

Strand			Knowledge and understanding				Processes and production skills									
			Digital systems		Representation of data		Collecting, managing and analysing data		Creating digital solutions by:							
									Investigating and defining		Producing and implementing		Evaluating		Collaborating and managing	
Content Description			Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data (ACTDIK007)		Recognise different types of data and explore how the same data can be represented in different ways (ACTDIK008)		Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009)		Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)		Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)		Explain how student solutions and existing information systems meet common personal, school or community needs (ACTDIP012)		Plan, create and communicate ideas and information independently and with others, applying agreed ethical and social protocols (ACTDIP013)	
Sequence of Lessons / Unit	Approx. time req'd	Year	CD	Achievement standard #	CD	Achievement standard #	CD	Achievement standard #	CD	Achievement standard #	CD	Achievement standard #	CD	Achievement standard #	CD	Achievement standard #
Communicate ideas and information	5-7	3	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	

Years F-2 Achievement Standard	Years 3 and 4 Achievement Standard	Years 5 and 6 Achievement Standard
By the end of Year 2 <ul style="list-style-type: none"> Students identify how common digital systems (hardware and software) are used to meet specific purposes. (1) They use digital systems to represent simple patterns in data in different ways. (2) Students design solutions to simple problems using a sequence of steps and decisions. (3) They collect familiar data and display them to convey meaning. (4) They create and organise ideas and information using information systems, and share information in safe online environments. (5) 	By the end of Year 4 <ul style="list-style-type: none"> Students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. (1) They explain how the same data sets can be represented in different ways. (2) Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input. (3) They explain how the solutions meet their purposes. (4) They collect and manipulate different data when creating information and digital solutions. (5) They safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used. (6) 	By the end of Year 6: <ul style="list-style-type: none"> Students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. (1) They explain how digital systems use whole numbers as a basis for representing a variety of data types. (2) Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. (3) They incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. (4) They explain how information systems and their solutions meet needs and consider sustainability. (5) Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols. (6)

Topic: Collaboration

Units

Year 3

Year 4

Communicate ideas and information 5-7 hours Learn how information systems can be used by students and others in their community.	Apply protocols 7-8 hours Develop a school ICT agreement and collaborate with others to complete an online task, using agreed protocols.
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Communicate ideas and information

The home is a useful context to study information systems for personal purposes. Use the school library borrowing system as a way to further explore information systems; other examples include online access to anything that requires a large amount of information and resources organised in an easily accessible format. Explore the possible use of information systems within the community. Explore virtual resources that are available globally and have a relevant class context. Students could create their own pseudo virtual tour of the school for a particular purpose.

Flow of activities				
Short text	Personal use Explore personal use of information systems for entertainment and communication.	School use Use the school library borrowing system as a way to explore information systems.	Community use Explore the possible use of information systems within the community.	Global virtual tour resources Explore virtual tour resources that are available globally and have a relevant class context.
AC alignment	<i>Evaluating (ACTDIP012)</i> <i>Digital systems (ACTDIK007)</i>	<i>Evaluating (ACTDIP012)</i> <i>Collaborating and managing (ACTDIP013)</i>	<i>Evaluating (ACTDIP012)</i> <i>Representation of data (ACTDIK008)</i>	<i>Investigating and defining (ACTDIP010)</i> <i>Producing and implementing (ACTDIP011)</i> <i>Evaluating (ACTDIP012)</i> <i>Collaborating and managing (ACTDIP013)</i>
Questions to guide exploration	<i>What information systems do I use?</i>	<i>How does a library borrowing system work?</i>	<i>How can information be stored and easily found?</i>	<i>How can I present information so you feel like you are actually there?</i>
What's this about?	<p>The home is a useful context to study information systems for personal purposes.</p> <p>Entertainment is an area where most families engage with information systems, such as paid subscriptions to music, television and movie content.</p> <p>Communication with interstate or overseas friends and family may be in the form of video and voice calls using telecommunications application software and is an example of a type of information system.</p> <p>Also becoming more and more prevalent are the home monitoring of security, home appliance and energy management, as well as monitoring the health of the individuals in the home. Information systems make this type of monitoring possible. Digital systems such as computers, tablets and smartphones are integral to the solutions, with particular software applications required.</p>	<p>A database is a computerised system that makes it easy to search, select and store information. Databases are used in many different places.</p> <p>A computerised school library borrowing system is an example of an information system that uses a database to:</p> <ul style="list-style-type: none"> • catalogue resources • manage the borrowing and returning of books and other resources • provide reports and statistics on the use of the library collection • provide integrated access to online and print resources. 	<p>Organisations such as libraries, large health care professionals and retail stores all use a database to search, select and store information.</p> <p>When information about an object or person is well structured or organised, it is easier to search for specific details or select particular records.</p>	<p>A virtual tour is a simulation of an existing location, often made up of a sequence of still images or, in some occasions, video. Sound effects, music, narration and text may also be incorporated. Some virtual tours offer a virtual reality experience when a VR headset such as Google Ccardboard.is worn by the viewer.</p>
The focus of the learning (in simple terms)	<p>Explore the way we use information systems for personal purposes, such as for entertainment and communication.</p> <p>Use Poll Everywhere or a similar collaboration tool to gather and record information about services, such as if they:</p> <ul style="list-style-type: none"> • have paid television access (Foxtel, Netflix etc) • have paid music access (Spotify, iTunes) • use an app (Skype or WhatsApp) to talk to friends and family overseas or interstate • have Google Home • have access to online books (Amazon) • use wi-fi to connect to multiple devices • make use of Xbox Live or PlayStation Live • watch YouTube • have access to a smartphone. <p>What are all of these used for – what are the purposes of the information systems? Create an affinity map of all the ideas that they have gathered. Students brainstorm ideas around the systems that they use in the house, record these on post- it notes, and then try to categorise them by common themes.</p>	<p>Use the school or local community library to explore the usefulness of an information system to locate, record and report on reading resources.</p> <p>If available, start with the class library of books. Check if the following kind of information, or data, is available on these books: title, author, genre, length, lexile score (reading level), student rating and so on.</p> <p>Ask how could we record and store this information? This could be done collaboratively using a Google spreadsheet, for example. Each student takes a book and records data into a shared document. Demonstrate how the complete document can be sorted and filtered to locate a book. Discuss the benefits of such a document, for example, for accessing who has the book, its rating or peer-written review or even a student-developed quiz. The user interface could be an option for further exploration. You may decide there is benefit from the class continuing to maintain this spreadsheet and each student adding their own review score as they read a book, which would allow them to then search by genre</p>	<p>Discuss in simple terms the use of databases such as for health records, the local library, the supermarket and other retail stores.</p> <p>Discuss the use of barcodes to identify particular items and why these are important.</p> <p>Discuss the need to protect personal information such as at the healthcare professional.</p> <p>Create a sample columns and rows they could use to store information about something of interest or that links to the class context, for example:</p> <ul style="list-style-type: none"> • Favourite movie, book characters or Superheroes • Class pet types • Local backyard animals, Australian animals organised by type, dinosaurs • Australian capital cities and towns. <p>Complete the table of information for each column and row to show how the data is useful the way the data is organised. It is beyond students at this level to create their own digital database.</p>	<p>Students could explore a VR museum identifying the digital system, data, processes and role of people, and then try to create a VR digital solution.</p> <p>As part of a study on classifying animals in Science, take a virtual tour of a museum and gather information about dinosaurs and sort them via characteristics.</p> <p>Students could create their own pseudo virtual tour of the school using either PowerPoint or Prezi. They could have each slide be a photo of a section of their tour, and then hyperlink arrows to different slides to allow the user to navigate the virtual space.</p> <p>Students plan the whole tour in a flow chart before creating the digital solution. They discuss usability and community need, to further ensure that they design a solution that is purpose built. Some starting points may be:</p> <ul style="list-style-type: none"> • How does a new student find the toilets and other important parts of the school?

