Subject Area Syllabus and Guidelines

Information and Communication Technology Education

Level 4 to Beyond Level 6

Queensland Studies Authority
Partnership and innovation

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Information and Communication Technology Education Subject Area Syllabus and Guidelines

Level 4 to Beyond Level 6

Cover: Students of Park Ridge State High School

Queensland Studies Authority, PO Box 307, Spring Hill, Queensland 4004, Australia
Phone: (07) 3864 0299
Fax: (07) 3221 2553
Email: office@qsa.qld.edu.au
Website: www.qsa.qld.edu.au

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Introduction

Subject area syllabuses have been developed to cater for specialised student interests within the framework of a core and common curriculum in Queensland.

The common curriculum and the subject areas

The role of the common curriculum for Queensland schools is to provide a comprehensive education for all students during the compulsory years of schooling. It consists of the eight nationally agreed key learning areas:

- The Arts
- English
- Health and Physical Education (HPE)
- Languages other than English (LOTE)
- Mathematics
- Science
- Studies of Society and Environment (SOSE)
- Technology.

The Queensland curriculum for the compulsory years of schooling is based on an outcomes approach.

The core of the Queensland curriculum for the compulsory years of schooling consists of a selection of essential learnings expressed as 'core learning outcomes'. 'Discretionary learning outcomes' describe what students know and can do beyond what is essential at a particular level.

Key learning area syllabuses describe core learning outcomes in developmental levels along learning continua for the 10 years of compulsory schooling. The common curriculum is conceptualised as a whole, rather than segmented into sections for different phases of schooling.

During the later years of compulsory schooling, many schools may offer their students subjects that allow them to engage in specialised studies in specific contexts. Syllabuses have been developed for five subject areas that are typically a focus of curriculum choice and specialisation. These are:

- Agricultural Education
- Business Education
- Home Economics Education
- Industrial Technology and Design Education
- Information and Communication Technology Education.

Through the experiences, challenges and opportunities associated with each subject area, students develop a unique range of knowledge, practices and dispositions. These can be described through learning outcomes that are specific to the subject area. In certain contexts, some learning outcomes from different key learning areas contribute to a subject area.

Subject area syllabuses and guidelines

Syllabuses and guidelines have been developed for five subject areas. Typically, schools will use the subject area syllabuses to plan a variety of courses of study that will provide particular students with specialised learning experiences in specific contexts.

Subject area strands are contextual. The strands are used to organise the learning outcomes in the syllabus. The strands contain two types of learning outcomes — 'central learning outcomes' and 'supplementary learning outcomes'. The central learning outcomes describe the learnings that are considered fundamental to the subject area. It is recommended that these be the primary focus of a course of study developed for a subject area. Central learning outcomes consist of subject-area-specific learning outcomes and some core learning outcomes from different key learning areas. Supplementary learning outcomes are additional learning outcomes that could be considered for inclusion to enrich a course of study.

Central and supplementary learning outcomes have codes that identify the strand and developmental level to which they belong (see Outcomes section). If these learning outcomes have been selected from a key learning area syllabus, the key learning area code for that learning outcome is indicated in parentheses.

Subject area syllabuses describe learning outcomes from Level 4 to Beyond Level 6. Subject area syllabuses are not specifically associated with particular year levels of schooling; however, it is predicted that they will be used for planning courses of study in middle schools and lower secondary schools. These subject area syllabuses may also be used in other educational settings where there are specific student interests in the subject area, appropriate school resources and teacher expertise.

Subject area syllabuses cannot be regarded as alternatives to each other or to particular key learning areas. Each subject area syllabus contains different subsets of learning outcomes from different key learning areas, as well as learning outcomes that are specific to particular subject areas.

Courses of study

Courses of study are planned sets of learning experiences and assessment tasks that have a specified duration and location in a school's overall curriculum offering. They may be units offered within a vertical timetable, a semester, a single year or multiple years. Courses of study may be developed from any of the subject area and/or key learning area syllabuses.

The time allocation for courses of study based on subject area syllabuses is a school-based decision.

Subject area syllabuses enable schools to plan courses of study that meet a variety of student needs and interests.

When planning courses of study, the following should be considered:

- the needs of students
- resources and staff
- the place and role of courses of study within the total school curriculum.

Further information is available in the Guidelines section.

Rationale

Nature of the subject area

Information and communication in the twenty-first century are increasingly interlinked and mediated by technology. Information and communication technology enables individuals to access, construct and publish information for particular purposes and audiences. It also allows communication and collaboration with others in real and virtual spaces. Individuals can use information and communication technology as a medium to express ideas and be creative. Interaction takes place at the interface between humans and machines. Interfaces can be designed and controlled to meet the needs of users.

Our society relies on the creation of knowledge and the exchange of information. Active and informed participants in this society need to be flexible and self-directed, work to patterns of logic, combine analysis with intuition, exercise discretion, behave ethically and work collaboratively. Citizenship within this society requires understandings of participation and power structures, specific interest groups, and the roles of governments in the knowledge-based economy. Knowledge-based economies are directly based on the production, distribution and use of knowledge and information. Through information and communication technology, individuals can make creative, innovative and socially responsible uses of information and create information and communication technology products for themselves and others.

In Information and Communication Technology Education, students develop and demonstrate the knowledge, practices and dispositions necessary to operate effectively in information-rich environments. They understand the transformation of data to information, information to knowledge, and knowledge to wisdom, and the interdependent human and technological agencies that lead to these transformations. Students critically analyse information and construct personal meanings to develop and present responses to information and communication challenges.

Nature of learning in the subject area

Information and Communication Technology Education draws on the disciplines of computer science, informatics, graphic design, communication and commerce.

The challenges in this subject area may be met in a variety of ways depending on constraints such as available resources, expertise, experience and time. The challenges may involve inquiry and problem-based learning or project-based collaborations that focus on student-centred learning in authentic tasks. Learning in Information and Communication Technology Education is not limited by the physical constraints of time or place. Through the internet, students, teachers and other professionals can participate in real-life and lifelike contexts as members of online communities.

Information and communication technology practice involves iterative and interdependent phases of immersion, challenge, response, review, enhancement and presentation. Students

use information and communication technology practice to respond to information and communication challenges — they create products such as interactive media products, hypermedia products, online events, robotic systems, screen designs and original publications.

Information and Communication Technology Education provides the context for students to develop a unique repertoire of knowledge, practices and dispositions. Students also have opportunities to develop some of the knowledge, practices and dispositions from the key learning areas of Technology, Studies of Society and Environment and The Arts.

Contribution of the subject area to lifelong learning

The Queensland school curriculum is designed to assist students to become lifelong learners. The overall learning outcomes of the curriculum contain elements common to all key learning areas and subject areas, and collectively describe the valued attributes of a lifelong learner.

A lifelong learner is:

- a knowledgeable person with deep understanding
- a complex thinker
- an active investigator
- a responsive creator
- an effective communicator
- a participant in an interdependent world
- a reflective and self-directed learner.

The Information and Communication Technology Education subject area provides many opportunities for students to develop the valued attributes of lifelong learners.

Knowledgeable person with deep understanding

Learners understand that information and communication technology assists people to access and use data in a range of contexts. They understand the interdependence of data flow and global communication. Learners understand that developments in information and communication technology influence, and are influenced by, social, ethical, cultural and environmental factors.

Complex thinker

Learners use critical and complex reasoning, lateral thinking and intuition to develop and evaluate information and communication technology products. They question and analyse community values and interpret reasons for the use of particular information and communication technologies. They predict the impact of these on individuals and communities. They critique and validate information and analyse viewpoints for bias.

Active investigator

Learners use their natural curiosity and enthusiasm to identify and define challenges, explore alternatives, and keep up-to-date with developments in information and communication technology. They test the suitability of information and communication technology tools and data for specific purposes and experiment with techniques for manipulating these. They access and synthesise information from a variety of sources.

Responsive creator

Learners use imagination, originality and aesthetic judgment to meet information and communication technology challenges. They take risks when developing creative solutions and products. They consider the impacts of information and communication technology products and developments on individuals and communities.

Effective communicator

Learners communicate information using appropriate language, symbol systems and representations. They use accepted standards of written, verbal and visual communication to communicate ideas. They use a range of information and communication technology tools to communicate to others, including virtual audiences. They compose design briefs and specifications, develop test reports, product proposals and evaluations. They critically explore ideas and values when debating social and ethical issues related to the development, use and impact of information and communication technology.

Participant in an interdependent world

Learners work independently and cooperatively and demonstrate confidence and initiative as they work with information and communication technologies in real-life and lifelike contexts. They work as members of local and global communities. They negotiate and resolve conflict as they manage resources to work towards common goals. They consider issues of appropriateness, challenge inequities, and advocate for and contribute to the socially just use of information and communication technologies. They appreciate the value of participating in the development of information and communication technology products.

Reflective and self-directed learner

Learners critically evaluate and reflect on assumptions, values, products and their own learning while working with information and communication technologies. They identify their strengths, limitations and preferred learning styles, and use this information to improve their learning. They evaluate information and communication technology products and systems and search for improvements and further opportunities.

Cross-curricular priorities

The Information and Communication Technology Education subject area incorporates and promotes the cross-curricular priorities of literacy, numeracy, lifeskills and a futures perspective.

Literacy

Literacy is a social practice that uses language for thinking and making meaning in cultures. It includes reading and writing, speaking and listening, viewing and shaping, often in combination in multimodal texts within a range of contexts. Critical thinking is also involved in these practices. Students seek and critically appraise information, make choices and use their literacy skills to become independent learners. They develop critical literacy by questioning the cultural and social practices embedded in various kinds of texts. Students learn about relationships between the contexts and audiences of those texts. They understand that literacy influences how people view themselves, their identities and their environments as well as providing ways to represent these views.

Students use text, graphics, sound, animation and video to discover and convey meaning in ways suitable for the context. A variety of media such as telecommunications tools, documents, audio-visual productions and the internet are employed.

Students:

- comprehend information, and organise and evaluate data
- identify within problems those parts that specifically require information and communication technology solutions
- develop successful search strategies
- reconstruct data as information within specific contexts
- critically analyse and reflect on data, information and knowledge
- use conventions regarding language and behaviour in digital formats and online communities
- participate in virtual forums.

Numeracy

Numeracy is the demonstration of practices and dispositions that accurately, efficiently and appropriately meet the demands of typical everyday situations involving number, space, measurement and data.

In Information and Communication Technology Education, students investigate real-life and lifelike challenges. Students apply numeracy understandings when representing real or imaginary objects and situations with virtual tools.

Meeting the numeracy demands of situations involving information and communication technology requires:

- an understanding of concepts of time, length, symmetry, shape, scale and ratio
- counting, measuring, designing, graphing, mapping, drawing plans and calculating
- identifying, making and using patterns and sequences
- reading, interpreting and creating documents that contain numerical constructs
- applying numerical symbols and/or spatial concepts in software programs, in using and building systems, and in developing graphical images
- critiquing numerical information for bias and misinterpretation.

Lifeskills

Lifeskills is a term used to describe the knowledge, practices and dispositions considered necessary for people to function adequately in their current and changing life roles and situations. Demonstration of lifeskills takes place in two overlapping dimensions: practical performance of, and critical reflection on, those skills.

It is possible to identify at least four sets of lifeskills that enable students to participate in four life roles. The lifeskills, and related life roles, are:

- personal development skills — growing and developing as an individual
- social skills — living with and relating to other people
- self-management skills — managing resources
- citizenship skills — receiving from and contributing to local, state, national and global communities.

In Information and Communication Technology Education, students have opportunities to understand and be empowered to live successfully in a globalised and information-rich society. They learn independently and collaboratively in online communities. They critically reflect on the appropriate use of information and communication technology in the community and the workplace. They develop self-discipline in managing time and other resources and display motivation and perseverance in seeing projects through to completion.

Futures perspective

A futures perspective involves knowledge, practices and dispositions that enable students to identify individual and shared futures. A futures perspective leads to insights and understandings about thinking ahead, and the roles of individuals and groups in envisioning and enacting preferred futures.

Students with insights and knowledge about the past and present consider the consequences of past and future actions. They take responsibility for their actions and decisions and are empowered to participate optimistically in processes of social innovation, recovery and renewal.

Students consider the social and ethical implications of developments in information and communication technology on individuals, communities and environments, both now and in the future. They explore their roles and responsibilities in relation to these developments.

Students have opportunities to innovate. They prepare scenarios, analyse trends, forecast and model. They communicate ideas and feelings related to information and communication technologies. They discuss the merits and drawbacks of possible, probable and preferred futures related to information and communication technologies.

Other curricular considerations

The Information and Communication Technology Education subject area also incorporates work education.

Work education

Work involves both the paid employment that people undertake and the unpaid work they perform within the groups, communities and societies to which they belong. It occurs with different types and groupings of people in different settings and is performed under many different conditions.

Work education involves **learning for work**, **learning about work** and **understanding the nature of work**:

- Learning for work involves developing work-related knowledge, practices and dispositions.
- Learning about work emphasises student understandings about work and the settings and conditions that characterise workplaces. It highlights the benefits of work to individuals and communities.
- Understanding the nature of work involves critically reflecting on and analysing the sociocultural, economic and political forces that influence the ways society values different kinds of work.

While work education includes providing opportunities for students to explore options for future education, training and paid employment, this is not its sole purpose; nor is it intended to focus exclusively on the development of vocationally oriented skills. Work education has

a much broader role — that of preparing students for work in all the forms and contexts in which it occurs. This includes preparing students to participate effectively in paid and unpaid work, to understand the issues involved in balancing these different kinds of work (including family responsibilities), and to recognise the benefits to society of assisting workers to achieve this balance.

Information and Communication Technology Education provides contexts and opportunities for students to develop and use information and communication technology products that have real-life applications and relevance.

