3 Planning for capability

3.1 Planning for breadth and depth across Key Stage 3

The revised National Curriculum in Design and Technology requires that students experience breadth of study. This demands a broad and balanced experience which meets the following criteria. Students:

- design and make in different contexts including work with control systems, using a range of materials during the Key Stage including timbers, metals, plastics, composites, ready made components and kits, textiles and food;
- learn through focused practical tasks in which they develop and practise particular skills and knowledge;
- undertake product analysis;
- work independently and in teams,

The Nuffield approach to this issue is to select a sequence of Capability Tasks for the entire Key Stage in which students design and make in the required contexts.

In preparation for each Capability Task, students will undertake product analysis and focused practical tasks. During the Capability Tasks, they will have the opportunity to work both as individuals and in teams. To achieve depth, the Nuffield Project recommends that students tackle three Capability Tasks per year in Years 7 and 8 and two in Year 9. Students will therefore undertake eight Capability Tasks across Key Stage 3.

There is a menu of Capability Tasks so that you can choose a sequence of eight such tasks as shown in Table 5 below. Graphic products tasks have been included in Year 9 so that, in schools where this may be an option, students can make an informed choice of GCSE course.

Table 5: The Capability Task menu for Key Stage 3

	Resistant materials	**Control**	**Food**	**Textiles**	**Graphic products**
Year 7	Novelties Incorporated or Rainbow Radios	Special effects or Masks	Creative Food or Healthy heart	Long and short of it or T-tops	
Year 8	Display your treasures or Carrying	Robots are Go! or Smart card security	Better food or Handmade or shop bought	Hot comfort or Carrier bags	
Year 9	Better weighing or Petshop parade	Electronic opportunities or Electronic education	School trip or Hi Quality Tours	Flat pack hats or Strut your stuff	Information communication kiosk or Live in design

3.2 Choosing a Capability Task sequence across Key Stage 3

The example below (Table 6) shows one of the many sequences of Capability Tasks that can be selected from Table 5. Close inspection shows that it meets the criteria for breadth and depth at this level of planning. A student following such a course would experience eight Capability Tasks and work in resistant materials, food, textiles and control and use both kits and components. The student would also spend enough time on each Capability Task for the work in each of the different media to be significant. If the Capability Tasks are taught in the way recommended by the Nuffield Project, the rest of the criteria are automatically fulfilled.

Clearly, students in other groups will approach the units of work in a different order. Some students may even tackle different Capability Tasks, depending on which year they are timetabled for different material experiences. It is important to scrutinise all the different Capability Task sequences that are being followed by students to ensure that each sequence meets the criteria of breadth and depth. One way to do this is to think of the activities that an individual student will experience as he or she moves from teacher to teacher, from room to room and from year to year.

Note that in the latter part of Year 9, the department has decided to re-group students to give them the opportunity to work within their chosen GCSE optional area. This has the advantage of both getting the GCSE course off to an early start and, at the same time, providing students with the opportunity to confirm they have made the right choice before the start of the course in Year 10.

Schools have found that it is very useful to share these Capability Task sequences with their students, to give them a clear picture of the activities planned and the time to be spent on each activity.

You may find that you have to consider several different sequences before you find the one that best matches the particular needs of the students in your school and makes the best use of the staffing and resources of your department.

Table 6: A possible Capability Task sequence for Key Stage 3

	Capability Task 1	**Capability Task 2**	**Capability Task 3**
Year 7	Resistant materials: Novelties Incorporated	Food: Healthy heart	Textiles: Long and short of it
Year 8	Control: Robots are Go!	Resistant materials: Display your treasures	Food: Better food
Year 9	Textiles: Strut your stuff	Control: Electronic opportunities	Re-group into GCSE options Taking: Resistant materials, Food, Textiles or Systems and control

3.3 Planning for continuity and progression across Key Stage 3

Continuity between Years 6 and 7

It is important that you know about the design and technology curriculum of your feeder primary schools. This is sometimes a daunting task when your school receives students from lots of different primary schools. It is clear, however, from those who have been able to visit primary schools, that in many cases secondary school teachers underestimate the abilities of students in Year 7 – and this is not only in design and technology. Whilst it might be impossible to know in detail what every child has experienced in their primary school, you can, by the way you teach design and technology, enable Year 7 students to reveal what they can do.

It is important to expect them to be capable and to give them the chance to show that they are capable. Of course, it is better if you can forge good links with feeder primary schools, especially those from whom you receive the majority of your students. Some schools have successfully organised design and technology activities for Year 6 students which take place in both the primary and the secondary schools. The results have invariably been that the secondary school teachers were impressed by the abilities of the Year 6 students and the Year 6 students, having been introduced to the specialist facilities of the secondary schools, did not 'back slide' on transfer. Active teaching of Capability Tasks as described in Section 2.3 (pages 14-20) is particularly important in enabling Year 7 students to make a good start. The opportunity to negotiate specifications with individual students can help you to make good use of what the students already know and can do.

