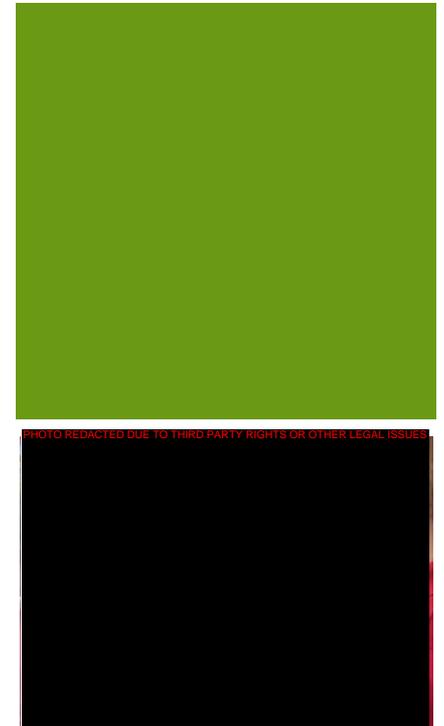


Ofsted's subject professional development materials:
Design and technology

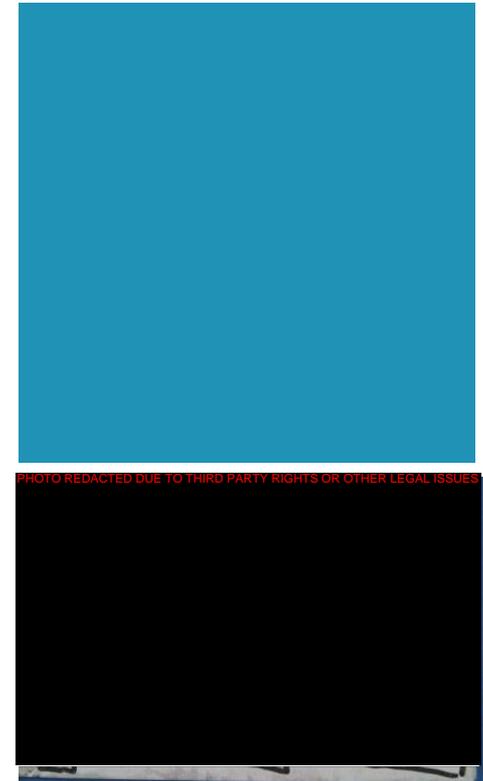
A training resource for
teachers of design and
technology in primary
schools

2012



About this resource

- Ofsted publishes a number of subject surveys every year. They look at developments in a specific subject over the previous three years, based on specialist inspectors' visits to a range of schools.
- This resource has been put together to help teachers in primary schools reflect on the main messages from the D&T report, *Meeting technological challenges*, published in March 2011.
- Subject coordinators should take the time to go through the resource prior to using it in a meeting. This will help you to appreciate that not everything can be covered in one session. It is far better to select the issues which match your priorities and to allocate time accordingly.
- At certain points, specific questions are suggested for discussion. They are to help you focus on your own practice.



Overview

This training looks at four key issues considered in the report. It poses questions for discussion and provides some of the commentary from the report. The questions covered are:

- Which activities genuinely are D&T and which are not?
- How challenging is D&T in your school?
- How can you ensure the most effective teaching in D&T?
- How effectively do you record and assess pupils' progress?
- What parts of D&T don't you teach and why?

You can take the issues in any order and spend as long as you like on each one. However, we suggest that at some stage you find time to look at all five. We begin with a quiz activity.



Which activities genuinely are D&T
and which are not?



Which activities genuinely are D&T and which are not?

This section focuses on the subject's identity and integrity. Our survey found that curriculum planning in D&T was best when the specific knowledge and understanding that pupils should learn and apply when developing ideas, planning, making products and evaluating them was clearly set out.

In these schools, activities were informed by clear design briefs that were well planned by teachers and based on three key elements. These elements define D&T:

- Designing and making a product
 - for somebody
 - and for a particular purpose.

