Information and communication technology in the proposed primary curriculum

Introduction

The proposed curriculum has taken a fresh approach to Information and communication technology (ICT). As children live and learn in a technologically rich world the ability to use ICT tools to support learning is more important than ever. This is why ICT capability has been identified as an **essential for learning and life**[1].

The new curriculum also identifies explicit requirements to develop, use and apply ICT capability across all areas of learning. Expectations that children will become proficient in using ICT to support high quality enquiry, creative and critical thinking, communication and collaboration are higher than ever. Children's progress in ICT can be ensured through a combination of focused teaching and purposeful application across all areas of learning.

ICT in the areas of learning

1. The importance statements

Importance statements set out what each area of learning is about and why it is important. They also illustrate how ICT makes an important contribution to learning in each area of learning. For example, the importance statements for *Understanding English, communication and languages* and *Understanding the arts* describe how children respond to and create texts of all types, including multimodal and moving image texts, as part of what it means to be literate in the 21st century. Using mathematical models to explore "what if?" questions is seen as an important part of *Mathematical understanding*.
In *Understanding physical development, health and wellbeing*, recognising and managing risk is an important aspect of learning, so online safety is important. In *Historical, geographical and social understanding* and *Scientific and technological understanding*, children consider how technology shapes the way we live.

2. Essential knowledge

Important ideas such as mathematical modelling, the importance of valid evidence, understanding form and convention, managing risks, communication and interdependence are described within the essential knowledge section of each area of learning. Taken as a whole, it is possible to see how these big ideas also contribute to a deeper understanding of ICT capability.

References:

1. **ICT capability**

   Focus: Children use and apply their ICT knowledge, skills and understanding confidently and competently in their learning and in everyday contexts. They become independent and discerning users of technology, recognising opportunities and risks and using strategies to stay safe.

   Children learn how to:

   1. **find and select information** from digital and online sources, making judgements about accuracy and reliability
   2. **create, manipulate and process** information using technology to capture and organise data, in order to investigate patterns and trends; explore options using models and simulations; and combine still and moving images, sounds and text to create multimedia products
   3. **collaborate, communicate and share** information using connectivity to work with, and present to, people and audiences within and beyond the school
   4. **refine and improve their work**, making full use of the nature and pliability of digital information to explore options and improve outcomes.

3. Key skills

A common set of learning and thinking skills underpin all areas of learning. Broadly it includes the skills of investigation, creativity and critical thinking, communication and evaluation. These skills are reflected in the way ICT is described in the essentials for learning and life framework[1].

ICT can enhance the way that children find, select and verify sources of information. It can support children in developing ideas and analysing information. It can support high quality collaboration and communication. Children should exploit the pliability of digital information to explore options, refine and improve work.

4. Breadth of learning

The breadth of learning section in each area of learning sets out the range and variety of experiences children should enjoy. The breadth statements say that children should communicate and collaborate with others, both face-to-face and remotely. They should enjoy a range of texts including books, print, moving images, and web-based material. In *Mathematical understanding* they should have opportunity to explore patterns and analyse data using ICT. Through *Understanding the arts* children should use ICT tools to capture, create and present work. In *Scientific and technological understanding* there should be opportunity to make observations and control devices using sensors and switches. The resources children use across the curriculum should be wide and include databases and geographic information systems.

5. Curriculum progression

This section sets out the ICT requirements that are embedded in the areas of learning. These should be considered alongside the overall requirements for ICT described through the essential knowledge, key skills and breadth of learning in each area of learning.

5.1

Find and select information from digital and online sources making judgements about accuracy and reliability.

Find and select information:

EARLY

- to explore digital resources by using hyperlinks and simple menus[2]
- to use the internet and other digital sources to find out about significant issues, events and people and explore real and imaginary locations[3].

References:

2. to use screen-based and book conventions to search for information efficiently and safely *(understanding English, communication and languages – E12).*
3. to use the internet and other digital sources and simulations to find out about significant issues, events and people, and to explore remote and imaginary locations *(historical, geographical and social understanding – E6).*

MIDDLE

- to use key words to search for and select appropriate information from the internet and other digital sources[4, 5]
- to verify the accuracy and reliability of the information found, distinguishing between fact and opinion[6].

References:

4. to skim, scan and use key word searches and other features of texts to locate and select information *(understanding English, communication and languages – M12).*
5. to identify patterns in communities, places and past events by searching for and locating information using keywords, and carrying out searches and surveys *(historical, geographical and social understanding – M2).*
6. to verify the accuracy and reliability of information, distinguishing between fact and opinion *(understanding English, communication and languages – M13).*

LATER

- to refine searches using advanced techniques and make choices about the appropriateness of the information found[7]
- to verify the accuracy and reliability of information found online, detect bias and distinguish evidence from opinion[8, 9].

References:

7. to search for information using ICT and other methods and make choices about the appropriateness of the information *(understanding English, communication and languages – L12).*
8. to verify the accuracy and reliability of information, including from online sources, detect bias and distinguish evidence from opinion *(understanding English, communication and languages – L11).*
9. to distinguish between fact and opinion and make choices about sources of online information to find out about communities, locations and events *(historical, geographical and social understanding – L2).*

5.2 Create, manipulate and process information using technology to capture and organise data in order to investigate patterns and trends; explore options using models and simulations; combine still and moving images, sounds and text to create multimedia products.

