# Draft Naace Framework for Information and Communication Technology (ICT)

## Early Years Foundation Stage, Key Stage 1, Key Stage 2

## Contents

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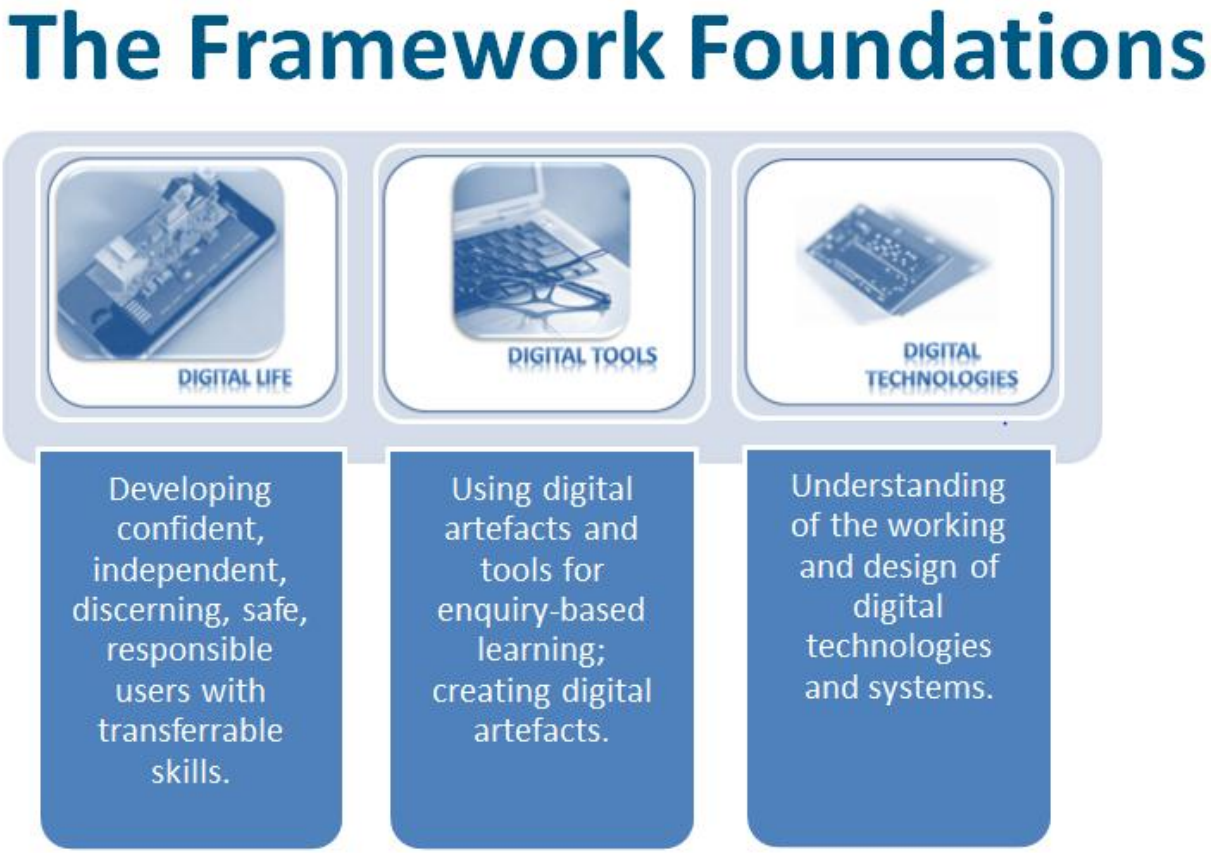
# Part 1: Introduction and Principles

## Introduction to the Framework

Welcome to the Naace ICT Curriculum Framework for Early Years Foundation Stage (EYFS) and Key Stages 1 and 2. We hope you find it useful when developing your own existing curriculum, identifying areas that may need additional support or input and in moving forward with ICT. This framework takes aspects of technology in EYFS and shows how this can be built on to develop children's learning experiences as they progress through Key Stages 1 and 2.

The Naace ICT Framework is a skeleton outline with the key areas of skills, processes, knowledge and understanding that fit within the ICT umbrella. Because of the holistic view that we take of ICT in the curriculum, we recognise that there is often not a clear cut boundary between areas of ICT learning. The Foundations of the Naace ICT Framework consist of the three areas, Digital Life, Digital Tools and Digital Technologies.



The Foundations are delivered through five areas of skills, processes, knowledge, and understanding, which provide opportunities for deeper, focused learning to support the three themes. Each Foundation theme can be found within each the five areas, all of which should be included in planning so that a broad and balanced learning experience is given to learners, whilst providing the depth of knowledge needed for future rigorous studies. Schools may find there is a need for further CPD for staff to ensure they feel confident to teach all areas effectively.

