Digital Learning Strategy and Action Plan

2017-2020

Argyll & Bute COUNCIL

Ambition
OUR VISION
Excellence
Equality

Community Services: Education

CONTENTS

1. Introduction

Digital technology is embedded in all aspects of modern life. Children, young people and adults alike have access to technologies today that are transforming how and where they connect, share, work and play in innovative and exciting ways. Children and young people are growing up in a world surrounded by technology. A digital lifestyle has become the norm.

Argyll and Bute is economically fragile due to the highly rural environment. Our economic future must have digital learning and people with digital skills at its heart.

The Scottish Government launched a Digital Learning and Teaching Strategy in September 2016. Their vision is for Scotland's educators, learners and parents to take full advantage of the opportunities offered by digital technology. In order to raise attainment, ambition and opportunities for all. Conditions must be created to realise this vision and unlock the potential of digital technology in schools. The number of key curriculum developments within digital learning requires teachers and learners to be confident and competent in the use of technology. Argyll and Bute establishments, staff and pupils must be ready to embrace the changes that will inevitably take place. Digital Learning within Education in Argyll and Bute is more than just providing students with a device it is:

- a combined use of technology, use of digital content, creation of digital content and teaching;
- a recognition that technology is the tool, not the teacher, and
- using technology to deliver learning that engages and motivates pupils.

Teachers are essential to digital learning. Technology may change the role of the teacher but it will never eliminate the need for a teacher.
The growth and development of different types of digital learning is rapid and constantly changing.

Argyll and Bute Education Service's aspiration in "Our Children Their Future", is to ensure that Argyll and Bute is the best place in Scotland for our children to grow up.

This vision will be delivered for all our children through the following 6 key objectives.
We will:

- raise educational attainment and achievement for all;
- use performance information to secure improvement for children and young people;
- ensure children have the best start in life and are ready to succeed;
- equip young people to sustain positive destinations and achieve success in life;
- strengthen partnership working and community engagement, and
- strengthen leadership at all levels.

2. Digital Learning in Argyll and Bute

Digital learning will play a key role in delivering the vision and these objectives. Across Argyll and Bute digital learning is delivered and experienced in a range of settings, including:

- Early Learning and Child Care;
- Primary and secondary schools;
- Youth learning services, and
- Partnerships with local colleges and business partners.

The size of schools varies significantly across the authority with primary school rolls ranging from under 5 to around 400, and secondary school rolls ranging from around 25 to over 1300.
There are currently 25 primary schools with a roll of fewer than 20 pupils.
The number of devices across the Education estate totals 5403 computers (Primary estate 2313, Secondary estate 3090) and 1877 iPads.

Despite these challenges a number of schools have achieved national recognition for work in computer programming, games design and use of technology. Examples of this work can be found at https://blogs.glowscotland.org.uk/ab/sal.

Argyll and Bute Education Services continue to support digital learning as an important feature of the delivery of high quality learning and teaching. The Digital Learning team currently consists of Education Officer, Education Support Officer and 2 Modern Apprentices.

From 2010, the IT service embarked on an ambitious plan which laid the foundations for learning technologies across Argyll and Bute education establishments. This included investment in wireless technologies, iPads, the Pathfinder North Network, rolling refresh of education hardware, deployment of a single Microsoft licence, domain extension and Lync pilot. It is recognised that digital learning is constantly evolving and a new strategy action plan is required to build on these developments.

The existing positive working relationship with IT, a fast and reliable education network and continued investment in our infrastructure are vitally important to the successful implementation of our strategy. Education and IT work closely to facilitate digital learning, support the development of digital leaders and the provision of digital opportunities and experiences for our learners.

Our strategy includes a renewed Vision for Digital Learning. Learners are at the heart of our vision, by learners we mean all learners, pupils, staff and the community.

Our 3 year strategic action plan is structured around the following 4 objectives which clearly support the 6 Education outcomes outlined on page 2:

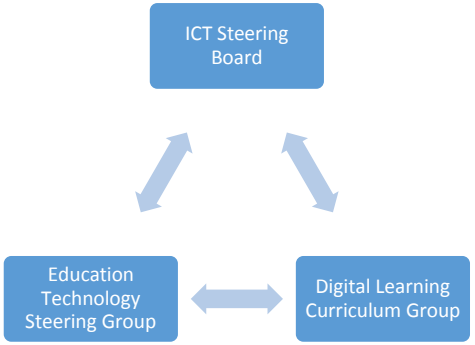
- Develop the skills and confidence of educators and learners in the appropriate and effective use of digital technology in learning, life and work;
- Improve opportunities and access to digital technology for all learners enabling them all to develop as digital leaders;
- Ensure that digital technology is a central consideration in all areas of curriculum and assessment delivery, and
- Empower leaders of change to drive innovation and investment in digital technology for learning and teaching;

3. Digital Learning - Our Vision

We will ensure that digital learning in Argyll and Bute:

- reshapes leaning environments to increase motivation, engagement and empowers learners;
- provides our young people with the skills required to contribute to the rapidly growing global digital economy including jobs which don't exist yet;
- supports our young people to acquire the skills, attributes and competencies necessary to flourish in life, learning and work now and in the future.
- provides exciting computer science and technology related learning opportunities for our young people, which will allow them to have the knowledge to create in addition to just being consumers of technology, and
- strives to increase the technology employment opportunities available locally giving our young people a choice in where they live and work.

4. Digital Learning Strategic Groups



Given the ever evolving nature of emerging digital technologies it is imperative that we communicate effectively with staff, pupils, parents and partners to successfully move towards achieving our vision.
The following groups will ensure that the education resources digital learning team continue to work closely with colleagues from schools and IT to implement our action plan.

