

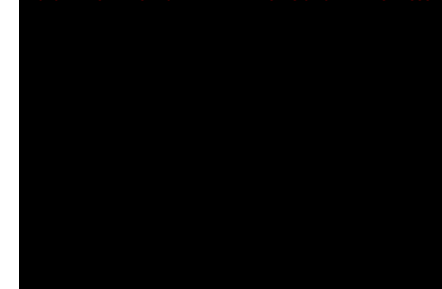
Ofsted's subject professional development materials: Design and technology

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

2012



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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 secondary schools reflect on the main messages from the D&T report, *Meeting technological challenges*, published in March 2011.
- We recommend that subject leaders take the time to look through the resources prior to sharing them with colleagues. Not everything can be covered in one session. We suggest that you focus on the issues which most closely match your own priorities and allocate time accordingly.
- At certain points, specific questions are suggested for discussion. They are to help you focus on your own practice.



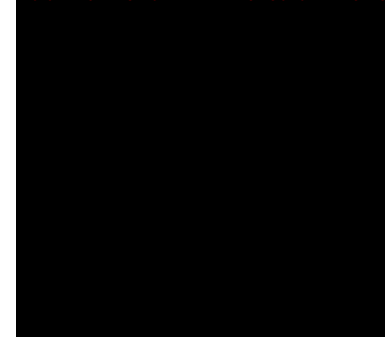
Overview

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:

- How challenging is D&T in your school?
- How can you ensure the most effective teaching in D&T?
- How can you ensure the best learning in D&T?
- What don't you teach in D&T and why don't you teach it?
- How effectively do you meet the subject-specific D&T training needs of the teachers in your school?



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Some questions on D&T at GCSE and AS/A2 designed to help you consider how D&T in your school compares with the national picture

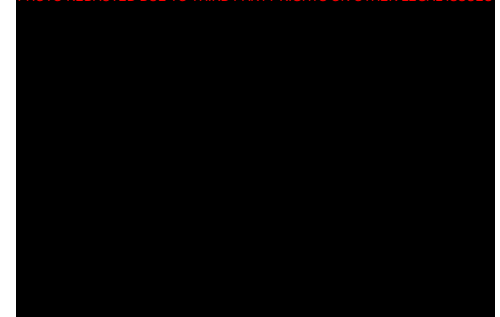


GCSE D&T questions

1. How many students sat GCSE D&T(full course) in 2010 in England?
2. In relation to numbers of students taking subjects at GCSE, D&T comes in the top 10 of subjects, but where precisely in the top 10 for 2011 does it sit?
3. What proportion of students in 2011 took D&T at GCSE in:
 - maintained schools?
 - selective schools?
 - independent schools?
 - academies?
4. What proportion of students gained at least a grade C in GCSE D&T in 2011?



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GCSE D&T answers

1. How many students sat GCSE D&T (full course) in 2011 in England? **226,400**
2. In relation to numbers of students taking subjects at GCSE, D&T comes in the top 10 of subjects, but where precisely in the top 10 for 2011 does it sit?

Fourth, behind the core subjects

3. What proportion of students in 2011 took D&T at GCSE in:
 - maintained schools? **38%**
 - special schools? **43%**
 - independent schools? **19%**
 - academies? **5%**
4. What proportion of students gained at least a grade C in GCSE D&T in 2011?
63%

Discussion point

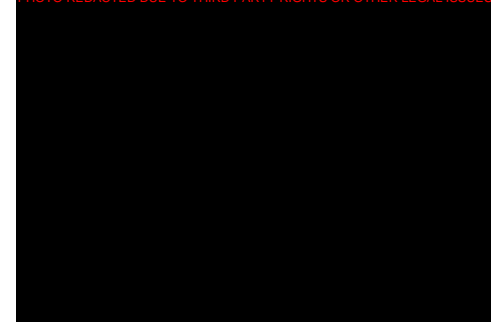
Now answer the questions for your school. If your school differs from the national average, why do you think this is the case?

