**Technologies: assessing progress and achievement**

This progression framework is a guide which is intended to support practitioners as they consider the evidence of knowledge and understanding, skills, attributes and capabilities provided by learners as they progress through and achieve a level in Technologies.

The significant aspects of learning (detailed in the associated professional learning paper) relate to the statements for each level within this progression framework. They should be considered jointly when assessing progress and achievement.

In order to demonstrate achievement of a level in Technologies, the learner provides a range of evidence related to the experiences and outcomes *within* a level as well as towards learning at the *next* level.

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| **awareness of technological developments (past, present and future), including how they work**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners begin to **explore** a variety of technology from different time periods and develop the **knowledge and understanding** which allows them to describe what they know and can do.. | Learners develop the **knowledge and understanding** of technology developments in the past and present and can speculate on possible future developments, They can **evaluate** the suitability of a product for a given purpose, its impact on society and any related issues.  | Learners **investigate** how everyday products have altered over time. They develop the **knowledge and understanding** which allows them to describe and justify a products functionality and develop an **awareness** of ethical issues relating to technological developments on society. | Learners develop the **knowledge and understanding** which allows them to identify and discuss the key changes in a technology product over its life span and **debate** related issues including ethical concerns. They can **create** a unique new product and justify their design making comparisons to past technological developments.  | Learners have the **knowledge and understanding** to compare and contrast traditional and contemporary production methods and explain the impact they have had on society. Learners **debate** the possible future impact of new and emerging technologies on economic prosperity and the environment. |
| **impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners play with and **explore** technologies to discover what these technologies can do and how they can help provide us with what they need and want. | Learners develop the **knowledge and understanding** which allows them to describe how resources are limited and how technology can help us conserve what we have. | Learners **explore** the relationships between science and technology through a range of technological projects taking into consideration how stakeholder groups such as consumers or businesses can influence the outcomes | Learner develop the **knowledge and understanding** that allows them to describe the principles behind sustainable development. They can **evaluate** the implications for individuals and societies of the ethical and political issues arising from technological developments. | Learners **investigate** and **evaluate** a range of materials, processes or designs in their local community. They have the **knowledge and understanding** to consider and discuss their environmental, political and economic impact, discussing the possible lifetime cost to the environment in Scotland or beyond. |
| **searching, processing and managing information responsibly.**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners **explore** the range of sources that can be used to access information and developan **awareness** of the significance of using key words when using search facilities.  | Learners have **knowledge and understanding** of safe and acceptable conduct when accessing and retrieving information. They have developed problem solving skills while developing more complex search **strategies** and have the **knowledge and understanding** to describe and apply the basic concept of copyright.  | Learners have gained the **knowledge and understanding** to demonstrate safe and acceptable conduct when accessing and retrieving information. Learners have gained the **knowledge and understanding** to differentiate between copyright and royalty-free materials. | Learners **investigate** the range of search facilities available and have the **knowledge and understanding** to justify their selection of information in terms of validity and reliability. Learners have the **knowledge and understanding to** identify plagiarism and the steps to be taken to prevent it. | Learners have the **knowledge and understanding** to **process** and **manage** information responsibly using appropriate software and to give reasoned arguments for their selection. Learners have the **knowledge and understanding** to reference sources accordingly. |
| **using digital products and services in a variety of contexts to achieve a purposeful outcome**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners have the **knowledge and understanding** to use digital technologies and software to collect data, **communicate**, **create**, capture and **manipulate** sounds, texts and images to represent experiences.  | Learners have the **knowledge and understanding** to use a range of digital technologies and software effectively to **collect, analyse, organise, retrieve, evaluate** and **present** data and information.  | Learners have the **knowledge and understanding** to use a range of digital technologies and software to develop skills in **creating** multimedia, capturing and **manipulating** sounds, text and images in a variety of ways and contexts. Learners have the **knowledge and understanding** to collect, **analyse** and **present** data and information. | Learners have the **knowledge and understanding** to undertake **creative** projects, using and combining multiple applications across a range of devices. Learners collect, **analyse** and **present data** and information making predictions and **solving problems.** | Learners have the **knowledge and understanding** to use digital technologies to undertake challenging **creative** real time projects, using and combining multiple applications across a range of devices. Learners collect, **analyse** and **present real time data** and information making predictions and solving problems |
| **cyber resilience and internet safety**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners have the **knowledge and understanding** to demonstrate online safety skills and can begin to make informed choices when using online technology. Learners can begin to demonstrate an **understanding** for the need for passwords & pin codes on devices(tablets, smart phones & computers) | Learners have the **knowledge and understanding** to demonstrate safe and responsible use of a wide range of technologies, including the internet and how to safely communicate with others. Learners begin to demonstrate an **understanding** for the need for secure passwords and keeping the password safe.  | Learners have the **knowledge and understanding** to demonstrate an awareness of the safety issues of giving away personal information online and can **identify** the differences between private and personal details that can identify them uniquely. Learners They **know how** to report cyber bullying. Learners have developed **strategies** to make a secure password.  | Learners have the **knowledge and understanding** of the strategies used to protect their personal devices and themselves while online. Learners can demonstrate an **understanding** of the legal implication of hacking.  | Learners have the **knowledge and understanding** of the strategies to protect their devices and themselves while online. Learners have the **knowledge and understanding** to demonstrate and can explain how viruses infect their devices and the legal implications of cyber-crime and the Darknet. |