Task

Identify which of the following activities fulfils the definition of D&T above and explain why.

Discussion point

How clearly do the design briefs in your own scheme of work reflect the three key elements?

Which activities genuinely are D&T and which are not?

Which of the following is a D&T activity?

Design and make...

- a model of a Viking longboat
- a portrait of Queen Elizabeth the first
- a coat to protect Teddy from the rain
- a moving vehicle for a driver to carry an egg safely across uneven ground
- a safe home for a pet animal of your choice
- an Egyptian pyramid
- a shelter for your playground to protect younger children from the sun
- refreshing drinks for your class picnic
- a volcano
- 'Incy Wincy spider'



Which activities genuinely are D&T and which are not?

The activities that had all three D&T elements – designing and making a product, for somebody (this can also apply to ‘people substitutes’ such as an animal or toy) and for a particular purpose – were the following:

Design and make...

- a coat to protect Teddy from the rain
- a moving vehicle for a driver to carry an egg safely across uneven ground
- a safe home for a pet animal of your choice
- a shelter for your playground to protect younger children from the sun
- refreshing drinks for your class picnic.

Reasons for choosing these and rejecting other activities:

D&T involves thinking about what products are used for and the needs of those who use them. A good D&T activity has to have sufficient depth and breadth to enable pupils to learn practical skills and provide them with the knowledge to make products that move/ light up/ are structurally sound and don’t collapse/ are safe and healthy. Pupils need to be able to test, refine and develop the products they design and make to check that they work and improve them if they don’t. Modelling, drawing or using certain types of 2D or 3D materials does not make the activity D&T.

Which activities genuinely are D&T and which are not?

The survey found that pupils enjoyed developing practical skills and made swift progress to develop knowledge and understanding about the properties of materials when they had specific problems or challenges to solve that fired their enthusiasm. Teachers in one school developed this challenge for Year 1 pupils to reinforce the message about being a responsible pet owner following a talk by the RSPCA:

'Provide your animal with a home with food and water, a sleeping area and an area for exercise. There must be a door that opens and closes securely to keep your animal safe.'

Task

With a partner, write down three design challenges to fascinate and excite a specific class or year group in your school to meet the following principles: designing and making a product – for somebody or for a particular purpose.

Issue 1

How challenging is D&T in your school?



How challenging is D&T in your school?

Here are some pupils' comments from two different schools. What do they tell you about the challenge and nature of their D&T experiences?

School A:

- 'I am not sure if our work is D&T or art.' – Year 5 pupil
- 'We do lots of modelling and drawing in D&T, and in our other lessons.' – Year 6 pupil
- 'D&T is about making models to look like the pictures in books.' – Year 2 pupil

School B:

- 'D&T is challenging because you have to develop original ideas. You cannot copy something, but you have to put your own creative stamp on the things you design.' – Year 6 pupil
- 'We expect our products to work and they do. Testing and making changes is a step-by-step process. We learn by doing.' – Year 5 pupil
- 'Sometimes when we have D&T in our heads, we still think about it when we are at home – thinking how to solve problems.' – Year 2 pupil

Discussion points

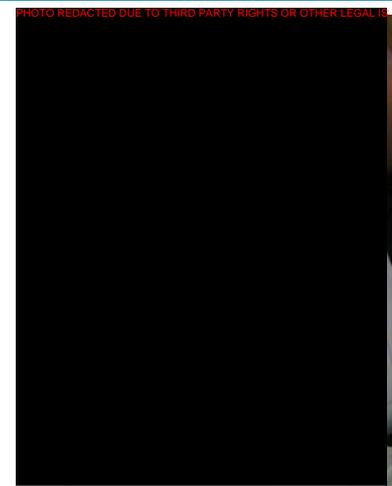
- Look back at the list of activities on slide six. Which of these might be part of the pupils' experiences in school A and which might be in school B?
- How challenging is D&T at your school? How do you know and how is it demonstrated?

