CASE STUDY

LEGO® Education MINDSTORMS®

LEGO® MINDSTORMS® Education EV3 at Kingsbury High School

Chris Carver is Head of the Technology Faculty at Kingsbury High School in North West London. With over 14 years of teaching experience, including eight as a curriculum leader of Computer Science, Art, Design and Technology, Chris has seen many changes in the way that these subjects are taught. Here, Chris gives his insight on using EV3 in the classroom.

The EV3 journey begins with the software and once the application is open, the quick start icon is highlighted so that the user can get up and running instantly.

Within this section there are simple to build models that are easily programmable. Those used to the previous version of MINDSTORMS® will immediately notice that the parameters on the program block icons are much easier to adjust, as each field has a drop-down menu.

The new EV3 kit is equally as easy to use. As usual, the kit comes in a sturdy box which is very handy for storage between lessons and enables the teacher to set up a lesson in no time. The sorting trays enable the user to find parts quickly and the helpful card inlayshelp students put the parts back at the end of the activity. The kit itself contains many of the familiar technical components of its predecessor, with the addition of a few new bespoke parts, in particular the new roller ball wheel, which I have to say, is absolutely fantastic! The EV3 brick has changed considerably with SD card storage, four output ports and improved on-brick functionality. Thehardware is also much improved and the kit comes with a fantastic colour

sensor, ultrasound and gyroscope. The latter two would previously have had to be purchased separately so this is a great bonus. The two main motors are smaller and less bulky and there is a third mini motor which enables for more refined and tidier models.

The software is a great improvement and has a whole new look. The build guides within the software are easy to access through the clever and intuitive lobby space. Instructions and tutorials are crisp and clear with quality animations that stir curiosity and the example programmes enable first-time users to fully understand the programming techniques through reverse engineering.

The tutorials also enable first-time users to quickly become familiar with the construction techniques and the core model was built very quickly. It was programmed and responsive within 20 minutes of opening the box. The modular aspects of this help the user progress through a basic course to grow familiar with the programming and engineering concepts. There is a wealth of useful information within the software in both visual and written form. As ever, the kit and build guides, together with tutorials, enable the teacher to quickly engage a class in collaborative learning. Students can build the models in teams where each has a role, as with many of the previous LEGO® Education sets.

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The Content Editor is a great way for students to write up their projects. This feature comes complete with writing templates and the ability to record images, video and sound directly into the student's notes. The notes can then be accessed by the teacher to add comments/ marks as needed. With LEGO® there are as ever endless opportunities for students to express their individuality and creativity whilst working to a design brief. Once the students have learnt the basics of construction and programming methods, they can then explore and develop solutions of their own that solve real-life problems. The software is very accessible and the way that users can go forward and backwards through menus is great. Windows can be popped open and closed also from the top menu and programming tabs. The ability to zoom in/out will give better access for students that have a visual impairment.

The EV3 set promotes STEM learning. Through a single activity students have the opportunity to use their knowledge of Science, Technology, Engineering and Maths and apply it in many ways. It is also very good for developing the students' soft skills as they work collaboratively in teams or groups and it promotes social inclusion and development.

EV3 is completely set apart from any rivals. The fact that students can immediately engagewith a familiar construction method/technology that most have been using from an early age enables them to quickly construct varying degrees of models depending upon ability. If the teacher wants to build inspirational models, there are four to choose from. The build guides and example programmes are included and I found that the Gyroboy was great for getting the students' attention and linking with the real technology behind the Segway urban transport system. In my opinion, the new EV3 set provides excellent value for money. The software, being backward compatible, enables the user to continue to use the NXT bricks alongside the EV3. Schools on a tight budget can buy a few at a time and still access most of the software functions. The rechargeable batteries are also a great help over time and worth the investment. I have found that you can never go wrong with LEGO Education products as they last a long time and spare parts are always easy to get hold of.