We recognise that personalising a curriculum to a school and to the learners in that school is crucial – whilst some suggestions are given about fleshing out the framework skeleton and about approaches to teaching and learning, there is sufficient flexibility and choice for a school to develop the curriculum so it works for them in their own context and builds on existing provision. Strong leadership and effective coordination will be needed to ensure a balanced approach to consolidating and applying digital skills, knowledge and understanding in subject areas other than ICT. Further support, resources and examples will be found in the Naace ICT Framework Toolkit.

It is important that there are opportunities for contextual problem solving and application of ICT skills and knowledge, but it cannot be assumed that skills can be "caught" in the process or that learners will have sufficient skills or insight for problem solving and creative approaches without them being "taught" discretely within that context. The context for developing skills and understanding helps provide a clear purpose for using ICT and reinforces the concept that technology can support learning, whatever curriculum area they are working in. There needs to be a systematic approach to teaching ICT in order to ensure opportunities for effective learning are planned for ALL aspects of the Framework.

## Using the Framework

It is widely acknowledged that many schools are well advanced in the adoption of a transformational ICT Curriculum. The framework should enable tweaking, refining and adapting of current curricula being used in school. As Ofsted said in their "ICT in Schools" report in 2011, there are many positive aspects in primary ICT education. It is important that curriculum developments build on current good practice and that this is not lost. The five areas of the Naace ICT Framework are outlined and defined in this document, along with some indicators for content which could be included in a curriculum. Definitions are provided in the Appendices and further examples and resources to support the implementation of the framework will be available in the Framework Toolkit.

Naace believes that there is no prescribed way of delivering messages to learners and there should be no prescribed script for any lesson. There is no comprehensive "right way" or "right tool" for delivering the Framework and as it is appropriately adapted in your own context, you will be able to recognise what is already good in your own curriculum and practice. The suggestions in the Framework Toolkit will supplement what you may already be using in school so that aspects of good practice can be continued, whilst areas for development can be easily identified. Those areas for development will assist in addressing recent developments and ideas about *what* needs to be learnt and the *how* it should be taught.

Although the tools and the current issues (e.g. the use of social learning, bring your own devices or the "flipped classroom" at the moment) keep evolving, the five areas of the Naace ICT Framework will remain relevant and need less frequent review than the materials in the Framework Toolkit, which will be subject to regular review every 2 years in order to remain relevant and up to date. There will be many ways of using the ideas provided in this Framework, which is why we will be encouraging teachers to share how they have used it to adapt existing curriculum to provide rich, effective learning experiences. By encouraging teachers to share the resources they have used when implementing the Framework, we will be able to learn from and support each other.

The Framework areas will support teachers as they plan learning experiences that are rich, broad, building on prior experiences throughout EYFS, KS1 and KS2 and should have sufficient depth to prepare for increasingly rigorous ICT in KS3 and KS4. In order to aid planning for progression, there are areas of study that can be linked to expected levels such as the current QCDA level descriptors for ICT or Bloom's Taxonomy. The Framework is not a scheme of work. Teachers should develop their own schemes, choosing the structure, order and combination of areas of study to best meet the needs of their pupils. In practice, a child's experience of this framework at EYFS, KS1 and KS2

will be integrated into cross curricular learning contexts for much of the time and each of the themes/areas will be indistinguishable. But for teachers, the themes and areas will support planning learning experiences so that they are rich, broad, build on prior experiences and have sufficient depth to prepare for increasingly rigorous ICT in KS3 and KS4.

Some aspects of ICT may appear in more than one area of learning e.g. programming is a skill that needs to be learnt, but it will also provide an insight into technologies and how they work. Because there is a natural overlap between aspects of these areas of knowledge, schools will be able to plan flexibly for the ability and aptitude of learners, including Gifted and Talented and available time-table time and ICT resources.

Proposals are based on the concept that learners have a "Digital Life". In practice this will be several interwoven digital lives - school, work, social networks, gaming, day to day activities such as shopping and possibly use of Web 3.0 technologies. In order to be effective, safe and knowledgeable citizens, learners should be able to choose and use tools appropriately for effective communication of ideas, finding information or solving problems. Making these choices wisely requires levels of understanding and a range of skills, knowledge and competence. It may involve understanding aspects of hardware and software, choosing to use a wiki to prepare shared information pages or deciding between the use of video or still photography when showing what they have learnt in a science topic. Having a high level of "Digital Wisdom" will result in learners who can make decisions about using technology in interesting, creative and productive ways and involves having a "bigger picture" of all the aspects of ICT and being able to make connections between them. Developing learners with Digital Wisdom lies at the heart of the ICT learning experiences and incorporates the wisdom that is not ours innately, but which we are able to develop through the appropriate use of technology.

