



Guidance

Curriculum and  
Standards

# Bridging plans: from Key Stage 3 to Key Stage 4

## Design and technology

**Design and  
technology  
subject leaders**

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Key Stage 3 Strategy publications referred to in this booklet are available at the following website address:

[www.standards.dfes.gov.uk/keystage3/publications](http://www.standards.dfes.gov.uk/keystage3/publications)

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# Introduction

## Background to the series

This booklet is designed to help design and technology (D&T) departments plan for effective transition from Key Stage 3 to Key Stage 4 by creating teaching and learning plans that bridge the key stages. In the literal sense, a bridge has two ends. Bridging plans will be effective only if teachers give thought to how the work at the end of Year 9 can be linked with the beginning of Year 10.

From a pupil's perspective, moving from Key Stage 3 to Key Stage 4 may be less marked than other key stage transitions because it does not usually involve a change of school. However, there are other milestones for consideration as pupils enter Key Stage 4. Perhaps for the first time in their lives, pupils make choices about the subjects they will study and, to some extent, the paths they will follow. They also become aware of how Key Stage 4 courses will be different, for example in having an element of assessment by coursework.

Many D&T departments use the time towards the end of Year 9 to offer pupils opportunities that complement or extend the work they have been doing. For example, some departments work to develop pupils' presentational skills in speaking and communicating their design ideas; others highlight aspects of the curriculum content which will be different in Key Stage 4.

The aim of these materials is to suggest additional ways in which you could help pupils make a confident start to Key Stage 4. This is not about starting GCSE courses early; it is about stimulating pupils' interest in future study in D&T. It is also about creating a sense of moving on, with an expectation of increasing maturity and independence as a learner. The aim should be to develop bridging plans that can be incorporated into a scheme of work and, with appropriate revision, used from year to year.

## How to use this booklet

A suggested sequence of steps is to:

- read the booklet and reflect on the suggestions it contains – you might want to encourage other colleagues to do so as well
- take your thoughts to a meeting of the department:
  - highlight some general points from the booklet
  - review what D&T projects you currently offer in Year 9 and what you offer in the first few weeks of Year 10 to those pupils who opt to take a D&T subject
  - consider possibilities for development, perhaps using the summary of suggestions on page 7 as a starting point
  - agree on the changes you want to make, possibly delegating detailed development to a smaller group
- allow time to review the implementation of your plan and make changes for future years.

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## Developing independent learners

Increasing numbers of departments recognise the need to think about pupils, not only in terms of their capabilities in the subject, but also in terms of their learning skills. Maturing towards independence is gradual; pupils do not suddenly change as they move from one key stage to another. However, the transition between Key Stage 3 and Key Stage 4 provides an opportunity to refocus attention, of both teachers and pupils, and to set up activities that could have a positive impact on pupils' learning skills.

### Expectations for the end of Key Stage 4

Pupils who are effective learners have the skills to learn on their own. They can be relied on to work independently, even for long periods. One LEA worked with teachers to identify statements that describe effective learners at different stages of their development. These statements identify the learning skills that pupils need to be taught. The following statements are for the end of Key Stage 4.

By age 16 effective learners:

- are well organised and plan their work confidently, balancing priorities
- show independence in solving problems, selecting the most effective strategy with confidence and seeking help when needed
- gather information efficiently and take notes in a variety of ways, selecting the method to suit the purpose
- can reorganise their work and present it with a clear sense of audience
- are effective team members and can recognise the different roles needed to complete a task and will often take on that role to ensure completion
- search for a purpose for learning and will challenge and question to ensure that what they are learning is appropriate
- explore how this new learning fits with existing knowledge and accommodate any changes to their overall 'map'
- assess their own work and can identify areas for improvement and seek help to clarify how they can improve.

Taking this list as a goal, think about some of your current Year 9 pupils. What steps do they need to take towards becoming independent learners in D&T?

### Strategies for developing pupils' learning skills

Pupils are more inclined to give up when they meet a challenge and to opt out of discussion and group work if they have not fully developed the skills needed to work independently, and if their organisational skills are weak. Such pupils require particular support. However, the need to develop learning skills is not confined to these pupils. As they grow older, *all* pupils need to acquire a greater perception of themselves as learners.

Research shows that pupils can be taught to become more independent in their work and thus become more effective learners. It often pays to start small, by concentrating on a particular learning skill, such as organising information.

- Model for pupils how the particular process or skill is carried out.
- Select tasks carefully to match your goals and to ensure that pupils experience success.
- Give good examples and make clear what are the criteria for success.
- Monitor individuals and the whole class and deal with difficulties.
- Provide positive oral and written feedback, not just marks and grades. As you begin to foster new habits in pupils, gradually increase expectations.
- Set challenging tasks for the whole class, building in necessary support.
- As a whole class, work collaboratively through the stages of solving a design problem, gradually reducing the support you provide.
- Focus particularly on understanding design problems and planning the solutions.
- Include short spells of carefully structured paired or small-group work.
- Expect pupils to share, comment on and evaluate each other's design work.
- Develop thinking skills by raising questions about ways of working and encouraging reflection on strategies for learning.

Note: This section draws on *Pedagogy and Practice: Teaching and Learning in Secondary Schools*: Unit 17: Developing effective learners (DfES 0440-2004).

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## Design and technology: from Key Stage 3 to Key Stage 4

As D&T is now an entitlement in Key Stage 4, pupils considering whether or not to continue their studies beyond Key Stage 3 need to be challenged, engaged and motivated. How can you make the best use of the time available in Year 9 to promote features of studying design and technology that make it both exciting and worthwhile? What fresh new challenges can pupils anticipate in Key Stage 4 and beyond?

By the end of Key Stage 3, successful pupils will work with increasing independence, using a wide range of materials, and apply their knowledge, skills and understanding within a range of contexts.

In Key Stage 4 there are new perspectives to consider. Pupils will build on their Key Stage 3 experiences by:

- taking more responsibility for improving their own learning and performance in both designing and making
- developing their design and communication skills to a higher level for formal GCSE assessment in designing and making within a range of contexts
- engaging in more independent in-depth work, such as product design and extended problem solving through relevant and challenging projects
- increasing their ability to visualise, analyse, read, listen to, understand and apply more complex sources of research information
- improving the precision and accuracy of both their designing and making.