Learning for work occurs through the development of transferable, conceptual understandings. This enables students to comprehend innovations that emerge during their school life and beyond. Learning in Information and Communication Technology Education can be applied to current and future life activities.

Students learn about work through formal and informal conversations and investigations. They understand that people use information and communication technologies for work in locations ranging from home sites to business environments. People from the information and communication technologies industry can visit the classroom and be online consultants in student projects. They may be willing to answer questions, provide ideas, mentor and interact with students.

Students understand that patterns of work have altered over time. They understand that the nature of work is evolving due to the impacts of technologies on society, on communities within societies, and on individuals within different communities. They critique and examine the social and ethical implications of these changes for themselves and others in work situations.

Understandings about learners and learning

The following assumptions about learners and learning underpin the Information and Communication Technology Education subject area.

Learners

- Learners are unique individuals and thinkers with divergent views about the world.
- Learners have a broad range of knowledge, attitudes, values and experiences shaped by their gender, socioeconomic status and geographical location, and by other aspects of their background, all of which form part of their learning environment. Their prior knowledge and experiences influence the meaning they make of any new learning experience.
- Learners grow, develop and learn in different ways, in different settings and at different rates. By engaging in learning activities that match their needs, interests, understandings and individual learning styles, learners have opportunities to develop and extend their capabilities.

Learning

- Learning is a lifelong process.
- Learning occurs within and across cultural contexts and social situations and is influenced by them.
- Learning is most effective when the learning environment is safe, supportive, enjoyable, collaborative, challenging and empowering.

- Learning is most effective when it involves active partnerships with students, parents/ carers, peers, teachers, and school and community members.
- Learning contexts should acknowledge equity principles by being inclusive and supportive and by acknowledging and valuing diversity.
- Learning is enhanced and supported when teaching approaches are culturally sensitive.
- Learner-centred strategies are most effective in enabling learners to make informed choices and to take actions that support their own and others' wellbeing.
- Learning requires active construction of meaning and is effective when it is developed in meaningful contexts and accommodates, acknowledges and builds on prior knowledge.
- Learning is enhanced when learners have opportunities to reflect on their own thinking and learning.
- Learning is enhanced by the use of a range of technologies.

Learner-centred approach

A learner-centred approach to learning and teaching views learning as the active construction of meaning, and teaching as the act of guiding and facilitating learning. This approach considers knowledge as being ever-changing and built on prior experience.

A learner-centred approach provides opportunities for students to practise critical and creative thinking, problem solving and decision making. This involves recall, application, analysis, synthesis, prediction and evaluation, all of which contribute to the development and enhancement of conceptual understandings. A learner-centred approach also encourages students to reflect on and monitor their thinking as they make decisions and take action.

Equity in the curriculum

The Queensland school curriculum is designed to challenge inequities by:

- acknowledging and minimising unequal outcomes of schooling for different groups of students
- identifying and minimising barriers to access, participation, active engagement, construction of knowledge and demonstrations of learning
- using the knowledge, practices and dispositions of all students as a basis for their learning and for enhancing the learning of others in the community
- developing understanding of, and respect for, diversity within and among groups
- making explicit the fact that knowledge is historically, socially and culturally constructed
- making explicit the relationship between valued knowledge and power relations
- identifying and promoting the capacity of the Information and Communication Technology Education subject area to develop knowledge, practices and dispositions that empower students to challenge injustices and inequities.

The curriculum also provides opportunities for students to learn about equity and equity issues in the context of the subject area.

Student access and participation

In an inclusive curriculum, consideration is given to the interrelationships between culture, language, ability, gender, sexual identity, location and socioeconomic circumstance, and their impact on students' perspectives and experiences, and therefore access to, and success in, the curriculum.

Students bring varied prior experiences to the classroom, some of which support their learning in Information and Communication Technology Education, and others that may make this more difficult. Students' diverse experiences and their resultant perspectives of information and communication technology need to be considered when planning.

The selection of concepts, contexts, contents and learning experiences needs to accommodate the diverse learning styles, interests and experiences of students if learning is to be maximised.

Learning about equity

Students explore, express and challenge personal, group and societal values that reinforce and perpetuate inequities.

Through the learning activities in Information and Communication Technology Education, students understand and appreciate diverse needs and perspectives, and learn to value and respect people, cultures and their environments. Students develop knowledge, practices and dispositions to critique social and political structures and power relations created through activities in information and communication technology that have the potential to work for or against individuals or groups.

Students develop understandings about the historical, societal, cultural, spiritual, political and economic constructions of and contexts in which information and communication technology products and practices are created and valued, and the dynamic interrelationships that exist between these. This promotes understanding of the heterogeneity of practices, beliefs and values within and across cultural groups. This, in turn, empowers students to become lifelong learners and active and critical participants in interdependent societies.

Outcomes

Framework

This syllabus provides a framework for planning learning activities and assessment opportunities through which students demonstrate what they know, and can do with what they know, in the Information and Communication Technology Education subject area.

Subject area outcomes

The subject area outcomes highlight the uniqueness of the Information and Communication Technology Education subject area and its particular contribution to lifelong learning. In this subject area, students develop the knowledge, practices and dispositions necessary to:

- understand and appreciate the nature of information and communication technologies that enable the presentation and communication of information
- critically evaluate information and communication mediated by technology
- make informed decisions in responding to information and communication technology challenges
- select and use techniques to respond creatively and productively to information and communication challenges
- reflect on and evaluate social and ethical issues related to information and communication technology and its impacts on individuals, communities and societies.

Strands of the subject area

The learning outcomes of the Information and Communication Technology Education subject area are organised into four strands:

- Accessing and Constructing Digital Information
- Digital Communication and Publishing
- Interfacing with Machines
- Participating in Online Communities.

Students develop their understandings of the concepts within the strands throughout the later years of compulsory schooling. Courses of study can be planned using learning outcomes from a single strand or from a number of strands. Courses of study may be planned to provide opportunities for students to demonstrate central learning outcomes from this syllabus together with core learning outcomes from the *Years 1 to 10 Technology Syllabus*. Some core learning outcomes from the *Years 1 to 10 Technology Syllabus* are included as supplementary learning outcomes.

Accessing and Constructing Digital Information

This strand focuses on students accessing and constructing information from data and information resources such as CD-ROMs, databases, spreadsheets and the internet. Students critically engage with information as they become responsible and discerning users of information.

The organisers for this strand are:

- nature of digital information
- techniques for accessing digital information
- techniques for constructing digital information
- social and ethical considerations related to accessing and constructing digital information.

Digital Communication and Publishing

This strand focuses on students designing and communicating through graphic design, multimedia production and publishing. Computer-generated products are designed, structured and produced from, for example, printed and digital text and images, multimedia, and web-based products. Students meet information and communication technology challenges that reflect production processes and graphical communication models used in personal situations, communities and industries. Students critically analyse and evaluate designs and products as constructs of cultures and social practices.

The organisers for this strand are:

- nature of digital communication and publishing
- techniques for digital communication and publishing
- social and ethical considerations related to digital communication and publishing.

Interfacing with Machines

This strand focuses on students designing, creating, using and evaluating information products that connect users and machines. 'Machines', in this context, are any apparatus consisting of interrelated parts, some of which are digital, that are used to solve information and communication technology challenges. Students critically review the applications and implications of control and power relationships in information communication and technology.

The organisers for this strand are:

- nature of machine interfaces
- logic of information-processing sequences
- nature of digital information and communication systems
- techniques for designing and developing machine interfaces
- social and ethical considerations related to machine interfaces.

Participating in Online Communities

This strand focuses on online communities and cultures, the significance and impacts of the internet and telecommunications on people, and the development of Australia's future in a global knowledge society. Students reflect on and critique online practices in relation to work, lifestyles and cultural identity for individuals and local and global communities.

Much of the communication that occurs in contemporary industrialised societies occurs through combining the interactive and broadcast technologies of the internet, telephone networks, interactive video networks, broadcast television and radio networks. Students understand how people choose mediums and practices to meet information and communication technology needs and apply information and communication technology practice in connected environments to develop informed communities.

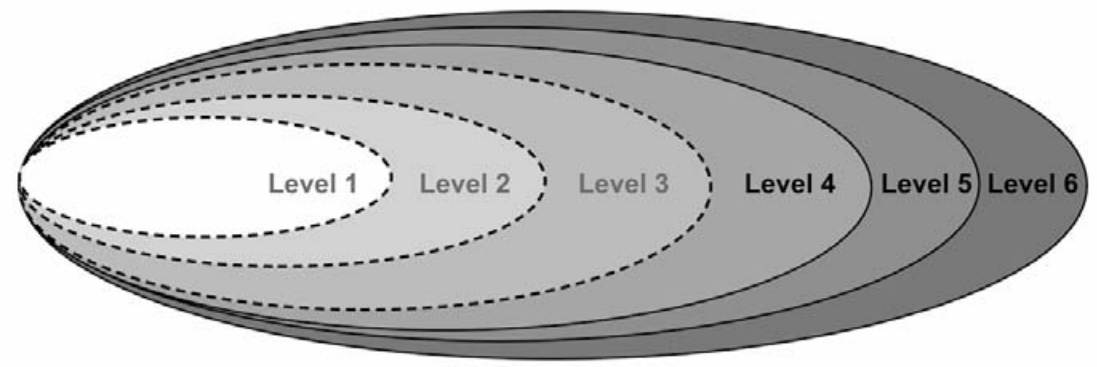
The organisers for this strand are:

- nature of online communities
- techniques for participating in online communities
- social and ethical considerations related to participating in online communities.

Levels

The levels outlined on the following pages indicate progressions of increasing sophistication and complexity in learning outcomes. This syllabus describes learning outcomes for Level 4, Level 5, Level 6 and Beyond Level 6. The sequencing of the learning outcomes is such that each level is 'nested' within the following level. Learning outcomes for successive levels are conceptually related to each other, forming a continuum rather than existing simply as a number of discrete entities.

A level statement is included for each level of each strand of the syllabus. The level statement summarises learning outcomes at each level and provides a framework for developing the central and supplementary learning outcomes.



Progression of conceptual development of outcomes

Central learning outcomes

Central learning outcomes describe those learnings that are considered fundamental to a course of study based on a subject area syllabus. They describe what students know, and can do with what they know, as a result of planned learning activities. The central learning outcomes are presented in order of increasing complexity from Level 4 to Beyond Level 6. Students should be provided with multiple opportunities to demonstrate those learning outcomes selected for inclusion in a course of study. A course of study may include only some of the learning outcomes described in this syllabus.

Central learning outcomes may be of two types:

- subject-area-specific learning outcomes — these are specific to the subject area and are not described in the core learning outcomes of the key learning areas

- core learning outcomes — these are selected from antecedent key learning areas, in a subject area context, and are fundamental to the subject area. Core learning outcomes are included from the Technology key learning area. These learning outcomes are labelled to indicate their key learning area code and strand codes. For example, a core learning outcome from the *Years 1 to 10 Technology Syllabus* and systems strand will be coded as Tech SYS.

Supplementary learning outcomes

Supplementary learning outcomes describe what students know, and can do with what they know, beyond what is considered fundamental at a particular level. They indicate additional learnings considered desirable. The supplementary learning outcomes are included to assist teachers in broadening the understandings of those students who have already demonstrated central learning outcomes. Additional supplementary learning outcomes could be developed by schools or teachers. At Beyond Level 6 all learning outcomes are supplementary.

Relationship of outcome levels to year levels

For the purposes of planning learning activities and assessment opportunities, outcome levels typically relate to years of schooling as follows:

- students demonstrating Level 4 outcomes are at the end of Year 7
- students demonstrating Level 6 outcomes are at the end of Year 10.

Some students will demonstrate the learning beyond the typical levels described above. Other students will require more time to demonstrate their learning.

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*L*earning outcomes

Accessing and Constructing Digital Information

Organisers for the learning outcomes in the Accessing and Constructing Digital Information strand are:

- nature of digital information
- techniques for accessing digital information
- techniques for constructing digital information
- social and ethical considerations related to accessing and constructing digital information.

Level 4	Level 5
Level statement Students discuss the nature and use of information and communication technologies. They apply their understandings to find and generate information to solve simple challenges.	**Level statement** Students understand the nature and structure of information. They make judgments about the effectiveness of solutions to information and communication technology challenges. They investigate the different sources of information and become discriminating users.
Central learning outcomes	**Central learning outcomes**
ACI 4.1 Students analyse the nature of information and discuss its relationship with data, knowledge and wisdom.	**ACI 5.1** Students investigate and describe the roles of information and communication technology in the transformation of data to information, knowledge and wisdom.
ACI 4.2 Students access information from electronic sources, including the internet, using operational and search strategies.	**ACI 5.2** Students identify and access digital information when making decisions about an issue of local concern.
ACI 4.3 Students investigate and map the ways in which data is categorised into fields in existing information systems.	**ACI 5.3** Students collect data and construct a simple information system.
ACI 4.4 Students analyse and describe privacy and intellectual property issues related to accessing and constructing information.	**ACI 5.4** Students investigate the validity and credibility of information constructed from data gathered for a specified purpose.
Supplementary learning outcome	**Supplementary learning outcome**
ACI 4.5 Students design an ethical code of personal behaviour based on their perceptions of cultural groups. (SOSE CI 4.2)	**ACI 5.5** Students devise practical and informed strategies that respond to the impact of particular perceptions of cultural groups held by a community. (SOSE CI 5.2)

Key:

- SOSE — in Years *1 to 10 Studies of Society and Environment Syllabus*; Strand: CI — Culture and Identity.

*L*earning outcomes

Accessing and Constructing Digital Information

Organisers for the learning outcomes in the Accessing and Constructing Digital Information strand are:

- nature of digital information
- techniques for accessing digital information
- techniques for constructing digital information
- social and ethical considerations related to accessing and constructing digital information.