The whole ICT learning experience lies within the context of 3rd Millennium Learning – a down-to-earth approach to using 21st century tools to empower learners, enabling learning that wouldn't otherwise be possible. Third Millennium schools embody a culture of embedded and effective ICT use across the curriculum, to the extent that it becomes invisible and the learning becomes paramount. They use resources and learning environments creatively, including opportunities to develop higher level thinking skills throughout each area of the ICT curriculum, equipping, empowering and enabling learners to adapt to an ever-changing digital landscape. Levels from Bloom's taxonomy have been mapped successfully to National Curriculum ICT levels and are available as part of the supporting materials in the Naace ICT Framework Toolkit.

In a Digital Life, tools and resources enable us to innovate, research and generate knowledge. They enable the generation of "artefacts" which can be used or created by learners - including digital documents, presentations, programmes and codes, video and audio files, images and photographs. There are some overlaps with digital technologies, where tools and artefacts are

likely to be combined for a purpose or to build a system, e.g. creating a website containing information, photos and video about a particular interest *for others to use*. Creating an artefact can include aspects of ICT which involve computational thinking, knowledge and understanding of computer science and coding, e.g. designing, developing and creating a game by programming, or developing an app *for others to use*. The program which is written may in turn act as an artefact for others. Understanding key characteristics of tools and being able to evaluate their design and suggest improvements are part of design processes. Alongside enquiry based approaches to learning, they provide valuable opportunities to incorporate higher level thinking skills, as learners apply their expanding range of knowledge, understanding and skills of tools and the technologies that support them.

## Digital Wisdom and ICT Capability – Teaching and Learning Strategies

ICT capability is about having the technical, cognitive and affective proficiency to access appropriately, to use, develop, create and communicate information using technological tools. Learners demonstrate this capability by purposefully applying technology to be creative, solve problems, analyse and exchange information, develop ideas, create models and control devices. They are discriminating in their use of information and ICT tools and systematic in reviewing and evaluating the contribution ICT can make to their work as it progresses.

ICT capability is much broader than a set of technical competences in software applications although, clearly, these are important. ICT capability involves the appropriate selection, use and evaluation of ICT. *In essence, pupils need to know what aspects of ICT are available to them, when to use it and why it is appropriate for the task.* Prensky suggests that this is an aspect of Digital Wisdom, which includes the wisdom arising from the use of technology to access cognitive power beyond our innate capacity, as well as prudent use of technology to enhance capabilities.

It is important that lessons are not driven by the tools available – either hardware or software - but focused on clear teaching and learning objectives. In such a context, ICT is used as a vehicle or as a powerful tool to solve problems and develop Digital Wisdom. Effective and appropriate use of ICT, knowledge, skills and understanding will need explicit, discrete ICT learning opportunities which incorporate higher level thinking skills, with opportunities for pupils to demonstrate their ability in the higher levels of attainment and application, rather than focusing on lower level skills of how to use software or knowledge of technology – level 1 and 2 in the diagram of Bloom's taxonomy below. Modelling design processes encourages learners to use higher level thinking skills such as level 4, 5 and 6 in the diagram.