How challenging is D&T in your school?

Inspectors found that pupils made very good progress when the challenge in designing and making became increasingly sophisticated, requiring them to think as designers, to apply their technological knowledge, understanding of complex principles and construction techniques. These schools set out clearly what pupils would learn in D&T. The following slide sets out the five features of good and better achievement from the report. They were demonstrated consistently in lessons, in pupils' books and the products and systems they made, and in discussions with them.

Task

Review the list on the following page. Bring together the D&T work produced over time by six pupils of different abilities. Using the checklist evaluate how well the five features are demonstrated. Are any of the features absent, are there any that need to be refined and developed further?



How challenging is D&T in your school?

Good achievement and challenge are evident when pupils:

- demonstrate a secure understanding of who they are designing and making for, the purpose of the product and how it would work, and the specific criteria their product must meet to be successful
- communicate their innovative ideas and plans clearly and modify their designs and prototypes in light of their testing and evaluation
- develop technical competence, applying measurement and using tools and components with increasing accuracy to safely make well-finished products
- draw effectively upon their scientific understanding and their knowledge of mechanisms, structures, forces or the effect of heat to create and explain how their products work
- use an increasingly technical vocabulary when talking or writing about what they might change as their work develops.

Issue 2

How can you ensure the most effective teaching in D&T?



How can you ensure the most effective teaching in D&T?

Activity

Think about the last D&T lesson you gave. Write down three ways in which you ensured effective teaching in D&T.

Discussion point

Discuss these lists with your immediate colleague and with the group.



PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER



How can you ensure the most effective teaching in D&T?

Look at the next two slides. The first lists many of the characteristics of effective teaching. This list was included in the report. The second highlights the features of good or better teaching over time that are shared across the whole teaching team. Teaching needs to be consistently good across the whole team of staff for pupils to make good and outstanding progress.

Discussion points

- Did you and your colleagues identify all the points given?
- As a group and/or as individuals, select the top three things you need to concentrate on to improve teaching and to make it even better in your school.



PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES



How can you ensure the most effective teaching in D&T?

Good teaching in D&T featured teachers who:

- used existing products to inspire pupils and to support their investigations, testing and analysis
- used focused tasks and demonstrations effectively to show pupils different methods of manufacture
- used their own work to model ideas, and to explain the methods they used to identify the problem or to tackle a task
- used resources effectively and adapted them well to overcome barriers to participation in practical work for pupils who are disabled or have special educational needs
- used questioning to encourage classes to contribute to the development of success criteria for design briefs, to prompt pupils to think through the problems they might encounter and to share strategies to solve them
- modelled and used technical language and subject-specific terms accurately
- structured learning effectively to encourage the pooling of ideas and findings to support pupils critically evaluating and extending or improving the ideas
- ensured D&T was relevant by linking activity to pupils' interests, establishing real contexts for their work, and building upon their knowledge and skills in other subjects
- managed discussions effectively to include all pupils' views and challenged pupils' thinking, particularly about the function of products and the needs of users
- ensured that learning intentions were clear in plans, made good use of available time, offered suitable challenge to all groups of pupils – including the more able – and developed their learning.

How can you ensure the most effective teaching in D&T?

Below are some features of good and better teaching over time in D&T:

- teachers throughout the school share a consistent and secure understanding of D&T
- planning has a well-defined and consistent focus on finding out how products work, how well they fit their purpose and how well they meet the needs of users
- lessons build firmly on pupils' earlier learning and ensure progressive challenge, breadth and depth to their designing and making
- good individual questioning and well-managed class discussion enable pupils to confidently develop design criteria in response to design briefs
- focused tasks, demonstrations using film or photographs, and teachers showing examples of their own work all support pupils' understanding of the mechanisms and construction required to design and make products safely and accurately
- a range of resources, including ICT and computer-aided design and making (CAD CAM), is adapted to support and successfully help pupils to overcome barriers to learning.