Level 6	Beyond Level 6
Level statement Students describe and evaluate the way people access and construct digital information. They use techniques of accessing and constructing information to establish a position on an issue.	**Level statement** Students identify issues related to current and future applications of accessing and constructing digital information. They build information systems to suit the needs of others.
Central learning outcomes **ACI 6.1** Students analyse the human process of transforming information to knowledge and knowledge to wisdom through information and communication technology mediation. **ACI 6.2** Students locate, access and evaluate digital information from a range of defined perspectives and present this information to defend or promote a particular viewpoint. **ACI 6.3** Students construct an information system based on research data in order to defend or promote a viewpoint. **ACI 6.4** Students investigate the ways people holding different viewpoints access and construct information for their own purposes.	**Supplementary learning outcomes** **ACI B6.1** Students describe possible, probable and preferred futures involving information products and their contribution to individuals and society. **ACI B6.2** Students identify an information need and critique the currency, credibility and bias of digital and traditional media. **ACI B6.3** Students identify an information need and construct an information system that enables others to query, analyse and summarise the data. **ACI B6.4** Students investigate how legislation controls the way information is constructed, gathered and distributed in socially responsible and discerning ways.
Supplementary learning outcome **ACI 6.5** Students develop a proposal to promote a socially just response to perceptions of cultures associated with a current issue. (SOSE CI 6.2)	**ACI B6.5** Students synthesise quantitative and qualitative data on perceptions of a current cultural issue to develop a community information strategy. (SOSE CI D6.2)

Key:

- SOSE — in *Years 1 to 10 Studies of Society and Environment Syllabus*; Strand: CI — Culture and Identity.

*L*earning outcomes

Digital Communication and Publishing

Organisers for the learning outcomes in the Digital Communication and Publishing strand are:

- nature of digital communication and publishing
- techniques for digital communication and publishing
- social and ethical considerations related to digital communication and publishing.

Level 4	Level 5
Level statement	**Level statement**
Students develop understandings of digital communication and publishing practices and use these to communicate solutions through a variety of media. They investigate the genres of digital communication and publishing.	Students use and evaluate a range of media to develop solutions to challenges that have technical constraints. They investigate the impacts of digital communication and publishing.
Central learning outcomes	**Central learning outcomes**
DCP 4.1 Students describe how design elements and principles, genre conventions and technical constraints in digital communication and publishing meet the needs of specific audiences.	**DCP 5.1** Students evaluate the use of design elements and principles and genre conventions in relation to technical constraints in digital communication and publishing.
DCP 4.2 Students create digital communication and publishing products for a particular audience within an identified genre convention and justify their use of design elements and principles.	**DCP 5.2** Students employ a range of digital communication and publishing media that comply with technical constraints and suit the needs of particular audiences.
DCP 4.3 Students analyse issues related to the use of a variety of digital communication and publishing media.	**DCP 5.3** Students investigate the impact of contemporary publishing media on themselves and their communities.
Supplementary learning outcomes	**Supplementary learning outcomes**
DCP 4.4 Students apply media languages and technologies through genre conventions to construct media texts. (Arts ME 4.1)	**DCP 5.4** Students construct and reconstruct meaning through the application of languages and technologies in the design and production of media texts. (Arts ME 5.1)
DCP 4.5 Students select media forms and apply technologies to construct and present media texts to target an audience. (Arts ME 4.2)	**DCP 5.5** Students emulate industry practices to promote, deliver and exhibit media texts in a range of contexts. (Arts ME 5.2)
DCP 4.6 Students analyse the media languages and technologies used by them and others to construct representations using generic conventions. (Arts ME 4.3)	**DCP 5.6** Students research and analyse various media representations within their cultural and historical contexts. (Arts ME 5.3a)

Key:

- Arts — in *Years 1 to 10 The Arts Syllabus*; Strand: ME — Media.

*L*earning outcomes

Digital Communication and Publishing

Organisers for the learning outcomes in the Digital Communication and Publishing strand are:

- nature of digital communication and publishing
- techniques for digital communication and publishing
- social and ethical considerations related to digital communication and publishing.

Level 6	Beyond Level 6
Level statement	**Level statement**
Students investigate innovation in digital communication and publishing and undertake projects in teams. They consider how access to digital communication and publishing affects different groups.	Students envision preferred futures for digital communication and publishing, and consider ways to optimise access for different groups. They present responses to design briefs that simulate real situations.
Central learning outcomes	**Supplementary learning outcomes**
DCP 6.1 Students investigate the increasing capacity of computer media to manipulate digital communication and publishing forms.	**DCP B6.1** Students create scenarios about possible, probable and preferred future trends of digital communication and publishing, and describe likely consequences.
DCP 6.2 Students work in teams to document and develop digital communication and publishing projects with specific purposes for a known community.	**DCP B6.2** Students develop and present responses to design briefs that simulate real-life practice, taking into account functional, aesthetic, technical, economic and cultural considerations.
DCP 6.3 Students investigate how having variations in access to digital communication and publishing impacts on different groups.	**DCP B6.3** Students investigate ways to optimise access to digital communication and publishing for different societal groups to minimise barriers to communication.
Supplementary learning outcomes	
DCP 6.4 Students apply an understanding of media languages and technologies to design and create media texts in a range of production contexts. (Arts ME 6.1)	**DCP B6.4** Students produce an interactive media product utilising multiple media languages and technologies. (Arts DME 6.1)
DCP 6.5 Students apply industry strategies to promote a specific media text to various audiences. (Arts ME 6.2)	**DCP B6.5** Students produce media texts within a range of media contexts and examine the impact of institutional structures on the design and production process. (Arts DME 6.2)
DCP 6.6 Students evaluate how contextual influences can contribute to personal interpretations of media. (Arts ME 6.3a)	**DCP B6.6** Students consider purpose, audience and context when presenting media texts for particular occasions. (Arts DME B6.3)

Key:

- Arts — in *Years 1 to 10 The Arts Syllabus*; Strands: DME — Discretionary Media; ME — Media.

*L*earning outcomes

Interfacing with Machines

The organisers for the learning outcomes in the Interfacing with Machines strand are:

- nature of machine interfaces
- logic of information-processing sequences
- nature of digital information and communication systems
- techniques for designing and developing machine interfaces
- social and ethical considerations related to machine interfaces.

Level 4	Level 5
Level statement Students understand the nature of interfaces and the sequencing of applications that simulate human behaviour. They understand the logic of systems and subsystems. They explore the impacts of machines simulating human behaviour.	**Level statement** Students determine preferred interfaces and control the sequencing of applications to meet human needs and expectations. They recognise the potential impacts of applications in a variety of situations.
Central learning outcomes	**Central learning outcomes**
IM 4.1 Students investigate the nature of interfaces and the familiar metaphors used to represent machine operations and techniques.	**IM 5.1** Students control and modify interfaces to meet human needs and expectations.
IM 4.2 Students explain the logic of algorithms for an information-processing sequence they have designed.	**IM 5.2** Students develop algorithms and software applications that incorporate multiple selection and user input.
IM 4.3 Students identify and explain the logic of systems and subsystems. (Tech SYS 4.1)	**IM 5.3** Students explain the structures, controls and management of systems and subsystems. (Tech SYS 5.1)
IM 4.4 Students incorporate feedback to refine and modify systems and/or subsystems. (Tech SYS 4.2)	**IM 5.4** Students incorporate control and management mechanisms in systems that include subsystems. (Tech SYS 5.2)
IM 4.5 Students discuss the social impacts of situations in which machines simulate human behaviour.	**IM 5.5** Students discuss social and ethical issues that they have identified in the development and application of software.

Key:

- Tech — in *Years 1 to 10 Technology Syllabus*; Strand: SYS — Systems.

*L*earning outcomes

Interfacing with Machines

The organisers for the learning outcomes in the Interfacing with Machines strand are:

- nature of machine interfaces
- logic of information-processing sequences
- nature of digital information and communication systems
- techniques for designing and developing machine interfaces
- social and ethical considerations related to machine interfaces.

Level 6	Beyond Level 6
Level statement Students construct interfaces and applications and justify decisions made on the basis of human, technical and ethical considerations. They understand the principles of complex systems and propose ways to manage and monitor systems.	**Level statement** Students collaboratively develop, refine and optimise interfaces and applications. They explore the internal and external relationships of the system to assess the effectiveness of the solution to the challenge, and explain how they meet the needs of specific users.
Central learning outcomes	**Supplementary learning outcomes**
IM 6.1 Students construct and justify an interface to meet human needs and expectations.	**IM B6.1** Students investigate adaptive technologies and develop effective and innovative interfaces for target groups.
IM 6.2 Students assess and select strategies to produce software solutions to information and communication technology challenges.	**IM B6.2** Students collaboratively develop a software application that allows users to control variables.
IM 6.3 Students explain principles underlying complex systems in terms of structures, control and management. (Tech SYS 6.1)	**IM B6.3** Students identify internal and external relationships of systems in order to optimise and enhance beneficial impacts. (Tech SYS B6.1)
IM 6.4 Students devise ways to manage and monitor the operation of complex systems. (Tech SYS 6.2)	**IM B6.4** Students develop and optimise complex systems and subsystems by selecting and using specialised techniques. (Tech SYS B6.2)
IM 6.5 Students describe and apply codes of social responsibility and ethics when responding to information and communication technology challenges.	**IM B6.5** Students identify and analyse social and ethical issues when responding to information and communication technology challenges.

Key:

- Tech — in *Years 1 to 10 Technology Syllabus*; Strand: SYS — Systems.

*L*earning outcomes

Participating in Online Communities

Organisers for the learning outcomes in the Participating in Online Communities strand are:

- nature of online communities
- techniques for participating in online communities
- social and ethical considerations related to participating in online communities.

Level 4	Level 5
Level statement Students participate in and investigate the nature of online communities, tools and services. They identify personal ethics of participating in online communities.	**Level statement** Students participate in and evaluate the nature of online communities, tools and services. They investigate the use of online media to promote specific interests.
Central learning outcomes	**Central learning outcomes**
OC 4.1 Students investigate the nature and purpose of online communities and services.	**OC 5.1** Students evaluate how individuals and small groups develop a sense of community online.
OC 4.2 Students describe communications tools and use a variety of these to participate in online events.	**OC 5.2** Students evaluate the communications tools used by communities to participate in online events.
OC 4.3 Students develop a code of practice for participating in online communities.	**OC 5.3** Students investigate the impacts of online interactions and how laws and conventions have evolved to govern online behaviour.
Supplementary learning outcomes	**Supplementary learning outcomes**
OC 4.4 Students analyse sources and forms of information and match these to the requirements of design challenges. (Tech INF 4.1)	**OC 5.4** Students explain how changes to sources, forms and management of information affect design and production decisions. (Tech INF 5.1)
OC 4.5 Students apply techniques for transforming and transmitting information for different audiences. (Tech INF 4.2)	**OC 5.5** Students compare and select techniques for processing, managing and presenting information for specific users. (Tech INF 5.2)
OC 4.6 Students critique information sources to show the positive and negative effects of a change or continuity on different groups. (SOSE TCC 4.4)	

Key:

- SOSE — in *Years 1 to 10 Studies of Society and Environment Syllabus*; Strand: TCC — Time, Continuity and Change.
- Tech — in *Years 1 to 10 Technology Syllabus*; Strand: INF — Information.

*L*earning outcomes

Participating in Online Communities

Organisers for the learning outcomes in the Participating in Online Communities strand are:

- nature of online communities
- techniques for participating in online communities
- social and ethical considerations related to participating in online communities.

Level 6	Beyond Level 6
Level statement	**Level statement**
Students investigate ways change can be effected through online communications. They document, develop and manage an online event. They consider the role of online communications in daily life in the future.	Students investigate participation in public forums using information and communication technologies. They develop solutions to online information needs within the local community. They develop an awareness of Australia's role within the globally connected community.
Central learning outcomes	**Supplementary learning outcomes**
OC 6.1 Students investigate the ways in which community groups have used online communications tools to effect change in their communities.	**OC B6.1** Students investigate how individuals may participate in national and global forums through online communities.
OC 6.2 Students document, develop and manage an online communication event with specific purposes for a known community.	**OC B6.2** Students select, design and manage a web-based portal to enable a community to host and participate in events, share information and support members.
OC 6.3 Students consider what the role of online communications in daily life may be in the future.	**OC B6.3** Students examine Australia's presence in global online communities and discuss future options for participation.
Supplementary learning outcomes	
OC 6.4 Students analyse issues related to the ownership and control of information in societies. (Tech INF 6.1)	**OC B6.4** Students identify changes in the ways information is presented and used in societies and describe how to capitalise on these changes to meet the needs of specific communities and groups. (Tech INF B6.1)
OC 6.5 Students use specialised techniques for managing and organising the presentation of information to meet detailed specifications. (Tech INF 6.2)	**OC B6.5** Students develop and use specialised techniques to present information in innovative ways. (Tech INF B6.2)
OC 6.6 Students produce a corroborated argument concerning causes of a change or continuity in environments, media or gender roles. (SOSE TCC 6.4)	**OC B6.6** Students evaluate the effectiveness of progressive actions from the past to recommend particular actions for the future. (SOSE TCC D6.4)

Key:

- SOSE — in *Years 1 to 10 Studies of Society and Environment Syllabus*; Strand: TCC — Time, Continuity and Change.
- Tech — in *Years 1 to 10 Technology Syllabus*; Strand: INF — Information.