In Year 9, teachers will want to decide which skills and contexts developed through projects over the year are most appropriate to the needs of pupils who choose to continue D&T work in Key Stage 4. They will also want to decide how these projects could help pupils approach their GCSE courses in D&T with greater independence and autonomy.

### Selecting bridging projects for development

The table opposite summarises four possible bridging projects in D&T. Some deliberately build on existing National Strategy materials and D&T Framework objectives and approaches. You will want to select ideas carefully, taking account of what you do currently in Year 9, your D&T curriculum organisation and the time available. Consider whether you already incorporate bridging activities in your departmental scheme of work. If so, is there value in reviewing what you currently do? If you do not yet use bridging projects, is there value in developing one or more of the projects outlined here? You might find it useful to copy the summary table and use it as a starting point for discussion with colleagues in your department.

This booklet gives details of each project and lists necessary resources so that you can scan the suggested projects to clarify what they are offering and check whether you have, or can obtain, any materials needed.

# Design and technology bridging projects

Project	Title	Time required	Summary	Page
1	<b>Celebration and self-assessment</b>	6–7 hours	This project helps pupils make a smooth transition to Entry level, GCSE D&T, engineering, manufacturing, home economics or catering. It focuses on how the strategies learned across a range of different materials areas in Key Stage 3 will be used in Key Stage 4. For pupils who do not plan to study D&T in Year 10, the focus can be shifted to how the strategies they have learned can be applied to science, humanities, English, mathematics, PSHE and citizenship.	10
2	<b>Designers for the future</b>	4–6 hours	In this project, the teacher works with a local designer to encourage pupils to design a classroom of the future. Pupils develop a wider awareness of the role of design and technology in society, its importance in wealth creation in a modern economy and the nature of the work of designers and makers.  As well as consolidating Key Stage 3 objectives for generating creative and innovative ideas, pupils are supported in key areas of progression to Key Stage 4, including negotiating own design briefs with real clients from industry and designing for markets.	18
3	<b>Design a product range</b>	5–9 hours	This project encourages pupils to work across materials areas and draw on their understanding and the full range of D&T skills. They work as a team, using ICT, to design and make a coordinated range of promotional products, e.g. for a local event or a commercial company.  This project also highlights the range of designing strategies pupils have learned when working with diverse materials and how they can apply those generic skills to their chosen examination route in Key Stage 4.	24
4	<b>Our own class project</b>	6–7 hours	Moving from pupils receiving a design brief from the teacher to pupils choosing and negotiating tasks with the teacher is one of the main areas for progression from Key Stage 3 to Key Stage 4. Pupils will be challenged to design for the needs of others, possibly exploring unfamiliar circumstances and focusing on 'inclusive design'.  This project encourages pupils to work on a class project, in which they negotiate and agree a task to work on.	28

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# Implementing your bridging plans

## Working with your department

Assuming you are following the guidance on page 3, 'How to use this booklet', and on page 6, 'Selecting bridging projects for development', there are a number of other issues to consider when implementing your plans.

Actively following up in Year 10 the developments initiated in Year 9 should ensure continuity and progression – the essential purpose of your bridging plans. Whether your bridging projects are located mainly towards the end of Year 9, split evenly between Years 9 and 10, or used mainly at the beginning of Year 10, there needs to be an explicit link between the key stages, so that pupils can see that they are developing what they have begun.

Discuss with colleagues how you will overcome potential obstacles to this process. For example, there may be significant changes in pupil groupings and staff allocations between Year 9 and Year 10.

- How can you ensure that these changes will not inhibit what you do and that all pupils gain full benefit from your bridging plans?
- Do your plans involve all pupils in the year group?
- What records or notes will need to be kept by pupils and teachers?
- How will you round off the work in Year 9 and re-engage with it in Year 10?

Detailed planning, which might be delegated to a smaller group of colleagues, might raise various questions to consider.

- What adaptations will you need to make to your scheme of work in order to incorporate the selected projects?
- What new material or adaptations to existing material do you propose to include?
- How will you ensure that teachers are briefed and that resources are prepared in time?

## Networking within your school

Effective implementation of plans needs to involve your school's senior leadership team. Support from the leadership team might include, for example:

- coordinating bridging plans across subjects
- fostering development of pupils' learning skills as a whole-school focus through transition to Key Stage 4.

You might seek the assistance of the leadership team in making arrangements such as:

- teacher release to develop ideas
- timetable changes towards the end of term.

## Networking with other schools and the LEA

There are considerable advantages to setting up or linking into local development groups to pool ideas and perhaps develop shared materials. This is an effective way of making best use of local capacity. Possibilities to consider are:

- linking with one or more local departments to initiate a joint development
- linking into LEA facilities and networks by working with your Key Stage 3 consultant and keeping them informed of developments.

# Project 1: Celebration and self-assessment

## Learning outcomes

Pupils maximise their chances of making good progress during Key Stage 4 by taking greater responsibility for their own learning. This means knowing what they do well, what they need to do better and how their experience in Key Stage 3 has prepared them for the different challenges of Key Stage 4.

There is a range of pathways open to pupils in Key Stage 4. This project helps pupils make a smooth transition to Entry level, GCSE D&T, engineering, manufacturing, home economics and catering. It focuses on how the learning strategies, across a range of different materials areas (such as food technology, textiles technology, product design and systems and control), in Key Stage 3 will be used in Key Stage 4. Pupils will be helped to realise how the strategies they have learned to help them explore ideas, generate ideas, develop and model ideas, plan, make and evaluate in a range of projects will be applied to their chosen D&T focus area in Key Stage 4.

For pupils who do not plan to study D&T in Year 10, the focus can be shifted to how the strategies they have learned can be applied to science, humanities, English, mathematics, PSHE and citizenship. This project helps develop the key skill of **Improving own learning and performance**.