| **Understanding the world through computational thinking**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners have the **knowledge and understanding** that allows them to comment on the processes involved in a variety of everyday tasks and can recount and sequence main events and identify patterns (similarities and differences). | Learners have the **knowledge and understanding** that allows them to **collaborate** to **create** solutions by breaking down an everyday task into more manageable steps; identifying key information, construct rules based on pattern concepts and **create** precise instructions and/or diagrams. | Learners have the **knowledge and understanding** to be able to **analyse** increasingly more complex problems, **create** and/or remix possible solutions using computational thinking techniques to justify, debug and **evaluate** its efficiency. | Learners have the **knowledge and understanding** that allows them to work from a design brief and select and justify the most appropriate steps to **formulate a solution**, including the use of more formalised computer concepts required. Learners can **evaluate** their process, debug, refine and compare solutions. | Learners have the **knowledge and understanding** to **analyse problems** within computing science across a range of contemporary contexts.They have the **knowledge and understanding** that allows them to justify their design through reasoned argument and can compare and **evaluate** against alternative solutions. |
| **understanding and analysing computing technology**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners explore and can identify common uses of Computing Science in the world around them.  | Learners explore uses of Computing Science in the world around them and can begin to identify the main features of digital technology – including key components and uses of computers, programs and the Internet. | Learners can identify the main features of Computing Science – including key components and uses of computers, programs and the Internet. Learners have an understanding of how the technology works such as computer networks including the internet.  | Learners understand the technical components of computing devices and their impact on device performance. They can investigate a chosen contemporary development in Computing Science, presenting an understanding of the potential impact on society. Learners can describe uses of binary to represent data types and stored programs.  | Learners can connect devices using communications services and networks. They are aware of the technical requirements and operation of computing devices including communications technologies. Learners have an understanding of contemporary areas of development in Computing Science. They are familiar with Computing Science processes and can apply these to real world problems.  |
| **designing, building and testing computing solutions**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners have the **knowledge and understanding** to explore a range of algorithms/instructions executing them using programmable devices and/or computers.  | Learners have the **knowledge and understanding** that allows them to demonstrate a range of basic **problem solving skills**, **creating** and improving simple algorithms using computer programs and programmable devices. | Learners have the **knowledge and understanding** to write algorithms to **solve simple problems**. Learners have the **knowledge and understanding** to allow them to **design**, **create** and debug computer programs using coding languages. | Learners have the **knowledge and understanding** that allows them to design, build and test computer solutions using coding and markup languages. They have the **knowledge and understanding** to explain code extracts from their program and can select and justify the most appropriate steps required to formulate a solution. | Learners have the **knowledge and understanding** that allows them to design, build and test real-world solutions. They can give reasoned arguments for their processes and can compare and **evaluate** alternative solutions. They have the **knowledge and understanding** to present information using more complex coding languages and multimedia. They can **demonstrate** an **understanding** of simple computer architecture. |
| **food and textiles technologies** |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners develops ideas and **solve simple problems** through **discussion** using a food ortextile context | Learners develops and use **simple problem solving** and **evaluative** strategies to meet designchallenges with a food or textile focus | Learners develops and **use problem solving** and **evaluative** strategies to meet design challenges with a food or textile focus | Learners use **creativity** to **plan**, **develop**, **make** and **evaluate** food or textile items | Learners **design**, **plan,** **produce** and **evaluate** increasingly complex food or textile items. Learners **apply** skills of **critical thinking** when **evaluating** the design features and effectiveness of everyday products and how these products meet the needs of the user. Learners **apply** **knowledge** of colour theory to a food or textile item or when using technology |
| **designing and constructing models/products** |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners **explore** how to construct models using their natural **curiosity**. Learners **evaluate** their work and can adapt and improve it.  | Learners use their **imagination** and **problem solving** skills to construct models. Learners have the **knowledge and understanding** to **evaluate**, adapt and improve where appropriate. | Learners **creatively** adapt, evolve and improve their designs when constructing a model/product.  | Learners have the **knowledge and understanding** and **problem solving skills** to design and construct models/products. Learners can **plan, develop, organise and evaluate** their work.  | Learners **apply critical thinking skills** throughout all stages of the design process. |
| **exploring uses of materials**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners **explore** a variety of materials and can **discuss** their similarities and differences and what they are used for. | Learners have a **knowledge and understanding** of basic properties and uses for a variety of materials and can **discuss** which ones are most suitable for a given task.  | Learners **evaluate** a selection of materials and choose the most appropriate to **create** a product. | Learners **search and retrieve** appropriate information to inform their selection of materials and have the **knowledge and understanding** to justify their choices. | Learners can give a **reasoned argument** for material selection and display detailed **knowledge and understanding** to support their choices. |
| **representing ideas, concepts and products through a variety of graphic media**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners use their **imagination** to draw items or ideas using various types of graphic media.  | Learners develop **knowledge and understanding** of graphic mediato **create** drawings that represent ideas in different situations. | Learners develop **knowledge and understanding** of graphic mediato **create** a design and develop **knowledge and understanding** of 3D design. | Learners develop **knowledge and understanding** of a variety of graphic media and can select the most appropriate to convey their ideas and concepts.  | Learners have the **knowledge and understanding** to select appropriate graphic mediaand can provide reasoned arguments for their selection. |
| **application of engineering**  |
| **Early Level** | **First Level** | **Second Level** | **Third Level** | **Fourth Level** |
| Learners **explore** a variety of products which have engineering properties.  | Learners develop **knowledge and understand** of engineering disciplines and can **create** basic **solutions to problems**. | Learners apply their **knowledge and understanding** to make connections between different engineering disciplines, science and mathematics. Learners can **solve** simple engineering **problems**.  | Learners **solve problems** by applying their **knowledge and understanding** of a variety of engineering disciplines. | Learners **solve real world real time problems** through the application of engineering principles and can **discuss** the impact engineering has on the world around them. |