TAS
TRINITY ANGLICAN SCHOOL
CAIRNS | AUSTRALIA

Digital Technologies P - 10

Australian Curriculum	
Foundation to Year 2 Learning in Digital Technologies builds on concepts, skills and processes developed in the Early Years Learning Framework. It focuses on developing foundational skills in computational thinking and an awareness of personal experiences using digital systems. By the end of Year 2, students will have had opportunities to create a range of digital solutions through guided play and integrated learning, such as using robotic toys to navigate a map or recording science data with software applications. In Foundation – Year 2, students begin to learn about common digital systems and patterns that exist within data they collect. Students organise, manipulate and present this data, including numerical, categorical, text, image, audio and video data, in creative ways to create meaning. Students use the concept of abstraction when defining problems, to identify the most important information, such as the significant steps involved in making a sandwich. They begin to develop their design skills by conceptualising algorithms as a sequence of steps for carrying out instructions, such as identifying steps in a process or controlling robotic devices. Students describe how information systems meet information, communication and/or recreational needs. Through discussion with teachers, students learn to apply safe and ethical practices to protect themselves and others as they interact online for learning and communicating.	**From selected activities** • Coding using Cubettos (Kindy & Year 1) • BeeBots (Prep – Year 2) teacher driven • Coding program using code.org Year 1 – Course 1 Year 2 – Course 1 and 2 • Extension: Hour of Code • Code.org + Scratch Junior • Scratch Junior will be teacher driven after 3 x professional development sessions with Dr. Jason Holdsworth. • Teachers to undertake the 8 unit CSER F – 6 Digital Technologies MOOC in November. Teacher work in teams to complete the remaining 4 units. **After-school opportunities** • **KBJ - Thursday** Yrs. 2-3 Junior ROCO Club 3:15 - 4:15 (KBJ - Library) – Ms Kershaw *$25/term* • **KBJ – Tuesday** Coding and Scratch Club 1:25pm (during activities time**)** • **WRJ – Monday** P-2 Robotics club 3:30 – 4:30 – Ms Rankin

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Years 3 and 4 Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking, such as categorising and outlining procedures; and developing an increasing awareness of how digital systems are used and could be used at home, in school and the local community. By the end of Year 4, students will have had opportunities to create a range of digital solutions, such as interactive adventures that involve user choice, modelling simplified real world systems and simple guessing games. In Year 3 and 4, students explore digital systems in terms of their components, and peripheral devices such as digital microscopes, cameras and interactive whiteboards. They collect, manipulate and interpret data, developing an understanding of the characteristics of data and their representation. Using the concept of abstraction, students define simple problems using techniques such as summarising facts to deduce conclusions. They record simple solutions to problems through text and diagrams and develop their designing skills from initially following prepared algorithms to describing their own that support branching (choice of options) and user input. Their solutions are implemented using appropriate software including visual programming languages that use graphical elements rather than text instructions. They explain, in general terms, how their solutions meet specific needs and consider how society may use digital systems to meet needs in environmentally sustainable ways. With teacher guidance, students identify and list the major steps needed to complete a task or project. When sharing ideas and communicating in online environments they develop an understanding of why it is important to consider the feelings of their audiences and apply safe practices and social protocols agreed by the class that demonstrate respectful behaviour.	**From selected activities** • Code.org: Semester Two Year 3 – Course 3 Year 4 - Courses 3 & 4 • Coding and Robotics using Lightning Lab and Spheros Obstacle Course Competition • Extension: Hour of Code • Code.org + Spheros (Year 3) • Code.org (Year 4) • Scratch 2 (Year 4 opt-in. Will be teacher driven to whole class after 3 x professional development sessions with Dr Jason Holdsworth.) • LEGO Mindstorms (Year 4, opt-in) • Coding and Robotics group at KBJ facilitated by Dr Jason Holdsworth JCU and supported by parents. • Teachers to undertake the 8 unit CSER F – 6 Digital Technologies MOOC in November. Teacher work in teams to complete the remaining 4 units. **After-school opportunities** • **KBJ - Thursday** Yrs. 2-3 Junior ROCO Club 3:15 - 4:15 (KBJ - Library) - Ms Kershaw *$25/term* • **KBJ - Thursday** Yrs. 4-6 ROCO Club 3:30 - 4:30 (KBJ - Library) Dr. Jason Holdsworth (and helpers) *$50/term* • **WRJ - Thursday** P-4 Young Engineers Club 1:30 – 3:15 (WRJ) Ms Wells, Ms Osmond • **WRJ – Monday** 3:30 – 4:30 Robotics club – Mr Long