ICT Steering Board

- The role of the ICT Steering Board is to set the strategic direction for ICT for the Council and to make strategic decisions about all ICT and digital developments. The ICT Steering Board oversee the prioritisation, development and delivery of the ICT capital work programme, ensuring the most appropriate deployment of funds and resources in support of the Council's corporate and service objectives. This extends to the assessment of outcomes and ensuring that expected benefits are delivered
- Membership includes Executive Director Customer Services; Head of Customer and Support Services; ICT and Digital Manager: ICT Project and Liaison Manager; Production Manager; ICT Client Liaison Officer; Head of Facility Services; Head of Planning and Regulatory Services; Finance Manager; Head of Governance and Law; Network and Servers Manager; Education Representative and NHS Highland Representative

Education Technology Strategy Group

- The role of the Education Technology Strategy Group it to set the strategic direction for digital learning within the Education Service and to make strategic decisions about ICT and digital developments across all functions of the Service. This includes monitoring and oversight of the Digital Learning Strategy and assessing and evaluating progress towards our agreed objectives and impact on learners
- Should make bids for ICT capital to the ICT Steering Board for project that bring innovation to the service.
- Membership includes Head of Education; Head of Customer and Support Services; ICT and Digital Manager, Customer Services; ICT Client Liaison Officer; Education Officer Digital Learning; Education Support Officer Digital Learning; Primary and Secondary Teachers and Headteacher representation.

Digital Learning Curriculum Group

- The role of the Learning Technologies Curriculum Group is to identify, discuss and implement digital resources and +developments which inform the curriculum and teaching and learning across Argyll and Bute. This group will make recommendations to the Education Technology Strategy group and support the implantation of the digital learning strategy
- Membership includes Education Officer Digital Learning; Education Support Officer Digital Learning; ICT Client Liaison Officer Primary and Secondary Teachers.

5. Digital Learning Action Plan (3 years)

Digital Learning Action Plan

Priority No.	QI	Priority
1		Develop the skills and confidence of educators and learners in the appropriate and effective use of digital technology in learning, life and work

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Develop a network of digital partnerships that support learners and teachers	Ongoing GLOW training and support offered in the 4 localities by December 18	MOD, Lead Officer 16+, Digital Learning team, Babcock, Mite, Google, XMA, UHI/Argyll College, Youth Workers, Existing work experience providers, GLOW, RM Education	Networking using the Digital Hub – Dunoon as the focus
Continue to develop technology events 3 – 18 to promote and provide new and exciting technologies for use across the curriculum. Giving our staff and learners the skills and confidence to use existing and emerging digital technology to effectively support and enhance	Deliver one central event annually.	Digital Learning Team, School Support, IT, schools and partners.	Digital Learning Team, School Support, IT, schools and partners. Using the Digital Learning Budget maintain sufficient digital learning technology sets to deliver these events.

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
learning and teaching and the wider curriculum. Use these events to develop the skills and talents of our young people as creators of digital content with a focus on promoting career opportunities in the technology sector	Deliver two area events annually by December and May. In each school term aim to undertake 15 school visits across all geographical areas	Digital Learning Team, School Support, IT, schools and partners. Modern Apprentices, Education Support Officer and XMA Lead Officer 16+ and Local technology companies	
Provide schools and Youth Services with update guidance on internet safety including cyber security	September 2018	Digital Learning Team, Police Scotland and technology companies	Meeting time in July/August. Identify existing online material and training
Through the area, geographical and school digital learning events the central team will co-ordinate professional learning opportunities for staff alongside learners to ensure their own digital literacy meet the requirements of the GTCS	Deliver one central event annually Deliver two area events annually by December and May In each school term aim to undertake 15 school visits across all geographical areas	Digital Learning Team, School Support, IT, schools and partners Digital Learning Team, School Support, IT, schools and partners Modern Apprentices, Education Support Officer and XMA	Digital Learning Team, School Support, IT, schools and partners Using the Digital Learning Budget maintain sufficient digital learning technology sets to deliver these events

Evidence of Impact on learners – How do we know?

Priority No.	QI	Priority
2		Improve opportunities and access to digital technology for all learners 3 - 18 enabling them all to develop as digital leaders;

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Education service digital learning team has the capacity and knowledge to manage and develop a central equipment resource bank and support establishments 3 -18. This will be delivered through digital learning sessions in localities and individual schools through the lending of class sets of specific technology. This will allow schools to trial resources demonstrating impact and benefit to learners and make informed decisions about investments and how technology can be best used to support and develop the curriculum	Annual audit of equipment in July and August. Annual audit of Digital Learning Team Knowledge in July and August	Digital Learning Team and Schools	Digital Learning Budget, through central suppliers identify emerging technologies and sector leading practices for Digital Learning Team to explore
Continue to develop technology events to promote and provide new and exciting technologies. Give staff and learners the skills and confidence to use existing and emerging technology to effectively support and enhance learning and teaching across the curriculum. Use events to develop the skills and talents of young people as creators of digital content	Deliver one central event annually Deliver two area events annually by December and May In each school term aim to undertake 15 school	Digital Learning Team, School Support, IT, schools and partners Digital Learning Team, School Support, IT, schools and partners Modern Apprentices, Education Support Officer and XMA	Digital Learning Team, School Support, IT, schools and partners Using the Digital Learning Budget maintain sufficient digital learning technology sets to deliver these events