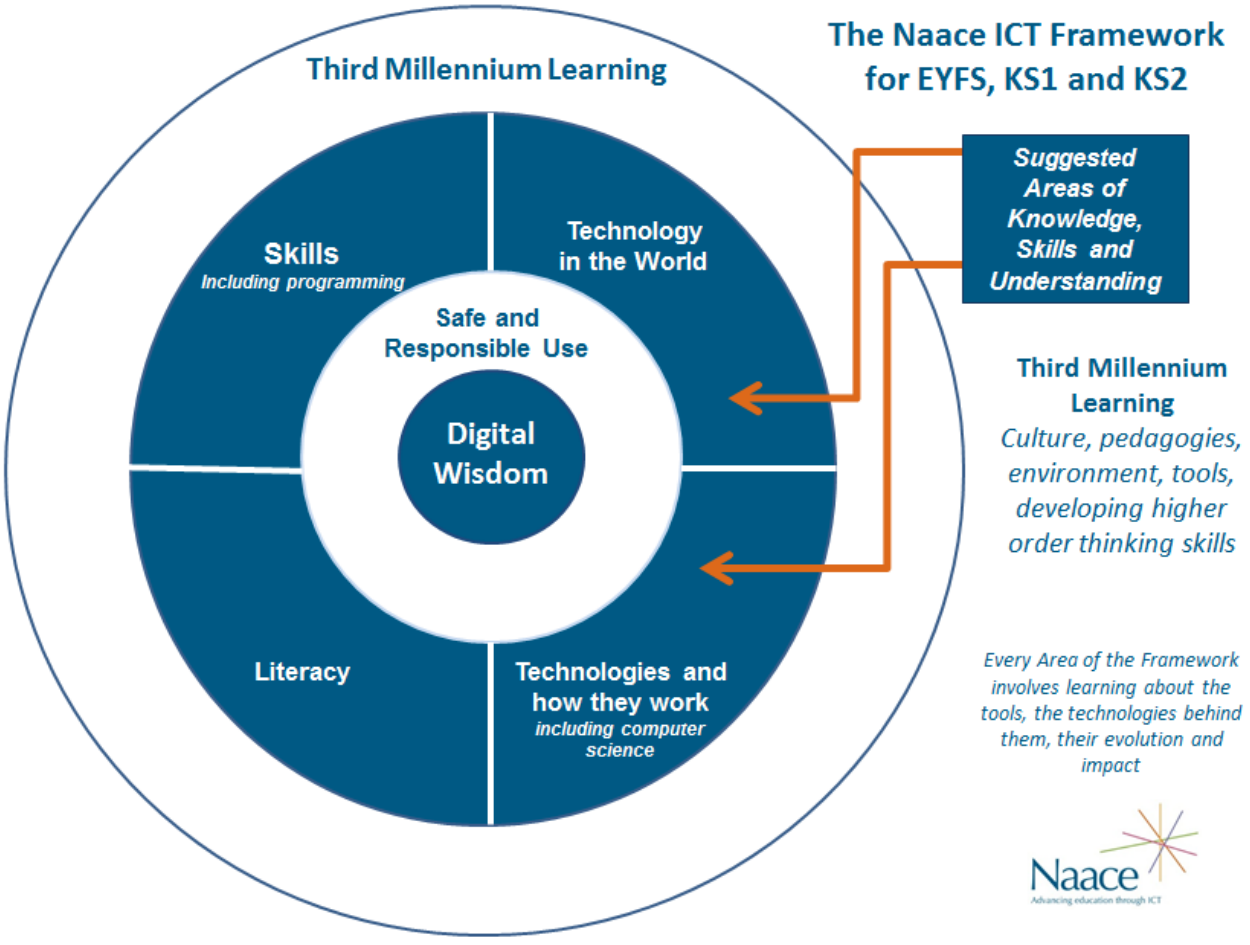

Moving beyond basic levels in Bloom's taxonomy (see above) enables learners to develop features identified by ISTEnets (see below).


- Innovator
- Evaluator
- Creator
- Communicator
- Collaborator
- Problem solver
- Analyst
- Social conscience
- Decision maker

# Part 2: EYFS, KS1, KS2 Naace ICT Framework

## The Naace Knowledge Hub

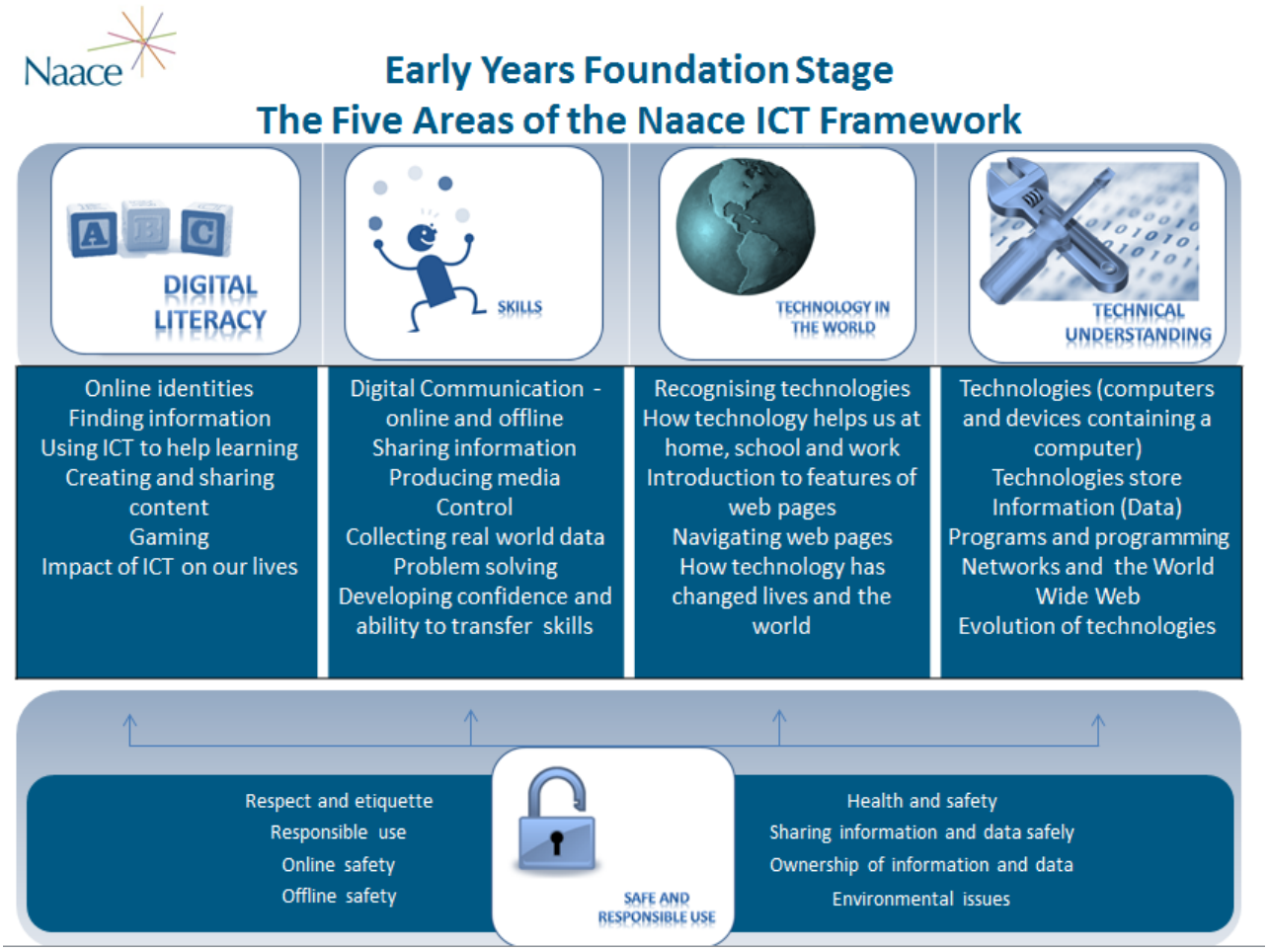
The Framework is based around the 5 areas of technical knowledge, digital wisdom, e-safety/security, world of work and digital literacy. Many aspects can and should be taught within contexts that are made relevant to pupils. Each of the indicated areas for study contain elements of Digital Life, Digital Tools and Digital Technologies, and when using the Framework opportunities should be incorporated for learners to see how areas are interconnected and interdependent. Some aspects of ICT may appear in more than one area of the Framework, e.g. programming is a skill that needs to be learnt, but it will also provide an insight into technologies and how they work. Because there is a natural overlap between aspects of these areas of knowledge, schools will be able to plan flexibly for the ability and aptitude of learners, available time-table time and ICT resources.