Issue 4

How effectively do you record and assess pupils' progress?



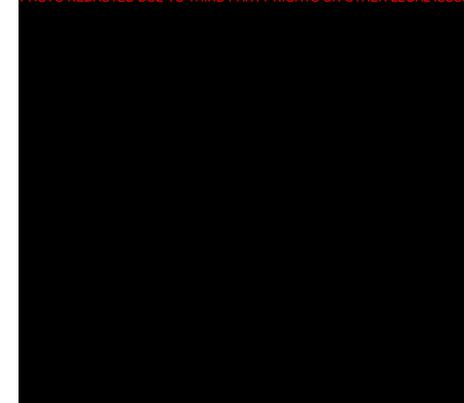
How effectively do you record and assess pupils' progress?

Effective assessment of pupils' D&T capability had the following features:

- procedures were not over-complex, were consistently applied and informed teachers' planning
- teachers identified the things pupils could do well and where they needed to improve
- teachers provided high-quality feedback to pupils to help them to increasingly take responsibility for their own learning
- pupils understood why they had specific targets and how they might achieve them in their current work
- teachers ensured that consistent systems were in place to track and analyse pupils' progress and attainment over time.



PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES



How effectively do you record and assess pupils' progress?

<p>What materials could you use if you were making an instrument like this?</p>	<p>You could cut up plastic bottles or tin or metal cans.</p>	<p>Ribbon and card board you could make it out of.</p>	<p>Card board, string and fabric you could make it out of.</p>
<p>Do you think the change of materials would change the type of sound it makes?</p> <p>No because I think it will still make the same sound although the drum because if I put plastic it will sound light and cardboard would be a deeper sound.</p>			

• If I were to make my monster again I would make its arms move with pneumatics system as well as its mouth. Have you thought about improving/changing the methods you have used to attach your components?

<p>It works by its mouth spring and closing also nothing has changed by my plan <small>what makes the mouth open and close? the spring</small></p>	<p>I didn't need to improve it at all.</p>
<p>Ok but I could have not changed my eyes because they are really good.</p>	<p>By putting the arms shut tighter up.</p>
<p>what else could you make with a simple pneumatic system? a pop up birthday card.</p>	

The best feedback was formative and teachers' comments asked questions to deepen pupils' learning.

Teachers encouraged pupils to respond to these comments and their books reflected many 'learning conversations'.

How effectively do you record and assess pupils' progress?

Teachers' plans were working documents. They focused clearly on what pupils were to learn, how this would be demonstrated, and the activities required to bring this about. Teachers annotated their plans meaningfully to identify what challenge and support were required for particular individuals to enable them to be successful.

In this example the teacher also noted significant steps in progress for certain individuals:

D&T Short term planning
Class: 4
Teacher: Miss Jones

Date: 12/07/2012

Lesson Objective	Activity	Learning Outcomes	Teaching Notes
To understand how air pressure can be used to produce and control movement	1. Introduction to 'Moving Monsters' brief. 2. Hands on investigating and testing collection No. 1 of products. 3. Record class findings. 4. Demonstration and constructing activity in groups of two pneumatic systems.	I can explain how simple pneumatic systems work using new vocabulary correctly.	Explain to them to work with Mrs Thomas at Stage 2, Board 5.
To know how to construct simple pneumatic systems	5. Comparing and contrasting - questions, recording findings and groups feedback to class.	I know how to make two simple pneumatic systems.	James and Sophia to assist and demonstrate at Stage 4 - need careful water, tubing and syringes.
To use appropriate vocabulary to describe how things work	6. Investigating replicated body parts and markings on collection of models. Matching 'sources of inspiration' exercise. 7. Ideas and drawings for own 'Moving monsters'. Drawing focus: appearance, which parts move and how.	I understand how products have been made and how products replicate real-life features.	MS Add 'hydraulic' - driven by fluid to key words card.
Learning outcomes not met		Learning outcomes met	
Distress Kostas Maccauley Vicky	All others	James - quickly grasped principles to air/water, badly displaced linked to water toys + teacher's notes and went to test larger volume syringes. Sam, Carter and Freddie drawing detailed drawings of their own 'Moving Monsters'. Sophia beginning to explore levers and fixing.	
Next lesson: demonstrate 'opening mouths' solutions and experiment with levers to create hidden movements. MS longer tube + larger volume syringes needed!			