Deliver events centrally, in each geographical area and individual establishments	visits across all geographical areas		
Tasks to achieve priority	**Timescale and checkpoints**	**Those involved – including partners**	**Resources and staff development**
Headteachers/senior leaders within establishments ensure that learning, skills and development from events are used to drive forward digital learning across the curriculum. In post event evaluations include a section for schools to outline next steps and expected impact on learners. Education officers to follow up with discussions in schools as part of the routine visits	Following events and/or schools visits evaluations are completed by the school Progress and next steps monitored by officers in QIT 4 visits	Digital Learning Team, Education Officers and Headteachers	QIT 4 visit Evaluation forms Digital Learning Team, Education Officers and Headteachers School improvement plans
Implement an effective solution for the management of school iPads to ensure that they support effective learning and teaching across the curriculum	Autumn 2017 Digital Learning Strategy Group meeting decide on solution Start migration for the current iPad estate and train staff in schools to be able to enrol new device into the MDM January 2018 Solution fully implemented for current iPad estate June 2019	IT, Digital Learning Team Depending on solution external supplier or redefinition of the web developer post	Funding for MDM, funding for external supplier or agreed redefinition of web developer post Training delivered across all locality areas to ensure that school staff have the knowledge and understanding to maintain the MDM beyond the transition period

Tasks to achieve priority	**Timescale and checkpoints**	**Those involved – including partners**	**Resources and staff development**
Through the area, geographical and school digital learning events the central team will co-ordinate professional learning opportunities for staff to ensure their own digital literacy meet the requirements of the GTCS	One central event annually Two area events annually by December and May Each term aim to undertake 15 visits across all geographical areas	Digital Learning Team, School Support, IT, schools and partners Modern Apprentices, Education Support Officer and XMA	Digital Learning Team, School Support, IT, schools and partners Using the Digital Learning Budget maintain sufficient digital learning technology sets to deliver these events
Headteachers and senior leaders in establishments plan through the improvement planning process for appropriate and effective digital provision to ensure consistency and effective progression across and through the curriculum	Roll out over 3 years support to schools in developing a vision and strategy for digital learning Annually in August audit improvements plans to identify digital learning priorities and allow central team to priories work	Schools, XMA, Digital Learning Team, Digital Learning Curriculum Group, Area Education Officers and Modern Apprentices	For XMA/Digital Learning Team to deliver 3 session to every primary school Digital Learning team deliver session in individual schools and across localities. Area Education Officers discuss Digital Learning priorities QIT1 and feedback to Digital Learning team
Secondary school technicians are supported to develop a consistent approach to supporting users across the education estate in creative learning opportunities	Discussion Autumn 2017 Education Technology Strategy Group Spring 2018 consult with HTs and professional associations as appropriate	Education Technology Strategy Group, EMT, IT, Headteachers, Technicians and professional associations	Meeting time and technician training as appropriate from education and IT

	Full implementation by June 2020		

Evidence of Impact on learners – How do we know?

Priority No.	QI	Priority
3		Ensure that digital technology is a central consideration in all areas of curriculum and assessment delivery

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Use of policy lead report, Education newsletters, SAL and SALi to communicate curricular and assessment developments, changes within digital learning, opportunities, training, resources, sharing of practice	Quarterly for newsletter, SAL and SALi	Digital Learning Team led by Modern Apprentices and school support	Support for Modern Apprentices in writing articles and reports
Headteachers and senior leaders in establishments ensure digital learning is an integral feature of the curriculum, teaching and learning	Audit QIT2 visit 2017/2018	Education Officers and Headteachers	QIT2 agenda and minutes and school improvement plans where appropriate

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Maintain an awareness of the development of digital assessment which may arise from Scottish Government NIF and support schools if required	Ongoing	Education Management team and Digital Learning team	National documentation
In partnership with e-Sgoil and Western Isles Council use the online Videoconferencing service Vscene to support the delivery of Gaelic medium education Continue to explore the use of Lync for learning and collaboration across the service	Ongoing	Education Strategy group, Education Support Officer – Gaelic, Digital Learning team	Evaluate impact on learning of use of Vscene, Support and training for Modern Apprentices in Vscene Evaluate any usage of Lync for this purpose
Implement an effective solution for the management of school iPads to ensure that they can be effectively used as an integral tool for learning and teaching	Autumn 2017 Digital Learning Strategy Group decide solution. Start migration for current iPad estate, train staff in schools to enrol new device January 2018 Solution fully implemented for current iPad estate June 2019	IT, Digital Learning Team, Depending on solution external supplier or redefinition of the web developer post	Funding for MDM, funding for external supplier or agreed redefinition of web developer post. Training delivered across all locality areas to ensure that school staff have the knowledge and understanding to maintain the MDM beyond the transition period
Provide support to schools who are undertaking planned and evaluated research projects focusing on using digital technologies to improve engagement, motivation and attainment of learners	Audit school improvement plans in August to prioritise support	Digital Learning team	School improvement plans Digital Learning team programme of work

Evidence of Impact on learners – How do we know?

Priority No.	QI	Priority
4		Empower leaders of change to drive innovation and investment in digital technology for learning and teaching

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Ensure the corporate IT team have capacity and knowledge to support developing school estate and teaching and learning	Year 1, 2 and 3 Quarterly at the Education Technology Strategy Group meetings	Education Technology Strategy Group, the Education Digital Learning Team and the Digital Learning Curriculum Group	Quarterly meetings and possible presentations to IT staff from education staff. Possible visits to other authorities.
Ensure the education service digital learning team has the capacity and knowledge to support schools	Quarterly meetings of EO and ESO and quarterly meetings of the Digital Learning Curriculum Group.	Education Digital Learning team, Education Scotland, XMA	Attendance at national meetings. Ongoing partnership with XMA, Google and other partners.

