

Key Stage 3 National Strategy

Year 9: Boosting achievement in ICT

This guidance is designed to help teachers enable pupils to maximise their achievements in ICT, especially those pupils who are working at level 4 and who are capable of achieving level 5 by the end of Key Stage 3. It reflects good practice in schools, and will help you to strengthen those pupils' ICT capability so that they will be able to reach national expectations by the end of the key stage.

Identifying pupils who have the potential to achieve level 5 in ICT

You need to identify those pupils currently working at level 4 who are capable of achieving level 5. To do this consider the following.

- Look at how pupils are performing in the core subjects. If pupils can achieve level 5 in the core subjects they have the potential to achieve level 5 in ICT. Find out who they are by using assessment information from core subjects.
- Consider which Sample teaching units your Year 9 group have been taught in Year 8. How well did your target pupils cope? Did they meet the learning outcomes?
- Have you used Sample teaching unit 8.5 as an assessment tool? Can you identify pupils working at level 4 from their work in Sample teaching units used in Year 9? Use the chart in **appendix 1** to help you and check on the National Curriculum in Action site (www.ncaction.org.uk).
- Look at previous records and assessment of pupils' work in ICT from Years 7 and 8. This should also help you to target support for those pupils who need it.

Having identified the group of pupils who should achieve at least level 5, you will need to plan some focused work to support them. This leaflet suggests some ways in which you might do this. All your planning and teaching should enable these pupils to demonstrate the key characteristics of level 5 achievement that are listed on the next page. By extending many of the Sample teaching units, you will be able to give these pupils the opportunity to demonstrate their ICT capability.

What makes a level 5?

Pupils working at level 5 in ICT demonstrate a number of characteristics. The following table shows these characteristics and gives examples of how these aspects may be accessed through the Sample teaching units.

Characteristics of level 5	Exemplification in the Sample teaching units
Solutions will combine the use of ICT tools and not just combine text and graphics.	Illustrated in Sample teaching units 8.2 and 8.5, for example.
Pupils will make decisions about content, structure and fitness for purpose and they will be able to justify their choices.	In Sample teaching unit 7.3 pupils produce a leaflet with the structure and content predetermined. In order to demonstrate level 5 achievement they would need to be given opportunities to choose their own structure and content and be able to justify their choices. They might demonstrate this by showing a number of solutions and talking about why they have made a particular choice.
All solutions will show a clear understanding of the 'input, process, output' sequence of events.	For example, pupils will be able to identify the information they need to put into a model, explore the relationships and change the variables in order to check hypotheses and answer 'what if ...' questions and communicate some solutions. This is exemplified in Sample teaching units 8.4 and 7.6.
At all stages pupils will be able to justify choices and show the process they have gone through. They will show evidence of understanding through their work and not just that they can manipulate a piece of software.	For example, by annotating their work, showing refinements made to a piece of work as it progresses, producing a portfolio or display. This is exemplified in Sample teaching unit 7.3.
Throughout, there will be evidence of checking the accuracy and plausibility of both the information pupils select and their own outcomes.	For example, by selecting appropriate information and choosing the right graphs, diagrams and layouts for the task. Pupils need to check that their results are accurate. This is exemplified in Sample teaching units 7.4 and 8.4.

You can also use the following documents to help identify appropriate expectations:

- the yearly teaching objectives in section 3 of the *Framework for teaching ICT capability: Years 7, 8 and 9* (DfES 0321/2002);
- Sample teaching units for ICT;
- the key characteristics in the ICT progression chart on the National Curriculum in Action website (www.ncaction.org.uk) (reproduced with the permission of QCA).

Practical suggestions

How you teach Year 9 pupils will depend on their prior experience of the Strategy. These are some possible ways forward.

1. If they haven't been taught any of the Year 8 Sample teaching units so far you might start by teaching those. However, you must plan to let them demonstrate level 5 achievement by extending the Sample teaching units to enable this. You may use a new context to assess their learning for example. This is exemplified in Sample teaching unit 8.1. Use the chart in **appendix 2** to see how this might be done.
2. If they have been taught Sample teaching units 8.1 to 8.4, use 8.5 as an assessment tool and allow them to show what they can do. This could be by letting them work more independently on each of the sections or by extending the work to enable them to complete further tasks.
3. If they have already completed Sample teaching unit 8.5 then they might be taught some of the Year 9 Sample teaching units. If they are still working below level 5 then you will need to structure the work to teach the key characteristics for achieving level 5 (see the table above). Pupils will need more guidance on the definition of the project and the outcomes they need to achieve. Intervention will need to be more frequent than with pupils working at higher levels who will be working more independently.

Working with pupils

You will need to check throughout Year 9 that pupils are on track to reach level 5. This can be done during normal lessons. Here are some suggestions for helping you to assess pupils as you teach.

- Work with this group of pupils directly. They will need extra support in structuring their work and in annotating it to show what choices they have made.
- Make sure that you focus some time on oral and mental work in lessons. This is an excellent way of checking pupils' understanding in order to inform your future planning. It also provides opportunities to keep past work fresh in pupils' minds. This is especially true of the more difficult concepts required for level 5 achievement.
- You need to give pupils short-term learning targets so that they can see an improvement in their performance. These targets should be derived from expectations and the yearly teaching objectives. Make sure that pupils know what you intend them to learn and that you can evaluate their success. For example:
 - *Today we are going to learn ...*
 - *Let's check what you now know ...*
 - *Let's identify the structure and content ...*

- *What do you need to do now to improve this work?*
- *How are you going to evaluate this?*
- *How are you going to write about this?*
- Use errors from previous work as key teaching points. This technique is central to assessing what pupils know and planning subsequent work to move learning forward and raise standards. Talk about common errors with pupils.
- Identify assessment opportunities and share them with pupils. Make sure pupils know what judgement is going to be made and how they should be presenting their work.
- Ensure that pupils understand and use vocabulary correctly, particularly subject-specific vocabulary.
- At the end of each lesson, stress the main teaching points and assess pupils' progress informally.
- Discuss the next steps and set regular work to do between lessons.

Preparing pupils for assessments

- Share success criteria with the pupils.
- Share models of good work, perhaps during starters and plenaries, but also during the lesson, to draw attention to specific points.
- Jointly annotate solutions, helping pupils to apply the success criteria, so that they understand how to achieve success themselves. They will also know how to annotate for understanding.
- Make assessment focuses clear.
- Help pupils to plan their work carefully. Jointly construct a flow diagram of steps when approaching a problem or use some of the project planning devices suggested in the Year 9 case studies.
- Discuss different aspects of pupils' attainment. Which areas do they need to target? Work with pupils who have similar needs in a group.
- Make sure that pupils know what the recording requirements are from the beginning. Give them a clear guide to what is expected in their portfolio or display. If they need to collect versions of their work to show progression they will need to know this.

Schools need to consider their planning for Year 9 pupils to ensure that, through the use of the Sample teaching units, pupils have been given sufficient learning opportunities to enable them to demonstrate their ICT capability. Planning should be adjusted to create such opportunities.

Appendix 1 Key characteristics for level 4 and level 5 from the National Curriculum in Action website (www.ncaction.org.uk)

	Characteristics	Example
<p>Level 4 is characterised by the ability to combine and refine information from various sources.</p> <p>Pupils interpret and question the plausibility of information.</p>	<p>Typically, pupils:</p> <ul style="list-style-type: none"> find and interrogate information, understanding the need for care in framing questions; amend and combine different forms of information from a variety of sources; generate and amend work; explore patterns and relationships using ICT-based models and simulations. They interpret their findings, question plausibility and recognise that poor-quality information leads to unreliable results; control events in a predetermined manner and to sense physical data; present information in different forms. They refine the quality of their presentations showing an awareness of the intended audience; compare their use of ICT with other methods. 	<p>Pupils are asked to investigate the Elgin marbles. They use various information sources, including the Internet, to gather information about the marbles. The teacher asks the class to create a presentation incorporating two contrasting points of view about the future of the marbles. Pupils cut and paste information from the Internet and create a scrapbook of information. They synthesise this information to create bullet points to use in a presentation. They combine pictures and text within the presentation. They present their work to other classes in the year group. Later, pupils conduct a survey to establish which point of view is most common within the school.</p>
<p>Level 5 is characterised by combining the use of ICT tools within the overall structure of an ICT solution. Pupils critically evaluate the fitness for purpose of work as it progresses.</p>	<p>Typically, pupils:</p> <ul style="list-style-type: none"> select the information they need for different purposes, check its accuracy and organise it in a form suitable for processing. An increased range of quantitative and qualitative information is considered; structure and refine information in different forms and styles for specific purposes and audiences; explore the effects of changing the variables in an ICT-based model; create sequences of instructions to control events, and understand the need for precision; monitor and measure external events with sensors; assess the use of ICT in their work and are able to reflect critically in order to make improvements in subsequent work. 	<p>Pupils investigate the logistics associated with staging school theatre productions. They gather information about costs from the head of drama. They collect information about hire of costumes, special effects and copyright fees. They create a spreadsheet model. They create a seat-booking system. They use information from this in their financial model to investigate break-even points for different productions. As part of the theatre theme they create programmes and posters for different productions.</p>

Appendix 2 Sample teaching units (Years 8 and 9)

Sample teaching unit/case study	Evidence of level 5 achievement
8.1 Public Information system	Pupils analyse the problem and demonstrate an understanding of structure by showing how the different parts of the solution might fit together. They may find information from the Internet, import it into a spreadsheet and refine the information through the use of things such as finding averages, producing appropriate graphs, linking graphics to text descriptions. They judge the accuracy of the results and information and combine it into a structured presentation, fit for purpose and enabling the audience to find the information they need. This may be through the use of menus, hyperlinks, etc. Throughout, they justify their choices and refine their work as a result of critical evaluation.
8.2 Publishing on the web	Pupils create and use an underlying structure to produce some linked web pages to enable people to navigate through the website. They select and refine text and graphics that are fit for purpose and suit the needs of the audience and demonstrate how the organisation of this information is fit for purpose . The structure is refined throughout the process and shows a range of routes to suit the user.
8.3 Information, reliability and bias	Pupils select information from the Internet to produce the solution of a problem. They justify their choices paying particular attention to accuracy , bias, fitness for purpose and content. They use an increasingly large range of both qualitative and quantitative information in their solution. The development of this information could be linked to the previous two Sample teaching units.
8.4 Models and presenting information	Pupils develop and restructure a computer model in order to explore hypotheses or answer 'what if ...' questions . They explore patterns and relationships, refining the model where necessary. They explore the effect of changing variables to improve their model. They question the plausibility of results and interpret their findings. They are able to justify the choice of information in the model to ensure fitness for purpose .
8.5 Integrating applications to find solutions	<p><i>Finance</i></p> <p>Pupils find and interrogate information from the existing database and the website. They extract the information relevant to the problem and recognise issues of accuracy. They refine the information to suit their model. They develop the model to explore hypotheses or answer 'what if ...' questions. They explore the effect of changing variables to improve their model to find possible solutions to the problem. They are able to justify the choice of information in the model to ensure it is fit for purpose and describe the solution.</p> <p><i>Production</i></p> <p>Pupils create and test a set of procedures to control the system, refining during the testing process. They understand how sensors could be used to monitor conditions, taking account of precision and accuracy.</p>

	<p><i>Marketing (i)</i> Pupils choose an appropriate method of marketing their plants. They justify their choice using such considerations as the audience they are reaching and the amount of information they need to use. They structure and refine the information appropriately justifying their choices. They will combine information from the variety of sources including the previous two activities.</p> <p><i>Marketing (ii)</i> Pupils decide on the information required to link with their marketing solution. They identify the fields and data types needed to do this. They create a simple database to demonstrate an understanding of structure and processing, organising it in such a way that they show that it solves their ICT problem, done by creating a data collection form and using it as a printed record.</p>
Case study 9.1	Pupils recognise that an ICT solution requires a number of procedures . They create and test a set of procedures to control the water ride system, refining during the testing process. They justify the choices for the individual modules of the ride. They understand how sensors could be used to monitor conditions , taking account of precision and accuracy .
Case study 9.2	Pupils develop a questionnaire to collect data enabling them to explore hypotheses or answer 'what if ...' questions, making choices of the data types and questions necessary to produce the answer. They create a database structure which enables them to interpret their collected data. They question the plausibility of results and interpret their findings producing appropriate graphs and text descriptions to justify their hypothesis . They combine this information into a structured presentation fit for a conference presentation .
Case study 9.3	Pupils find information from various sources to enable them to check the validity of their ICT solution for their front-of-house ticketing system. They extract relevant information and review issues of accuracy. They use the information to develop the model for both seating and finances. They explore the effect of changing variables to improve and test their model. They are able to justify the choice of information in the model and describe the solution to their booking system. They structure marketing information which is fit for purpose for two different audiences, justifying their choice as well as producing, refining and testing a user guide for the booking system.

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Ref: DfES 0816-2003

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Department for Education and Skills

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