Create, manipulate and process:

EARLY

- to collect, sort, record and represent information to inform investigations and designs[10, 11, 12]
- to draw conclusions from data they have collected[13, 14]
- to give instructions to make things happen using programmable devices[15, 16]
- to use ICT to capture information[17]
- to try alternatives using a range of tools and techniques to alter text, images and sounds[18, 19, 20]
- to combine written text with graphics, sound and moving images and present work appropriately[21].

References:

10. to collect, group, match, sort, record and represent information for a purpose and store it using ICT *(mathematical understanding – E16).*
11. to explore and observe in order to collect data and describe and compare their observations and findings *(scientific and technological understanding – E1).*
12. to sort and group information using ICT to inform investigations and designs *(scientific and technological understanding – E3).*
13. to generate and explore questions that require the collection and analysis of information *(mathematical understanding – E15).*
14. to interpret and draw conclusions from information they have collected *(mathematical understanding – E17).*
15. to generate instructions for movement *(mathematical understanding – E14).*
16. to give instructions to make things happen using programmable devices *(scientific and technological understanding – E9).*
17. to choose and record images and sounds using ICT *(understanding the arts – E8).*
18. to explore a wide range of media and materials to create artworks, improvise and depict imagined worlds, and model the real world through the arts *(understanding the arts – E1).*
19. to try out a range of tools and techniques with a range of materials for artistic purposes *(understanding the arts – E2).*
20. to experiment with designs, shapes, colours and sounds, using ICT where appropriate *(understanding the arts – E7).*
21. to combine written text with illustration, moving image and sound *(understanding English, communication and languages – E18).*

MIDDLE

- to use ICT to collect, including using surveys, and structure information so that it can be searched and analysed, including using appropriate field headings and data types[22, 23, 24]
- to capture, record and analyse data using sensors in order to support observations and investigations[25]
- to use ICT to explore a range of number patterns and models including changing values and asking "what if?" questions[26]
- to refine sequences of instructions to control events or make things happen using ICT[27, 28].

References:

22. to identify patterns in communities, places and past events by searching for and locating information using keywords, and carrying out searches and surveys *(historical, geographical and social understanding – M2).*
23. to collect and structure information using ICT so that it can be searched and analysed, including using appropriate field headings and data types *(mathematical understanding – M25).*
24. to explore and investigate in order to collect data, analyse it and identify patterns *(scientific and technological understanding – M1).*
25. to capture, record and analyse data using a range of instruments, including sensors *(scientific and technological understanding – M3).*
26. to generate and explore a range of number patterns, including multiples *(mathematical understanding – M2).*
27. to create sequences of instructions using ICT, including generating symmetric and repeating geometric patterns *(mathematical understanding – M24).*
28. to refine sequences of instructions to control events or make things happen using ICT *(scientific and technological understanding – M9).*

LATER

- to answer questions by using ICT to collect, store, analyse and present data[36]
- to check for errors and omissions in data[37]
- to represent data from analysis in appropriate ways, including the use of graphs[38]
- to use ICT to develop and explore simple models by changing variables and simple formulae[39]
- to use ICT to create and refine sequences of instructions to explore problems and make controllable systems[40, 41]
- to use a variety of ICT tools to create, develop and refine presentations and performances, integrating effects to enhance outcomes[42, 43, 44].

References:

36. to make and record accurate measurements and detailed observations, presenting them appropriately, and analyse and interpret them *(scientific and technological understanding – L3).*
37. to discuss, sort and order events according to their likelihood of occurring (mathematical understanding – L30).
38. to use ICT to represent data on a scattergraph, and proportional data in a pie chart in order to explore possible relationships and interpret the findings *(mathematical understanding – L32).*
39. to explore number patterns and properties, and represent them using graphs, simple formulae and ICT *(mathematical understanding – L3).*
40. to create and refine sequences of instructions, using ICT to construct and explore geometric patterns and problems *(mathematical understanding – L25).*
41. to make controllable systems or models, devising and refining sequences of instructions taking into account users, purposes and needs *(scientific and technological understanding – L7).*
42. to combine written text and illustration, moving image and sound, integrating different effects to add power to the words and meanings *(understanding English, communication and languages – L23).*
43. how paragraphs, bullets, hyperlinks, screen layout and headings are used to organise and link ideas, and to use these in their own work *(understanding English, communication and languages – L27).*
44. to select, develop and refine techniques and the use of materials and media to represent their ideas and express themselves *(understanding the arts – L6).*

EARLY	MIDDLE	LATER
	Create, manipulate and process:	
	• to use ICT to explore alternative ideas in order to refine and improve outcomes and performances[29, 30, 31] • to use a variety of ICT tools to create, refine and present work in a variety of digital and printed formats[32, 33, 34, 35].	