Using learning outcomes to plan for learning and assessment

Learning outcomes provide a framework for planning learning and assessment by describing what it is that students should know and be able to do with what they know. Using learning outcomes for planning involves:

- adopting a learner-centred approach to learning and teaching
- planning learning activities and assessment at the same time
- assisting students to work towards demonstrating their learning
- establishing clear expectations of student demonstrations as a basis for monitoring the progress of student learning.

The learning outcomes are sequenced conceptually in four progressive levels. This conceptual development is represented in the level statements for each strand. Learning outcomes at each level are qualitatively different from the corresponding learning outcomes at the levels before and after. This sequencing across levels helps teachers plan learning activities to cater for the range of developmental characteristics of students.

When planning units of work, teachers could select learning outcomes from within a strand, across strands, across levels or across subject areas and key learning areas. Assessment tasks provide opportunities for students to demonstrate their learning.

Planning should make provision for students to demonstrate learning in more than one context and on more than one occasion. Activities incorporating a variety of content and contexts should be organised to provide these opportunities. Planning for learning and planning for assessment are concurrent processes. Learning activities can be opportunities for teachers to gather evidence about students' demonstrations of learning.

Central content

The central learning outcomes and central content are the focus for planning learning activities and assessment tasks.

The organisation of content within a strand should not be considered hierarchical. Any of the content can be considered at any level; not all of the content need be selected at every level. Central content should be selected to suit students' needs, interests and abilities and to take account of their prior knowledge and experiences.

The central content of each strand is identified on the following pages.

Central content

Accessing and Constructing Digital Information

Nature of digital information

- transformation of data to information, information to knowledge and knowledge to wisdom
- information as a commodity
- sources of information
- presentation forms.

Techniques for accessing digital information

- elements of the information literacy cycle
  - define the information needs in a problem
  - locate information
  - select appropriate information relevant to the problem
  - organise information and develop the solution
  - present the solution
  - evaluate the solution
- use of search techniques for information retrieval
- use of operational techniques for data retrieval including querying
- use of advanced techniques including structured query language, Boolean operators, look-up tables
- analysis methods to determine relevance of gathered information.

Techniques for constructing digital information

- evaluation of accessed and/or constructed information to determine its authenticity and reliability
- basic structural components of generic software including databases, spreadsheets, expert systems and internet browsers
- entities and relationships within information systems
- diagrammatic mapping of information to show its structure, associations and extensions.

Social and ethical considerations related to accessing and constructing digital information

- selecting and printing and/or saving portions of text and images from the internet
- intellectual property — ownership of information from electronic sources
- methods of acknowledging sources of information
- accuracy, privacy, security, bias, equity and multiple perspectives in information
- project management strategies
- development of criteria and standards for decision making.

Central content

Digital Communication and Publishing

Nature of digital communication and publishing

- forms of digital communication and publishing
  - desktop publishing
  - web publishing
  - presentation graphics
  - multimedia including digitised video and audio production
  - image manipulation including morphing, animation, fly-through animations, virtual reality scenarios, 2D design and 3D modelling
  - hypermedia and hypertext.

Techniques for digital communication and publishing

- techniques
  - image capturing, scanning
  - importing and exporting different file formats across platforms
  - manipulating media effects including watercolour, charcoal, transparent, opaque
  - file management
  - optimising the quality of inputs and outputs
  - operational techniques with software including painting, drawing, manipulating an image, CAD, modelling, desktop publishing, web composing, audio and video editing, authoring and animation
  - storyboarding a production and developing hypertext links
  - use of archives and libraries of components in design and visual production
- technical constraints of hardware and software
- audience needs including purpose, age, literacy, familiarity with media, language and culture
- design elements and principles including page design and layout
- genre conventions
- digital elements including text, pixels, palettes, fonts, text boxes, frames, objects
- team work and responsibilities.

Social and ethical considerations related to digital communication and publishing

- predicted future trends in the design and publication industry
- impact of digital communication and publishing on individuals and communities
- nature and purpose of human communication in information and communication technology contexts from individual, group, national and global perspectives
- factors influencing design decisions
- code of ethics, copyright and intellectual property.

Central content

Interfacing with Machines

Nature of machine interfaces

- metaphors
  - screen icons for software applications
  - menu functions that simulate processes from other situations.

Logic of information-processing techniques

- steps of the software development cycle
  - define the problem
  - specify the solution
  - design the algorithm
  - implement the algorithm (write the program)
  - test the program
  - evaluate the solution
  - document the process
- importance of accurate problem definition and program specification
- nature of an algorithm
  - is a result of mapping a specification into a process
  - may operate on different sets of data
  - is largely independent of the programming language in which it may be implemented
  - involves a finite number of steps
  - comprises processes operating on data structures
- algorithm description methodology
- standard algorithm composition rules (corresponding to programming language-control structures)
  - sequence (steps are carried out in sequential order)
  - selection (choice of one element from a number of elements)
  - iteration (repetition of an element).

Nature of digital information and communication systems

- file management, machine management and disk operations
- connecting, using, maintaining and managing computer systems and peripherals including monitors, printers, keyboards, disk drives, plotters, scanners, mouses, modems, graphics tablets, touch screens, video capture, sound capture and voice recognition
- effect of information and communication systems on language — text messaging and email abbreviations.

Techniques for designing and developing machine interfaces

- using customised graphic software such as icon editors, GIF animators
- awareness of navigation tools in hypermedia and web design
- images of culture, and changes in culture, as noted through machine interfaces, particularly metaphors.

Social and ethical considerations related to machine interfaces

- social and ethical issues related to the ways in which humans interact with machines — spamming, hacking, theft, fraud and artificial intelligence
- codes of practice and ethics.

Central content

Participating in Online Communities

Nature of online communities

- who participates, who builds them, uses them and how a sense of community develops using online tools, events and information services
- purposes of online communication, and strategies for participating online
- importance of personal webs and communications networks for individuals, families and small groups
- evaluating online communication strategies
- developing an online community
- influence of new forms of work and changing work practices on internet-based communications and communities
- online technologies and tools empowering lobby groups to participate in political, environmental, financial, social and cultural debates
- applications and design of online services and events — e-commerce, virtual schooling, learning online, research collaboration, communication.

Techniques for participating in online communities

- tools and terminology used by online communities — web boards, chat facilities, email, streaming
- structure and purposes of online events — online interviews, debates, conferences, data gathering from primary sources, personal and group exchanges, guest books
- applications for synchronous and asynchronous communication within online events
- project management strategies for online events.

Social and ethical considerations related to participating in online communities

- etiquette for interacting with others privately and in public forums
- legislation related to online interactions
- strategies to respond to inappropriate sites and offensive behaviour
- strategies for developing effective and valuable contributions to online discussions, publications and broadcasts
- set up of software and hardware to participate in online community events — bulletin boards, email lists, chat sessions
- predicted trends in online communities.

Assessment

Assessment is the purposeful, systematic and ongoing collection of evidence for use in making judgments about students' learning. In this syllabus, the central learning outcomes are presented in levels of increasing sophistication and complexity to form continua of learning. The assessment focuses on monitoring demonstrations of learning to provide evidence of student progress in this subject area.

Purposes of assessment

Information obtained from assessment can be used for a variety of purposes, including providing feedback on students' learning and informing decision making about students' progress.

Providing feedback

Assessment:

- provides ongoing feedback on the progress of individual students and groups of students throughout the learning and teaching process
- informs students, teachers, parents/carers, others in the community and/or school authorities about students' learning.

Informing decision making

Assessment information helps teachers to:

- make decisions about student needs, the learning and teaching process, and resource requirements
- plan learning and teaching programs for individuals, classes and the whole school
- discuss future learning pathways with students and parents/carers
- make decisions about providing learning support to particular groups of students
- develop learning resources and curriculum materials.

Principles of assessment

For assessment to be effective, it should:

- focus on learning
- be comprehensive
- be valid and reliable
- take account of individual learners
- be an integral part of the learning and teaching process
- provide opportunities for students to take responsibility for their own learning and for monitoring their own progress
- reflect equity principles.

Focus on learning

Assessment should focus on what students are expected to know and be able to do with what they know. Students should be made aware of what is being assessed, how and when they will be assessed, and how judgments will be made about their demonstrations of learning. Teachers may then use information from assessment to plan further learning.

Comprehensive range of evidence

Judgments about students' demonstrations of learning should be based on a comprehensive range of evidence gathered and recorded over time. To collect such evidence, teachers need to provide multiple opportunities in a variety of contexts for students to demonstrate what they know and can do with what they know, and use a variety of assessment techniques and recording instruments. Because students have different learning styles, evidence should be gathered from various sources. (Examples of assessment techniques, recording instruments and sources are provided in table 1 on page 33.)

Valid and reliable evidence

Assessment should provide valid and reliable evidence. It is essential that judgments about what students know and can do with what they know are based on a broad range of evidence gathered and recorded over time. Teachers' judgments should be consistent within their own classes for different students, for different assessment opportunities, and at different times. They should also be consistent with the judgments of other teachers in their own school and other schools.

Individual learners

At any one time in their schooling, students could demonstrate their learning in different ways and at different levels. When planning assessment, teachers need to take account of the fact that each student will progress at a different rate across and within the subject area. They also need to take account of factors that influence students' learning — in particular, their prior knowledge, experiences and unique circumstances, and their social, emotional, physical, cognitive and linguistic development.

Integral part of learning and teaching process

Assessment is an integral part of the learning and teaching process and should support students' learning. As teachers plan learning activities, they should also plan how they will monitor student progress. Learning activities can be used as opportunities to gather evidence about the progress of students' learning. Assessment opportunities should match the learning activities and teaching methods students have experienced. Assessment opportunities should be meaningful, interesting and challenging, and contribute to the development of students as lifelong learners.

Responsibility for own learning and self-monitoring

Assessment should provide feedback and help students take responsibility for their own learning. This involves giving students opportunities to set their own learning goals, to monitor their progress in relation to their learning, and to gather information that they and others can use to make decisions about future learning. Opportunities also need to be provided for students and teachers to develop shared understandings about how learning might be demonstrated, and for students to explain in their own terms how they might demonstrate their learning.

Equity principles

Assessment based on principles of equity enables students to demonstrate learning in ways that are sensitive to, and inclusive of, their circumstances. When planning and conducting assessment, teachers need to take account of students' learning styles, abilities, disabilities, gender, sexual identity, socioeconomic circumstances, cultural and linguistic backgrounds, and geographical locations. This includes:

- providing assessment opportunities that assist students, or groups of students, to overcome barriers that might limit their demonstrations of what they know and can do with what they know
- negotiating assessment with students so that they maximise their opportunities to demonstrate their learning.

Process of assessment

The process of assessment involves:

- providing students with opportunities to demonstrate what they know and can do with what they know
- gathering and recording evidence of students' learning
- using the evidence to make overall judgments about students' learning.

Opportunities to demonstrate learning

Students should have multiple opportunities to demonstrate the learning that has been the focus of planned activities. Assessment opportunities need to be provided over time and in a range of contexts. Teachers can use learning activities as assessment opportunities, or design specific tasks that provide students with opportunities to demonstrate their learning.

Gathering and recording evidence

Evidence about students' learning should come from several different sources and be gathered and recorded over time using a variety of assessment techniques and recording instruments. This evidence should be relevant to the learning being assessed and should be collected in a focused and systematic way.

Sources of evidence

Using evidence from a variety of sources accommodates different learning styles, the different ways in which students may demonstrate learning, and learning that has taken place in different contexts. Sources of evidence can include learning activities as well as specifically designed assessment tasks. Examples of activities, tasks, products or processes that could be used as sources of evidence are shown in table 1.

Assessment techniques

Assessment techniques include observation, consultation and focused analysis. Peer- and self-assessment can also be used to gather evidence about students' learning. Combinations of these techniques provide teachers with more comprehensive evidence on which to base judgments.

Assessment techniques should be selected to suit the context in which the learning is being demonstrated, and the type of evidence required. Teachers should familiarise students with the techniques through modelling and practice. Descriptions of these techniques are provided in table 1.

Record keeping

Record keeping must support planning and be manageable and easily maintained. It must also provide accurate evidence drawn from a range of contexts.

Teachers need to keep records on observation, consultation, focused analysis and peer- and self-assessment. Several examples of recording instruments are listed in table 1.

A **student folio** is a useful way of collating and storing evidence about a student's learning. Folios are developed over time and can include evidence such as responses to assessment tasks, products from learning activities, annotated samples of work, anecdotal records, checklists, photographs or video/audio tapes. This collection of work provides an informative picture of a student's accomplishments. Materials for the folio could be selected by the student or the teacher, or by negotiation between the two.

The use of the folio will determine which materials are included. Examples of folios include working folios for ongoing feedback, documentary folios for making judgments, and show folios for reporting and comparing judgments.

Table 1: Examples of ways to gather and record evidence from a variety of sources

Sources of evidence	Assessment techniques	Recording instruments
Students can provide evidence about what they know, and can do with what they know, in a variety of forms. Sources of student evidence of the demonstrations of learning may include: • practical tasks — responses to information and communication technology challenges such as developing interactive media products, screen designs, screen presentations, hypermedia products, robotic systems, participating in online events • project folios including design briefs, design ideas and proposals, specifications and modifications, plans, interview reports, presentation of products • written tasks such as investigative reports, summaries of processes used, evaluative reports, short and extended responses • oral tasks such as debates, demonstrations, persuasive speeches, seminar presentations • peer- and self-reflection through feedback from small or large group discussions or responses to evaluation questions.	**Observation** Teachers observe students as they participate in planned activities. Teacher observation occurs continually as a natural part of the learning and teaching process and can be used to gather a broad range of evidence about students' demonstrations of learning. Teacher observations can also be structured to gather particular kinds of information in relation to learning. **Consultation** Teachers discuss student work with students, colleagues, parents/carers or other paraprofessionals. The varying perspectives of the participants in consultations can help enrich the evidence gathered about students' demonstrations of learning. Consultation can be used to verify the evidence gathered using other techniques. Some consultation may reveal a need for more detailed assessment. **Focused analysis** Teachers examine in detail student responses to tasks or activities. This technique provides detailed evidence about students' demonstrations of learning. **Peer- and self-assessment** Students use the above techniques to assess their own work and the work of their peers. Peer- and self-assessment allow teachers to take account of students' perceptions when gathering evidence.	Teachers can record their judgments about students' demonstrations of learning using a variety of instruments. Recording instruments include: • anecdotal records • teacher/student journals • folios • checklists • statements of anticipated evidence or criteria sheets • annotated work samples • audio and visual recordings (including photographic and video or multimedia) • test results over time • observation notes • feedback sheets • peer- and self-assessment sheets • profiles • progress charts.