## Objectives

Year 9 project experience across D&T	<ul style="list-style-type: none"><li>■ What I know and have learned</li><li>■ How I will use this in the next stage of my learning</li></ul>
Year 9 levels of expertise	<ul style="list-style-type: none"><li>■ What I can do</li><li>■ What I need to do to improve</li></ul>
Year 9 teaching objectives	<ul style="list-style-type: none"><li>■ Review ongoing progress to meet criteria, invite feedback and incorporate it into work</li><li>■ Evaluate how ideas and solutions would benefit individuals and/or the community</li><li>■ Identify any design weaknesses in the choice of materials and manufacturing processes</li><li>■ Formulate criteria to judge the quality of a product and the extent to which it meets the need, purpose and resource limits, and its impact on society</li><li>■ Make alternative design proposals regarding the choice of materials</li></ul>

	<ul style="list-style-type: none"> <li>■ Explain the choices and decisions made in designed products, processes and systems and identify alternative possibilities</li> <li>■ Appreciate the conflicting demands placed upon designers and makers and acknowledge the balance between help and harm</li> </ul>
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## Background to the project

This project aims to keep interest high once pupils have chosen their focus area or course for Key Stage 4. It gives pupils structured opportunities to evaluate their own learning and transfer learning across focus areas. Pupils:

- carry out an accurate self-assessment and distinguish between evaluating the product, the process and their learning
- list the skills they have gained and identify their level of competence
- identify the relevant knowledge, skills and experience that will help them in Key Stage 4
- identify their strengths and weaknesses, suggesting areas for improvement, and set themselves targets for the future
- appreciate how to address areas that they want to improve
- discuss their progress and help others reflect on their own strengths
- draw on their experience and relate their past work to similar future tasks, developing clear goals for future learning.

Once pupils have reflected on their experience during the key stage, a display or presentation of the work is encouraged. Public recognition of pupils' achievements in D&T is very important. Exhibitions of their work communicate powerfully their accomplishments in design and technology. Competitions and award schemes can be of great value to pupils to celebrate their achievements.

## Resources

- slide presentation illustrating the importance of D&T in the National Curriculum. The presentation can be downloaded from [www.standards.dfes.gov.uk/keystage3](http://www.standards.dfes.gov.uk/keystage3)
- QCA/DfES Unit 9F 'Moving on to Key Stage 4 – reviewing and target setting' ([www.standards.dfes.gov.uk/schemes2/secondary\\_dt/](http://www.standards.dfes.gov.uk/schemes2/secondary_dt/))
- *Framework for teaching design and technology: Years 7, 8 and 9* Key Stage 3 National Strategy ([www.standards.dfes.gov.uk/keystage3](http://www.standards.dfes.gov.uk/keystage3))
- *Good assessment practice in design and technology* (Ofsted, 2003)  
An examination of assessment practice in design and technology, focusing on target setting and providing pupils with feedback  
([freepublications@ofsted.gov.uk](mailto:freepublications@ofsted.gov.uk))

- *Pupils' learning from teachers' responses* (AAIA, 2000)  
Booklet including information on marking strategies, feedback to pupils and helping pupils assess their work ([www.aaia.org.uk/assessment.htm](http://www.aaia.org.uk/assessment.htm))
- NAAIDT Assessment Gallery  
The NAAIDT Portfolio comprises a database of D&T coursework together with the grade or level attained, where these exist, and a brief commentary ([www.naaidt.org.uk/resources/portfolio/index.html?Adv=1%20](http://www.naaidt.org.uk/resources/portfolio/index.html?Adv=1%20))

#### **Competitions and award schemes suitable for Year 9:**

- Audi Innovation Awards ([www.audiinnovation.org](http://www.audiinnovation.org))
- CREST (Celebrating CREativity in Science and Technology) ([www.setnet.org.uk](http://www.setnet.org.uk))
- Creative Spaces ([www.ncw.org.uk/creativespaces](http://www.ncw.org.uk/creativespaces))
- Jaguar F1 in Schools Design Challenge (CAD/CAM) and Team Marketing (Textiles) ([www.f1inschools.co.uk](http://www.f1inschools.co.uk))
- Taste of Success Food Awards ([www.data.org.uk/secondaryfoodawards](http://www.data.org.uk/secondaryfoodawards))
- The Think Kit ([www.patent.gov.uk/about/marketing/thinkkit/](http://www.patent.gov.uk/about/marketing/thinkkit/))
- Toyota Technology Challenge ([www.rapideducation.co.uk/toyota/index.htm](http://www.rapideducation.co.uk/toyota/index.htm))
- Young Engineers for Britain ([www.youngeng.org/yeb.html](http://www.youngeng.org/yeb.html))

## **Structure of the project**

<b>Introduction</b>	Individual and group activities set up to review what has been learned in D&T in Year 9 across all the projects completed	1 hour
<b>Main body of the project</b>	Producing an exhibition or PowerPoint presentation using a template entitled 'My achievements in D&T'	4–5 hours
<b>Conclusion</b>	Discussion and card-matching activities focused on applying learning 'When will I use this again?' (in D&T focus area, in other subjects and in lives outside school)	1 hour

## Lesson 1: Self-assessment

Introduce the project by outlining the objectives and emphasising that it is an opportunity for pupils to develop the key skill of being responsible for improving their own learning and performance.

In this lesson you will combine whole-class presentation with small-group discussion. The self-assessment profile, 'Moving on to Key Stage 4' on pages 16–17, can be used to help pupils identify what they have learned in D&T this year across all the focus areas. It aims to highlight the aspects of pupils' work that they are most proud of.

Pupils should reflect on their progress across the year and what skills they still need to improve.

Model for pupils how they might analyse and record their progress by:

- using the self-assessment profile
- discussing the criteria for good work and reflecting on which aspects of their work meet those criteria
- reflecting on the experience of their learning and their preferred learning styles (classwork, homework, researching, practical investigations, working in teams, working with others outside the school)
- reflecting on their enjoyment and effort
- identifying ideas for improving their products, the process and their learning and setting targets for improvement
- reflecting on how well they have planned their progress.

Suggest that groups carry out specific tasks to analyse and record their progress.