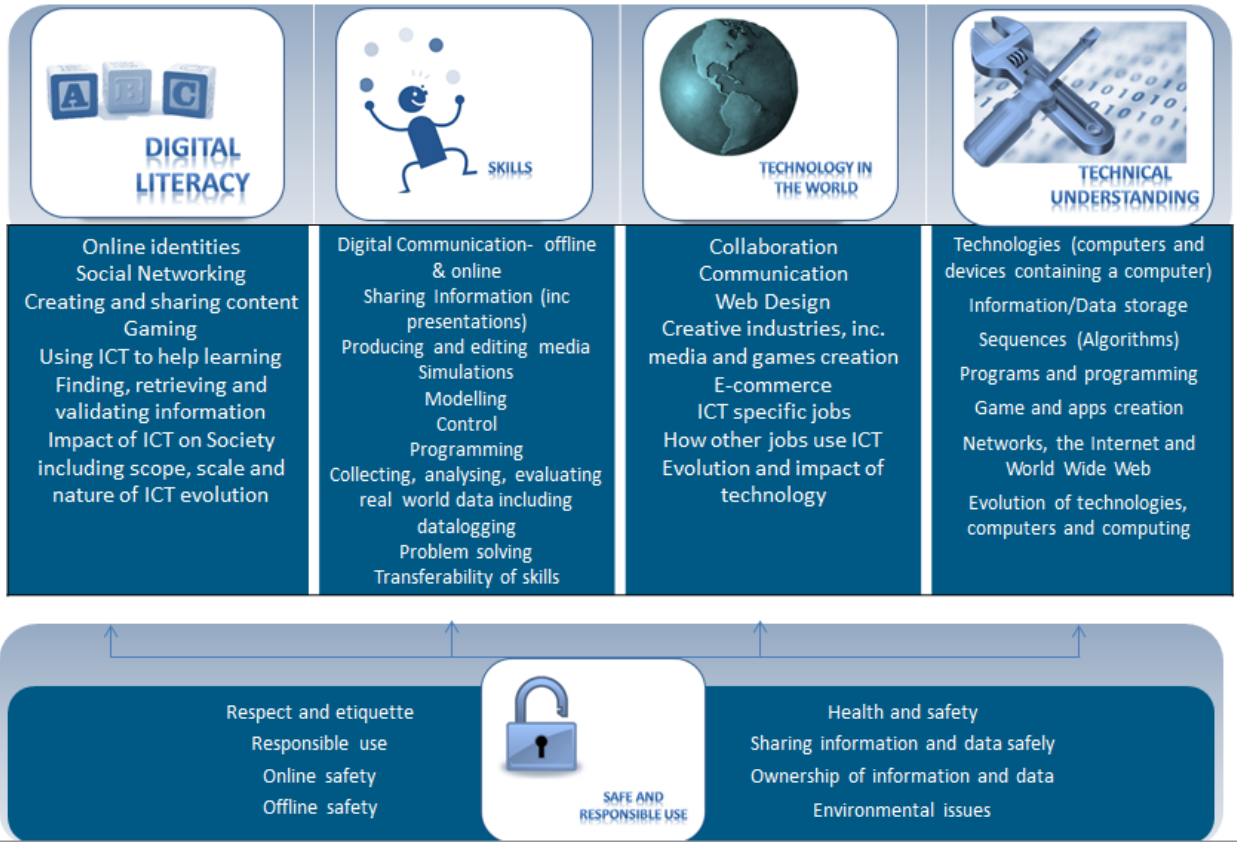
## The Five Areas of the Naace ICT Framework

