

Professional learning paper: Significant Aspects of Learning

Assessing progress and achievement in the Technologies

The work in progress on Significant Aspects of Learning was reviewed in June and July 2015 in the light of feedback from practitioners, schools and education authorities and in the context of developments in national education policy. This has led to a number of changes both in the overarching paper and in each of the papers related to an area of the curriculum.

Within each of the curriculum area papers changes include:

- the addition of two sections which set the context for the work on significant aspects of learning
- the addition of references, wherever appropriate, to the relationship between significant aspects of learning and the development of skills for learning life and work, literacy and numeracy and digital competencies
- changes (usually minor) to the definition and illustration of the significant aspects of learning in that area
- the use of a common format in the presentation of the significant aspects of learning
- the insertion of hyperlinks to texts referenced in the paper.

The major single change within this paper, when compared to the original, is that the sections within this paper have been reordered to match the order in the other curricular papers in this series. This should support practitioners who need to refer to more than one of the papers. Again in order to match the other papers some headings have been removed and text allocated to other sections. There are no major changes to the content of the paper.

This preface has been added to each paper. Feedback from practitioners made it clear that the original papers lacked a clear initial statement of context and purpose.

Preface

This paper is one element of a suite of resources which support assessment of progress and achievement. You are recommended to read this paper in conjunction with the following:

- *Monitoring and tracking progress and achievement in the broad general education:* bit.ly/edscotapasal
- *Assessing progress and achievement overarching paper*
- *Technologies progression framework*
- *Annotated exemplification of work in the technologies:* bit.ly/edscotsaltech

This resource supplements the [Technologies Principles and Practice paper](#) and the [Experiences and Outcomes for Technologies](#).

Introduction

The introduction to each paper has been revised as necessary to make clearer links to the Principles and Practice papers which identify the key aims of learning in the relevant curriculum area.

The Technologies Principles and Practice paper underlines the entitlement of all children and young people to experience learning in all six organisers of the Technologies as a vital, exciting part of their Broad General Education:

Technology – the application of knowledge and skills to extend human capabilities and to help satisfy human needs and wants – has had profound effects on society.

Within Curriculum for Excellence, the technologies curriculum area relates particularly to contexts that provide scope for developing technological skills, knowledge, understanding and attributes through creative, practical and work-related activities. ... These experiences and outcomes offer a rich context for the development of all of the four capacities and for developing the life skills that are recognised as being important for success in the world of work. They also offer an excellent platform for a range of technology-related careers.

This paper builds on this through using significant aspects of learning to provide valid, reliable and challenging assessment of progress and achievement in Technologies. This paper provides:

- a description of the significant aspects of learning within Technologies
- an outline of what breadth, challenge and application look like within Technologies
- information on planning for progression through curriculum levels, using breadth, challenge and application.

The overarching paper in this professional learning resource contains a section on 'What are the significant aspects of learning?' Feedback suggested strongly that it would be helpful to practitioners as they refer to and use the curriculum area papers to have a slightly abridged version of this section included in each curriculum area paper.

What are significant aspects of learning?

Significant aspects of learning have been identified for each curriculum area. Each significant aspect of learning brings together a coherent body of knowledge and understanding and related skills, as outlined in the Principles and Practice paper and detailed in the Experiences and Outcomes. Each significant aspect of learning

- is common to all levels from early to fourth
- can provide sound evidence of learning in accord with the principles of [Building the Curriculum 5: A Framework for Assessment](#)
- supports the practice of holistic ('best fit') assessment
- can be effectively used to inform assessment of progression within a level and achievement of a level
- can be used to plan further progression within a level and from one level to the next.

Using significant aspects of learning makes assessing progress and achievement more dependable and more manageable. This structure:

- supports practitioners in planning and integrating learning, teaching and assessment
- ensures that learners and practitioners can draw on a range of meaningful, robust, valid and reliable evidence from all four contexts of learning: classroom activities, interdisciplinary learning, the life and ethos of the school and personal achievements, including those outwith the school
- affords learners space to demonstrate the breadth of their learning, effective responses to challenging learning experiences and the ability to apply what they have learned in new and unfamiliar situations
- allows learners to progress by different routes and pathways through the experiences and outcomes
- helps practitioners avoid fragmented approaches to assessment which prevent learners from demonstrating the full range of their knowledge, understanding and skills
- removes the need to rely on evidence derived from single brief learning experiences or end of unit tests
- affords practitioners opportunities to plan and assess within a curricular area the development of the skills, attributes and capabilities required for learning, life and work, including the development of literacy, numeracy and digital competencies

- supports practitioners in making holistic ('best fit') judgements about the achievement of a level either in an individual significant aspect of learning or, drawing on evidence from across the relevant significant aspects of learning, in a curriculum area.