## Lessons 2–5: What do we learn through design and technology?

### The importance of design and technology

*Design and technology prepares pupils to participate in tomorrow's rapidly changing technologies. They learn to think and intervene creatively to improve quality of life. The subject calls for pupils to become autonomous and creative problem solvers, as individuals and members of a team. They must look for needs, wants and opportunities and respond to them by developing a range of ideas and making products and systems. They combine practical skills with an understanding of aesthetics, social and environmental issues, function and industrial practices. As they do so, they reflect on and evaluate present and past design and technology, its uses and effects. Through design and technology, all pupils can become discriminating and informed users of products, and become innovators.*

([www.nc.uk.net/nc/contents/DT-home.htm](http://www.nc.uk.net/nc/contents/DT-home.htm))

With the whole class, use the slide presentation on the Key Stage 3 website ([www.standards.dfes.gov.uk/keystage3](http://www.standards.dfes.gov.uk/keystage3)), which illustrates the National Curriculum importance statement for D&T, above.

Each slide explores a part of the statement. Photographs inspire the pupils to think about what that part of the statement means. Ask pupils for key words to explain each part of the statement, giving one or two examples to start them off. For example, for 'tomorrow's rapidly changing technologies', examples could be 'designing for the future', 'new electronic products', 'smart materials'. Record words pupils suggest as part of the presentation.

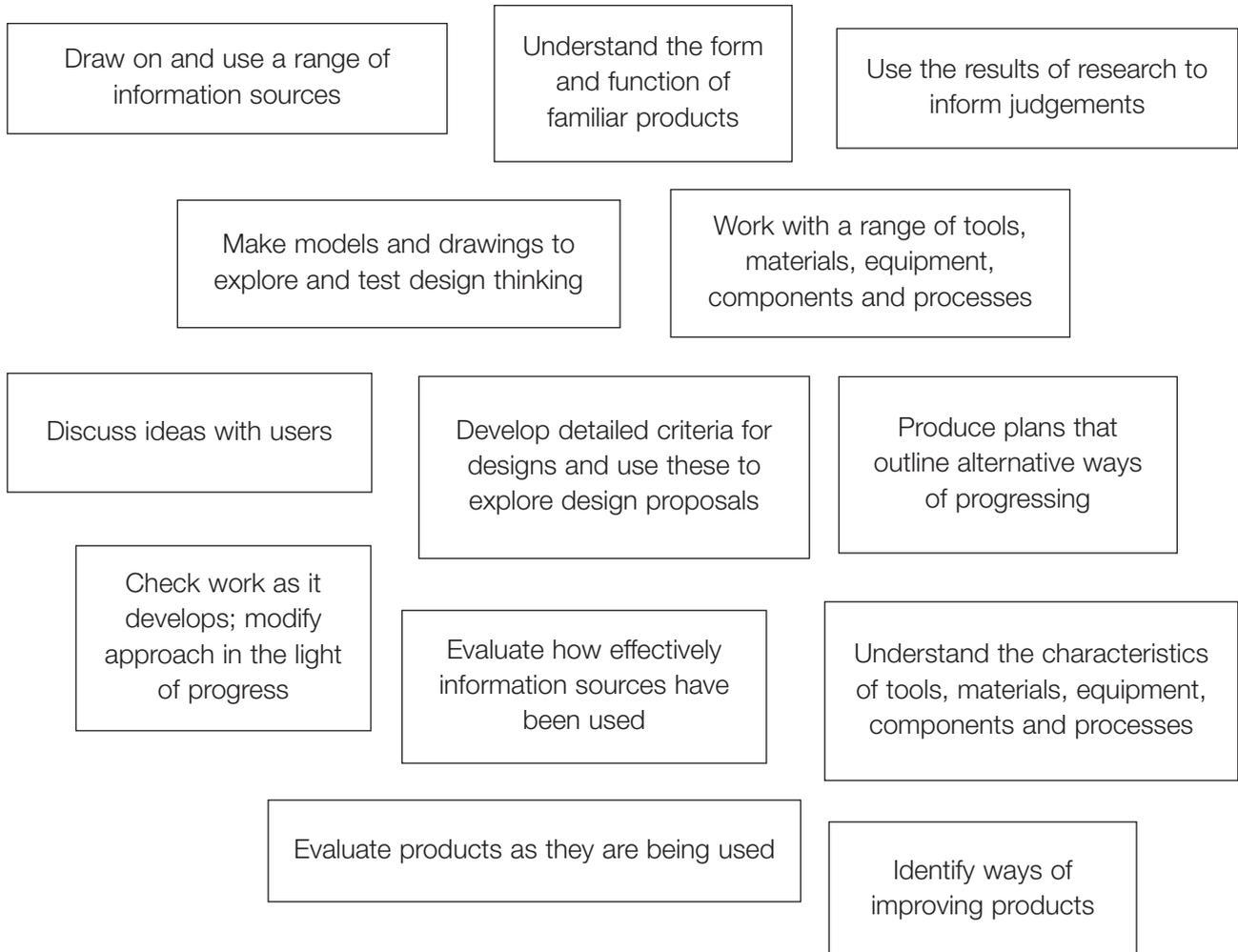
Over the next three lessons pupils should reflect on their greatest personal achievements under each of the headings in the slide presentation. Suggest pupils choose elements of their work to demonstrate what they have achieved under each heading and present their achievements as an exhibition or presentation. They can collect scanned examples from their portfolios, comments from people that they have worked with, photos of products they have made and so on. Encourage them to work together to choose which parts of their work to display and to discuss how to make their presentation effective.

As a way of celebrating pupils' achievements you could arrange for each class to set up an exhibition of work in the school hall or entrance hall. Pupils could invite their year head, tutors, other teachers, parents and people from the local community to view their exhibition and/or listen to pupils' presentations.

Your D&T department could also present specific awards, for example for innovation, CAD/CAM or sustainable technology. You could also encourage pupils to enter for national awards or competitions.

## Lesson 6: Using my learning

For lesson 6, intended as a follow-up lesson in Year 10, put statements from the National Curriculum programme of study for Key Stage 4, or statements from level 5/6 of the attainment target, on cards, such as:



Organise pupils in small groups and ask them to discuss each statement and suggest an example of when this skill might be used again:

- in a D&T focus area
- in another subject
- in their life, for example as a consumer or shopper.

Ask pupils to sort the cards into these three categories. The teacher takes feedback from each group.

By introducing pupils to the GCSE assessment criteria early in Year 10, teachers can involve pupils in identifying their personal targets, in negotiating aspects of their learning and in monitoring their own progress. It may also be possible to continue and extend the peer-group assessment featured in this project.

## Self-assessment profile – moving on to Key Stage 4

Now you have reached the end of Key Stage 3, you need to reflect on your own performance, consider how you have progressed and set yourself some real targets to work towards. You need to measure and record exactly what you know, understand and can do. By thinking hard and recording honestly, you will be able to see where you need to focus your efforts over the next two years. You need to set your aims high and work hard to reach the highest possible level of attainment.

Think about your performance, subject knowledge, designing skills, making skills and your ability to evaluate and communicate. Complete the following table, thinking about how well you have performed in each area.

Area for development	Can do	Can do well	Need to improve
The design process			
<b>Designing skills</b>			
Clarifying the task <ul style="list-style-type: none"> <li>■ Understanding the task</li> <li>■ Interpreting the task</li> <li>■ Recording the design considerations</li> </ul>			
Generating ideas <ul style="list-style-type: none"> <li>■ Evolving ideas, adapting and adjusting ideas</li> <li>■ Diversifying ideas, wide range of possible ideas</li> <li>■ Proposing design possibilities</li> </ul>			
Developing ideas <ul style="list-style-type: none"> <li>■ Modelling design possibilities</li> <li>■ Refining design ideas</li> <li>■ Stating how the product could be made, techniques and processes to be used</li> </ul>			
Communicating intentions <ul style="list-style-type: none"> <li>■ Verbally</li> <li>■ Graphically – technical, visual and pictorial</li> <li>■ Modelling</li> </ul>			

Area for development	Can do	Can do well	Need to improve
Producing quality products			
Planning <ul style="list-style-type: none"> <li>■ Ingredients needed</li> <li>■ Equipment required</li> <li>■ Making sequence time plan</li> </ul>			
Working with materials <ul style="list-style-type: none"> <li>■ Selecting, measuring</li> <li>■ Combining ingredients</li> </ul>			
Health and safety issues <ul style="list-style-type: none"> <li>■ Using tools and equipment safely</li> <li>■ Recognising hazards</li> </ul>			
Evaluating skills – justifying and reviewing processes and products			
<ul style="list-style-type: none"> <li>■ During designing and making</li> <li>■ After designing and making</li> </ul>			
Learning methods – the way you learn best			
<ul style="list-style-type: none"> <li>■ Focused practical tasks – being taught skills through demonstration and practice</li> </ul>			
<ul style="list-style-type: none"> <li>■ Design skills</li> <li>■ Making skills</li> </ul>			
Product analysis			
<ul style="list-style-type: none"> <li>■ Looking at existing products</li> </ul>			
Design-and-make assignments			
<ul style="list-style-type: none"> <li>■ Independent work</li> <li>■ Team work</li> </ul>			

From *Create! Food Technology Teacher's Resource Pack* by Mottershead & Woods.  
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# Project 2: Designers for the future

## Learning outcomes

This project combines several important elements and will support pupils in:

- thinking about designing for the future and their role in designing products and understanding tomorrow's technologies
- working with a local designer, mentor or ambassador on a design brief
- using ICT to link to the world outside school, for example working as a design team, perhaps with another school/company, video-conferencing, sharing CAD files and presenting ideas
- understanding designing for clients and markets, and industrial applications
- being aware of the wide variety of roles and career opportunities in the area of design and technology.

It develops the key skills of **Working with others** and **Communication**. It also develops a wider awareness of the role of design and technology in society, its importance in wealth creation in a modern economy and the nature of the work of designers and makers. It consolidates Key Stage 3 objectives for generating creative and innovative ideas and provides support for some key areas of progression to Key Stage 4, including negotiating pupils' own design briefs with real clients from industry and designing for markets.

## Objectives

Key Stage 3 Framework sub-skills of designing	Year 9 objectives
Exploring ideas and the task	<ul style="list-style-type: none"> <li>■ Explore needs, wants and opportunities in the context of designing for markets</li> <li>■ Speculate about and envisage both common and unusual possibilities presented by the task</li> <li>■ Explore ideas in ways that show an understanding of their impact on the future</li> </ul>
Generating ideas	<ul style="list-style-type: none"> <li>■ Produce creative solutions which address the design criteria in expected and/or unexpected ways</li> <li>■ Be prepared to take risks when generating ideas through a range of creative and critical thinking techniques</li> </ul>
Developing and modelling ideas	<ul style="list-style-type: none"> <li>■ Try alternative, sometimes unconventional approaches for overcoming difficulties, modifying proposals and communicating these to others</li> </ul>
Planning	<ul style="list-style-type: none"> <li>■ Work on tasks facilitated by the teacher and/or others</li> </ul>
Evaluating	<ul style="list-style-type: none"> <li>■ Evaluate how their ideas and solutions would benefit individuals and/or the community</li> </ul>

## Background to the project

This project is based on a combination of the QCA/DfES scheme of work unit 8F, 'The world of professional designers', and the 'Young Foresight' programme for Year 9.

It is intended that the class works with a local designer on a design brief that is set in the future. In addition to Young Foresight mentors, schools could enlist the help of local and national programmes such as SETNET Ambassadors or Design Council projects to support this bridging project.

Key features of the project are to:

- plan a stimulating launch to the project, perhaps a 'futuristic' multimedia presentation or an appropriate visit or presentation
- secure time off normal timetable – perhaps as an activity week or two three-hour morning sessions, as a break from the routine of a D&T timetable
- organise pupils to work in teams
- allow pupils to choose problems that they are interested in solving
- give plenty of opportunities for the designer to model for the class how they approach designing, such as developing ideas, prototyping and testing, and to show examples of their previous projects and work
- encourage pupils to design with the materials and make prototype models as quickly as possible rather than relying on drawing
- negotiate deadlines with the group to maintain pace and reflect how industry operates.