These are broad areas of ICT knowledge, skills and understanding that Naace considers essential for learners in the Third Millennium. It is important that learners develop their understanding within meaningful contexts in order to support their understanding and transferrable application of skills. Content cannot be fixed in time as the speed of technological advance means that the schemes of work must be flexible enough to enable teaching on new tools, ethical and safety issues and ways of working and learning to be adopted quickly, both within the subject of ICT and the wider use of ICT tools throughout learning and teaching. However, these are intended to be generic and not tied to particular tools or technologies.

We have defined the suggested areas of the Naace ICT Framework as follows:



# Key Stage 1 and 2
# The Five Areas of the Naace ICT Framework



## Safe and responsible use


This is an area of knowledge that Naace recommends should be embedded throughout the other areas of knowledge, with contextual opportunities to apply knowledge and understanding within those other areas of ICT, as well as in other curriculum subjects. Learners will explore both online and offline safety issues, as well as developing an awareness of ownership of digital artefacts, copyright issues and data/identity protection.

EYFS children are learning that appropriate, respectful ways to communicate are important and this should include digital communications, whether online or offline. Knowing that they create things that belong to them and can be shared with others will include the creation of digital artefacts – videos, photos, sound recordings, pictures, etc - and the different ways that technology can help us share with others. This introduces the need for appropriate treatment of information and data. Considering recycling of equipment or turning off the power at night provides a useful introduction to environmental issues.

As they progress through KS1 and KS2, learners will develop this awareness into a deeper understanding of e-safety, health, environmental, social and moral issues in relevant contexts as they use technology for meaningful learning, including online interactions, research and sharing their own work.


## Digital Literacy

The focus of this area is developing ICT skills that can be thoughtfully applied in a range of different situations. Digital literacy is a term that may have many different definitions and is used in many different ways. We have used the definition from Futurelab (see Appendix). It is one aspect of the Digital Wisdom that is at the heart of what we are teaching. As children develop their skills and understanding of the technologies that are available, they are then able to use them in different curriculum contexts, with increasing independence in the choices they make. They will increasingly take the lead in making decisions about which tool will help them achieve the desired outcome. Skills are consolidated and reinforced by cross-curricular application. In order to apply skills in a range of contexts, there will be times when Digital Skills are being developed hand-in-hand with Digital Literacy.

For example, EYFS children will be observed choosing to use a camera when they think it is appropriate –Literacy - alongside learning to use the camera to take a photograph and upload it to a computer –Skills – and the names of parts of the camera – Technologies and how they work.

As they progress through KS1 and KS2, children will become increasingly confident about applying their Digital Skills, becoming increasingly efficient and effective communicators, collaborators, researchers, analysts, evaluators who show imagination and creativity in their use of technology in different aspects of their learning and life beyond school.

## Skills


Just as sporting skills can be honed and refined through practice and application, so digital skills can be practised in order to improve them. This area deals with the use of a range of common ICT tools for communication, information finding, content creation, control and the application of ICT to everyday personal, social, creative, learning and work outcomes. Teaching digital skills enables learners to make informed and sensible choices about when and how they should be using ICT, as well as selecting an appropriate tool for the job. These skills are determined by what a child needs to participate effectively in digital activities at home as well as at school , rather than tied to particular tools and technologies that might become outdated.

In EYFS, children will be supported to make their own images, videos, sound and text content using a range of tools in different contexts. They will learn to communicate with others using different digital tools, e.g. voice recording with microphones built into technology, texting on a mobile phone, picture on an internet page; they will share information about their learning using the same kinds of technology and they may play with floor turtles or other electronic toys, giving them instructions and controlling their movement.

As learners progress through KS1 and KS2, they will develop increasingly sophisticated presentation and multimedia skills. They will share information in a variety of forms, both offline and online, and understand what simulations are and how they are used. They will become increasingly proficient and discerning when finding information and data, using their higher level thinking skills to evaluate its veracity and analyse it. Programming skills will be developed, with a range of opportunities for learners which may include floor turtles, screen turtles, robots, games creation, apps and websites.