The use of significant aspects of learning will inform:

- moderation activities based on holistic judgements supported by dependable evidence
- monitoring and tracking progress in learning
- quality assurance approaches
- the use of assessment to inform improvement at all levels of the education system.

A number of changes have been made in this section:

- the significant aspects are presented as a bullet pointed list
- the previous SALs have been replaced by 13 SALs listed under the relevant organiser
- Technological developments in society and business have been combined as SALs must be common to all levels and there are only business E's and O's at 3rd and 4th level.
- numbering of significant aspects of learning has been removed; there were concerns that numbering could be interpreted as an order of priority

Significant Aspects of Learning in the Technologies

There are 13 significant aspects of learning (SAL) in the Technologies. They are bulleted under the organiser headings below:

Technological developments in society and business

SALs must be common to all levels from early to fourth, the outcomes and experiences for business are at 3rd and 4th level only. Children and young people begin to understand how technologies affect the world of work and their impact on society more generally from their early years experiences onwards therefore it is logical to merge these organisers for the purpose of assessing progress and achievement.

- 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.

Digital Literacy

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.

- 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

Computing Science

- Understanding the world through computational thinking
- Understanding and analysing computing technology
- Designing, building and testing computing solutions

Food and Textile Technologies

Food and textiles like other technological organisers cuts across different curricular areas. For further information on this SAL please also refer to Health and Wellbeing.

- food and textile technologies

Craft, Design, Engineering and Graphics

- 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 significant aspects of learning learners will develop and demonstrate:

- **knowledge and understanding of the big ideas and concepts of 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**

What do breadth, challenge and application look like in the technologies?

Breadth

Many of the Technologies experiences and outcomes are themselves broad. The Technologies are practical areas of learning, where the process learning and the product created by the learner are both important. Assessment within the Technologies needs to reflect this breadth of activities and cover both process and product. Within early years establishments and primary schools, learners' experiences 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
- crafting products using different materials and tools
- preparing a range of dishes and meals
- using a range of manual and computer-aided graphical skills

Assessment, focused on the significant aspects of learning and the progression frameworks, should capture that breadth. 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. A range of assessment evidence will reflect that breadth and ensure a proper balance between skills and knowledge.

Challenge

Appropriate challenge is a key factor in meeting learners' needs. Evidence of achievement in Technologies 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 Technologies contexts
- integrate different materials or media and technologies.

Achievement in developing and using technological skills and knowledge may also be enhanced through challenges encountered in enterprise activities, residential stays or work experience placements.

Application

Children and young people have planned opportunities to apply technological 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. Given the

breadth of the Technologies, there are many opportunities for skills from one of the contexts for learning, such as computing or graphics, to be applied across other experiences, such as textiles. Such 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 technological 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 learning in Technologies and can develop relevant skills, attributes and capabilities which will support them in further learning, life and work.

This section contains significant change as the SALs have been changed in the previous section.

Planning for progression through breadth, challenge and application in the Technologies

The following illustrates progression in each of the organisers in the technologies.

- **technological developments in society**

Throughout the Technologies, children and young people need to be shown and demonstrate safe and responsible use of a wide range of technologies including the internet.

At Early Level, children explore technologies to discover what they can do and how technologies can help in society. At First Level, children explore the use of current technological developments and can recognise ways in which they help and potential issues they may bring. Working collaboratively, children can discuss and develop imaginative ideas to create a product of the future. At Second Level, learners can design or improve their ideas or products through exploring technologies in the world around them. Learners can identify how everyday products have changed and improved over time and can make the link between scientific and technological developments. At Third Level, young people can begin to understand the link between scientific and technological developments. At Fourth Level, through comparing traditional and contemporary production methods, young people can assess the technologies contribution and impact in the world around them. Through investigating technological advancements, young people can debate the likelihood of the technological developments becoming a reality in the short or long term. Young people can debate the impact of new and emerging technologies on economic prosperity and the environment.

