City of the Future »

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Stepping into the classroom for the first time can be daunting, especially when translating industry experience into meaningful learning. In this reflective account, a trainee teacher explores how the Maker's Red Box 'City of the Future' resource supported confidence and student independence during their PGCE placement, demonstrating the power of flexible design challenges in shaping D&T practice.

Coming from a background in set design, construction, and prop making, I entered my PGCE year with an understanding of design and manufacturing but very little idea of how to translate that into engaging classroom practice. I was lucky to be placed at Finham Park School, where innovation and creativity are at the heart of the curriculum. Their support helped me relax, experiment, and grow into a confident teacher.

An exciting part of the journey was the ability to explore the Maker's Red Box 'City of the Future' resource. As a new and enthusiastic PGCE student, I was challenged by my subject mentor to see if the resource could really upskill a trainee teacher. The resource itself comes in an impressive box with beautifully illustrated concept art, high-quality materials, and everything you would need to run a full-scale design challenge.

Maker's Red Box

The premise is simple but ambitious: students collaborate to design a futuristic city. The approach can be flexible in terms of individual, paired, or group working, whereby the students choose a sector to explore and design, such as transport, health, energy, entertainment, sport and housing, to create a hexagonal 'tile' that forms part of a class-wide cityscape. The resource encourages autonomy, creativity, and real-world thinking, taking a hands-on approach that uses stunning concept illustrations, keyword prompts, card-modelling materials, and electronic components. There is access to digital files online as well as a memory stick with teaching resources, laser-cutting files, and 3D printing files.

From the outset, conversations about energy generation, emerging technologies, and sustainability flowed naturally. My role was to introduce key ideas, then step back and let the students explore, debate, and take ownership of their learning.

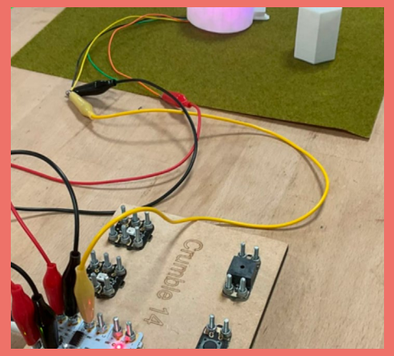
"I enjoyed creating it and would want to do it again."

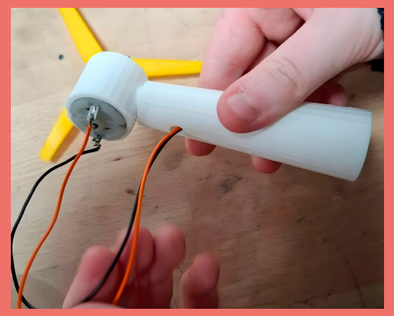
"It was very creative and enjoyable with a lot of independence."

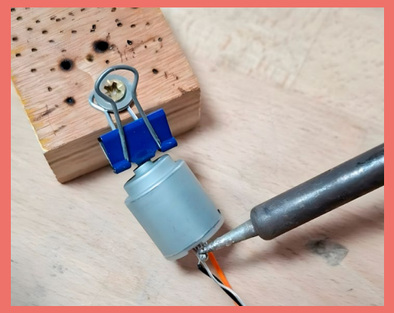
– Student Feedback

Teaching and Learning

This project was an amazing introduction to the realities of classroom teaching. The scheme of learning is a blend of digital and physical making, and it gave me the chance to teach a wide range of skills all at once. From soldering and programming/simulating street lighting using microprocessors to troubleshooting 3D printer errors, I was constantly learning alongside my students.







Students could explore different tools and processes simultaneously, which made it ideal for adaptive teaching. Some students explored the possibilities of CAD/CAM, while others were wiring LEDs and programming the microprocessor to turn on with an LDR. It was messy, exciting, and the classroom was full of energy.

One of the most valuable lessons I learned was how to step back and let students lead. The resource made it clear that my role was to introduce key elements, then give students the space to explore. This ensured the students were more engaged, creative, confident, and independent, which led to lessons that buzzed with collaboration and problem-solving.

Planning and Practicalities

The resource offers flexibility in terms of delivery. We were able to deliver it in a shorter timeframe than recommended, which required an adapted plan to make it work within the tight timeframe of our curriculum projects.

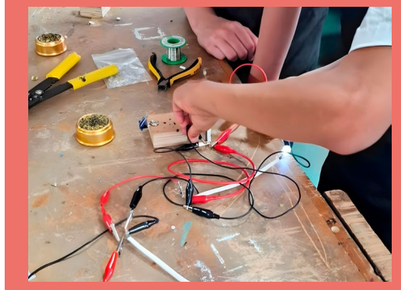
From a teacher perspective, time management became a key skill. 3D printing alone took up a significant chunk of time, and balancing that with teaching soldering, checking CAD models, and supporting coding meant every lesson was packed full of learning. Resource planning is just as important.

The resource is incredibly well thought out, but you may require access to additional equipment such as:

- Microcontrollers (Crumble or micro:bit) and respective software (to programme LEDs, motors, etc.).
- Enough soldering stations and safety equipment.
- Electronic components such as motors (LEDs and wires are included).
- A reliable 3D printer and filament.

Despite the tight schedule, we completed the project and the outcomes were fantastic. The flexibility of the scheme of learning means you can cherry-pick elements to suit your timetable, equipment, and student needs.

The biggest takeaway was the power of independent learning. Watching students take ownership, whether they were programming microprocessors to turn on LEDs, designing wind turbines with motors that turned, or debating environmental ethics, was inspiring. As a trainee teacher, I learned just as much as they did. It showed me that ambitious schemes of learning, when scaffolded well, offer incredible opportunities for adaptive teaching with student-led exploration.



Maker's Red Box
tinyurl.com/y56zu5bv

What is it and who is it for?
tinyurl.com/yc2s8v2h

Finham Park School
tinyurl.com/yc6bcphb