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Headteachers/senior leaders within establishments participate in the strategic decision making process to progress digital learning i.e. making informed decision about bandwidth, types and ratios of devices	Review progress June 2018 and complete June 2019	Education Technology Strategy Group role, senior leaders in schools', the CLO	Input from corporate IT at a Headteacher meeting in 2017/2018 to ensure that senior leaders in schools have the information required to make such decisions Advice from the Digital Learning Curriculum Group on device and applications.
Headteachers/senior leaders within establishments are encouraged to ensure appropriate investment in hardware and professional learning opportunities for staff	Review progress June 2018 and audit ratio June 2019.	Education Technology Strategy Group, senior leaders in schools', the CLO, XMA, Google, Digital Learning Curriculum Group	Input from corporate IT at a Headteacher meeting in 2017/2018 to ensure that senior leaders in schools have the information required to make such decisions Advice from the Digital Learning Curriculum Group on device and applications
Headteachers/senior leaders within establishments are encouraged to ensure appropriate timetabling of provision at all stages i.e. that all learners pre 5 to S3 are being taught digital learning and have regular access to appropriate devices to enhance and support their learning	September 2017 presentation to HT's on digital strategy. Audit teaching provision of digital learning across all establishments August 2017. Audit June 2019	Schools, Digital Learning team, Digital Learning Curriculum Group, IT and Education Technology Strategy Group	Presentation to Headteacher's outlining responsibilities of school arising from national and Argyll and Bute digital learning strategies. Feedback as appropriate from the Digital Learning Curriculum Group on pilots and learning from other authorities
Headteachers/senior leaders within establishments are encouraged to ensure a consistent approach to the use of a wide range of provision and skills development, particularly in early years and primary	Roll out support to schools in developing a vision and strategy for digital learning	Schools,XMA, Digital Learning Team, Digital Learning Curriculum Group,	For the Digital Learning team/ XMA to deliver 3 sessions to every primary school. Digital Learning team deliver sessions in individual schools and across localities

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Secondary school technicians are supported to develop a consistent approach to supporting users across the education estate	Discussion at Autumn 2017 Education Technology Strategy Group meeting Spring 2018 consult with Headteachers and professional associations as appropriate Full implementation by June 2020	Education Technology Strategy Group, EMT, IT, Headteachers, Technicians and professional associations	Meeting time and technician training as appropriate from education and IT
Develop staff confidence and skill in using digital technologies to enhance learning	ongoing	XMA, Digital Learning team, Digital Learning Curriculum Group, Headteachers and staff in schools	For XMl Learning Team/Digit to deliver 3 session to every primary school. Digital Learning team deliver sessions in individual schools and across localities. Digital Learning team and the Digital Learning Curriculum Group will communicate with schools any other development opportunities that become available

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Implement an effective solution for the management of school iPads	Autumn 2017 Digital Learning Strategy Group meeting decide on solution. Start migration for the current iPad estate and train staff in schools to be able to enrol new device into the MDM January 2018 Solution fully implemented for current iPad estate June 2019	IT, Digital Learning Team, Depending on solution external supplier or redefinition of the web developer post	Funding for MDM, funding for external supplier or agreed redefinition of web developer post Training delivered across all locality areas to ensure that school staff have the knowledge and understanding to maintain the MDM beyond the transition period

Tasks to achieve priority	Timescale and checkpoints	Those involved – including partners	Resources and staff development
Education Technology Strategy Group annually review schools usage of bandwidth to ensure appropriate and effective digital access as outlined in the Scottish Governments Digital Learning Strategy September 2016	Annually at summer Education Digital Strategy group meeting	Education Digital Strategy group, IT	Broadband allocation and usage report from IT and Education Digital Strategy group meeting
Visit other Local Authorities and schools to explore the impact Chromebooks and Google GSuite are having on learning and teaching Undertake primary and secondary pilots of Chromebooks/GSuite in partnership with GLOW and or Google and the Education Psychological Service to ensure there are measures of impact on learners and attainment Monitor schools use of Google Gsuite and impact on learning and teaching Develop an understand of how Chromebooks could work on our network	December 2017 for propriety work December 2018 evaluate pilots and May 2019 decide on strategy	IT, Education Digital Strategy group, schools and Digital Learning Curriculum Group, GLOW	Site visit to other authorities IT team to liaise with Google to allow GSuite to work on the education network Pilot schools and the digital learning team undertake Google training Initiate primary and secondary Chromebook/GSuite pilot in partnership with Education Psychological service

Evidence of Impact on learners – How do we know?

6. Supporting Materials

http://teachcs.scot/wp-content/uploads/2017/05/TeachCS.pdf

This guide introduces and explains the Computing Science (CS) SALs and the updated experiences and outcomes and Benchmarks. It provides an exemplification guide and resources for use in Early and Primary years. It is the result of four years of work drawing on:

- Research literature in CS education
- A range of international curriculum efforts
- Experience of best-practice CS pedagogy in Scottish primary and secondary contexts
- Teaching resources from across the world

The authors are all practising CS educators, bringing experience of teacher education, CS education research, resource creation, as well as deep knowledge of the discipline of computing science. They are keenly aware of the challenges involved in CS teaching.

In secondary schools, Benchmarks can support subject specialist teachers in making robust assessments of learners' progress and the standards they achieve. They will help teachers ensure that learners make appropriate choices and are presented at an appropriate level for National Qualifications in the senior phase. This can help avoid excessive workload for teachers and unnecessary assessments for learners.

Below are the benchmarks extracted from the National Technologies benchmarks which are relevant to digital learning.