## Resources

- QCA/DfES Unit 8F The world of professional designers  
QCA/DfES Unit 7E Activity week  
([www.standards.dfes.gov.uk/schemes2/secondary\\_dt/](http://www.standards.dfes.gov.uk/schemes2/secondary_dt/))
- Design Council ([www.designcouncil.org.uk](http://www.designcouncil.org.uk))
- Young Foresight ([www.youngforesight.org/yf/www/default.asp](http://www.youngforesight.org/yf/www/default.asp))
- SETNET Ambassadors ([www.setnet.org.uk](http://www.setnet.org.uk))
- Audi Innovation Awards ([www.audiinnovation.org](http://www.audiinnovation.org))  
Challenges based on future scenarios
- Bright Ideas CD: DATA ([www.data.org.uk](http://www.data.org.uk))
- Time Next ([www.time.com/time/europe/html/030929/index.html](http://www.time.com/time/europe/html/030929/index.html))  
Future trends for products
- TNTY Futures ([www.tnty.com/newsletter/futures/](http://www.tnty.com/newsletter/futures/))  
Future trends and possibilities – an article to adapt for pupils

## Structure of the project

<b>Introduction</b>	Stimulating scene setting and negotiating the design brief – presentation, discussion and small-group activities to engage pupils in thinking about the ‘classrooms of tomorrow’	1 hour
<b>Main body of the project</b>	Teams work on the design brief, identifying roles, developing and prototyping ideas for a classroom of the future	2–4 hours
<b>Conclusion</b>	Pupils present their ideas to a panel which decides on awards for the best design ideas and presentations	1 hour

### Lesson 1: Classroom of the future

To start off this project, the first lesson should involve a combination of presentation, discussion and small-group activities to engage pupils in thinking about the ‘classrooms of tomorrow’. For example, you could use the video from the Young Foresight programme (see website address on page 19) or a multimedia presentation with predictions and pictures depicting life ten years from now.

Introduce the designer who is going to work with the class on this project. The designer should show the pupils sketches, ideas boards, photographs of finished interiors as well as examples of unusual, futuristic and innovative designs from across the whole design spectrum.

The designer should then set the class a design brief using a mock letter from the LEA asking the pupils to present their designs for a multi-functional classroom. Pupils will be asked to work in teams of four to develop the brief and aim to present prototype models, drawings, ideas sheets and a short presentation to an LEA panel in four hours’ time.

Discuss with the pupils how they might best use the time to complete the project.

To prepare pupils for the next session when they will generate and present their ideas, ask the designer to highlight five key questions to focus their minds:

- How might the classroom reflect new technologies?
- How could it make pupils excited about learning?
- How could the space be made flexible enough to change its function, for example to become a common room once lessons had finished?
- What role might a teacher have in a future classroom?
- How could sustainability, for example in lighting, heating and use of recycled materials, be built in?

## Lessons 2–5

Organise pupils to work in their teams to generate ideas for a classroom of the future. With the designer, remind pupils of the five key questions posed at the end of the previous lesson and help them generate and develop further innovative ideas. For example, you could use the '4 Rs of creativity' (see page 22) from Young Foresight to support pupils.

To help pupils sketch or write down ideas, suggest that they:

- generate ten different design ideas on a theme
- use related worlds such as plants, trees and underwater to develop more ideas, re-express some of the ideas they generated in their group session by applying words such as 'dripping', 'shattering', 'swelling', 'shrinking'
- use revolutionary questions to develop more ideas, such as 'put the inside on the outside', 'use less to achieve more'
- use random links to develop more ideas, such as linking an idea to 'bones' or 'the speaking clock'.

The teacher and designer should facilitate the groups in developing and prototyping ideas and guide them in structuring and preparing their presentations.

## Lesson 6

In the final lesson, pupils present their ideas to a panel, which decides on awards for the best design ideas and presentations.

# YF7: Using the 4 Rs of creativity

## You will need

- A pencil
- Your workbook
- Access to pictures of plants and trees
- Access to pictures of underwater scenes

## You will learn

How to use the 4 Rs of creativity to generate design ideas

## What to do

Work in a group of four. You will use the four different creativity techniques to develop further design ideas from an initial brainstorm on one of the following themes: Headware / Storage / Carrying devices / Lighting Work through Stages 1 – 5.



**shaping things to come**

### Stage 1 Basic brainstorming

Choose a theme and brainstorm ten different design ideas. You can present your ideas as words, quick sketches or both.

### Stage 2 Related world

Use the related world technique to develop more ideas from your basic brainstorm. Related worlds you can use are: The world of plants and trees Underwater world. You can present these ideas as words, quick sketches or both.

### Stage 3 Re-expression

Use the following words to help you re-express some of the ideas from your basic brainstorm.

Dripping / Seething / Swelling / Shattering / Shrinking



You can present these ideas as words, quick sketches or both.

### Stage 4 Revolutionary questions

Use the following statements to help you develop more ideas from your basic brainstorm. Put the inside on the outside. Use less to achieve more. Travel without moving. The whole is greater than the sum of the parts. You can present these ideas as words, quick sketches or both.

### Stage 5 Random links

Use the following items to help you develop more ideas from your basic brainstorm. Tomatoes / Bones / Tin cans / The speaking clock You can present these ideas as words, quick sketches or both.

## YF7: Using the 4 Rs of creativity

### What to discuss

Collect together your design ideas and try to decide on answers to the following:

- What needs does each idea meet? (Use the PIES approach to help you.)
- Which of the ideas could probably be developed into successful products?
- Which of the ideas could possibly be developed into successful products?
- Which of the ideas are unlikely to be developed into successful products?

### For Homework

Write a few sentences explaining which of the creativity techniques you found most useful.



# Project 3: Design a product range

## Learning outcomes

In Key Stage 3, pupils usually work on a series of projects focused on a specific material such as food, textiles or resistant materials. This bridging project provides a design-and-make assignment where pupils work across materials areas and draw on their understanding and skills from all parts of D&T.

Pupils should work in teams to design and make a coordinated range of promotional products, for example for a local event or a commercial company.

This project provides pupils with the opportunity to use ICT to help them to work collaboratively on a design-and-make project, to draw on expertise and help from outside the school, and to use features of CAD/CAM (computer-aided design and manufacture). ICT has transformed the way that pupils can work in teams and gain access to expertise outside the classroom by using e-mail, conferencing and electronic whiteboards. Team projects can be undertaken with other schools, using shared design software.

A further outcome is to highlight the range of generic designing strategies pupils have learned when working with diverse materials and how they can apply those generic skills to their chosen area of study in Key Stage 4.