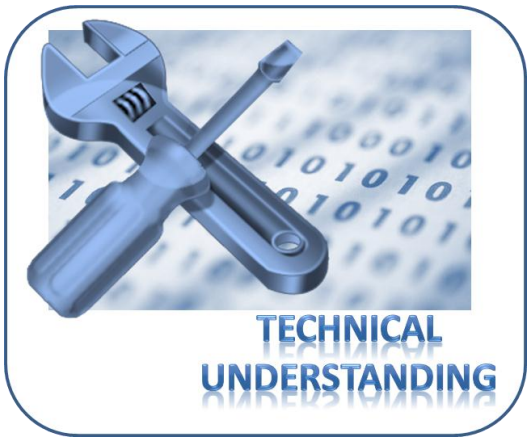
## Technology in the world


Learners develop an understanding of how technology makes a difference at home, in school and within the workplace, as well as the impact technology has had on society over the years.

In EYFS learners will recognise different types of information are on a web page including text, images and buttons to help with navigation. They will develop an awareness of how technology is used in the world around us, including some of the ways people use ICT to help them in their jobs or to make tasks such a grocery shopping more convenient.

As they progress through KS1 and KS2, children will build on this awareness. They will continue to evaluate web pages, looking at what makes a web page useful, helpful or interesting and using design processes when preparing their own web pages. They will develop a greater understanding that the ICT they use is supported by people who have many different types of jobs, within in many different creative industries. They will learn about the different ways that technology is used to communicate and collaborate with each other at home and at work, e.g. social media, video conferencing. They will discuss how technology has made our lives different to those of our parents and grandparents.

## Technical Understanding




This area deals with knowledge and understanding of how technologies, computers and computer systems work, how information and data is stored and similarities/differences between networks, the internet and the World Wide Web. It covers aspects of what is sometimes referred to as computer studies or computer science. Increasingly, the terminology that is used for activities reflects the terminology that is used in computing, programming, coding and games development. They develop an awareness of how information and data can be stored and have opportunities to see the workings of a computer, identify the parts of a computer on the inside/outside. This area also covers the pace at which technology has changed over the last 50 years, the nature of some of those changes, the prospects for further change and the key individuals who have made the changes possible.

By the end of EYFS, children will have developed an awareness that there is something inside a piece of technology that makes it work, which may be e.g. a code or program in a web page/game or hardware "bits" inside a DVD player. As they progress through KS1 and KS2 their understanding develops further and they begin to create their own simple programs, including games and apps.

In EYFS, children may talk about digital information being stored and as children progress through KS1 and KS2, they will be able to make the distinction between information stored on one computer on a drive or in the "cloud". They will become increasingly proficient at accessing or sharing data and information digitally will include developing an understanding of which parts of the technology are used to store data and the format that is needed.

In EYFS, children will explore how technology enables us to connect with others. As they progress through KS1 and KS2, they will develop an understanding that links are made between computers in school and between computers all over the world, that some technologies are networked, connected to the internet or not connected. From developing awareness that coding/programming is used to make a web page or game, they will develop a deeper understanding and gain practical experience of coding/programming. This may involve using embed codes in their own online pages, adapting a ready prepared programme for their own purpose, creating a game or interactive activity using a visual programming tool such as Kodu or Scratch or creating an app.

## Additional Note: Evolution and Impact

Naace believes it is important that learners understand the impact of evolving technology on society over the years, how computing has developed and that they consider the future of technology. **Within each** of the suggested areas of the Framework, wider learning opportunities should be encouraged, along with creative activity in the classroom, so that learners develop a bigger picture of how technology has and can develop or have an impact on lives. Through that, learners can discover a sense of wonder at the speed of technological change and vast increases in capability, as well as 'future-gazing' – debating and contemplating hitherto unknown technologies.

## Finally

This is a framework designed to inform and support those who are developing their own school curriculum and who wish to provide breadth and balance, as well as a rigorous approach which prepares learners for more in depth studies at KS3, KS4 and beyond. In the spirit of professional generosity, the curricula, lessons and resources that you develop as a result of considering aspects of this Framework can be shared back with the larger community of educators by emailing them to office@naace.co.uk .

# Part 3: Definitions

## Digital Literacy:

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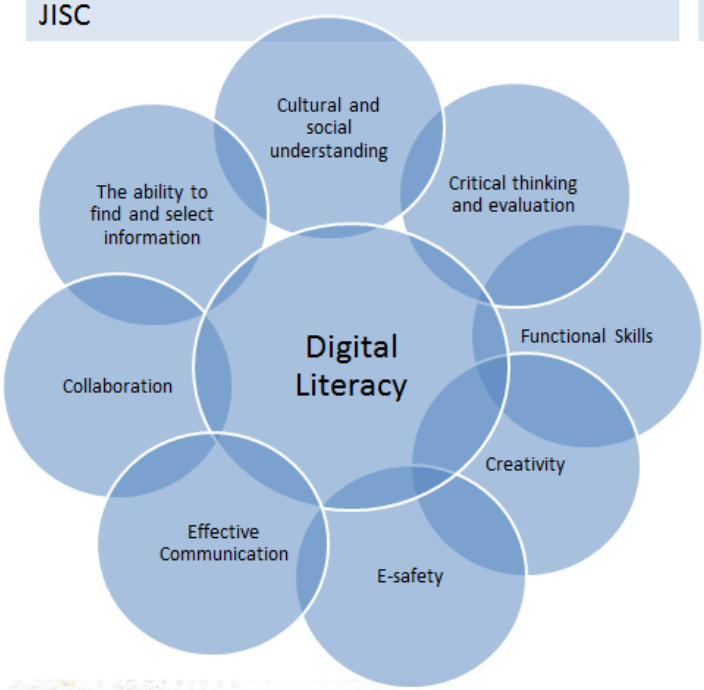
### Digital Literacy