More GCSE D&T questions

1. How many students sat GCSE D&T electronic products in 2011 in England?
2. How many students sat GCSE D&T systems and control in 2011 in England?
3. How well did boys do in 2011 and which D&T courses have the highest entries for boys?
4. How well did girls do in 2011 and which D&T courses have the highest entries for girls?



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More GCSE D&T answers

1. How many students sat GCSE D&T electronic products in 2011 in England?
9,900 – and 66% gained A* to C
2. How many students sat GCSE D&T systems and control in 2011 in England?
4,300 – and 65% gained A* to C
3. How well did boys do in 2011 and which D&T courses have the highest entries for boys?
56% gained A* to C grades. The highest entries were in electronic products, RM, GP and S&C
4. How well did girls do in 2011 and which D&T courses have the highest entries for girls?
73% gained A* to C grades. The highest entries were in food and textiles

Discussion point

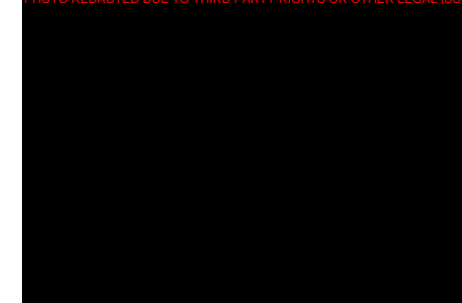
Now answer the questions for your school. If your school differs from the national average, why do you think this is the case?

Post-16 D&T questions

1. How many students took D&T in 2011 in England
 - at AS level?
 - at A level?
2. Is the trend of entries for D&T at A level rising, static, or falling?
3. What proportion of students taking A level D&T in 2011 gained grades B and above?



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Post-16 D&T answers

1. How many students took D&T in 2011 in England
 - at AS level? **21,261**
 - at A level? **14,871**
2. Is the trend of entries for D&T at A level rising, static, or falling?
The three-year trend is falling
3. What proportion of students taking A level D&T in 2011 gained grades B and above?
42.9%

Discussion point

Again, answer the questions for your school. If your school differs from the national average, why do you think this is the case?

One last question

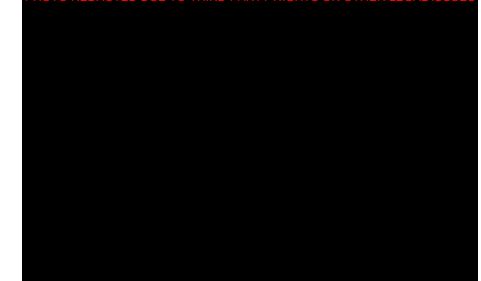
At what age can students give up D&T in England?

Is it...

- at the age of 13?
- at the end of Key Stage 3?
- at the end of Year 9?



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Answer

At what age can students give up D&T in England?

Is it...

- at the age of 13?
- at the end of Key Stage 3? **Correct – whenever that may be.**
- at the end of Year 9?

Discussion points

1. When do students in your school give up D&T?
2. What particular problems does this pose for you in ensuring that you cover the full programmes of study at Key Stage 3?

Issue 1

How challenging is D&T in your school?



How challenging is D&T in your school?

Our survey found that students enjoyed:

- opportunities for practical and active learning
- working on individual projects and using their own ideas to create products that work realistically.

However, students reported that although they found satisfaction in gaining technical skills they did not always find D&T as challenging as their other subjects. In some lessons, particularly at Key Stage 3, students did not have enough opportunities to demonstrate their technical skills.

Discussion points

1. How challenging is D&T at your school? How do you know and how is it demonstrated?
2. The following slide sets out features of good and better achievement and challenge from the report. What opportunities do students have to demonstrate these within your existing schemes of work?