Progression in designing across Years 7, 8 and 9

Teaching design strategies through Resource Tasks was discussed in Section 2.3 and the point made that it is only by choosing and using these in Capability Tasks that students could demonstrate progress in designing. Table 1 on page 10 gives suggestions as to which design strategies should be taught within each Capability Task. This is a clear way of ensuring that, as students move from teacher to teacher, all staff have a firm understanding of what designing skills have been taught.

For example, once students have been taught the use of image boards during their first Capability Task, using SRT 8, all staff can expect them to know not only how to prepare an image board to stimulate ideas but also when the strategy might be most usefully employed again. Conversely, if all students are to be taught how to write interview questions during their fourth Capability Task, in Year 8, it would be inappropriate for staff to use interviewing techniques with students in Year 7, before they have all been taught SRT 4 and know how to develop questioning strategies most effectively.

Over the Key Stage, this enables all students gradually to build up a whole menu of designing strategies. Eventually, they should be able to choose the most appropriate strategies for themselves. This is particularly important when they start to work more independently on their Key Stage 4 coursework tasks.

Progression through Capability Task challenge

The Capability Tasks have been designed to make use of the knowledge and skills taught through Resource Tasks and Case Studies. The Capability Tasks that a student tackles in Year 7 are likely to be less challenging than those tackled in Year 8, which, in turn, will be less challenging than those tackled in Year 9. This progression in challenge has been achieved through the manipulation of the following features.

1 The design of the product

The greater the complexity of technical working required, the more challenging the task. The more difficult the product is to make, the more challenging the task. The greater the number of requirements to be met by the product, the more challenging the task.

2 The materials, components, tools and equipment

The wider the range of materials and components available, the more challenging the task. The wider the range of tools and equipment available, the more challenging the task. These ranges should get wider as students move through the Key Stage.

3 The time available

This is usually decided by the teacher, although time management within the task is a feature over which students have some control and where decisions can affect success. Long periods of self-direction are very demanding in terms of planning and sustaining motivation.

4 The type of working required

The range of scenarios here includes: working solo; working as part of a group all dealing with a single medium of outcome; working as part of a group with different members dealing with different media of outcome.

The more lines of communication, the more challenging the task becomes.

5 Presentation and reports

Presenting and reporting design proposals and/or methods used for tackling the task add to the demands of the task.

You can manipulate these features to make the Capability Tasks more or less challenging. You may wish to do this for the class as a whole in response to the timing of the task. A task designed for Year 7 can easily be made suitable for Year 8 by changing the challenge. Or you may wish to do this on an individual basis through negotiation with a student, so that the student has to meet requirements that are more stringent than those for others in the class.

3.4 Ensuring coverage of the programme of study

A sequence of Capability Tasks like that shown in Table 6 will cover most elements of the Programme of Study. An audit of the Programme of Study requirements for each Capability Task (plus associated Resource Tasks and Case Studies) is given on the Nuffield Secondary Design & Technology website. Such an audit will always make assumptions about both the way the task has been taught and the success of the teachings so it is likely that you will need to carry out your own audit on completion of a Capability Task to get a true picture-

A feature of the Revised Orders is the explicit mention of the influence of designers and others from industry and commerce. Responding to this gives students the chance to design and make for real clients rather than imagined markets. There are several opportunities for this in the Capability Tasks in the Teachers File. The task setting outlined in 'The story so far' can be adapted to include real clients. Here are some examples.

Table 7: Designing for real clients

Year	Title
Year 7	Rainbow Radios – the client could be the manager of the local Dixons interested in developing a new product line Healthy heart – the client could be a local leisure centre mounting a keep fit campaign Masks – the client could be a local fancy dress hire shop
Year 8	Display your treasures – the client could be a local antiques shop Hot comfort – the client could be the local branch of Shelter and the brief changed to develop clothing for the homeless Better food – the client could be the manager of a local supermarket
Year 9	Hi Quality Tours — the client could be the local travel agency Information communication kiosk – the client could be the manager of the local BT shop Electronic education – the client could be the manager of a local toy shop

A highly effective way of involving real clients is to work with a local special school. Such an activity needs to be undertaken carefully and sensitively. Another way to tackle this is to contact your local REMAP branch. REMAP is a registered charity dedicated to designing and making technical equipment for disabled people. They have a network of regional organisers covering the whole of England, Wales and Scotland. Many schools have made successful contact. The headquarters is at 'Hazledene' Ightham, Sevenoaks, Kent, TN15 9AD, telephone: 01732 883818.