

# First taste

## Bridging the gap and cementing the future: Building on learning from Key Stage 2

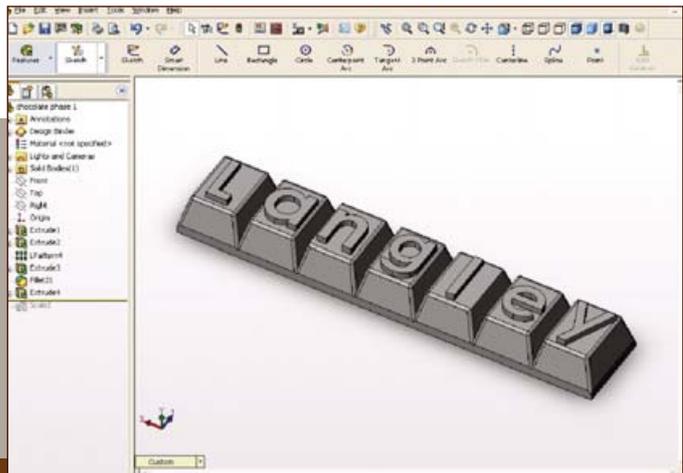
**It is quite amazing when we reflect that Key Stage 2 students have been demonstrating capability, to varying degrees, for some 5-6 years within the subject of design and technology by their age of 11. Naturally difficulties exist when we recognise that different institutions have a variation in expertise and resource levels. So when receiving Key Stage 2 students from external feeders (other schools) we must try to understand their design and technology experience and give them opportunities to demonstrate what capabilities they possess.**

Recently my new set of enthused technologists embarked on their first DMA (Design and Make Assignment). The DMA is supported through the use of Unit 6/7 Transition: Building on Learning from Key Stage 2. The students were asked to design and manufacture a chocolate bar for Langley School Enterprise. A poster was used as a method of recording the student's individual experiences. The poster provided an accurate means of identifying the students' understanding of their technical and problem-solving capability which they had experienced and their understanding of it. It also included the identification of language and conventions

which students are required to use and understand. The poster format also serves as a method of holistic representation of the experience enabling the student to identify key phases of their own development. This particular DMA offers the student a great deal of creative flexibility. Variations can be achieved in both the shape of the former and the ingredients of the bar. The DMA is six to eight weeks in length.

The benefit to using such a DMA is that also serves as a way of providing students with the experience of linking with other departments such as food, art and business studies (satisfaction survey) enabling students to get a feel for the school layout.

The poster shows how students competently designed a chocolate bar. It includes the students identification of different needs: that of the client and that of the manufacturing process. For example the former requires students to identify draft angles, filleted edges, shape, depth, vacuum hole position and depth. It also requires the understanding of creating a former using a CNC machine and making the mould out of food grade plastic using a vacuum former.



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It's important to note that difficulties with this process must not be eliminated automatically by the teacher and that such difficulties provide examples where students can use previous experience to help them overcome problems which they face independently or as a group. Problems include the need to simulate the cutting of the former using CAD-based software to ensure that the quality of the finished product meets the needs of the design; difficulties with temperature control for food grade plastic; CNC machine cutting tool sizes, speeds, depths and finishes. Often allowing mistakes to be made provides an exciting forum of ideas and opportunities to quickly assess what students know and how they can learn to overcome these. The process needs to be seen as 'iterative', 'recursive', creating small concrete steps towards the project's outcome.

The learning which comes from a project such as this is quite extensive. For example the student grasps the understanding of drawing in 2D and creating solid objects in 3D. They must then relate the attributes between the object and the product which basically exists as a mental picture. Using CAD allows them to appreciate such benefits as repeat patterns, manipulating shapes through adding and wasting (cutting) processes and the ability to make changes at any stage upon receiving feedback from various inputs (simulation, group, teacher). It also provides a firm base between using automated processes in creating an outcome, in other words the issues of inputting information into a CNC machine via a file and the product which is machined at the end and how this can affect the quality and function of the mould. Once the former is

successfully machined and the mould is formed for chocolate bars of various descriptions, ingredients are made and presented to the public for feedback. Again it is important that teachers do not intervene at this stage. If the student or group have not recognised a fault with their work then the general public will provide a method of feedback and the results will empower the students to find ways of overcoming their design faults. Any aspect of failure with respect to the bars aesthetic quality or function must be seen as a greater step towards success. Faults are recorded and rectified and the bars are again presented to the public for feedback and final evaluation. The moulds can still be used after the project has been completed by students with parents at home. A moral dimension can also be added to the design brief based on healthy eating!



The QCA Unit 6/7 Transition: building on learning from Key Stage 2 is available for download from the D&T Association site [www.data.org.uk](http://www.data.org.uk)