Benchmarks – Early Level Technologies

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Digital Literacy	**Using digital products and services in a variety of contexts to achieve a purposeful outcome**	I can explore digital technologies and use what I learn to solve problems and *share* ideas and thoughts. **TCH 0-01a**	• Recognises different types of digital technology. • Identifies the key components of different types of digital technology. • Logs on to a preferred device with a given password. • Identifies icons for different applications. • Opens and close a pre-saved file. • Identifies and consistently use the close icon. • Uses digital technologies in a responsible way and with appropriate care.
	Searching, processing and managing information responsibly	I can use digital technologies to explore how to search and find information. **TCH 0-02a**	• Identifies and uses images and key words when searching for specific information. • Demonstrates an understanding of how information can be found on websites as text, audio, images and video. • Demonstrates an understanding of how they should not use materials owned by others without permission.
	Cyber resilience and internet safety	I can explore, play and communicate using digital technologies safely and securely. **TCH 0-03a**	• Demonstrates an understanding of appropriate behaviour and language in the digital environment. • Demonstrates an understanding of the importance of passwords and passcodes for example access to school building.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Technological Developments in Society and Business	**Awareness of technological developments (Past, Present and Future), including how they work.**	I enjoy playing with and exploring technologies to discover what they can do and how they can help us. **TCH 0-05a**	• Discusses times when they have used different technologies.
	Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.	To help care for the environment, I reduce, re-use and recycle the resources I use. **TCH 0-06a** I understand how local shops and services use technologies to provide us with what we need and want in our daily lives. **TCH 0-07a**	• Understands what can be reduced, re-used and recycled. • Gives examples of how people (for example police, fire, healthcare) who help us use technologies in their everyday work.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Computing Science	Understanding the world through computational thinking	I can explore computational thinking processes involved in a variety of everyday tasks and can identify patterns in objects or information TCH 0-13a	• Identifies and sequences the main steps in an everyday task to create instructions/an algorithm for example, washing hands. • Classifies objects and groups them into simple categories for examples, groups toy bricks according to colour. • Identifies patterns, similarities and differences in objects or information such as colour, size and temperature and simple relationships between them.
	Understanding and analysing computing technology	I understand that sequences of instructions are used to control computing technology. TCH 0-14a I can experiment with and identify uses of a range of computing technology in the world around me. TCH 0-14b	• Demonstrates an understanding of how symbols can represent process and information. • Predicts what a device or person will do when presented with a sequence of instructions for example, arrows drawn on paper. • Identifies computing devices in the world (including those hidden in appliances and objects such as automatic doors).

Benchmarks – First Level Technologies

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Digital Literacy	**Using digital products and services in a variety of contexts to achieve a purposeful outcome**	I can explore and experiment with digital technologies and can use what I learn to support and enhance my learning in different contexts. **TCH 1-01a**	• Communicate and collaborate with others using digital technology for example, email, Glow or other platforms. • Opens and saves a file to and from a specific location. • Identifies the key components of frequently used digital technology and whether it is a piece of hardware or software. • Uses digital technology to collect, capture, combine and share text, sound, video and images.
	Searching, processing and managing information responsibly	Using digital technologies responsibly I can access, retrieve and use information to support, enrich or extend learning in different contexts. **TCH 1-02a**	• Demonstrates an understanding of the concept of ownership of material and ideas. • Demonstrates an understanding of the different functions of a browser and search engine. • Recognises what should and shouldn't be searched for on the Internet.
	Cyber resilience and internet safety	I can extend my knowledge of how to use digital technology to communicate with others and I am aware of ways to keep safe and secure. **TCH 1-03a**	• Demonstrates understanding of my rights and responsibilities as a digital citizen. • Demonstrates understanding of the potential dangers online and who to go to for advice and who to report a concern to. • Demonstrates an understanding for the need for strong passwords. • Explains the need to get a person's permission before taking a picture or video of them.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Technological Developments in Society and Business	Awareness of technological developments (Past, Present and Future), including how they work.	I can explore the latest technologies and consider the ways in which they have developed. TCH 1-05a	• Identifies changes to technologies for example, televisions and mobile phones.
	Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.	I can take appropriate action to ensure conservation of materials and resources, considering the impact of my actions on the environment. TCH 1-06a I understand how technologies help provide for our needs and wants, and how they can affect the environment in which we live. TCH 1-07a	• Identifies ways in which energy can be saved. • Understands how and where we waste materials and resources. • Demonstrates an understanding of how technologies, by meeting our needs and wants, affect the environment in which we live.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Craft, Design, Engineering and graphics	**Representing ideas, concepts and products through a variety of graphic media**	I can explore and experiment with sketching, manually or digitally, to represent ideas in different learning contexts. **TCH 1-11a**	• Recognises 2D and 3D shapes and how they can be used to visually represent ideas/concepts. • Creates manual and/or digital sketches to represent ideas..
	Understanding the world through computational thinking	I can explore and comment on processes in the world around me making use of core computational thinking concepts and can organise information in a logical way **TCH 1-13a**	• Follows sequences of instructions/algorithms from everyday situations for example, recipes or directions, including those with selection and repetition. • Identifies steps in a process and describes precisely the effect of each step. • Makes decisions based on logical thinking including IF, AND, OR and NOT for example, collecting balls in the gym hall but NOT basketballs, line up if you are left-handed OR have green eyes. • Collects, groups and orders information in a logical, organised way using my own and others' criteria (MNU 1-20a and b).

	Understanding and analysing computing technology	I understand the instructions of a visual programming language and can predict the outcome of a program written using the language. **TCH 1-14a** I understand how computers process information. **TCH 1-14b**	• Demonstrates an understanding of the meaning of individual instructions when using a visual programming language (including sequences, fixed repetition and selection). • Explains and predicts what a program in a visual programming language will do when it runs for example, what audio, visual or movement effect will result. • Demonstrates an understanding that computers take information as input, process and store that information and output the results.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Computing Science	**Designing, building and testing computing solutions**	I can demonstrate a range of basic problem solving skills by building simple programs to carry out a given task, using an appropriate language. **TCH 1-15a**	• Simplifies problems by breaking them down into smaller more manageable parts. • Constructs a sequence of instructions to solve a task, explaining the expected output from each step and how each to contributes towards solving the task. • Creates programs to carry out activities (using selection and fixed repetition) in an visual programming language. • Identifies when a program does not do what was intended and can correct errors/bugs. • Evaluates solutions/programs and suggests improvements.