"… those capabilities which fit an individual for living, learning and working in a digital society" JISC

"… the confident and critical use of ICT for work, leisure, learning and communication" EU




From **Futurelab:** Digital literacy across the curriculum
http://www.futurelab.org.uk/resources/documents/handbooks/digital_literacy.pdf

*"Digital Literacy is a complex and contested term… goes beyond a focus on the individual technical competence and functional skills needed in order to operate digital tools; it refers to the more subtle and situated practices associated with being able to create, understand and communicate meaning and knowledge in a world in which these processes are increasingly mediated via digital technologies."* - Futurelab

Some of these aspects of ICT may be developed, consolidated and applied through other curriculum areas such as Maths, MFL, Science, etc but in order to be digitally literate across the curriculum, skills need to be taught in a focused way .

## Digital Wisdom:

Being able to choose and use tools appropriately for achieving effective communication of ideas, finding information or solving problems involves levels of understanding in order that wise choices may be made, underpinned by a sound understanding of the technologies involved. Digital Wisdom involves having a "bigger picture" of all the aspects of ICT and being able to make connections between them. As well as prudent use of technology, digital wisdom includes the potential that technology has to support learners in being wise beyond their innate capability. Having a high level of Digital Wisdom means decisions can be made about using technology in interesting, creative and productive ways.

*"Digital wisdom is a twofold concept, referring both to wisdom arising from the use of digital technology to access cognitive power beyond our innate capacity and to wisdom in the prudent use of technology to enhance our capabilities. Because of technology, wisdom seekers in the future will benefit from unprecedented, instant access to ongoing worldwide discussions, all of recorded history, everything ever written, massive libraries of case studies and collected data, and highly realistic simulated experiences equivalent to years or even centuries of actual experience. How and how much they make use of these resources, how they filter through them to find what they need, and how technology aids them will certainly play an important role in determining the wisdom of their decisions and judgments. Technology alone will not replace intuition, good judgment, problem-solving abilities, and a clear moral compass. But in an unimaginably complex future, the digitally unenhanced person, however wise, will not be able to access the tools of wisdom that will be available to even the least wise digitally enhanced human."* Prensky

## Digital Artefacts:

From the Latin phrase *arte factum,* from *ars* skill + *facere* to make

From the Oxford English dictionary, the definition of an artefact is "an object made by a human being, typically one of cultural or historical interest." Another definition is that it is something observed in scientific experiments or investigations, not naturally present but occurring as a result of preparative or investigative procedures.

A digital artefact is made by a human being with skill or art. Although digital content is produced using technology tools and applications, it is "made with skill" and may result from preparative or investigative procedures. Learners need to be taught both the knowledge and skills required to create high quality "artefacts" that can compete against the best in the world. Digital artefacts include information prepared or shared in digital forms e.g. photos, videos, digitally prepared text, multimedia, databases, websites, presentations, music, e-books, programs, coding, etc.

# Third Millennium Learning

## Culture, attitudes and pedagogies

Responses to technology by whole school community are positive, creative and demonstrate a willingness and open-ness to use technology to enhance learning, teaching, assessment and communication with all stakeholders.

## Environment and tools

The physical environment and availability of a wide range of tools supports learning across the curriculum, is conducive to developing effective teaching and learning opportunities and supports the creative use of technology.

## Developing Learners

Third Millennium schools promote approaches to teaching and learning that encourage higher level thinking skills. Pedagogies may promote the higher levels of Bloom's taxonomy, or ISTEnets for students, or PLTS (Personal Learning and Thinking Skills). Tech-empowered, constructivist, design process approaches are used.

## Features often seen in Third Millennium Schools

- Embedded technology
- Invisible technology
- Technology enabled learning
- Technology empowered learners
- Personalisation through tech
- Range of tools
- Technology enabled assessment
- Technology enabled parental involvement
- Independent learning
- Collaborative learning
- Exploration in learning
- Dynamic learning
- Thinking skills
- Celebrated achievements
- Data to inform and improve
- Flexible teaching and learning spaces to support flexible approaches to learning experiences
- Clear impact of tech on outcomes
- Vision for lifelong learning journeys
- Tech-captured learning experiences

## Design Processes

*Learner should use design processes when creating digital artefacts, digital solutions and digital systems.*