



curriculum for excellence: technologies

experiences and outcomes

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Technologies

Experiences and outcomes

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The technologies framework provides a range of different contexts for learning, including the themes across learning; learning for sustainability, global citizenship, enterprise, that draw on important aspects of everyday life and work.

The framework develops knowledge, skills, attributes and capabilities around 13 key concepts/significant aspects of learning in the technologies.

- Awareness of technological developments (Past, Present and Future), including how they work.
- Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.
- Using digital products and services in a variety of contexts to achieve a purposeful outcome
- Searching, processing and managing information responsibly
- Cyber resilience and internet safety
- Understanding the world through computational thinking
- Understanding and analysing computing technology
- Designing, building and testing computing solutions
- Food and textile technologies
- Designing & constructing models/products
- Exploring uses of materials
- Representing ideas, concepts and products through a variety of graphic media
- Application of Engineering

Within each of the key concepts/significant aspects of learning learners will develop and demonstrates

- knowledge and understanding of the key concepts in the technologies
- curiosity, exploration and problem solving skills
- planning and organisational skills in a range of contexts
- creativity and innovation
- skills in using tools, equipment, software, graphic media and materials
- skills in collaborating, leading and interacting with others
- critical thinking through exploration and discovery within a range of learning contexts
- discussion and debate
- searching and retrieving information to inform thinking within diverse learning contexts
- making connections between specialist skills developed within learning and skills for work
- evaluating products, systems and services
- presentation and communication skills.
- awareness of sustainability

The framework includes creative, practical and work-related experiences and outcomes which develop skills for business, digital literacy, computing science, food, textiles, craft, design, engineering, graphics and applied technologies. Learning, teaching and assessment in the technologies should span a range of the 13 key significant aspects of learning, for example when planning business education in S1 to S3 it should cover Digital Literacy significant aspects of learning and Technological Developments in Society and Business significant aspects of learning (as well as Social subject significant aspects of learning).

As with literacy, numeracy and health and wellbeing, digital literacy should be placed at the heart of all learning, not only the technologies area of the curriculum. Digital literacy outcomes could be met in any/all curriculum areas and so all practitioners can contribute to and reinforce them.

Digital Literacy

| Organiser | Early | First | Second | Third | Fourth |
|---|---|--|---|---|---|
| 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 | 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 | 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 | 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 | I can select and use digital technologies to access, select relevant information and solve real world problems. TCH 4-01a |
| Searching, processing and managing information responsibly | I can use digital technologies to explore how to search and find information. TCH 0-02a | Using digital technologies responsibly I can access, retrieve and use information to support, enrich or extend learning in different contexts. TCH 1-02a | I can use digital technologies to search, access and retrieve information and are aware that not all of this information will be credible. TCH 02-02a | 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 | I can use digital technologies to process and manage information responsibly and can reference sources accordingly. TCH 4-02a |
| Cyber resilience and internet safety | I can explore, play and communicate using digital technologies safely and securely. TCH 0-03a | 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 | 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 | 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 | I can explore the impact of cyber-crime for business and industry and the consequences this can have on me. TCH 4-03a |

Food and Textile Technology

| Organiser | Early | First | Second | Third | Fourth |
|-------------------------|--|---|--|--|---|
| Food and Textile | <p>I enjoy exploring and working with foods in different contexts TCH 0-04a</p> <p>I enjoy experimenting with a range of textiles TCH 0-04b</p> <p>I can share their thoughts with others to help further develop ideas and solve problems. TCH 0-04c</p> | <p>I can use a range of simple food preparation techniques when working with food TCH 1-04a</p> <p>I can use a range of tools and equipment when working with textiles TCH 1-04b</p> <p>I am developing and using problem solving strategies to meet challenges with a food or textile focus TCH 1-04c</p> <p>I can adapt and improve ideas and can express my own thinking in different ways TCH 1-04d</p> | <p>I am developing dexterity, creativity and confidence when preparing and cooking food TCH 2-04a</p> <p>I am developing dexterity, creativity and confidence when working with textiles TCH 2-04b</p> <p>I can extend and explore problem solving strategies to meet increasingly difficult challenges with a food or textile focus TCH 2-04c</p> <p>I can discuss, debate and improve my ideas with increasing confidence and clear explanations TCH 2-04d</p> | <p>I am gaining confidence and dexterity in the use of ingredients and equipment and can apply specialist skills in preparing food. TCH 3-04a</p> <p>I can use textile skills in practical and creative situations in my place of learning, at home or in the world of work TCH 3-04b</p> <p>By using problem-solving strategies and showing creativity in a design challenge, I can plan, develop, make and evaluate food or textile items which meet needs at home or in the world of work. TCH 3-04c</p> | <p>I can explore the properties and functionality of ingredients, textiles and equipment to establish their suitability for a task at home or in the world of work. TCH 4-04a</p> <p>I can confidently apply preparation techniques and processes to make food and textile items using specialist skills, materials, equipment in my place of learning, at home or in the world of work. TCH 4-04b</p> <p>Showing creativity and innovation I can design, plan and produce increasingly complex food or textile items which satisfy the needs of the user, at home or in the world of work. TCH 4-04c</p> <p>I can apply skills of critical thinking when evaluating the quality and effectiveness of my own or others' products. TCH 4-04d</p> |