Making judgments about demonstrations of learning

Judgments about what students know, and can do with what they know, are an integral and ongoing part of the assessment process. For example, throughout the assessment process, teachers make judgments about:

- students' responses to particular assessment tasks
- what students know and can do with particular content

Such judgments are part of the ongoing monitoring of student progress and inform planning for future learning activities and assessment opportunities. The criteria on which judgments are to be based should be drawn from students' learning and made known to students before tasks are undertaken so that the basis for judgments is clear.

Teachers make judgments about students' learning when satisfied that they have sufficient evidence. In making these judgments, teachers need to:

- analyse what it is that students are expected to know and be able to do with what they know
- consider how student learning has progressed
- use a range of evidence
- make judgments about what learning a student has demonstrated.

Some students may be able to demonstrate what they know and can do with what they know the first time they have an opportunity to do so. When they have additional opportunities that result in further demonstrations, they are considered to have demonstrated learning consistently. Other students may need more opportunities to demonstrate their learning before the same decision can be made. A judgment can be made when a consistent pattern of demonstrations has been established.

The exercise of each teacher's professional judgment is fundamental to the assessment process. Decisions should be based on explicit criteria, using a range of evidence to determine demonstrations of learning. Judgments about a student's demonstrations of learning should be made without reference to the performance of other students.

Consistency of teacher judgments

To be consistent, teacher judgments about students' learning must hold true in later situations and be comparable with the judgments of other teachers.

An individual teacher's judgments need to be consistent:

- within their own classes for different students
- for different assessment opportunities at different times
- with those of other teachers in the same school (i.e. consistency within schools)
- with those of teachers in other schools (i.e. consistency among schools).

Strategies for ensuring consistency of teacher judgments include:

- ***sharing understandings about the learning***: Teachers discuss what students have to know and do to demonstrate their learning.
- ***collaborative planning***: Teachers work together to plan for learning and assessment, and to reach shared understandings about what is required for learning to be demonstrated. Collaborative planning in middle or secondary schools may involve teachers of the same year level, teachers of consecutive year levels, or teachers with subject expertise in two or more areas. Teachers might also plan collaboratively, especially for the transition from Year 7 to Year 8.
- ***common assessment tasks***: Teachers cooperatively plan and/or moderate assessment tasks focusing on the intended learning. This allows teachers to develop shared understandings about what students are expected to know and do with what they know.
- ***statements of anticipated evidence, or criteria sheets***: Teachers identify the properties, components or dimensions by which students' demonstrations of learning will be judged. In developing a common statement of anticipated evidence, or criteria sheet, teachers collaboratively analyse the intended learning to identify and record the anticipated evidence or criteria that will be used as the basis for judgments. Anticipated evidence could be identified in a design brief, criteria sheet, assessment task or verbal description.
- ***moderation processes (formal and informal)***: Teachers discuss and compare judgments made about students' work and associated demonstrations of learning. Formal moderation processes occur when school authorities require teachers from within or among schools to discuss the consistency of judgments about demonstrations of learning. Informal moderation occurs any time that teachers discuss and compare their judgments of students' work.
- ***samples of typical responses***: Teachers compile, and refer to, samples of student work that show how learning may be demonstrated. The samples could be annotated samples of student responses to selected assessment tasks.

Reporting

Reporting is the process of communicating timely, accurate information about students' learning. Its main purpose is to acknowledge and support student learning. Reporting may be formal or informal.

Reporting to students and parents/carers

Teachers need to provide regular feedback to students and parents/carers about student learning and progress. This kind of reporting is an important and ongoing part of the learning and teaching process and can occur incidentally as well as in planned ways.

Students and parents/carers also need to be provided with information about student progress at certain points in time as identified by schools in their overall plans for learning, assessment and reporting.

Reporting on student progress in relation to learning

Information reported to students and parents/carers as part of the ongoing learning and teaching process could include:

- explanations of particular assessment opportunities
- evidence about demonstrations of learning
- judgments about demonstrations of particular learning
- clarification of what students are expected to know, and be able to do with what they know, and how their learning could be demonstrated
- identification of future assessment opportunities and anticipated evidence.

Information reported to students and parents/carers at particular points in time could include:

- records of the learning previously demonstrated by the student
- descriptions of the learning that students have had opportunities to demonstrate since reporting last occurred
- statements about what students were expected to know, and do with what they know, to demonstrate their learning
- descriptions of the contexts in which learning and assessment have occurred
- records of the learning demonstrated by the students since the previous report
- information that is specific to individual students, such as the student's self-assessment, goals or future learning plans.

Language, formats and modes of reporting

The language, formats and modes used for reporting should be meaningful and relevant to the proposed audience. Possible modes for reporting include:

- written reports (print or electronic)
- student–teacher conferences
- teacher–parent/carer interviews
- student-led three-way conferences (student, teacher and parents/carers)
- culminating presentations
- portfolios (print or electronic).

Guidelines

Planning courses of study

Subject area syllabuses broaden the curriculum choice and specialisation for students during the later years of compulsory schooling — that is, during middle and lower secondary schooling. The Information and Communication Technology Education subject area syllabus allows teachers to develop a variety of courses of study that meet the specific needs and interests of students.

Learning outcomes for a course of study should be selected on the basis of how best they complement each other and how they collectively fulfil the intent of the course of study. They may be selected from the Information and Communication Technology Education subject area syllabus or combined with learning outcomes from other syllabuses. For example, an information and communication technology course of study can be planned using the learning outcomes from:

- the *Information and Communication Technology Education Subject Area Syllabus and Guidelines*
- the *Information and Communication Technology Education Subject Area Syllabus and Guidelines* and a key learning area syllabus (or syllabuses)
- the *Information and Communication Technology Education Subject Area Syllabus and Guidelines* and another subject area syllabus (or syllabuses).

The learning outcomes within subject area syllabuses are not mandated. Schools may develop courses of study using a subset of the learning outcomes described within the strands. Central learning outcomes, together with some or all of the supplementary learning outcomes, can be used to develop courses of study.

Decisions about learning outcomes selected for a course of study will be influenced by:

- school and school authority policies
- the place and role of the subject area course of study within the total school curriculum.

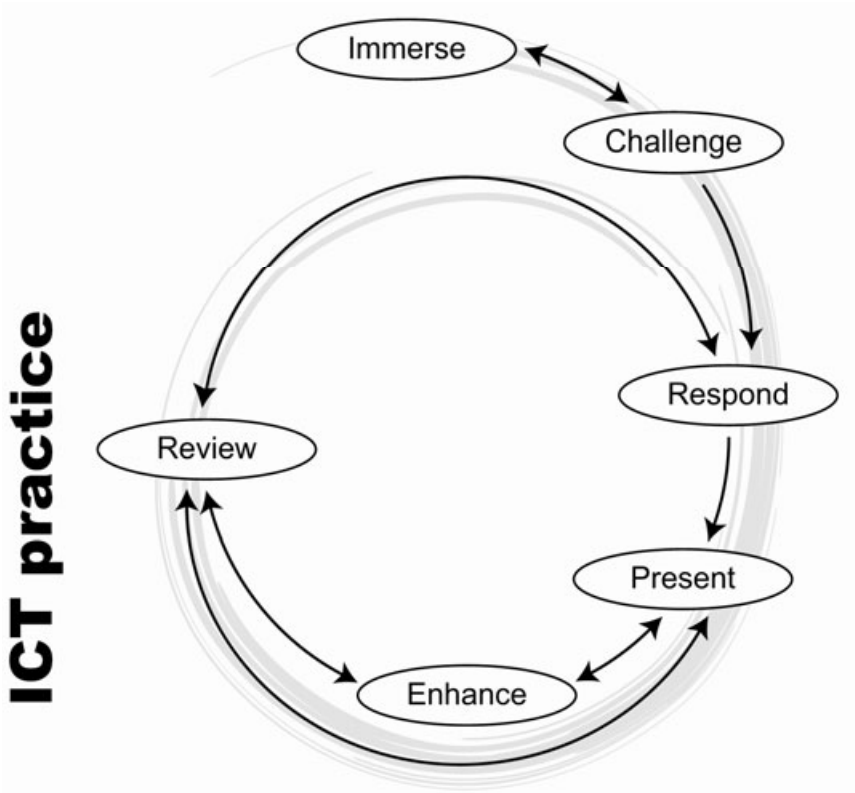
Information and communication technology courses of study

Worthwhile information and communication technology courses of study:

- provide opportunities for students to understand and use information and communication technology practice
- include opportunities for students to use a variety of information and communication technologies
- take account of legal requirements
- take account of the availability of school facilities and resources.

Information and communication technology practice

Information and communication technology practice describes the actions students may use to respond to information and communication technology challenges. The model below illustrates the actions of information and communication technology practice. The model illustrates possible sequences of actions that may be implemented to respond to a challenge. Some actions may be implemented more than once to enhance the quality of the final response or product.



The actions of information communication technology practice

Immerse — immerse self in an information and communication technology context. Immersion is intended to develop students' familiarity with and understandings of a particular information and communication technology context. Immersion learning experiences should be motivating for students, and provide opportunities for students to experiment and to develop understandings needed to use specific information and communication technology tools or software applications.

Challenge — understand and define the challenge. A challenge may be a brief, problem, inquiry, scenario or project for which a response is required. A challenge may describe technical constraints and specifications within which the response or solution is to be developed. Students may undertake challenges independently or collaboratively.

Respond — develop a response to the challenge. A response may be presented in several forms — for example, a prototype, final product or modified product. A challenge may require that a response be given in one or more forms.

Present — present the response for the intended user or audience. The response should be presented in a format that meets the requirements of the challenge and, in particular, the specific needs of the user or audience.

Review — evaluate the response or presentation. Review actions are implemented in order to identify how a product or presentation can be enhanced. Review actions may include reflecting, analysing, evaluating, testing and using client or self-developed criteria to assess the quality of the response or presentation. The response or presentation should be reviewed in terms of the requirements of the challenge.

Enhance — improve the current response or presentation. Information collected through a review can be used to enhance the quality of the response or presentation.

Legal requirements

Information and communication technology courses of study are conducted subject to a range of legislation and regulations. Courses of study in information and communication technology must be planned taking account of legal requirements.

The underlying principle of legislation and regulations is protection for the people who work in the industry and for the consumers who use the products.

Safety

All learning activities undertaken in this subject area must be planned and conducted with due regard for the safety of all concerned. The legal requirements to do so are described in the documents listed below.

Teachers and students must follow safe work practices in a designated area free of avoidable hazards. They must be provided with appropriate safety equipment. Students should not participate in activities until they have been advised of the risks involved and provided with demonstrations of correct procedures.

The standards for establishing and maintaining a safe workplace in Queensland are set by the *Workplace Health and Safety Act 1995*. This Act provides for a number of regulations, advisory standards and codes of practice that apply to specific industries — for example, Workplace Health and Safety Regulation 1997, and Workplace Health and Safety (Miscellaneous) Regulation 1995.

The Department of Education and the Arts has developed policies related to risk assessment and risk management. The *Department of Education Manual* is available on their website. The following module is specifically for planning courses of study in information and communication technology:

- HS-10-10 Office Machines and Equipment — Including the Use of Computers.

To view copies of these modules, go to http://education.qld.gov.au/corporate/doem/, click on ‘Health & Safety’ at the top of the page, then ‘HS-10-1 – HS-10-121’. Alternatively, go directly to http://education.qld.gov.au/corporate/doem/healthsa/healthsa.html.

Examples of information and communication technology courses of study

Multiple courses of study with different focuses can be developed from the Information and Communication Technology Education subject area syllabus. The following are examples of courses of study that may be planned to meet the needs and interests of students and school communities. These examples provide some preliminary ideas for planning and illustrate the range of courses of study that can be planned.

- An **Information and Communication Technology** course of study may include all the learning outcomes from all strands within the syllabus — Accessing and Constructing Digital Information, Digital Communication and Publishing, Interfacing with Machines,

and Participating in Online Communities. This course would provide students with opportunities to develop a broad range of knowledge, practices and dispositions related to information and communication technology.

