

## Ask a scientist - RMPS Science Week 2021

### **Graeme - Civil Engineer**

The P6s asked **what kind of projects am I currently work on?** Right now, I work for Barratt Homes who are a housing developer or house builder. I am currently across Edinburgh in areas like Leith, Portobello and Burdiehouse.

In response to the questions from the P5s, **is it dangerous to be an engineer?** Absolutely! But if you follow the rules and instructions you will be ok. We wear protective equipment such as hardhats, high visibility clothing and safety boots.

**How long does it take to make a room or to build a building?** I can't tell you how long it takes to build a room, but it takes about four months to build a house, but depending on the size of the building it could take a lot longer - some skyscrapers could take maybe up to 10 years, but just depends on the size of the projects of the size of the building.

**Do we use a lot of resources?** Yes, we use a variety of resources on site, however we try and make it as renewable or responsibly sourced as possible to reduce the environmental impact. For example, we use materials like timber, clay bricks, concrete, plastics (for pipes), or slate roof tiles.

The last question from the P5s, **is engineering a fun job?** Absolutely yes as there are always a variety of challenges and puzzles to be solved, in a variety of settings and locations. I rarely have a dull day!

The P2s ask **where do I work?** I'm based in Edinburgh, and usually work from an office, but I do sometimes work from a building site when I'm needed on site to look at any problems or challenges.

**How do you carry or transport heavy bricks?** Fortunately, these days we use machinery to do most of the heavy lifting - in the old days (20 ish years ago) people would have to carry bricks up ladders, probably loads as much as 30 kilos on your shoulder! Modern practices involve using machinery like forklift trucks and other lifting equipment to help get bricks and heavy items up scaffolding for any works happening at height.

**How do you build houses?** From the ground up! For a new housing development, we would first make sure there are new roads & sewers in place and also new services like electric, water and gas. Then we would start building the house

foundations, usually made of concrete, then build the walls and put a roof on top. Once we have a roof, then its windows and doors, and then we work on the inside of the house, and keep going until the house is finished.

**What happens when it rains?** When it rains really heavy (or snow) then if a builder is working outdoors they stop working and go to the site canteen for shelter. Very simply, if the environment is not safe, then work stops.

**How do you connect the bricks?** Bricks are connected, or stuck together using a type of paste called mortar, which acts like a glue. If you have a look at the walls of your school building you will see bricks with mortar in between. If you touch it, then it'll feel hard like stone.

**What are roofs made from?** Roofs can be made from a variety of materials but in general for homes, there will be a timber truss (wooden frame) which is then covered by more wood and then it'll be finally covered by slate tiles. Sometimes roofs can even be made from metal, like big supermarket buildings or warehouses.

Bryce in P1 wants to know **what is the tallest house I have ever built?** The company I work for builds some tall houses, as big as three storeys high. We also build blocks of flats which can go as high as six-storeys.

**What tools do we use to fix houses?** We use the same tools and materials that we use to build it in the first place - sometimes problems won't always be visible, so we have to do some investigating to find out.

Mohammed in P1 asked **what tools are used?** First of all, the big biggest and best tool of all is your brain! After that it depends on what job you have to do.