## Objectives

<b>Designing</b>	<ul style="list-style-type: none"><li>■ Combine ideas from a variety of sources</li><li>■ Be prepared to take risks when generating ideas through a range of creative and critical thinking techniques</li><li>■ Adopt an appropriate role within a group</li></ul>
<b>Making</b>	<ul style="list-style-type: none"><li>■ Draft a plan for batch production that will enable them to produce their chosen idea</li><li>■ Suggest alternative ways of working to overcome any problems</li><li>■ Demonstrate a skilful use of a wide range of techniques during trialling and production, including measuring, marking out, cutting and joining; decorative and construction techniques; quality checking</li><li>■ Devise tests and evaluate effectiveness; suggest improvements to their design</li></ul>

## Background to the project

This project is adapted from the SCAA optional task and test for Year 9 and the QCA/DfES scheme of work unit 9C, 'Using ICT to link with the world outside school'.

### Going public

*Every community has its local attractions and services. These may be historical, recreational, commercial or public. They are publicised in different ways to make local people and visitors aware of them. As a team, design and make a range of products in different materials to help publicise an event, attraction or service in your local community.*

It is important that your D&T department plans as a team so that pupils are able to draw on knowledge, skills and understanding from across the materials areas and from previous projects to reinforce their learning. The intention is that pupils work as a team to explore and generate design ideas, developing themes and images for a product range – manufactured in a range of materials, such as food, metal, plastics, wood and textiles.

A test is used to inform pupils and teachers about levels of achievement.

## Resources

- QCA/DfES Unit 9C Using ICT to link with the world outside school ([www.standards.dfes.gov.uk/schemes2/secondary\\_dt/](http://www.standards.dfes.gov.uk/schemes2/secondary_dt/))
- National Strategy D&T Module 4, 'Teaching the sub-skills of designing' ([www.standards.dfes.gov.uk/keystage3/](http://www.standards.dfes.gov.uk/keystage3/))
- Bright Ideas CD: DATA ([www.data.org.uk](http://www.data.org.uk))

## Structure of the project

<b>Introduction</b> and first part of the project	Investigating the context Evaluating existing products Exploring a handling collection Generating, developing and evaluating ideas Planning making	1–4 hours
<b>Middle part of the project</b>	Making and testing	3–4 hours
<b>Conclusion</b>	Presentations and test	1 hour

## Lessons 1–4

### Investigating the context

Introduce the design brief and organise pupils into small groups. In these groups, pupils discuss the task and the issues that the task addresses, for example:

- What will the product need to be like if it is to be attractive to potential customers?
- What are the main features of a successful product?
- What would be the appropriate materials and techniques for multiple production?

### Evaluating existing products

In their small groups, ask pupils to:

- analyse the products in terms of form, function, appearance and novelty appeal
- analyse the materials, components and construction
- compare products and identify strengths and weaknesses.

Show pupils how to use two evaluating strategies – ‘ACCESS FM’ and ‘Compare and Contrast’ from Module 4 of the Key Stage 3 D&T programme (DfES 0971-2004 G).

### Exploring a handling collection of possible materials and stimulus for ideas

Give pupils a range of materials to examine. They should have different characteristics, properties and aesthetic qualities, utilising a variety of manufacturing and finishing processes, including some that are unusual in their applications and interpretations. Ask pupils to use the materials to model some ideas by making notes and sketching.

Encourage pupils to evaluate the success of their modelled ideas as products designed to meet specific requirements.

In a combination of individual and group work, give pupils time to improve an existing product or idea developed in earlier activities. Development should involve generating, modelling and testing ideas in a range of materials, and producing sample products.

Finally, in their small groups, pupils should agree on the design theme for their product range and the ways that it can be outputted to a range of different materials using CAD/CAM. Each pupil should produce a design for making and then plan with their group how they are going to make the products.

## Lessons 5–7

During these lessons, products will be made and tested using the pupils’ plans.

## Lesson 8

Pupils give short presentations as a team with an evaluation of the project and then take an individual assessment (page 27).

## Pupil evaluation and assessment

- 1 Make a sketch of your design for the product range. Label it to show what each part of the product range was made from and how it was constructed.
- 2 Choose one part of your product range that could be better designed. State why and how it could be improved.
- 3 Explain the link between your product and the event, attraction or service for which it was produced.
- 4 Describe two techniques that you used to make one product in your range interesting to look at.
- 5 Describe two finishing techniques you considered for one product in your range. List the tools and equipment needed for each finish and say what each tool would be used for.
- 6 Draw a flow diagram to show the main stages for batch production for one product in your range.
- 7 Describe two checks for quality you carried out and why they were needed.
- 8 Describe your user testing.

This page is also available in a modifiable Word version. It can be downloaded from [www.standards.dfes.gov.uk/keystage3](http://www.standards.dfes.gov.uk/keystage3)

# Project 4: Our own class project

## Learning outcomes

Design briefs can seem very artificial to pupils. They can seem as if they come from nowhere. But, for designing to be done well, it relies on pupils' understanding what they are doing and why.

In Key Stage 4, pupils identify their own tasks for examination projects. In Key Stage 3 we prepare them for this by revealing the purposes of an assignment – both designing and learning purposes. The shift from pupils receiving a design brief *from* the teacher to pupils choosing and negotiating tasks *with* the teacher is one of the main features of progression from Key Stage 3 to Key Stage 4.

Another important aspect is the progression to designing for the needs of others and to exploring unfamiliar circumstances. One project that challenges pupils in this way focuses on 'inclusive design'.

This is an opportunity for pupils to work on a class project together, where they negotiate and agree a task that they would all like to work on.