References:

29. to explore alternative approaches to develop and refine performances and communications using ICT where appropriate *(understanding the arts – M3).*
30. to explore a range of techniques, materials, processes and media, including digital media, to draw, sculpt, model, design, paint and print *(understanding the arts – M6).*
31. to recall, plan and explore sounds using symbols and ICT *(understanding the arts – M19).*
32. to create effects by combining written text with illustration, moving image and sound *(understanding English, communication and languages – M21).*
33. to use features of layout, presentation and organisation in print and on screen *(understanding English, communication and languages – M24).*
34. to explore a range of techniques, materials, processes and media, including digital media, to draw, sculpt, model, design, paint and print *(understanding the arts – M6).*
35. to create and present work in a variety of digital forms *(understanding the arts – M4).*

5.3

Collaborate, communicate and share information using connectivity to work with, and present to, people and audiences within and beyond the school.

EARLY	MIDDLE	LATER
Collaborate, communicate and share:		
• to use ICT to communicate with known audiences[45] • to use strategies to stay safe when using ICT and the internet[46].	• to use ICT to exchange ideas and collaborate with others remotely[47] • to use ICT safely and appreciate the need to keep electronic data secure[48] • to explore alternative approaches to develop and refine communication[49].	• to select and use ICT to communicate and collaborate with others remotely and in locations beyond the school[50] • to organise and adjust communication according to the needs of the audience and the technology, including taking account of the quality and content of the communication[51, 52] • to use a variety of ICT tools to create, refine and present work in a variety of digital and printed formats using appropriate forms and conventions[53, 54] • to use ICT safely, managing risk and respecting other users[55, 56].
References: 45. to communicate with known audiences using ICT where appropriate *(understanding English, communication and languages – E19).* 46. to use strategies to stay safe when using ICT and the internet *(understanding physical development, health and wellbeing – E5).*	References: 47. to share ideas and collaborate with others remotely using ICT *(understanding English, communication and languages – M22).* 48. to use ICT safely including keeping their electronic data secure *(understanding physical development, health and wellbeing – M6).* 49. to explore alternative approaches to develop and refine performances and communications using ICT where appropriate *(understanding the arts – M3).*	References: 50. to communicate and collaborate with others remotely and in locations beyond the school by selecting and using appropriate ICT *(understanding English, communication and languages – L25).* 51. to organise and adjust what they say, including the use of spoken standard English, according to the formality of the context, the needs of their listeners and any communication technology being used *(understanding English, communication and languages – L3).* 52. to identify differences between spoken and written language, both on paper and on screen, taking account of context, purpose and audience *(understanding English, communication and languages – L8).* 53. to evaluate structural and organisational features, including the use of different presentational devices, layouts and combinations of formats, and their effects *(understanding English, communication and languages – L15).* 54. to select and use appropriate ICT tools and techniques to develop and refine their ideas across the arts *(understanding the arts – L3).* 55. to use ICT safely including using software features and settings *(understanding physical development, health and wellbeing – L7).* 56. to recognise how their behaviour and the behaviour of others may influence people both positively and negatively *(understanding physical development, health and wellbeing – L10).*

5.4

Refine and improve their work making full use of the nature and pliability of digital information to explore options and improve outcomes.

EARLY	MIDDLE	LATER
Refine and improve their work:		
• to plan, discuss and review work developed using ICT in order to improve it[57].	• to refine sequences of instructions[58] • to explore alternative approaches to develop and refine work[59] • to use features of layout, presentation and organisation in print and on screen[60].	• to select and use appropriate ICT tools and techniques to develop and refine their ideas[61] • to plan, create, shape and review their work, knowing when and how to improve it using ICT[62, 63].
References: 57. to plan, discuss and review their work in order to improve it including using ICT where appropriate *(understanding English, communication and languages – E16).*	References: 58. to refine sequences of instructions to control events or make things happen using ICT *(scientific and technological understanding – M9).* 59. to explore alternative approaches to develop and refine performances and communications using ICT where appropriate *(understanding the arts – M3).* 60. to use features of layout, presentation and organisation in print and on screen *(understanding English, communication and languages – M24).*	References: 61. to select and use appropriate ICT tools and techniques to develop and refine their ideas across the arts *(understanding the arts – L3).* 62. to plan, create, shape and review their work, knowing when and how to improve it including the use of ICT *(understanding English, communication and languages – L21).* 63. to choose equipment and tools, including ICT, to make their work more effective and efficient, and explain the reasons for their choices *(scientific and technological understanding – L2).*

6. Cross-curricular studies

Clearly opportunities will arise to develop, use and apply ICT across the whole curriculum. This section of the programmes of learning sets out where there are significant and distinctive opportunities to develop literacy, numeracy, ICT and learning and thinking skills, personal and emotional skills and social skills.

In addition to the generic opportunities to enhance learning, activities where ICT can make a particularly distinctive contribution, such as using spreadsheets to create simple mathematical models and using ICT to control products in scientific and technological understanding, are identified.

7. Assessing Progress

Teachers should refer to the level descriptions for ICT when making assessments about pupils' progress, drawing on evidence from across the curriculum as a whole.