- An **Information-processing** course of study would focus on learning outcomes from the Accessing and Constructing Digital Information strand and would emphasise the transformation of data to information and information to knowledge through a variety of information systems. The course of study could be collaboratively designed and implemented with teachers of other key learning areas — for example, Studies of Society and Environment and/or Science.
- A **Multimedia** course of study would focus on students developing and using multimedia products in a variety of contexts. This course could be developed using central learning outcomes from the Accessing and Constructing Digital Information and Digital Communication and Publishing strands. The course would also include the supplementary learning outcomes from the Digital Communication and Publishing strand — for example, outcomes from the Media strand within The Arts key learning area.
- A **Digital Design** course of study would focus on students developing digital products for use by others, for example, web pages of resources or presentations for particular teachers within the school or for specific purposes such as a virtual tour developed for new students or visitors. The completed commissioned works could be published on to a school intranet or burnt to a CD-ROM. This course could be developed using central learning outcomes from all strands.
- A **Computer Systems** course of study would focus on hardware and network infrastructure. This course could be developed using learning outcomes from the Interfacing with Machines strand (with particular focus on those drawn from the Technology key learning area) and on outcomes from Participating in Online Communities.
- A **Human Computer Interface** course of study would focus on the design and analysis of computer interfaces. This could be developed using learning outcomes from Digital Communication and Publishing, Interfacing with Machines, and Participating in Online Communities. The emphasis would be on the technical and visual controls imposed by software designers on how people (including those with intellectual and physical challenges) make use of ICT devices. Students could design individual web pages or customise existing pages to act as a personal portal.
- A **Living Online** course of study would focus on the range of services available online — from generic information and news services to personal financial transactions. A variety of telecommunications media would be investigated and used through formal or informal interactions with other students. Students could organise and host an online event as a culminating activity. This course could be developed using the central learning outcomes from the Digital Communication and Publishing, Interfacing with Machines, and Participating in Online Communities strands.

Planning learning and assessment

An outcomes approach requires that students demonstrate what they know and can do with what they know. In an outcomes approach there is a strong link between learning and assessment, and strategies for these should be planned together. Assessment involves the ongoing and systematic collection of information about students' learning.

Teachers are encouraged to monitor students' learning during everyday activities rather than at the end of a course of study. When planning, teachers should include opportunities for ongoing monitoring and gathering of information about students' learning. Feedback from

assessment of these demonstrations, which may be diagnostic, formative or summative, leads to short-term or long-term revision of curriculum plans.

When planning for assessment, it is necessary to identify:

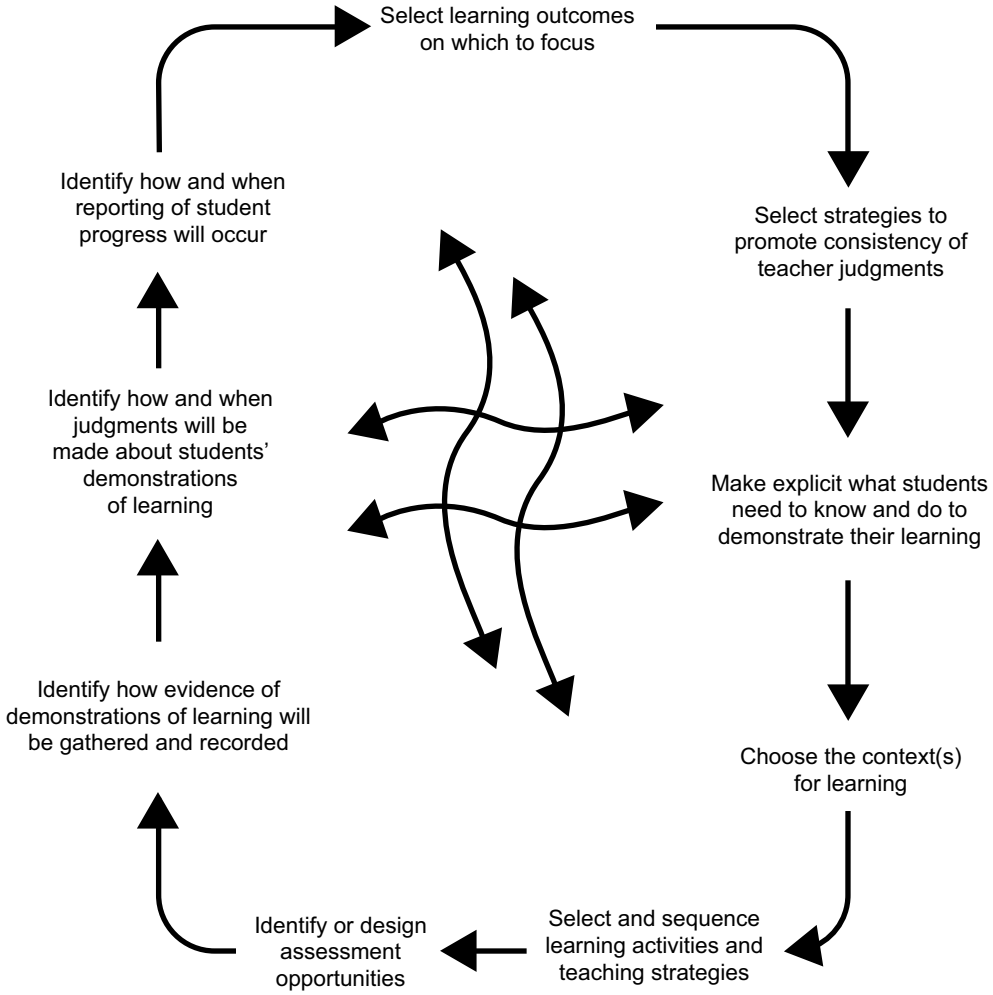
- suitable contexts in which students can demonstrate what they know and can do with what they know
- the anticipated evidence or criteria against which judgments can be made about whether students have demonstrated their learning.

A model for planning units of work

Although individual teachers will approach planning in different ways, when teachers plan using learning outcomes, they:

- select learning outcomes on which to focus
- select strategies to promote consistency of teacher judgments
- make explicit what students need to know and do with what they know
- choose the context(s) for learning
- select and sequence learning activities and teaching strategies
- identify or design assessment opportunities
- identify how evidence of learning will be gathered and recorded
- identify how and when judgments will be made about students' learning
- identify how and when reporting of student progress will occur.

These features are an essential part of long-term planning (e.g. yearly or semester programs) and short-term planning (e.g. units of work). The essential features of the planning process are illustrated in the following model. The model highlights the dynamic and cyclic nature of planning using learning outcomes.



Planning for learning, teaching, assessment and reporting

Planning with central learning outcomes

The major considerations for planning learning opportunities and related assessment are the central learning outcomes.

Activities planned for students should have within them opportunities for student learning and the collection of information about students' demonstrations of learning.

Activities should draw on the central content of the relevant strands.

Elaborations

Elaborations are designed to help teachers understand the intent of the central learning outcomes. They provide examples of possible content and contexts for developing and demonstrating the learning outcomes.

Accessing and Constructing Digital Information

ACI 4.1 Students analyse the nature of information and discuss its relationship with data, knowledge and wisdom.	**ACI 5.1** Students investigate and describe the roles of information and communication technology in the transformation of data to information, knowledge and wisdom.	**ACI 6.1** Students analyse the human process of transforming information to knowledge and knowledge to wisdom through information and communication technology mediation.
Students know: • **nature of information** – data originates from a variety of sources and can take a variety of forms e.g. numbers, texts, images, sounds – all information carries a bias and can be interpreted in different ways – information stored electronically may be redundant and needs purposeful checking for integrity and reliability – information is a commodity • **data, information, knowledge and wisdom** – hierarchy of knowledge – knowledge is a personal construction of meaning	**Students know:** • **roles of information and communication technology** – machines process large quantities of data quickly and accurately – machines search, summarise, analyse and present information in different forms – data can be updated electronically or manually – machines collect data automatically using data logging and remote sensing – information is created through the human interpretation of machine collected or processed data	**Students know:** • **the role of human processes in transforming information to knowledge and knowledge to wisdom** – humans use past experience and prior learning to interpret information and construct knowledge – belief systems influence how humans interpret information and construct knowledge – humans critically interpret information and can detect logical errors – humans correlate and synthesise disparate forms of information in the construction of knowledge to wisdom
Students: • **analyse the nature of information** – review different sources and forms e.g. books, internet, CD-ROMs – examine an information source and identify potential bias – determine the form and purpose e.g. an electronic list of names and addresses is a commercial commodity • **discuss the relationship of information to data, knowledge and wisdom** – consider 'everyday' information sources to show how data becomes information and can be sorted for different purposes e.g. telephone directories – discuss how different groups use information e.g. scientists create knowledge from data	**Students:** • **investigate how data is transformed into information** – access dynamically updated information sources e.g. automatic weather stations on the internet, web cams – access manually updated information sources e.g. global news services on the internet – access financial planning services on the internet or simulate through spreadsheet application – discuss how gathering local data can generate useful information and knowledge – compare the efficiency and accuracy of the processing of data by human and electronic means – explore ways of collating and organising data to facilitate its transformation to information	**Students:** • **analyse how humans transform information into knowledge and knowledge to wisdom** – identify the human qualities associated with transforming information to knowledge – conduct an experiment to investigate the different ways people interpret the same raw data – determine the levels and strategic points of human intervention in dynamically and manually updated information sources e.g. weather forecasts versus raw data – track the sequence and process of transforming data into a news report – identify the possible sources of error in information systems

Accessing and Constructing Digital Information

ACI 4.2 Students access information from electronic sources, including the internet, using operational and search strategies.	**ACI 5.2** Students identify and access digital information when making decisions about an issue of local concern.	**ACI 6.2** Students locate, access and evaluate digital information from a range of defined perspectives and present this information to defend or promote a particular viewpoint.
Students know: • **strategies for accessing electronic information** – the information literacy cycle (defining, locating/accessing, selecting, interpreting/organising, presenting/communicating, evaluating) – operational strategies e.g. accessing and using search engines, using search strings and queries in databases – search strategies e.g. keywords, associated words, key concepts – use of the 'help' function	**Students know:** • **the use of digital information in making decisions** – discussion and mapping exercises e.g. concept maps, brainstorming, decision trees – research techniques e.g. interviews, surveys, monitoring of media articles • **an issue of local concern** e.g. traffic congestion, environmental degradation	**Students know:** • **defined perspectives** – sources, currency and accuracy of data – interests, bias and misrepresentation • **particular viewpoints** e.g. commercial, government, political, religious, environmental
Students: • **access information using operational and search strategies** – apply elements of the information literacy cycle – identify potential sources and employ strategies for access e.g. conduct an experiment to identify the most efficient way to access current, relevant information about a given topic – determine information needs e.g. devise information problems and propose solutions for peers – participate in an internet games contest	**Students:** • **identify and access information about a local issue** – identify, collect and sort data relevant to a local issue • **make decisions about a local issue** – transform data into information through discussion and evaluation • **present conclusions** – select appropriate media and format	**Students:** • **locate, access and evaluate digital information** – recognise the significance of different forms of information e.g. textual, numeric, graphic – develop criteria to evaluate the integrity of information – distinguish between local, national and international sources of information e.g. sphere of influence, censorship • **present information to defend or promote a particular viewpoint** – consider the combinations of presentation forms, language, images, audiences – summarise and sequence content to promote a viewpoint – choose appropriate graphic forms to reinforce a position e.g. diagrams, maps, graphs, photographs, moving image sequences

Accessing and Constructing Digital Information

ACI 4.3 Students investigate and map the ways in which data is categorised into fields in existing information systems.	**ACI 5.3** Students collect data and construct a simple information system.	**ACI 6.3** Students construct an information system based on research data in order to defend or promote a viewpoint.
Students know: • **data** – types e.g. multimedia elements, textual, numeric, data must be categorised in order to be processed by a machine – relationships exist between data that can be represented in an information system • **information systems** – purposes e.g. to store data – generic applications and their formats e.g. spreadsheets, databases • **ways to map information systems** – simple representations of data structures and their relationships e.g. concept maps, data flow diagrams	**Students know:** • **data collection** – information needs determine the data that is collected – strategies for data collection • **construction of information systems** – specific software applications are used in accessing and constructing information e.g. spreadsheets, databases, expert systems	**Students know:** • **strategies for constructing an information system** – software applications – manipulation techniques e.g. selection, omission, representation of specific information
Students: • **investigate and map information systems** – consider or review a range of existing information systems e.g. spreadsheets, databases, expert systems – identify the purposes of the systems, the expected entries and search results e.g. titles, numbers, populations – identify the data types – identify and map simple structures and relationships	**Students:** • **collect data and construct a simple information system** – identify the required information types e.g. anecdotal, historical, statistical, graphical – gather raw data – create a system by setting up generic software application and entering data – test a system by asking hypothetical questions and running simple queries	**Students:** • **defend or promote a viewpoint with research data** – identify suitable information that represents a given perspective – transform data to suit processing by an information system • **construct the information system** – select and populate the information system – generate queries and reports to support viewpoint

Accessing and Constructing Digital Information

ACI 4.4 Students analyse and describe privacy and intellectual property issues related to accessing and constructing information.	**ACI 5.4** Students investigate the validity and credibility of information constructed from data gathered for a specified purpose.	**ACI 6.4** Students investigate the ways people holding different viewpoints access and construct information for their own purposes.
Students know: • **issues related to privacy and intellectual property** – information is developed for particular purposes/audiences – information is accessed for a variety of purposes – information as a commodity can be misused e.g. sale of email lists – information can be owned and its use can be limited without the permission of the owner/author – appropriate conventions must be used for acknowledging sources or penalties ensue	**Students know:** • **factors affecting validity and credibility** – the original source and the way in which it was collected e.g. the time and place of publication, the interests and motivations of the author – credibility and reliability e.g. whether the results can be duplicated through repetition of the data collection	**Students know:** • **ways people access and construct information for their own purposes** – the publication of information to serve a range of motives e.g. education, sales, advocacy, protest, subversion, persuasion – data is collected and represented for particular purposes
Students: • **analyse the privacy issues related to accessing and constructing information** – discuss scenarios where privacy is breached through the misuse of or improper access to databases, or inappropriate publication of personal information – consider the paradox between the need for individual privacy and public security • **analyse the intellectual property issues related to accessing and constructing information** – identify authorship and ownership of information e.g. government, individual – discuss the impacts on individuals whose work has been published without their permission or knowledge	**Students:** • **investigate the validity and credibility of information** – deconstruct the domains of a URL to determine authorship, country of origin and organisation e.g. government, educational, commercial, personal – compare reports on a particular topic that have been prepared at different times and from different sources – identify who gathered the data and what their purpose was in presenting the information – compare reports from differing points of view e.g. drug company and Australian Medical Association, trade union versus government	**Students:** • **investigate motives for accessing and constructing information** – categorise the level of editorial control and monitoring in information e.g. government websites, individual publications – assess legality in terms of national boundaries e.g. internet gambling – identify target audience and key arguments of persuasion e.g. age demographic, lobby groups, tourist promotion – identify affiliations the source has with other agencies