## Objectives

<b>Design-and-make assignment</b>	<ul style="list-style-type: none"><li>■ To carry out a design-and-make assignment in negotiation with the teacher, and prepare and follow a design brief</li><li>■ To design and make a product, by bringing together what they have learned during the key stage, and by applying the knowledge, skills and understanding they developed during the product evaluation activities and focused practical tasks</li></ul>
<b>Product evaluation and focused practical tasks</b>	<ul style="list-style-type: none"><li>■ How to assess people's needs, for example selecting and using appropriate techniques to understand the situation in which a product is used, e.g. through carrying out an observational study or interview</li><li>■ How case studies or observation can be used to clarify people's needs and wants</li><li>■ How to generate criteria to evaluate products that are designed to meet users' needs; appreciating the effect that a client's lifestyle and personal situation can have on designing, and how a user interacts with their environment</li><li>■ Suggest improvements to designs of products so that they are more appropriate for older people, and justify suggestions in terms of values (pupils' own and those they have learned to respect in others). This may involve discussion of some of the ethical issues that result from the conflicting demands faced by designers</li></ul>

## Background to the project

This project builds on two units from the QCA/DfES scheme of work – unit 9F, ‘Moving on to Key Stage 4: reviewing and target setting’ and unit 9B, ‘Designing for markets: mini-enterprise’.

The design brief should be negotiated with the class and could link to a current or topical issue, for example raising money for a charity or as part of a local or national event that coincides with the school project.

The design solution can be taken just to a proposal stage, where groups are asked to present their idea and how they would go about realising the project. Most of all, it is important to review what makes a good choice of a project and to rehearse this with pupils who are about to choose their own projects in Key Stage 4.

One approach is for you, as the teacher, to present the design brief and then renegotiate it with the class.

### Inclusive designing

*A small manufacturing company has asked you to design and make a prototype of a product for use at home that will appeal to older people. The company wants to achieve the ‘Owl mark’ for this product, and wants you to think about the following statement in your design of the product: ‘Design for the young and you exclude the old. Design for the old and you include the young.’ This reinforces the fact that you, as a designer, will need to have empathy with those who will use your designs.*

## Resources

- QCA/DfES Unit 9F Moving on to Key Stage 4: reviewing and target setting  
QCA/DfES Unit 9B Designing for markets: mini-enterprise  
([www.standards.dfes.gov.uk/schemes2/secondary\\_dt/](http://www.standards.dfes.gov.uk/schemes2/secondary_dt/))
- National Strategy D&T Module 4, ‘Teaching the sub-skills of designing’  
(Activities: ‘Role play and user needs’, ‘Live like the user’, ‘Observe people and products’)  
([www.standards.dfes.gov.uk/keystage3](http://www.standards.dfes.gov.uk/keystage3))
- Design Council ([www.designcouncil.info/inclusivedesignresource](http://www.designcouncil.info/inclusivedesignresource))
- Helen Hamlyn Research Centre at the Royal College of Art  
([www.hhrc.rca.ac.uk](http://www.hhrc.rca.ac.uk))
- *Designing to make a difference* ([www.lemelson.org/utility/latdc\\_movie.php](http://www.lemelson.org/utility/latdc_movie.php))  
Quicktime video on inclusive design
- *Inclusive design*: ESL Industries ([www.eslindustries.com](http://www.eslindustries.com))  
Special needs products

## Structure of the project

<b>Introduction</b>	Introducing and negotiating the project	1 hour
<b>Main body of the project</b>	Exploring the task, generating ideas, developing prototypes	4–5 hours
<b>Conclusion</b>	Groups of pupils presenting their final ideas	1 hour

### Lesson 1

Introduce the project by showing a short video on inclusive design, 'Designing to make a difference'. Organise pupils in small groups and ask them to discuss a list of headlines (see page 31).

Ask the class to spend some time, before the next lesson in two weeks' time, with an elderly relative or neighbour to observe them carrying out everyday tasks and report back, describing any difficulties they noticed. Emphasise that it is the problems they need to identify at this stage, not the solutions.

The National Strategy D&T Module 4, 'Teaching the subskills of designing', provides some useful supporting activities for the introduction, including 'Role play and user needs', 'Live like the user' and 'Observe people and products'.

### Lessons 2–5

Ask each pupil to talk about their observations and list the problems they have identified on a flipchart.

Discuss these with the class and agree which design challenges might realistically be tackled in the time allowed for the project. Pupils could vote for the problems they would most like to address.

Divide the class into groups to tackle four problems, for example:

- hanging out the washing
- picking up dog mess
- carving a joint of meat
- picking items up from the floor.

Set groups to generate possible solutions and develop some of their ideas. Encourage them to make prototypes as they design.

### Lesson 6

Each group presents their final idea using a range of methods, including presentation slide shows, exhibitions and video.

*Part of this example draws on a project at Launceston College who worked with Kenneth Grange, product designer from Pentagram, facilitated by the Design Council.*

## Headlines

Design for the young and you exclude the old.  
Design for the old and you include the young.

There are already 130 million people over 50 in the European Union.  
By 2020, one in every two European adults will be over that age.

'**Dependable**' networked '**smart**' or assistive home technology systems should enable the person to retain a quality of life and independence within their own home.

**One in every three British adults is already over 50.**

In the West, growing evidence suggests that the effect of improved diet, medicine and living conditions is to prolong not just life expectancy but active life.

The over-50s in the UK already hold more than 60% of all savings.

Taking early retirement and looking forward to an increasingly active 'third age' of healthy, independent life after work, these people will make demands for new products and services.

For the past 40+ years industry and commerce have aimed products at young people, ignoring the needs of older people.

From packaging to fashion, design can create unnecessary obstacles to older people.

Design with older people in mind will be multi-generational, inclusive, universal and in every sense better design – it will certainly not be boring.

# Bridging plans: from Key Stage 3 to Key Stage 4

- Do you have specific plans for lessons that bridge between the end of Key Stage 3 and the beginning of Key Stage 4?
- Do your pupils have a sense of a new beginning when they start Key Stage 4 courses?
- Do you develop pupils' expectations for future learning in your subject?
- Do you take the opportunity to enhance pupils' skills as independent learners?

Giving attention to these questions can ensure that Year 9 pupils receive a fresh stimulus at the end of Key Stage 3 and that their work links effectively with the challenges of Key Stage 4.

This booklet is one of a set of three, focused on ICT, design and technology and modern foreign languages. This set follows an initial set of three, for the core subjects of English, mathematics and science, published in 2004. The aim is to capture and make best use of time at the end of Year 9 and into Year 10. Each booklet:

- suggests a common approach to fostering pupils' development as independent learners;
- identifies aspects of the chosen subject that might be developed to improve transition from Key Stage 3 to Key Stage 4.

The maximum benefit will be found where these developments are led and supported across the school by senior leaders.

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