Technological Developments in Society and Business

| Organiser | Early | First | Second | Third | Fourth |
|--|--|--|---|---|--|
| 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 | I can explore the latest technologies and consider the ways in which they have developed. TCH 1-05a | I can investigate how product design and development have been influenced by changing lifestyles. TCH 2-05a | I understand how scientific and technological developments have contributed to changes in everyday products. TCH 3-05a | I can analyse products taking into consideration sustainability, scientific and technological developments. TCH 4-05a |
| 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 | 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 | 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 | I can evaluate the implications for individuals 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 | 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 |

Craft, Design, Engineering and Graphics

| Organiser | Early | First | Second | Third | Fourth |
|---|---|---|---|--|---|
| Design and construct models/product | I explore ways to design and construct models. TCH 0-09a | I can design and construct models and explain my solutions. TCH 1-09a | I can extend and enhance my design skills to solve problems and can construct models. TCH 2-09a | I can create solutions in 3D and 2D and can justify the construction/graphic methods and the design features. TCH 3-09a | I can apply design thinking skills when designing and manufacturing models/products which satisfy the user or client. TCH 4-09a |
| Exploring uses of materials | I explore everyday materials in the creation of pictures/models/concepts. TCH 0-10a | I can recognise a variety of materials and suggest an appropriate material for a specific use. TCH 1-10a | I can recognise basic properties and uses for a variety of materials and can discuss which ones are most suitable for a given task. TCH 2-10a | I can explore the properties and performance of materials before justifying the most appropriate material for a task. TCH 3-10a | I consider the material performance as well as sustainability of materials and apply these to real world tasks. TCH 4-10a |
| Representing ideas, concepts and products through a variety of graphic media | I explore and discover different ways of representing ideas in imaginative ways. TCH 0-11a | I can explore and experiment with sketching, manually or digitally, to represent ideas in different learning contexts. TCH 1-11a | 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 | I can apply a range of graphic techniques and standards when producing images using sketching, drawing and software. TCH 3-11a | 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 |
| Application of Engineering | I explore a variety of products covering a range of engineering disciplines. TCH 0-12a | I explore and discover engineering disciplines and can create solutions. TCH 1-12a | I can extend my knowledge and understanding of engineering disciplines to create solution. TCH 2-12a | I can apply my knowledge and understanding of engineering disciplines and can develop/build solutions to given tasks. TCH 3-12a | I can solve problems through the application of engineering principles and can discuss the impact engineering has on the world around me. TCH 4-12a |

Computing Science

| Organiser | Early | First | Second | Third | Fourth |
|--|--|---|--|---|---|
| <p>Understanding the world through computational thinking</p> | <p>I can explore computational thinking processes involved in a variety of everyday tasks and can identify patterns in objects or information.</p> <p>TCH 0-13a</p> | <p>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.</p> <p>TCH 1-13a</p> | <p>I understand the operation of a process and its outcome. I can structure related items of information.</p> <p>TCH 2-13a</p> | <p>I can describe different fundamental information processes and how they communicate and can identify their use in solving different problems.</p> <p>TCH 3-13a</p> <p>I am developing my understanding of information and can use an information model to describe particular aspects of a real world system.</p> <p>TCH 3-13b</p> | <p>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.</p> <p>TCH 4-13a</p> <p>I can informally compare algorithms for correctness and efficiency.</p> <p>TCH 3-13b</p> |
| <p>Understanding and analysing computing technology</p> | <p>I understand that sequences of instructions are used to control computing technology.</p> <p>TCH 0-14a</p> <p>I can experiment with and identify uses of a range of computing technology in the world around me.</p> <p>TCH 0-14b</p> | <p>I understand the instructions of a visual programming language and can predict the outcome of a program written using the language.</p> <p>TCH 1-14a</p> <p>I understand how computers process information.</p> <p>TCH 1-14b</p> | <p>I can explain core programming language concepts in appropriate technical language.</p> <p>TCH 2-14a</p> <p>I understand how information is stored and how key components of computing technology connect and interact through networks.</p> <p>TCH 2-14b</p> | <p>I understand language constructs for representing structured information</p> <p>TCH 3-14a</p> <p>I can describe the structure and operation of computing systems which have multiple software and hardware levels that interact with each other.</p> <p>TCH 3-14b</p> | <p>I understand constructs and data structures in a textual programming language</p> <p>TCH 4-14a</p> <p>I can explain the overall operation and architecture of a digitally created solution</p> <p>TCH 4-14b</p> <p>I understand the relationship between high level language and the operation of computer</p> <p>TCH 4-14c</p> |

Computing Science (continued)

| Organiser | Early | First | Second | Third | Fourth |
|--|---|---|---|---|---|
| Designing, building and testing computing solutions | I can develop a sequence of instructions and run them using programmable devices or equivalent. TCH 0-15a | 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 | I can create, develop and evaluate computing solutions in response to a design challenge. TCH 2-15a | I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements. TCH 3-15a | 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 |