced an animal which fulfilled the design brief.

Following the success of the small-scale animal activity, Paige and Colin were confident that the children could progress to a further challenge. The class was asked to utilise their newly developed skills on a bigger scale and build a classroom den/reading area. The class worked together to design and build this, including some pupils who are often more reluctant to engage in group activities.

To complete the project, representatives from Orkney Builders returned to the class, this time to work for pupils individually using **real** woodworking tools as they created Santa's Face.

Skills and qualities developed

Practical tool use – pupils initially developed skills through MakeDo cardboard tools before progressing to manual tool use (hammer, saw, screwdriver) supported by Orkney Builders.

Risk management – pupils were encouraged to be mindful about their actions and potential risks involved throughout the projects and reminded how to use each tool safely and appropriately when needed.

Planning – pupils had a finite amount of materials and time to create their designs so forward planning was key. In particular, pupils had to consider what part of the animal would move (e.g. wings, tongue, tail) and how they would use the MakeDo tools to secure joints.

Collaboration – pupils were allowed to pick their own groups for the KAPLA and MakeDo challenges. Pupils had to compromise with others in the group regarding design ideas and effective teamwork was needed throughout to ensure the tasks were finished within time limits.

Problem solving – as with many engineering activities, problem solving is crucial. Pupils had to derive solutions to a range of problems including creating a strong foundation for marble runs and using the correct material for junk modelling joints.





Impact

Paige Archibald, Teacher

The project and series of class inputs provided a great stimulus for a variety of cross curricular follow-up tasks which the pupils continued to immerse themselves in. With literacy (particularly writing), numeracy and STEM all mentioned within the Glaitness School Improvement Plan for 2021/22, this project was an innovative way to develop school improvement priorities using STEM as a rich context for learning

"A particular focus of mine was to try and increase engagement and motivation towards literacy. This project opened up endless opportunities for both talking and listening and writing lessons, including: imaginative newspaper articles about the builders discovering gold during the new build, thank you letters for visiting professionals, a recount of the experience of one of the visitors, drawing up plans for our own junk-modelled classroom den, five points of characterisation based around their animal creations and finally, imaginative stories written in pupils' free time based solely on the animal they made using the tools. This was probably the biggest win for us, as two incredibly reluctant writers were asking to go and write another page of their book during their own free time. This resulted in a 13-page story with a clear beginning, middle and end to the life of 'Barry the Dragon' (Barry became somewhat of a school celebrity!)."

Following on from the success of the 'tools' projects, and to continue promoting cross-circular links through STEM, Paige and the class set up a Christmas enterprise project selling homemade candles in conjunction with another local business. The pupils had one aim from this project – raise enough money to buy their own set of KAPLA blocks. The project saw pupils writing scripts and recording promotional videos and as well as costing and designing labels. The class smashed their fundraising goal and bought their own set of MakeDo tools with the extra profit.

To continue to build positive links between the school and Orkney Builders, pupils are going for a site visit in term 3 to see how the new build is progressing and the class are already planning their next STEM challenge using their own MakeDo and KAPLA sets.

Impact

Colin Nisbet, RAiSE

The project was used to lead a school professional learning session to highlight STEM as a vehicle for cross-curricular learning.

It has been a catalyst for other STEM activities across different levels within Glaitness, including pupils undertaking the Young STEM Leader non formal level 2 Award, classes exploring electrical circuits through problem solving challenges, and practitioners introducing digital technology such as Micro:Bits to lessons to promote coding and other digital literacy.

The collaboration between Glaitness and Orkney Builders is beneficial and there will be a legacy to build upon at the school and beyond.

In terms of the DYW agenda, around 7% of Orkney working population - approx. 700 jobs - work within 'Construction', higher than the UK average. The project promotes inclusion and introduces the sector to young people.

Feedback

Feedback from pupils, staff and Orkney builders has been very positive.

Pupils

I loved making the animals with the Make Do tools.

I really enjoyed sawing off the wood to make the wooden Santas.

The Japanese saw was easiest and awesome.

I learnt more about hand-eye coordination and how to keep your hand straight with a saw.

I loved making the stars with the nails and hammering them in.

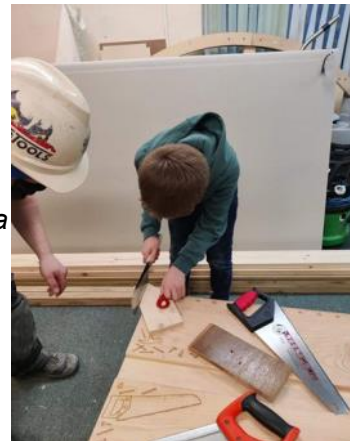
I liked using the hammers and trying not to hit myself.

The Kapla challenges were awesome.

The marble run challenge was the best when we made a ramp.

I loved trying on the builders hat and boots which were so heavy.

Our class den was huge and I sawed out the windows. It was hard work and you needed to be strong.



Head Teacher

Ingrid Rendall

"The project has created such valuable learning across the curriculum. The children were so motivated and engaged in all aspects, even those reluctant writers. Creating their own characters allowed for development of so many skills – working together, problem solving, creativity to name a few. The sense of success they expressed was really inspiring. The opportunity to have the staff support and engaging with industry through Orkney Builders, presently on the school site, gave the whole project such added value and relevance. Just so worthwhile."

Ingrid Rendall

Orkney Builders

Callum Murdoch

"Orkney Builders were proud to have sent representatives to primary 4 to speak to the pupils about what we do as builders. We discussed the different projects we have carried out around Orkney, the works being carried out within the school itself and the importance of Health and Safety in what we do every day. We carried out a practical workshop where the pupils used Kapla blocks to construct models of bridges, buildings and even the St Magnus Cathedral."

"Pupils had to consider what tools they would use if they were actual builders and considered the techniques that would be required to ensure their structures could stand up. All of these discussions and activities were undertaken with great enthusiasm, with some fantastic innovation and creativity shown by the pupils. The sessions highlighted the importance of developing the skills of the pupils and we are hopeful that it has sparked an interest in the construction industry, within these future builders and engineers!"