- **digital literacy**

Through the use of digital technology and applying digital skills, children can support, enrich or enhance their learning in different contexts. Children are building an awareness and understanding of Cyber resilience and internet safety.

At early level, children use digital technology to find information, be creative and solve problems and know why passwords are important. At first level, children use digital technology to organise, manage, retrieve and access information safely. Across first and second level, children develop their skills in creating, capturing and manipulating, sounds, text and images in a variety of ways and contexts and be aware of the safety issues around sharing content online. At second level, learners recognise the benefits and can use search facilities to access and retrieve information to enhance and extend their learning. At third level, young people can effectively explore and use the features of a range of computer programmes and peripherals to solve problems and enhance their learning. They know a range of strategies to protect their devices online. At fourth level, building upon skills developed at third level, young people will be able to successfully solve increasingly complex problems or issues and are aware of the implications of hacking.

- **technological developments in business**

There are no specific outcomes and experiences for this area of development until third level. However children and young people will begin to understand how technologies affect the world of work and the impact on society more generally from their early years experiences onwards. Connections should be made naturally to the outcomes for social studies and to technological developments in society. For example at early level young people are able to explore how local shops and services provide us with what we need in our daily lives. Through real life settings and role play they can explore how different technologies can help meet both our needs and wants. At first level learners can explore how meeting these needs and wants can affect the environment in which we live. As learners move into second level they can make suggestions as to how individuals and organisations can use technologies to reduce the impact on our environment taking into consideration the costs and benefits involved.

As learners progress to third level they should be aware of how digital technologies can make a contribution to business. This can include the collection and presentation of information, including the calculation of costs and revenues in enterprise projects. At fourth level learners should be able to understand the costs and benefits of using technology in the workplace and this will include health and safety in addition to the ergonomic factors around workplace design.

- **computing science**

At early level learners explore a range of programmable and digital devices, developing an understanding of cause and effect through inputting algorithms / instructions and watching and reporting on what happens next. At first level learners demonstrate a range of basic computational thinking skills creating, evaluating and improving simple algorithms and developing an awareness of how the process underpins computer programming. At second level learners can analyse and explain more complex algorithms. They have the ability to design, build and test computer programs using coding languages and can explain simple code extracts from their programs. They explore how computers are used in the world of work and the impact of computing science on future careers. At third level learners can design, build and test computer solutions using coding and markup languages. They can explain code extracts from their program and can select and justify the most appropriate steps required to formulate a solution. At fourth level learners can design, build and test

real-world solutions. They can give reasoned arguments for their processes and can compare and evaluate alternative solutions. They can present information using more complex coding languages and multimedia. Learners demonstrate an understanding of simple computer architecture.

- **food and textile technologies**

At early level learners develop ideas and solve problems through discussion using a food or textiles context. At first level learners can develop and use simple problem solving and evaluative strategies to meet design challenges with a food or textiles focus. At second level learners develop these strategies further to meet design challenges with food or textiles focus. At third level young people can use creativity to plan, develop, make and evaluate food or textile items which meet the needs at home or in the world of work. At fourth level young people can design, plan, produce and evaluate increasingly complex food or textile items which satisfy the needs of the user. In addition, young people can apply and evaluate the use of design and colour in food or textile items.

- **craft, design, engineering and graphics**

At early level, children draw and build structures, explore materials and learn about different ways of joining them. At first level, children develop skills in using common tools and creating images of technological items, designing and building products using kits and a range of craft materials. At second level, children have an increasing awareness of the materials and structures in their schools and homes. They develop skills in recognising and solving problems, applying design, graphic, engineering and craft skills and knowledge. By third level, children recognise the capacity of design, craft and engineering skills to address local and wider environmental, social and economic challenges, bringing a comprehensive range of technological skills and knowledge to bear. At fourth level, young people are confident and well informed in relating their own increasing skills in craft, design, engineering and graphics to those necessary for real-world application and the world of work, contributing innovative ideas to technological considerations and projects.

This section has been reworded to stress the value of using all elements of the professional resource: overarching paper, relevant curriculum area paper(s), progression framework(s) and annotated exemplification.

Next steps

Practitioners are encouraged to use this paper with the other elements of the professional learning resource to inform reflection on practice and plan for improvement as they support learners' progress and achievement in learning. The professional resource, including this paper, can be used to stimulate, inform and support professional dialogue during quality assurance and moderation activities.