	<p>They should end up with categories such as entertainment, communication, power conservation, education and security.</p> <p>Discuss student experiences of using free, or trial, games and the bought versions, or compare free apps with those purchased or those with in-app purchases.</p> <p>Identify the digital system (hardware and software and network), data, processes and people – who uses the system, and for what purpose?</p> <p>Students draw a floor diagram of their house showing where all the technology is in the house. They could have it colour-coded depending on whether it is an example of hardware, software or a connection via a network.</p>	<p>and score etc to find books that interest them that their peers enjoyed.</p> <p>Discuss students' experiences with borrowing books and other resources from the school library. Ask how the librarian knows what books are borrowed, what books they have and how to find a type of book, or a book by a certain author or by topic.</p> <p>Ask the librarian to explain and demonstrate how the library resources are catalogued using an information system. Explain that the information is stored and accessed in a database. Discuss the usefulness of the system benefits of a digital system. It may be possible to explain the non-computerised system that used a paper-based manual approach to managing the borrowing of resources.</p>	<p>A key to successfully organising information into 'bite-sized' pieces is to ask what questions need to be answered. For example, in response to the question 'In our class, what is the most popular day for birthdays, such as 3rd or 27th?' This should prompt students to think about how birthdates are organised so you could search just for the day and not the complete birthdate. In this instance, this would involve separating the day, month and year so you could search just for day.</p> <p>Another example could be the most popular first name or street number – students need to understand that you cannot list a full name or street address because you cannot answer the question when the information is structured in this way.</p>	<ul style="list-style-type: none"> • How do I get to the school garden and what might I find there? • Where are places to play in our school? • What artworks are on display this term? <p>The collaboration aspect of this task involves being explicit about how to plan the task as a group, discuss roles and manage consistency of style and time.</p> <p>Note: If undertaking this aspect of the sequence more time will be required than the suggested 5–7 hours.</p>
<p>Supporting resources and tools and purpose/ context for use.</p>	<p>Online tools Poll Everywhere Poll Everywhere is a useful collaboration tool.</p> <p>RoomSketcher Use an online tool that enables students to sketch their room.</p>	<p>School librarian or community librarian or the class teacher who is familiar with the school's system.</p> <p>How to guide Creating library records on a spreadsheet A guide to showing how Excel spreadsheets can be used to record data about library resources.</p>	<p>How to guide What is a database? A guide to databases, with relevant example simply explained.</p>	<p>Virtual museum tours Australian Museum Natural History View the Girraffatitan 360° video as well as other multimedia on natural history Smithsonian National Museum of Natural History Louvre Museum National Museum of Computing, UK</p> <p>Presentation tools Prezi A presentation type software for iOS</p> <p>How to guide Virtual Museum Exhibit A how to of a virtual museum exhibit. Useful background knowledge for the teacher to see how to set up a presentation.</p>
<p>Assessment</p>	<p>Suggested approaches may include: labelled diagram colour coded with a description of the purpose of each of the systems (eg entertainment, communication, power conservation).</p> <p>Achievement standard Safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.</p>	<p>Suggested approaches may include: spreadsheet entry for their class library book, or level of engagement in discussion of school library borrowing system.</p> <p>Achievement standard Safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.</p>	<p>Suggested approaches may include: database headings for columns and rows example that includes two or three questions that the structure would allow to generate an answer.</p> <p>Achievement standard Safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.</p>	<p>Suggested approaches may include: Design and implementation of a virtual tour.</p> <p>Achievement standard Safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.</p>