Benchmarks – Second Level Technologies

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Digital Literacy	Using digital products and services in a variety of contexts to achieve a purposeful outcome	I can extend and enhance my knowledge of digital technologies to collect, analyse ideas, relevant information and organise these in an appropriate way. TCH 2-01a	• Identifies and saves in a range of standard file formats • Saves files using an organised filing system. • Stores, shares and collaborates using an online cloud based service for example, Glow or other platforms. • Identifies the key features of input, output and storage devices. • Selects and use applications and software to capture, create and modify text, images, sound and video. • Selects the most appropriate digital software to perform a task.

	Searching, processing and managing information responsibly	I can use digital technologies to search, access and retrieve information and are aware that not all of this information will be credible. **TCH 2-02a**	• Uses search engines to search the internet for specific or relevant information for example, using quotation marks to narrow the results. • Access websites and use navigation skills to retrieve information for a specific task. • Demonstrates an understanding of usage rights and can apply these within a search for example creative commons
	Cyber resilience and internet safety	I can explore online communities demonstrating an understanding of responsible digital behaviour and I'm aware of how to keep myself safe and secure. **TCH 2-03a**	• Demonstrates an understanding of the content they should include in an online profile. • Discusses the importance of being a responsible digital citizen, giving examples of appropriate online behaviours and actions. • Identifies appropriate ways to report concerns. • Uses strong passwords. • Has an understanding of the law as it relates to inappropriate or illegal online behaviours, for example, the sharing of inappropriate images

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Technological Developments in Society and Business	**Awareness of technological developments (Past, Present and Future), including how they work.**	I can investigate how product design and development have been influenced by changing lifestyles. **TCH 2-05a**	• Gives examples of how our changing lifestyles have impacted on product design.

	Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.	I can analyse how lifestyles can impact on the environment and Earth's resources and can make suggestions about how to live in a more sustainable way. **TCH 2-06a** I can make suggestions as to how individuals and organisations may use technologies to support sustainability and reduce the impact on our environment. **TCH 2-07a**	• Explains how and why it is important to conserve energy. • Discusses the advantages and disadvantages of how technologies impact on the environment for example, renewable energy technologies.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Craft, Design, Engineering and graphics	**Representing ideas, concepts and products through a variety of graphic media**	I can use a range of graphic techniques, manually and digitally, to communicate ideas, concepts or products, experimenting with the use of shape, colour and texture to enhance my work. **TCH 2-11a**	• Sketches geometric shapes to create objects. • Produces sketches to communicate ideas that include pattern and texture • Draws geometric shapes accurately. • Sketches 2D and 3D drawings of objects • Describes primary and secondary colours and the moods/feeling associated with each. Demonstrates planning for a targeted audience when creating a of graphic display

	Understanding the world through computational thinking	I understand the operation of a process and its outcome. I can structure related items of information. **TCH 2-13a**	• Compares activities consisting of a single sequence of steps with those consisting of multiple parallel steps, for example, making tomato sauce and cooking pasta to be served at the same time. • Identifies algorithms/instructions that include repeated groups of instructions a fixed number of times and/or loops until a condition is met. • Identifies when a process is not predictable because it has a random element for example, a board game which uses dice. • Structures related items of information for example, a family tree (MNU 2- 20b). • Uses a recognised set of instructions/ an algorithm to sort real worlds objects for examples, books in a library or trading cards.
	Understanding and analysing computing technology	I can explain core programming language concepts in appropriate technical language. **TCH 2-14a** I understand how information is stored and how key components of computing technology connect and interact through networks. **TCH 2-14b**	• Explains the meaning of individual instructions (including variables and conditional repetition) in a visual programming language • Predicts what a complete program in a visual programming language will do when it runs, including how the properties of objects for example, position, direction and appearance change as the program runs through each instruction. • Explains and predicts how parallel activities interact • Demonstrates an understanding that all computer data is represented in binary for example, numbers, text, black and white graphics. • Describes the purpose of the processor, memory and storage and the relationship between them • Demonstrates an understanding of how networks are connected and used to communicate and share information, for example the internet.

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Computing Science	**Designing, building and testing computing solutions**	I can create, develop and evaluate computing solutions in response to a design challenge **TCH 2-15a**	• Creates programs in a visual programming language including variables and conditional repetition. • Identifies patterns in problem solving and reuses aspects of previous solutions appropriately for example, reuse code for a timer, score counter or controlling arrow keys. • Identifies any mismatches between the task description and the programmed solution, and indicates how to fix them.

Benchmarks – Third Level Technologies

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Digital Literacy	**Using digital products and services in a variety of contexts to achieve a purposeful outcome**	I can explore and use the features of a range of digital technologies, integrated software and online resources to determine the most appropriate to solve problems. **TCH 3-01a**	• Uses the most appropriate applications and software tools to capture, create and modify text, images, sound, and video to present and collaborate. • Demonstrates an understanding of file handling for example, uploading, downloading, sharing and permission setting, for example within Glow or other platforms.

	Searching, processing and managing information responsibly	Having used digital technologies to search, access and retrieve information I can justify my selection in terms of validity, reliability and have an awareness of plagiarism. **TCH 3-02a**	• Gathers and combines data and information from a range of sources to create a publication, presentation or information resource. • Uses applications to analyse data and identify trends/make predictions based on source data. • Demonstrates efficient searching techniques for example using 'and', 'or', 'not'
	Cyber resilience and internet safety	I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others. **TCH 3-03a**	• Demonstrates an understanding of the legal implications and importance of protecting their own and others' privacy when communicating online. • Evaluates online presence and identifies safe guards. • Present relevant ideas and information to explain risks to safety and security of their personal devices and networks including encryption. • Applies appropriate online safety features when becoming involved with online communities such as online gaming, chat rooms, forums and social media. • Demonstrate an understanding of different cyber threats, for example, viruses, phishing, identity theft, extortion and sextortion. • Demonstrates understanding of device security including personal and domestic devices.