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Australian Curriculum	
Years 5 and 6 Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as identifying similarities in different problems and describing smaller components of complex systems. It also focuses on the sustainability of information systems for current and future uses.By the end of Year 6, students will have had opportunities to create a range of digital solutions, such as games or quizzes and interactive stories and animations. In Year 5 and 6, students develop an understanding of the role individual components of digital systems play in the processing and representation of data. They acquire, validate, interpret, track and manage various types of data and are introduced to the concept of data states in digital systems and how data are transferred between systems.They learn to further develop abstractions by identifying common elements across similar problems and systems and develop an understanding of the relationship between models and the real-world systems they represent. When creating solutions, students define problems clearly by identifying appropriate data and requirements. When designing, they consider how users will interact with the solutions, and check and validate their designs to increase the likelihood of creating working solutions. Students increase the sophistication of their algorithms by identifying repetition and incorporate repeat instructions or structures when implementing their solutions through visual programming, such as reading user input until an answer is guessed correctly in a quiz. They evaluate their solutions and examine the sustainability of their own and existing information systems. Students progress from managing the creation of their own ideas and information for sharing to working collaboratively. In doing so, they learn to negotiate and develop plans to complete tasks. When engaging with others, they take personal and physical safety into account, applying social and ethical protocols that acknowledge factors such as social differences and privacy of personal information. They also develop their skills in applying technical protocols such as devising file naming conventions that are meaningful and determining safe storage locations to protect data and information.	**From selected activities** • Code.org - Years 5/6: Accelerated Course • Coding and robotics using Lightening Lab and Spheros. • Year 5 – Course 5 New to TAS students complete Accelerated Course covering components from Course 1-5. • Coding and robotics using Lego Mindstorms • Teachers to undertake the 8 unit CSER F – 6 Digital Technologies MOOC in November. This includes one full day of f2f professional development with Lauren Stanhope from Adelaide University to complete 5 units. Teachers work in teams to complete the remaining 4 units. • Digital Citizenship and Cybersafety workshops conducted with Year 6 students and their parents in February. • A further Cybersafety workshop is to be conducted with Year 5 and 6 students in Term 3 with the Cairns Child Protection and Investigation Unit. **After-school opportunities** • **WRJ – Thursday** Year 6 Robotics Club (Hummingbird Kits building robotic animals) (teacher & parent driven) 3:30 – 4:30 • **WRJ – Friday** Hummingbird Robotics (Art/Robotics integration) 1 term 3:30 – 4:30 Ms Ashburton • **KBJ - Thursday** Y4-6 ROCO Club 3:30 - 4:30 (KBJ - Library) Dr Jason Holdsworth (and helpers) *$50/term* • **WRJ – Monday** R**obotics club** – Wendy Ashburton (T4) 3:30 – 4:30

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Years 7 and 8 Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as decomposing problems and prototyping; and engaging students with a wider range of information systems as they broaden their experiences and involvement in national, regional and global activities. By the end of Year 8, students will have had opportunities to create a range of digital solutions, such as interactive web applications or programmable multimedia assets or simulations of relationships between objects in the real world. In Year 7 and 8, students analyse the properties of networked systems and their suitability and use for the transmission of data types. They acquire, analyse, validate and evaluate various types of data, and appreciate the complexities of storing and transmitting that data in digital systems. Students use structured data to model objects and events that shape the communities they actively engage with. They further develop their understanding of the vital role that data plays in their lives, and how the data and related systems define and are limited by technical, environmental, economic and social constraints. They further develop abstractions by identifying common elements while decomposing apparently different problems and systems to define requirements, and recognise that abstractions hide irrelevant details for particular purposes. When defining problems, students identify the key elements of the problems and the factors and constraints at play. They design increasingly complex algorithms that allow data to be manipulated automatically, and explore different ways of showing the relationship between data elements to help computation, such as using pivot tables, graphs and clearly defined mark-up or rules. They progress from designing the user interface to considering user experience factors such as user expertise, accessibility and usability requirements. They broaden their programming experiences to include general-purpose programming languages, and incorporate subprograms into their solutions. They predict and evaluate their developed and existing solutions, considering time, tasks, data and the safe and sustainable use	**Semester One - Year 7** • Ethical Practices in IT/Cybersafety • Student Blogging • Robotic Sumo Challenge • Programming using Scratch based mBlockly • Introduction to OneNote for collaboration **Semester Two - Year 8** • Introduction to Microsoft Excel • Robotic Soccer Challenge • Programming using Scratch based mBlockly • Computer system design: Hardware focus • Introduction to Multimedia Presentations/Film Making **After-school opportunities** *Makerspace* – Students come together to learn, design and make. Students will build their own drones or work on robotics projects with assistance from staff **WRS - Wednesday** Mr Keys/Mr Lamond/Mr Gynther 3:30 – 4:30 in A2.