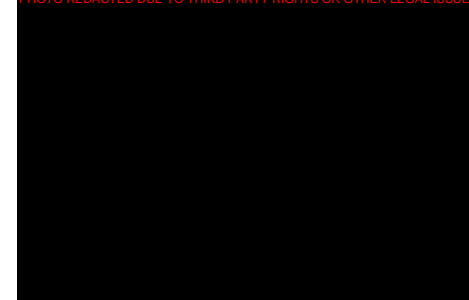
Features of good and better achievement and challenge

Good achievement and challenge was evident when students:

- demonstrated high commitment to acquiring, analysing and applying knowledge
- worked with increasing responsibility and independence, making choices and taking decisions about their work
- were extremely productive, demonstrating good project management and efficient use of time, including the use of computers to aid design and manufacture
- worked constructively with others and managed risks exceptionally well to manufacture products safely and consider suitability for users
- responded to ambitious challenges, showing significant levels of originality, imagination or creativity, and produced ideas and manufactured prototypes that were varied and innovative.



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Issue 2

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



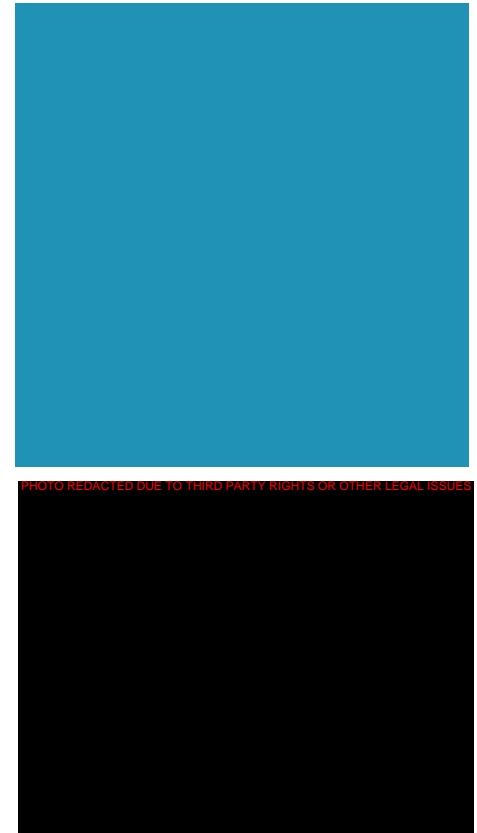
How can you ensure the most effective teaching in D&T?

Activity

Write down three ways in which you ensure effective teaching in D&T. Please make sure you are specific about D&T and that you do not rely on generic aspects of effective teaching.

Discussion point

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



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

Activity

Look at the next slide. It lists many of the characteristics of highly effective teaching. This list was included in the report.

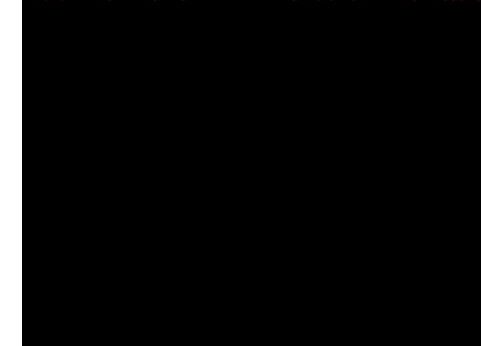
Discussion point

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. How will you go about achieving these improvements?



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

The characteristics of highly effective teaching in D&T include:

- Teachers having good breadth and depth of subject knowledge – especially the properties and working characteristics of a number of materials, including smart materials.
- Teachers staying up to date, enabling them to make relevant and appropriate reference to the latest technological advances and developments.
- Teachers effectively questioning students to enable them to make better connections between the various materials and properties they are studying.
- Teachers understanding what good design is and robustly challenging superficial and stereotypical imagery.
- Teachers purposefully planning what students would know, understand and be able to do by the end of lesson in a very clear, measureable and challenging approach.

Issue 4

How can you ensure the best learning in D&T?



How can you ensure the best learning in D&T?

Look at the next slide. It lists many of the characteristics of highly effective learning. This list was also included in the report.

Discussion points

1. How do you structure learning to ensure that students progressively become better designers and makers and how do you make this clearer to them in lessons?
2. With a partner identify alternative methods that could be used to check the rigour and breadth of students research.
3. Look at a recent lesson plan and discuss how well the resources and tasks are planned to challenge the most able students in the class. How might you adapt the lesson to further promote students progress if you found that they finished earlier than you expected them to?