Curriculum Organisers		Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement
Technological Developments in Society and Business	**Awareness of technological developments (Past, Present and Future), including how they work.**	I understand how scientific and technological developments have contributed to changes in everyday products. **TCH 3-05a**	• Discusses advantages and disadvantages of using technologies in our everyday life.

	Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.	I can evaluate the implications forindividuals and societies of the ethical issues arising from technological developments. **TCH 3-06a** I can identify the costs and benefits of using technologies to reduce the impact of our activities on the environment and business. **TCH 3-07a** I can explore the impact, contribution and use of various software applications and emerging hardware in business. **TCH 3-08a**	• Demonstrate an awareness of ethical issues around product development • Demonstrates an understanding of the impact of technologies on the environment and business • Searches, edits and manipulates text and numbers using appropriate hardware and software

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Craft, Design, Engineering and graphics	**Representing ideas, concepts and products through a variety of graphic media**	I can apply a range of graphic techniques and standards when producing images using sketching, drawing and software. **TCH 3-11a**	• Produces sketches which show an understanding of proportion. • Produces 2D and 3D sketches using a range of techniques. • Produces rendered drawings which may include colour, surface texture, tonal change • Justifies the choice of colours, layout in a promotional graphics. • Recognises design principles and DTP terms. • Produces orthographic and pictorial drawings/sketches of everyday objects, products or buildings by extracting information from given pictorial drawings accurately • Use appropriate drawing standards, symbols and conventions where these apply. • Uses computer aided design (CAD) commands, techniques and practices required to create a model. • Produces 3D rendered CAD models • Produces a range of 2D and 3D CAD drawings

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Computing Science	**Understanding the world through computational thinking**	I can describe different fundamental information processes and how they communicate and can identify their use in solving different problems **TCH 3-13a** I am developing my understanding of information and can use an information model to describe particular aspects of a real world system **TCH 3-13b**	• Recognises and describes information systems with communicating processes which occur in the world around me • Explains the difference between parallel processes and those that communicate with each other • Demonstrates an understanding of the basic principles of compression and encryption of information • Identifies a set of characteristics describing a collection of related items that enable each item to be individually identified • Identifies the use of common algorithms such as sorting and searching as part of larger processes.
	Understanding and analysing computing technology	I understand language constructs for representing structured information **TCH 3-14a** I can describe the structure and operation of computing systems which have multiple software and hardware levels that interact with each other. **TCH 3-14b**	• Understands that the same information could be represented in more than one representational system • Understands that different information could be represented in exactly the same representation • Demonstrates an understanding of structured information in programs, databases or webpages • Describes the effect of mark-up language on the appearance of a webpage, and understand that this may be different on different devices • Demonstrates an understanding of the von Neumann architecture and how machine code instructions are stored and executed within a computer system • Reads and explains code extracts including those with variables and data structures • Demonstrate an understanding of how computers communicate and share information over networks including the concepts of sender, receiver, address and packets. • Understands simple compression and encryption techniques used in computing technology

	Designing, building and testing computing solutions	I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements **TCH 3-15a**	• Designs and builds a program using a visual language combining constructs and using multiple variables. • Represents and manipulates structured information in programs, or databases for example, works with a list data structure in a visual language, or a flat file database. • Interprets a problem statement, and identifies processes and information to create a physical computing and/or software solution. • Can find and correct errors in program logic. • Groups related instructions into named subprograms (in a visual language). • Writes code in which there is communication between parallel processes (in a visual language). • Writes code which receives and responds to real world inputs (in a visual language). • Designs and builds web pages using appropriate mark-up languages.

Benchmarks – Fourth Level Technologies

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Digital Literacy	**Using digital products and services in a variety of contexts to achieve a purposeful outcome**	I can select and use digital technologies to access, select relevant information and solve real world problems. **TCH 4-01a**	• Demonstrates an understanding of how digital literacy will impact on their future learning and career pathways. • Consistently use a range of devices and digital software and applications and services to share, create, collaborate effectively and publish digital content online
	Searching, processing and managing information responsibly	I can use digital technologies to process and manage information responsibly and can reference sources accordingly. **TCH 4-02a**	• Gathers, evaluates and combines data and information from a range of sources to create a publication, presentation or information resource. • Evaluates applications to analyse data and identify trends/make predictions based on source data. • Evaluates efficient searching techniques for example using 'and', 'or','not'
	Cyber resilience and internet safety	I can explore the impact of cyber-crime for business and industry and the consequences this can have on me. **TCH 4-03a**	• Demonstrates understanding of how industry collects and uses personal data ethically and how this relates to data security legislation. • Demonstrates understanding of how cyber security breaches in industry can impact on individuals. • Evaluates the digital footprint of industry and identifies good practice • Identifies the main causes of security breaches in industry. • Demonstrates understanding of safe disposal of data and devices.