of information systems, and anticipate any risks associated with the use or adoption of such systems. Students plan and manage individual and team projects with some autonomy. They consider ways of managing the exchange of ideas, tasks and files, and techniques for monitoring progress and feedback. When communicating and collaborating online, students develop an understanding of different social contexts, for example acknowledging cultural practices and meeting legal obligations.	

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Australian Curriculum	WRS
Years 9 and 10 Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as precisely and accurately describing problems and the use of modular approaches to solutions. It also focuses on engaging students with specialised learning in preparation for vocational training or learning in the senior secondary years. By the end of Year 10, students will have had opportunities to analyse problems and design, implement and evaluate a range of digital solutions, such as database-driven websites and artificial intelligence engines and simulations. In Year 9 and 10, students consider how human interaction with networked systems introduces complexities surrounding access to, and the security and privacy of, data of various types. They interrogate security practices and techniques used to compress data, and learn about the importance of separating content, presentation and behavioural elements for data integrity and maintenance purposes. Students explore how bias can impact the results and value of data collection methods and they use structured data to analyse, visualise, model and evaluate objects and events. They learn how to develop multilevel abstractions, identify standard elements such as searching and sorting in algorithms, and explore the trade-offs between the simplicity of a model and the faithfulness of its representation. When defining problems students consider the functional and non-functional requirements of a solution through interacting with clients and regularly reviewing processes. They consolidate their algorithmic design skills to incorporate testing and review, and further develop their understanding of the user experience to incorporate a wider variety of user needs. Students develop modular solutions to complex problems using an object-oriented programming language where appropriate, and evaluate their solutions and existing information systems based on a broad set of criteria including connections to existing policies and their enterprise potential. They consider the privacy and security implications of how data are used and controlled, and suggest	**Semester One: IT Hardware, Software and Programming** • Digital System and Network design • Advanced Microsoft Excel • Robotics Rescue challenge using Arduino programming (mBot) • Python Programming development using Grok Learning in preparation for UNSW ProgComp **Semester Two: IT Game and Web Design (differentiated approach)** • Python Programming development using Grok • 2D game design • 3D game design • Webpage Authoring with Adobe Dreamweaver **Semester One: STEM elective** Students learn about the components of an aquaponics system, chemistry, physics, environmental sustainability as well as marine and terrestrial ecology. The class create a mini aquaponics system where they then explore different variables and components of the system in an attempt to increase productivity as well as their own understanding of the science involved. Students learn good scientific practices, as well as skills in data analysis, that enable them to make accurate and insightful scientific evaluations and recommendations. **Semester Two: STEM elective** Students learn about the fundamentals of a mini quadcopter drone. This includes: electronics, hardware and software development, graphical design, aviation, electrical engineering and programing. In

how policies and practices can be improved to ensure the sustainability and safety of information systems. Students progressively become more skilled at identifying the steps involved in planning solutions and developing detailed plans that are mindful of risks and sustainability requirements. When creating solutions, both individually and collaboratively, students comply with legal obligations, particularly with respect to the ownership of information, and when creating interactive solutions for sharing in online environments	small groups the class create a drone using all of the necessary components including designing, using computer-aided design (CAD) software, and fabricating a frame on the Makerbot Replicator 3D printers. On board memory will act as a black box collecting flight data that students can analysis and reprogram using Cleanflight software. **After-school opportunites** *Makerspace* – Students come together to learn, design and make. Students will build their own drones or work on robotics projects with assistance from staff **WRS - Wednesday** Mr Keys/Mr Lamond/Mr Gynther 3:30 – 4:30 in A2.