How effectively do you record and assess pupils' progress?

Across this school, teachers assessed and recorded pupils' learning consistently. Three levels of expectation were used in every class in every D&T project. The class teachers used this information to inform their planning, and in doing so considered what was required to challenge and support individual children during their next D&T project to improve their achievement. Subject leaders used the pupil performance grid from each class to enable them to gain an overview of achievement in D&T across the school each term. They used this data to identify patterns of achievement across different groups.

Pupil Performance Grid – Subject: D&T

Year Group: Lower Key Stage 2 **Class Teacher:** Miss Jones, Mrs Wingate, Mr Copper

Children below National Expectations	Children at National Expectations	Children above National Expectations
Rebecca Blue Nathan Foster *Macaulay Pearson	Kirstie Abbey Tony Bay Fiona Cook Victor David *Jordan France Freddie James *Christine Jenkinson Seri Li (EAL) Callum Masters Maisie Mori Stephen Mainprize Jenson Nye Caitlin Onger Josh Parr Susan Roper Tejpal Sear Chloe Smith Charlie Tiny *Paul Ward Charlotte Wilshaw *Regan Young	*Andrew Ball Sarah Clayton James Grant Sophia Gray Liz Hurst Michael Prince Salnum Singh *Michelle White

* Free School Meals Highlight = SEN Underline = LAC Bold = Children who have made most progress

How effectively do you record and assess pupils' progress?

The report recommends that primary schools should 'improve the use of assessment of pupils' progress in D&T, ensuring that pupils know how well they are doing and what they should do to move on to the next stage'.

Discussion points

- What changes could you make to securely implement this recommendation?
- Review the next project, activity or task that you have planned for your pupils. What is the key learning within the project and how are you going to check how well pupils have understood this?
- How will you feed back to pupils about how well they are doing and how to improve?
- How could you improve consistency in teachers' assessments of pupils' learning across the school?

Issue 5

What parts of D&T don't you teach and why?



What parts of D&T don't you teach and why?

Inspectors found remarkable consistency to the D&T that was not being taught, and the impact this has on pupils' learning, for example: 'Pupils had insufficient opportunities to learn about circuits, or computer control or how to use ICT in D&T.'

The report recommended regular high-quality training so that teachers were confident and able to support pupils in learning about these technically challenging aspects of the subject.

Discussion points

- Are there any aspects of the technologically challenging and more modern parts of the subject that you ought to be teaching that you don't?
- What are you going to do about this and how are you going to fill the gaps?



Summary and conclusion



Summary task

Please consider this question as your summary task:

Discussion point

What three priorities and accompanying actions do you now have for improving D&T in your school, as a result of the discussions in which you have just been engaged?

To help you in this, we suggest you look at the specific criteria we use to judge D&T on subject inspections. You can find this material on Ofsted's website:

www.ofsted.gov.uk/resources/generic-grade-descriptors-and-supplementary-subject-specific-guidance-for-inspectors-making-judgements



PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES



Conclusion

We hope you have found this resource helpful in prompting discussion about how to improve provision and outcomes for young people in D&T in your school.

There is much more in the *Meeting technological challenges* report, which can be found on Ofsted's website: www.ofsted.gov.uk/publications/100121

You will also find examples of good practice on Ofsted's website: www.ofsted.gov.uk/resources/goodpractice

We welcome comments on this training resource. Please write to enquiries@ofsted.gov.uk and ensure that you put 'D&T professional development materials' in the subject box of your email.



PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES