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Technological Developments in Society and Business	**Awareness of technological developments (Past, Present and Future), including how they work.**	I can analyse products taking into consideration sustainability, scientific and technological developments. **TCH 4-05a**	• Identifies factors which affect product design.
	Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.	I can examine a range of materials, processes or designs in my local community to consider their environmental, social and economic impact. **TCH 4-06a** I can present conclusions about the impact of technologies on the economy, politics and the environment. **TCH 4-07a** I can select and use appropriate hardware and software which supports evolving business activities. **TCH 4-08a**	• Demonstrates an understanding of the impact of materials and processes on design. • Explains the impact of technologies on globalisation, patterns of work and conditions of employment. • Updates and presents information using appropriate hardware and software

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Craft, Design, Engineering and graphics	**Representing ideas, concepts and products through a variety of graphic media**	I can extend my use of manual and digital graphic techniques to realise ideas, concepts and products and recognise the importance of real world standards. **TCH 4-11a**	• Produces sketches which show proportion and scale. • Produces 2D and 3D sketches using perspective techniques, surface texture, tonal change and colour • Uses colouring media when drawing/sketching • Plans and justifies the choice of colours, layout and presentation techniques in graphic displays • Recognises and can apply the design principles and DTP terms. • Plans, produces and justifies the choice of informational graphics to suit a given scenario or brief. • Produces orthographic and pictorial drawings by extracting information from given drawings, including detail such as hidden detail, centre axis. • Identifies and uses appropriate drawing standards, symbols and conventions, including third angle projection, dimensioning, line types and use of scale. • Creates assembled and exploded pictorial drawings from a 3D CAD assembly model. • Identifies CAD commands, techniques and practice employed in the production of 3D graphics and models. • Produces rendered 3D CAD models to show the light source, surface texture, materials applied to the model and a background

Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Benchmarks to support practitioners' professional judgement

Computing Science	**Understanding the world through computational thinking**	I can describe in detail the processes used in real world solutions, compare these processes against alternative solutions and justify which is the most appropriate. **TCH 4-13a** I can informally compare algorithms for correctness and efficiency **TCH 3-13b**	• Identifies the transfer of information through complex systems involving both computers and physical artefacts, for example, airline check-in, parcel tracking and delivery. • Describes instances of human decision making as an information process, for example, deciding which check-out queue to pick, which route to take to school, how to prepare family dinner / a school event. • Compares alternative algorithms for the same problem and understands that there are different ways of defining "better" solutions depending on the problem context for example, is speed or space more valuable in this context?
	Understanding and analysing computing technology	I understand constructs and data structures in a textual programming language **TCH 4-14a** I can explain the overall operation and architecture of a digitally created solution **TCH 4-14b** I understand the relationship between high level language and the operation of computer **TCH 4-14c**	• Understands basic control constructs such as sequence, selection repetition, variables and numerical calculations in a textual language • Demonstrates an understanding of how visual instructions and textual instructions for the same construct are related • Identifies and explains syntax errors in a program written in a textual language • Demonstrates an understanding of representations of data structures in a textual language. • Demonstrates an understanding of how computers represent and manipulate information in a range of formats • Demonstrates an understanding of program plans expressed in accepted design representations for example pseudocode, storyboarding, structure diagram, data flow diagram, flow chart • Demonstrates an understanding of the underling technical concepts of some specific facets of modern complex technologies for example, on line payment systems and satnav. • Demonstrates an understanding that computers translate information processes between different levels of abstraction

	Designing, building and testing computing solutions	I can select appropriate development tools to design, build, evaluate and refine computing solutions to process and present information whilst making reasoned arguments to justify my decisions. **TCH 4-15a**	• Analyses problem specifications across a range of contexts, identifying key requirements. • Writes a program in a textual language which uses variables and constructs such as sequence, selection and repetition. • Creates a design using accepted design notations for example, pseudocode storyboarding, structure diagram, data flow diagram, flow chart. • Develops a relational database to represent structured information. • Debugs code and can distinguish between the nature of identified errors e.g. syntax and logic. • Writes test and evaluation reports. • Can make use of logical operators – AND, OR, NOT. • Writes a program in a textual language which uses variables within instructions instead of specific values where appropriate. • Designs appropriate data structures to represent information in a textual language. • Selects an appropriate platform on which to develop a physical and/or software solution from a requirements specification . • Compares common algorithms for example, those for sorting and searching, and justify which would be most appropriate for a given problem. • Design and build web pages which includes interactivity.

7. Breadth, Challenge and Application in Digital Learning

What does *Breadth* look like in Digital Learning

Many of the digital learning experiences and outcomes within the Technologies are themselves broad. The Technologies are practical areas of learning, where the process learning and the product created by the learner are both important. Within all establishments learners' experiences in digital learning span a wide range of activities including:

- using digital technologies to demonstrate learning eg videos, audios, animation, presentations
- exploring software to learn the scope and limits to its use
- simple coding, creating using digital technologies
- investigating how technologies can help improve people's quality of life
- building with construction kits

Within the structures of secondary schools, breadth continues to be important in ensuring young people's entitlement to learning across the experiences and outcomes within and across each of the organisers.

What does *Challenge* look like in Digital Learning

Appropriate challenge is a key factor in meeting learners' needs. Evidence of achievement in digital learning can be provided when children and young people are afforded challenges through opportunities to:

- take part in open ended tasks which promote creativity
- take different roles in teams including leadership
- take more responsibility for choosing aspects to study and pursue these to a conclusion
- report conclusions to their classmates
- integrate skills from two or more of the contexts
- integrate different media and technologies

Achievement in developing and using digital skills and knowledge may also be enhanced through challenges encountered in enterprise activities, interdisciplinary learning or work experience placements.

What does *Application* look like in Digital Learning

Children and young people have planned opportunities to apply digital skills and knowledge embedded within courses and programmes. Tasks ensure that learners have opportunities to reinforce and extend their skills by applying them in new, increasingly demanding settings. Planned opportunities help children and young people to become aware of the relevance of their learning to life beyond school. It is also important to capture occasions when young people have applied digital skills and knowledge in the wider life of the school, in other curricular areas and in interdisciplinary tasks which make connections across learning. Experiences in clubs and activities which enhance young people's personal achievement provide opportunities for application of learning in new and unfamiliar settings. As practitioners work in partnership with parents, community agencies and employers, learners can appreciate the wider application of the knowledge and understanding, skills, attributes and capabilities developed by digital learning and can develop relevant skills, attributes and capabilities which will support them in further learning, life and work.