Digital Communication and Publishing

DCP 4.1 Students describe how design elements and principles, genre conventions and technical constraints in digital communication and publishing meet the needs of specific audiences.	**DCP 5.1** Students evaluate the use of design elements and principles and genre conventions in relation to technical constraints in digital communication and publishing.	**DCP 6.1** Students investigate the increasing capacity of computer media to manipulate digital communication and publishing forms.
Student know: • **design elements** e.g. points, lines, colours, shapes, tones, textures • **design principles** e.g. rhythm, harmony, unity, balance, symmetry, contrast • **digital elements** e.g. pixels, resolutions, transparencies, overlays, fonts, palettes • **genre conventions** e.g. style sheets, heading positions • **technical constraints** e.g. graphics capability of hardware, image resolution, software functions, file sizes, transportability across platforms/software, software/hardware compatibility **Students:** • **describe how design elements and principles, genre conventions and technical constraints are used to meet the needs of specific audiences** – investigate digital communication and publishing and describe the use of design elements and principles – compare and contrast print and digital publishing e.g. newsletters – create digital postcards by experimenting with the use of different elements and principles – investigate a range of graphics file types and sizes and most appropriate uses – investigate the difference between the generation of colour with pigment and with light e.g. on a computer, red + green + blue = white	**Students know:** • **effective use of design elements and principles** – clear communication to an audience – consistency of design – restricted and controlled use of digital elements e.g. number of fonts – contrast and control of colours for legibility • **factors affecting use** – final presentation form influences the design of digital publications e.g. use of data projector – the intended audience affects the presentation of design elements – digital publishing allows manipulation and manufacturing of images e.g. computer generation of films and advertisements **Students:** • **evaluate the use of design elements and principles and genre conventions in relation to technical constraints** – evaluate the success of communicating to an audience – determine whether the design elements and principles have been used effectively – evaluate if an example has complied with the genre conventions – explain the use of design elements in publications for an intended audience – investigate and evaluate computer-generated advertisements and animations	**Students know:** • **capacity of computer media** – increased graphic capacity – heightened memory – sophisticated input devices – conversion of traditional media to digital media – alternative storage devices e.g. DVD burners, USB sticks – increasing user friendliness and lower costs • **manipulation of digital communication and publishing forms** – layering, morphing, montage, stitching – convergence of technologies and forms e.g. internet, television, DVD, radio **Students:** • **investigate the capacity of computer media to manipulate digital communication and publishing forms** – review media articles and advertisements to compare performance of desktop computers and software in the production of digital communication and publishing – discuss the strategies and purposes of computer-generated animations and special effects e.g. animated films – use software to manipulate images e.g. create new images by combining disparate images – create a tutorial or workbook on the production of a selected digital communication and publishing form

Digital Communication and Publishing

DCP 4.2 Students create digital communication and publishing products for a particular audience within an identified genre convention and justify their use of design elements and principles.	**DCP 5.2** Students employ a range of digital communication and publishing media that comply with technical constraints and suit the needs of particular audiences.	**DCP 6.2** Students work in teams to document and develop digital communication and publishing projects with specific purposes for a known community.
Students know: • **particular audiences** – identification of audience characteristics e.g. age, literacy, familiarity with media, language and culture – techniques to modify presentation of information to suit audience needs e.g. altering font sizes, types and emphases, changing background and foreground colours • **genre conventions** – templates and style sheets are used to allow creators to follow conventions – recognisable use of codes such as fonts, layout, header positions e.g. vertical columns, headings and white space in newsletters	**Students know:** • **a range of digital communication and publishing media** – the functions and capacities of different software applications and input devices e.g. images, sound, videos • **technical constraints** e.g. file size, image resolution, storage capacity, virtual memory	**Students know:** • **project management processes** – projects have audiences, purposes and design briefs – different digital communication and publishing tools – proposals and project plans e.g. various tasks, timelines, criteria for completion – projects have phases e.g. implementation, evaluation and reporting
Students: • **create digital communication and publishing products** – develop multimedia scrapbooks for peers – develop 'choose your own' adventure presentations for young children – develop presentations on sun safety for preschool children – develop personalised stationery • **justify their use of design elements and principles** – describe how the design elements and principles have been used to communicate effectively with the audience e.g. how the choice of fonts, colours, graphics and visual layout is effective in a sun-safety campaign for preschoolers	**Students:** • **employ a range of digital communication and publishing media** – consider the relationship between design and technical operation e.g. download time of graphic images – modify designs to meet output restrictions e.g. quality and resolution of printing – build a web page for the school community incorporating digital images and making use of the school logo, colours and motto – collaboratively create a multimedia prospectus for the school including recorded interviews and footage of major school events – build an electronic autobiography using a range of digital components – create a marketing campaign including advertisements/web pages – explain a scientific or environmental system using animation software	**Students:** • **work in teams** e.g. assign roles, allocate tasks, set timelines, determine criteria for completion • **document and develop a digital communication and publishing project with specific purposes for a known community** – define the problem – identify the audience – select media and consider technical constraints – allocate tasks to team members – liaise with clients – establish design and technical conventions – create and present draft solutions and determine the most effective – critically evaluate the outcome of project using self-generated criteria, checklists, documents, surveys – share the outcomes of the project with others e.g. local community, education authorities

Digital Communication and Publishing

DCP 4.3 Students analyse issues related to the use of a variety of digital communication and publishing media.	**DCP 5.3** Students investigate the impact of contemporary publishing media on themselves and their communities.	**DCP 6.3** Students investigate how having variations in access to digital communication and publishing impacts on different groups.
Students know: • **nature of digital media** – individual authorship – convergence – transportability and access – commercial and non-commercial • **issues related use of digital communication and publishing media** – considerations when converting forms and media e.g. nature of intellectual property and copyright, procedures regarding the use of other people's intellectual property, conventions for referencing print and electronic resources	**Students know:** • **impacts of contemporary publishing media** – creation of a consumer culture – identification of pop cultures and subcultures – globalisation and the creation of a monoculture – manipulation of viewpoints, attitudes, values, behaviours, morals – creation of needs to access or own new technologies e.g. audio streaming, DVD – ability to filter news services	**Students know:** • **variations in access** e.g. socioeconomic conditions, geography, political infrastructure, disability, age, technical knowledge • **impacts on different groups** – capacity for individuals and groups to have their voices heard – restricted access to information through censorship, self-regulation, editing – thoughts and actions influenced by motives or intentions of publishers – restricted access due to technical constraints e.g. registration of websites with particular search engines and indexes
Students: • **analyse the issues** – brainstorm a range of issues concerned with the ownership and intellectual property of digital elements – roleplay scenarios dealing with inappropriate use of digital media e.g. using images without permission – identify who owns the digital elements used in presentations e.g. CD encyclopaedias, news service websites – identify the copyright restrictions relevant to particular websites – discuss how the manipulation of images affects ownership – comply with authors' conditions for the use of animated GIFs, clip art, backgrounds or other resources in the form of acknowledgments or direct hyperlinks	**Students:** • **investigate the impacts of contemporary publishing media** – identify ways in which publications influence our viewpoints, attitudes, values, behaviour, morals e.g. selected subject matter, language, images, messages conveyed – identify media influences on consumers e.g. to purchase products, lifestyle needs – identify ways in which publications can represent or misrepresent cultures and societies – investigate the impact of digital publishing e.g. e-books at a personal and social level – discuss the currency and frequency of internet news images and question the messages they convey – describe the impacts of customising the news that individuals receive through subscription to special interest groups	**Students:** • **investigate the impacts** – discuss the implications of unequal access – identify ways in which publications reflect the viewpoints and values of specific cultural and social groups – locate and present examples of the globalisation of digital publishing – describe how censorship laws and codes of practice attempt to restrict the influence of media on individuals and communities – investigate the role of technology in the syndication of news and the impact of this on different viewpoints – investigate what is reported on news websites and how this impacts on people's understanding of events

Interfacing with Machines

IM 4.1 Students investigate the nature of interfaces and the familiar metaphors used to represent machine operations and techniques.	**IM 5.1** Students control and modify interfaces to meet human needs and expectations.	**IM 6.1** Students construct and justify an interface to meet human needs and expectations.
Students know: • **nature of interfaces** – interactions with operating systems through differing means e.g. text, graphic, voice – interactions with specialised software e.g. drawing, publishing • **familiar metaphors** – screen icons for software applications e.g. paintcan, mailbox, trashcan – menu functions and techniques e.g. copy, paste – virus software • **machine operations associated with metaphors** e.g. spelling (checking against given dictionary database); saving (writing to file)	**Students know:** • **interfaces can be controlled and modified** – display interface control e.g. control panels, desktop themes, smart agents, selection of desktop and taskbar icons – navigation and viewing options – nature of plug-in and inbuilt applications e.g. sound or media players – mouse speed, magnification, and text size – software can be customised to meet individual needs	**Students know:** • **interfaces can be constructed to meet human needs** – individual needs vary and interfaces can be customised accordingly – new/personal metaphors can be developed – interfaces can be activated in a variety of ways e.g. use of hotkeys and macros – smart agents can be developed to enhance the interaction with the interface e.g. use of web-based development tools – the nature of interfaces is constantly changing e.g. versions, platforms, user interaction, metaphors – identified patterns of use govern desktop design e.g. common icons carried on in newer versions of operating systems
Students: • **investigate the nature of interfaces** – interact with text interfaces e.g. HTML – interact with graphical interfaces e.g. GUI environments – investigate common applications e.g. operating system accessories (Paint, Notepad, calendar) – comment on the interface between people and machines e.g. automatic teller machines, vending machines • **investigate familiar metaphors** – construct a retrieval chart to represent machine operations and techniques and their metaphors e.g. copying text places onto a 'clipboard' that is a reserved space in memory – compare electronic with non-electronic operations and techniques e.g. electronic mail – consider how the metaphors used reflect current thinking e.g. recycling or trashcan	**Students:** • **control and modify interfaces to meet human needs and expectations** – sort and view file directories by icon, filename, type, date – default settings for media applications (sound) – install desktop themes and screensavers – dock and undock toolbars and taskbars – customise toolbars – create personal email theme/style/signature – tailor virus-checking software – modify grammar and language checking settings – use a wizard to construct an interface – zip and unzip applications – accept, refuse and remove cookies	**Students:** • **construct an interface to meet human needs and expectations** – propose new metaphors for an interface – design and create personal desktop icons – propose ways of interacting with machine interfaces – record sounds to accompany desktop operations – customise wallpaper and screensavers – propose a future version of a known proprietary operating interface • **justify the interface in terms of:** – cultural understandings – intellectual and physical challenge – ease of understanding – familiarity – consistency – underlying metaphors

Interfacing with Machines

IM 4.2 Students explain the logic of algorithms for an information-processing sequence they have designed.	**IM 5.2** Students develop algorithms and software applications that incorporate multiple selection and user input.	**IM 6.2** Students assess and select strategies to produce software solutions to information and communication technology challenges.
Students know: • **the logical nature of algorithms** – linear, non-linear or iterative sequencing of steps required to complete a task – nature of variables • **ways to construct information-processing sequences** – the software development cycle (problem definition, solution specification, selection and application of appropriate design methodology, implementation of the design, testing for errors, evaluation of product or process of solutions, and documentation of the solution) – algorithm design methodology e.g. structured design charts, pseudocode, Nassi-Schneiderman diagrams – concept mapping or storyboarding – rules or syntax of selected programming language or software application – operational interfaces and file management – debugging strategies	**Students know:** • **how to incorporate multiple selection and user input into algorithms and software applications** – navigation and selection structures within simple programming environments or software applications e.g. buttons, text commands – procedures for checking user input – hyperlinks – sequence, selection and iteration constructs of the chosen programming language	**Students know:** • **strategies that produce software solutions** – steps in the project management process (understand the problem, negotiate the problem and solutions, develop a proposal and project plan, implement the project, evaluate the project, report on the project) – the importance of accurate problem definition – design specifications for software development – nature and purpose of end-user documentation
Students: • **explain the logic of algorithms for an information-processing sequence they have designed** – produce simple algorithms and identify if they are linear or iterative e.g. making coffee, polishing shoes, getting ready for school – implement simple algorithms in a robotic programming environment – roleplay algorithmic instructions – sequence or prioritise items in a list – design a storyboard with single or multiple paths and identify its non-linear sequence	**Students:** • **develop algorithms and software applications that incorporate multiple selection and user input** – use hardware and software to produce linear and/or non-linear software applications – produce and evaluate the codes and finished applications e.g. programs, web pages – test and refine software solutions – document (internally and externally) and justify solutions – maintain a problem-solving log of the development process	**Students:** • **assess and select strategies to produce software solutions to information and communication technology challenges** – plan and implement software development projects using the project management process – test and critically assess how users interface with completed programs – evaluate the intellectual and collaborative processes within the software development task – produce end-user documentation for completed programs