How can you ensure the best learning in D&T?

The characteristics of the best learning in D&T include:

- Students know from the outset of the lesson what is expected of them and how this would help them to be informed consumers or better designers and makers.
- Lessons include an interesting range of relevant tasks specifically planned to involve students in demonstration, discussion, and presentation of their work to others and for critical analysis.
- Lessons provide opportunities for teachers to check the rigour and breadth of their research, and to check deeper understanding of technical knowledge and how they link this to the purpose of the product and needs of the client.
- The flow of feedback between teacher and students as lessons proceed enables misconceptions to be tackled quickly and greater challenge through adaptation of resource or task to be introduced. Consequently students' learning and progress flourish.
- Careful monitoring by teachers during lessons supports regular and accurate assessment.

Issue 5

What don't you teach in D&T and why don't you teach it?



What D&T don't you teach?

Inspectors found remarkable consistency in the D&T that was not being taught, and the impact this had on students learning, for example:

- insufficient opportunities for students to develop knowledge of electronics, systems and control and computer aided design and manufacture
- students' knowledge of modern and smart materials and their properties was weak at Key Stage 3 and thinly represented in Key Stage 4 schemes of work.

Discussion points

1. 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?
2. What are you going to do about this and how are you going to fill the gaps?

What D&T don't you teach?

The report identified why the D&T curriculum had to modernise:

The teaching and learning of design and technology in schools take place against a rapid rate of technological change. The challenge to keep the curriculum up to date and exciting is vital if the potential of D&T to help all pupils become confident and capable members of a technologically advanced society is to be realised. Scientific and technological research and invention continue to develop new materials and processes, such as functional foods, synthetic flavours, hydrogels that absorb up to 500 times their own weight in water, and photochromic materials that react to changes in temperature by changing colour. Resources that enable pupils to work with innovative and modern materials such as these provide what some academics are calling 'a high octane boost to learning' in D&T. This is because they represent an opportunity to think and investigate in practical ways how and why such technologies work. In so doing, they enable pupils to develop greater technical rigour in designing and making, and also to apply their scientific and mathematical understanding.

Discussion point

What opportunities and challenges will modernising the D&T curriculum bring to your school. What could your D&T curriculum look like and over what timescale can you achieve this?

Issue 5

How effectively do you meet the training needs of all who teach D&T in your school?



How effectively do you meet the training needs of all who teach D&T in your school?

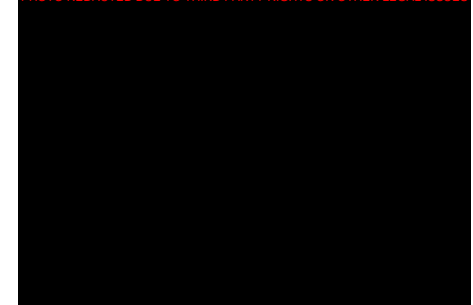
The report recommends that secondary schools should: ensure that teachers have access to high-quality subject professional development to enable them to teach students about modern and smart materials , electronics and systems and control, make effective use of computer aided design and manufacture resources, and stay up-to-date with developments in research and innovation.

Discussion points

1. What changes do you need to make to your programme of CPD to implement this recommendation?
2. What information do you need and over what timescale do you need to implement this?



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Summary and conclusion



Summary task

Please consider this question as your summary task:

Discussion point

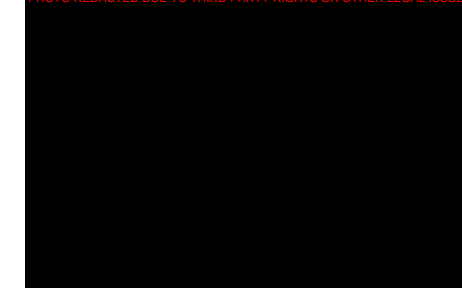
What three priorities and accompanying actions do you now have for improving D&T in your school as a result of the discussions in which you have just been engaged?

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



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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.

