

NE712 Linking STEM curriculum learning to careers

Case study: Maths and civil engineering

East Leake Academy wanted to find a way of using employers to support the teaching of Year 8 (age 12-13 years) maths content:

'...anything that can bring to life any of the following that students find difficult: Scale drawings and bearings, area and perimeter, estimating measures, volume and surface area ... So that students are confident with the above skills, can link them to real-life applications and see the differences as well as the links between topics e.g. the difference between area and perimeter and the links between them.'

The project responded to specific Key Stage 3 National Curriculum requirement for students to be taught to, 'use scale factors, scale diagrams and maps', and to think mathematically, particularly to, 'develop their use of formal mathematical knowledge to interpret and solve problems'.

CR Civil Engineering is located just a mile down the road from the school and were already working with the school to provide workplace visits and encourage interest in vocational courses and apprenticeship pathways. The employer was keen to explore new ways of working with the school and this project gave the opportunity to reach a whole year group early on in their school career. Discussions with the employers training coordinator and one of the directors identified a potential learning project that could be shaped around a contract they had won to build the car part at Market Harborough train station.

In the classroom, students were shown a memo from the company's quantity surveyor, including the message:

'I and my colleagues at CR Civil Engineering want to see if you have the kind of skills we're looking for to join our team of experts. We are proud to have won the 'Considerate Contractors' award and want to ensure that the heavy engineering work causes as little disruption on the roads and in the local community as possible. So, we want to minimise the number of trucks that go to and from the construction site.'

The company's quantity surveyor sent across architect's plans with dimensions and the specification for building up the car park surface, including the capacity of different trucks, leaving students to do the calculations. Working in groups, students completed logbooks prepared by the maths team and a selection was sent across to CR Civil Engineering – a process that presented the head of maths with a problem, expressed in an email message:

'I am really chuffed! I have tried to whittle them down but still have 20!'

Feedback took place at an assembly for the whole year group, involving their training manager, quantity surveyor and the managing director. As well as announcing the students who would be invited for a JCB experience day at their head office, the firm showed a short video to explain the variety of roles involved in their business, with the quantity surveyor explained how the project helped them:

'They all put a lot of effort into it ... It promotes CR Civil Engineering on its own merit and it also gives back to the community.'

Impact assessment, using a short online form involving the whole year group, and interviews with a selection of students revealed that the project had opened their eyes to the variety of career opportunities in Engineering and the future value of mathematics':

'It showed us how we could use maths in reality ... I didn't know you could use it in Engineering'

'It was different. So, whether it was easier or harder, it was still more fun than a normal maths lesson ... We were learning not just about maths, but about careers and Engineering'

'I enjoyed learning how to be in a group and not arguing with everyone and we've learned different skills ... how to communicate without having a go at each other'