Interfacing with Machines

IM 4.3 Students identify and explain the logic of systems and subsystems. (Tech SYS 4.1)	**IM 5.3** Students explain the structures, controls and management of systems and subsystems. (Tech SYS 5.1)	**IM 6.3** Students explain principles underlying complex systems in terms of structures, control and management. (Tech SYS 6.1)
Students know: • **systems and subsystems** – need for and role of subsystems within systems • **logic of systems** – inputs, processes, outputs – function of components – organisation of the components in systems and subsystems and the links between them e.g. compatible hardware and software – components are organised to achieve a goal e.g. computer systems, networks, control systems, remote sensing and monitoring	**Students know:** • **structures** – how components within a system interact with each other e.g. configuration, connectivity (exchange of information), architecture – components within the system rely on each other e.g. protocols, compatibility, data communications – a system may include redundant features to enable it to manage component failure e.g. mission critical systems in banks to avoid data loss, a redundant power supply in personal computer • **controls** – role of control mechanisms in modifying inputs, processes and outputs e.g. printer alert messages, no disk space, invalid disk format – role of predetermined conditions in the behaviour of systems e.g. selling point of shares in stock market, thermostatically controlled air-conditioning systems • **management** – structures and controls within systems can be managed to optimise outputs e.g. strategies to maintain and adjust computer systems, disaster recovery plans – security levels and the allocation of permission to individuals	**Students know:** • **principles underlying complex systems** – complex systems are defined by their sophistication, adaptability and increased functionality, user-friendliness, interoperability of components, degree of fuzzy logic and multi-tasking, parallel processing – multiple points of control are required to monitor and optimise the operation of complex systems – strategies to manage and maintain complex systems e.g. quality-control procedures, use of fail-safe mechanisms, security
Students: • **identify and explain the logic of systems and subsystems** – use diagrams and algorithms to identify logic of systems they have created e.g. design of models and deployment of sensors in automated systems – assemble or disassemble a system to analyse its operation	**Students:** • **explain structures, controls and management** – draw schematic diagrams, data flow diagrams, concept maps to illustrate the structures of systems – prepare arguments for and against machine control of human activity e.g. banking, robotics and automation in industry	**Students:** • **explain principles underlying complex systems** – graphically represent the different relationships between component parts in complex systems – analyse efficiency within specific parts of a computer program in order to optimise performance e.g. structuring and sorting data in a spreadsheet, developing macros versus software features – identify the roles within the effective management of complex systems e.g. network manager, technician, help desk operator

Interfacing with Machines

IM 4.4 Students incorporate feedback to refine and modify systems and/or subsystems. (Tech SYS 4.2)	**IM 5.4** Students incorporate control and management mechanisms in systems that include subsystems. (Tech SYS 5.2)	**IM 6.4** Students devise ways to manage and monitor the operation of complex systems. (Tech SYS 6.2)
Students know: • **feedback** – information gathered about the operation of a system – forms of feedback from ICT systems e.g. screen or sound alert, dialog box or verification message, error message, pop-up windows, automated email reports on network status, virus alert – forms of feedback from system users e.g. peer assessment and testing, software review	**Students know:** • **control and management mechanisms** – components or subsystems that monitor and modify the outputs e.g. virus-checking procedures (automatically delete executable files, automatically update virus definition list), automated back-up procedures to prevent data loss, firewalls	**Students know:** • **ways to manage operation** – quality systems e.g. reliability, efficiency, security, accountability, productivity – standards for naming conventions and security levels • **ways to monitor operation** – needs audits and analyses – system-monitoring applications – optimal hardware (up-to-date drivers, additional RAM or virtual memory) – usage logs – internet histories – capacity planning and load monitoring – security and vulnerability audits
Students: • **incorporate feedback** – respond to error messages or systems failure in the operating of hardware systems – redesign or reprogram a robotic device or sensor after assessing its operation – alter instructions to macro to achieve desired outcome – modify algorithms to debug a program	**Students:** • **incorporate control and management mechanisms** – establish file directories and other structures for personal computer environment – set up email program to accept mail from trusted sources e.g. use filters and limit size of attachments – set user profiles and security levels	**Students:** • **devise ways to manage and monitor the operation of complex systems** – identify and implement strategies to manage and monitor personal computing environment e.g. memory check, de-fragment, registry sweep (removal of temporary and cached files) – tweak virtual memory settings (to suit graphical applications) – optimise interface for user friendliness – ensure safety including personal protection through filtering

Interfacing with Machines

IM 4.5 Students discuss the social impacts of situations in which machines simulate human behaviour	**IM 5.5** Students discuss social and ethical issues that they have identified in the development and application of software.	**IM 6.5** Students describe and apply codes of social responsibility and ethics when responding to information and communication technology challenges.
Students know: • **situations in which machine sequences simulate human behaviour** e.g. artificial intelligence, smart agents, fuzzy logic, industrial robots, automated systems • **social impacts of technology** – unemployment – increased costs – deskilling of traditional craft workers – shortage of knowledge workers and information technology professionals – reduction of human interaction in business – reduced permanence of employment e.g. contracts, portfolio career	**Students know:** • **social and ethical issues related to the development and application of software** – creation and distribution of viruses – unauthorised collection of email addresses (for spamming or junk mail) or passwords – privacy – external monitoring of systems – criminal purposes (cracking) – unauthorised access (hacking) – interception of online communications	**Students know:** • **codes of social responsibility and ethics** – nature of ethics and its distinction from law – code of ethical practice from professional groups e.g. Australian Computer Society – censorship system for computer games
Students: • **discuss the social impacts** – identify uses of robotics and automation in business and industry – explore scenarios to identify the social impacts of technology – conduct a survey to gauge public opinion of automated phone services – roleplay or conduct mock radio talkback on public attitude to technology – investigate and report on fictional accounts of machines simulating human behaviour – review Asimov's Laws of Robotics – investigate and report on specialised software and adaptive technologies	**Students:** • **discuss social and ethical issues that they have identified** – investigate legislation concerning unauthorised use of software – consider the case histories of virus writers – examine levels and forms of hacking e.g. script kiddies (vandalism), cracking (criminal behaviour), hactivism, hacking to show security loopholes – debate the 'hacker ethic' – analyse the potential effects of human misuse of information and communication systems – investigate covert and overt ways that personal information can be collected through people's online interactions	**Students:** • **describe and apply codes of social responsibility and ethics** – devise and apply personal code of ethics in developing software applications – discuss reasons for the publication and promotion of ethical codes – discuss reasons for national ratings systems for computer games – assess internet content and services against established ethical codes and personal code of ethics – use examples from fiction to stimulate debate about unethical breaches of individual privacy and security

Participating in Online Communities

OC 4.1 Students investigate the nature and purpose of online communities and services.	**OC 5.1** Students evaluate how individuals and small groups develop a sense of community online.	**OC 6.1** Students investigate the ways in which community groups have used online communications tools to effect change in their communities.
Students know: • **nature of online communities** – professional, shared purpose, commercial, social, support groups – use of communications tools e.g. email, IRC, MSN, bulletin boards, newsgroups • **purpose of online communities** – provide information, support, advice, counselling – conduct online events e.g. video streaming, communications projects, web cam, video conferencing – provide services e.g. financial services, infomediary, auctions	**Students know:** • **ways to evaluate online communication strategies** e.g. suitability, effectiveness, accessibility • **individuals and small groups develop a sense of community online** – purposes for engaging in online communities e.g. sharing and expanding common interests, enhancing education, promoting social issues, offering support – communications tools used by individual and small groups e.g. online synchronous and asynchronous communications tools, websites and web-based tools used to sustain online communities	**Students know:** • **uses of communications tools** – online synchronous and asynchronous communications tools are used by government, news services, global community and cultural groups to effect change – the design of services and events can empower individuals to contribute to online communities e.g. access and interactivity encourages participation, web space for publication, templates of letters and emails for advocacy • **ways change in communities has been effected** – groups promote their ideals, actions and beliefs through online communities e.g. Green Peace – communities can harness the power of individuals to support a common cause e.g. crime watch, reconciliation
Students: • **investigate the nature and purpose of online communities and services** – research and present examples of online communities, events or services – propose an online strategy for a particular purpose e.g. online petitions for a conservation group – identify and evaluate the purpose of online communication services that are of interest to adolescents e.g. career information, entertainment, shopping, free web-based email	**Students:** • **evaluate how individuals and small groups develop a sense of community online** – evaluate forms of communication used by virtual communities for fostering communication between people e.g. email, chat rooms, web boards – examine how individuals and closed discussion groups use combinations of tools and services to communicate – analyse the impact of particular behaviours in an online community – investigate an online community and monitor its growth and change over time – reflect on own participation in an online community – investigate school websites and how they represent and support their communities – investigate the significance of online communities across cultural and geographic boundaries	**Students:** • **investigate the ways online communications tools have been used to effect change** – establish criteria to evaluate the communications tools that seeks to effect change e.g. legality, ethics, effectiveness of the tools used, quality and persuasiveness of language, appropriateness of endorsement and sponsorship – develop a case study to describe the ways online communications tools have been used to effect change e.g. environmental organisations, political lobbying, social influence – discuss strategies used by online communities to empower members to contribute to change e.g. email lists, web forms, chat rooms, surveys

Participating in Online Communities

OC 4.2 Students describe communications tools and use a variety of these to participate in online events.	**OC 5.2** Students evaluate the communications tools used by communities to participate in online events.	**OC 6.2** Students document, develop and manage an online communication event with specific purposes for a known community.
Students know: • **various communications tools** – synchronous and asynchronous e.g. listservs, bulletin boards – services e.g. ISP, web-hosting, support services (search engines, lists) – tools and/or events for particular purposes e.g. online databases, surveys, registrations, subscriptions • **online events** e.g. video streaming, communications projects, web cam, video conferencing **Students:** • **describe communications tools** – explain communications terminology e.g. construct a glossary of terms – discuss communications guidelines e.g. timing, structure, etiquette – explain how to use synchronous and asynchronous tools – describe how to subscribe to lists • **participate in online events** – communicate with other schools – participate in online events e.g. curriculum projects – build a web page for another school e.g. virtual field trip which may include a guest book and chat room	**Students know:** • **ways to evaluate communications tools** – consider effectiveness of type and structure, and ability to meet needs of audiences – test the effectiveness of communications tools to participate in online events effectively – discuss the potential of online services and events to gain data, share information, opinions and ideas, build communities **Students:** • **evaluate communications tools** – reflect on their use of communications tools in an online event – review the constraints of the communications tools used in an online event e.g. restrictions of bandwidth in receiving live video streaming of news event – consider the issues of access for individuals participating in online events e.g. hardware capability, software plug-ins – investigate the structure of the event e.g. organisation, power structures, timing, censorship, moderation	**Students know:** • **project management of an online communication event** – events have audiences and purposes – range and suitability of the communications tools – proposal and project plan e.g. tasks, timelines and criteria for successful completion – project implementation and evaluation – project report **Students:** • **document, develop and manage an online communication event** – manage an online event for a known community e.g. email list for a local event – set up an online service that can be used in an online community e.g. web page – critically evaluate the outcome of an online event using self-generated criteria, checklists, documents, surveys – create an archive of the event – share the outcomes of the event through presentation to others e.g. local community, education authorities

Participating in Online Communities

OC 4.3 Students develop a code of practice for participating in online communities.	**OC 5.3** Students investigate the impacts of online interactions and how laws and conventions have evolved to govern online behaviour.	**OC 6.3** Students consider what the role of online communications in daily life may be in the future.
Students know: • **participation in online communities** – purpose and nature of participation affects behaviour e.g. formality imposed by group membership – participants may bring existing views, prejudices and intent to online interactions • **code of practice** – purpose for developing codes of practice e.g. for individuals, groups, organisations – guidelines for communicating safely and effectively online e.g. net etiquette, protecting privacy – strategies to deal with inappropriate behaviour	**Students know:** • **impacts of online interactions** – communications technology alters the way people work, learn, seek and share ideas, take leisure, pursue personal goals, develop relationships – communications technology can be used to harm others e.g. computer crime, hacking, spamming • **laws have evolved to govern behaviour** – laws evolve to meet new circumstances e.g. internet gambling – laws protect individual rights e.g. libel, slander – individuals have democratic rights to privacy	**Students know:** • **role of online communications in daily life** – worthwhile applications of communications technologies in daily life e.g. virtual schooling, e-commerce, information retrieval, home management – how people communicate in public and private spaces e.g. with work colleagues, family members – how communications technology is impacting on the management of daily life e.g. online shopping • **online communications in the future** – technologies may be accepted or rejected by societies in terms of suitability, consequences, health or ethical concerns, marketing influences
Students: • **develop a code of practice** – roleplay scenarios dealing with inappropriate online interactions e.g. flaming, harassment, legality of sharing downloaded files – discuss how online groups control inappropriate online activity – consider media reports of abuse and misuse of online communications – discuss etiquette in traditional human interactions and relate this to online communication – consider school internet usage policy and guidelines – present codes of practice related to specific online interactions e.g. supplying personal information or credit card details online, net etiquette in participating in online curriculum projects – discuss how the developed code of practice responds to identified issues e.g. protection of privacy, unsolicited email, virus attachments, sharing downloaded music files	**Students:** • **investigate the impact of online interactions** – develop a case study of a change in social practice e.g. the workplace – compare and contrast traditional and electronic practices e.g. mail, banking – investigate computer crime • **investigate how laws have evolved to govern behaviour** – identify the need for new laws to govern online interactions – conduct a class debate e.g. on the criminality of the theft of data, on the adoption of an online persona – discuss the changing nature of theft and how legislation has been generated to counter these changes – roleplay the trial of a computer criminal e.g. a person accused of writing and distributing a virus – write a science fiction story in which an alien visitor reports on the ethics of current online communications	**Students:** • **consider preferred futures for online communications** – collate and annotate media articles on online communication issues and new technologies – develop case studies of situations where online communications are shaping daily life e.g. WAP, palm pilots and electronic organisers, e-book readers, satellite navigation – develop scenarios for a preferred future e.g. school of the future, work through telecommuting – write a speculative scenario describing the day in the life of one of their grandchildren

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