

This unit of work was created in collaboration with teachers from St Francis of Assisi Primary School, Mill Park, Victoria.

Unit Overview

The focus of these lessons is to demonstrate to students the opportunities that arise through digital technologies to help those in need. The three ways of thinking (systems thinking, design thinking and computational) that are embedded in the curriculum are the focus for these lessons. Students evaluate current technologies to help people and design a new system that would help a minority group.

Originally this unit of work was incorporated into a unit of work that is centred around Confirmation. The purpose of these lessons brought Biblical stories into a modern-day context. By this stage, teachers had delved into stories linked to Confirmation and have identified the Beatitudes. The purpose of these lessons is to look at how people demonstrate the values that have been taught through the stories and Beatitudes in a current day context.

Curriculum Targeted Areas

The digital technology is central to this unit of work. Areas of interest may include:

- Design and Technology
- Personal and Social Capability
- Critical and Creative Thinking
- Religious Education

Further investigation into these areas is required to ensure they align with the following activities. Activities may need to be modified to ensure Content Descriptions and Achievement Standards are met.

Australian Curriculum Alignment

The following sessions have been created using the Australian Curriculum: Digital Technologies Curriculum. Activities may need to be modified to ensure state Digital Technologies Curriculum Standards/Syllabus are met. ACS has support and documents to help align this unit to other Digital Technology Curricular.

Session

'Session' has been used to define the order of tasks to complete the unit. It does not define a set time required to complete the task. Time allocated to complete a session is the teacher's discretion. This allows for flexibility for to drive the duration of the task and make modifications if necessary. Sessions can be merged into one allocated class period or may run over multiple periods.

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



Key Preparation

ACS Resources

Resources have been created to help teachers and students unpack and understand topics found within the Digital Technologies Curriculum. These give brief explanations of the topic and the expectations to teach the topic at the curriculum year level. It is intended the information is presented in a way that will set the foundation for further research.

Access resources via: <https://www.acs.org.au/ict-educators.html>

Digital Devices

The focus of this unit is evaluating current systems (systems thinking) and using that information to design their own design (design thinking) then explaining using flow charts (computational thinking) the process of the new design. Design thinking, systems thinking and computational thinking will be demonstrated through plans and drawings.

Global Examples

A selection of stories from around the world that specifically have digital technology at the core of giving opportunity to those who are less fortunate.

[Block By Block Minecraft to help build communities](#)

[The Ocean Clean Up](#)

[World Vision - Fight against Famine](#)

[Solar Buddy](#)

[Be my Eyes](#)

[Drones and Farming](#)

[Care Messages Sending medical messages](#)

[World Reader App to improve literacy](#)

[Litre of Light Foundation](#)

[Litre of Light Foundation at Night](#)

Key Understandings

Students will:

- Investigate how digital technology is a catalyst to help those less fortunate.
- Use their own drive to create and explain a digital system that has the potential to help their wider community.

Key Questions

- What role does digital technology play to help those that are less fortunate?
- How does the digital technology operate? How is data collected and interpreted?
- What are the strengths and weaknesses of that system?
- How could you use digital technology to help those that are less fortunate? What digital system would you create? What beatitudes are present in your system?
- How would your system operate?

Key Vocabulary

Data, transmit, networks, digital system, systems thinking, computational thinking, design thinking, design solution, hardware, software, user experience, user interface, algorithms, iteration, branching, user input.

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
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Levels 5-6



1.	Introduction	<p>Learning Intention Students will identify how digital technology is the catalyst to help those less fortunate.</p> <p>Success Criteria I can make a connection between the use of digital technology and its role to help others.</p>	<p>How do we show compassion to those less fortunate than us?</p> <p>Students discuss when they have seen the beatitudes in their life, on a local or global scale.</p>	<p>Students will watch the video ‘Project Daniel’.</p> <p>Start a discussion with the students around what they saw and how that video made them feel. Complete a written reflection.</p>
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> • Project Daniel – Not Impossible’s 3D Printing Arms for Children of War-Torn Sudan 		<p>Teacher Resources</p> <ul style="list-style-type: none"> • YouTube Video Look Inside: Mick Ebeling Intel • National Geographic Project Daniel: 3D Printing Prosthetic Arms for Children in Sudan 	
2.	Technology’s use in society	<p>Learning Intention Students will identify how digital technology is the catalyst to demonstrate the support and equality for all.</p> <p>Success Criteria I can evaluate the current technology by identifying its strengths and weaknesses.</p>	<p>Complete a discussion around how people in society use technology to help others.</p>	<p>Students are broken into groups and are given opportunities to look at how technology has helped those that are less fortunate. Focus on networks and transmitting data.</p>
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> • ACS Student Resource: Networks • ACS Student Resource: Data Transmission • ACS Student Resource: Common Components • Resources from the ‘Key Preparation Global Examples’ 		<p>Teacher Resources</p> <ul style="list-style-type: none"> • ACS Teacher Resource: Networks • ACS Teacher Resource: Components of a Digital System 	

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



3.	Potentials of technology	<p>Learning Intention Students will create their own system that has the potential to help others.</p> <p>Success Criteria I can design a digital system that will help someone else.</p>	<p>If you have the chance, what digital system could you make that helps people that are less fortunate?</p> <p>Commence a discussion that looks at any pressing issues happening in society. Enable students to think of ways new technology could help combat these issues.</p>	<p>In the same groups, students begin to think of how they could use technology to help those that are less fortunate. Students evaluate these designs based on the purpose of the project – to help those in need.</p>
Session Resources	Student Resources		Teacher Resources	
4.	Designing digital technology for a purpose	<p>Learning Intention Students will identify the role of the user when design the digital solution.</p> <p>Success Criteria I can include user input into my design and steps.</p>	<p>Expectations of the design and drawings are set in this session. Factors to consider when designing the digital solution include:</p> <ul style="list-style-type: none"> • Details of the different screens and functions that are available for the user (user interface) • Details of the type of hardware and software to use • How data will be transmitted 	<p>Narrowing down their ideas from their previous session to focus on one creation.</p> <p>Taking an idea from the previous session, students begin to design a digital system in more detail. They create through drawings and sketches. Students look at the current digital systems and how the interface is designed. They model their design off the different systems they have found online.</p>
Session Resources	Student Resources		Teacher Resources	
	<ul style="list-style-type: none"> • A3 paper and pencils to sketch and design their digital solutions 		<ul style="list-style-type: none"> • ACS Teacher Resource: Evaluating Digital Solutions 	

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



5.	Breaking down how their system works in finer detail	<p>Learning Intention Students will explain how their solution operations using explicit instructions (algorithms).</p> <p>Success Criteria I can draw and explain how my solution works in detail.</p>	Commence the discussion with a brief overall sharing opportunity to discuss their creations. Focusing in on identifying the beatitudes.	Once they have designed their digital system, students will draw it in more detail focusing on multiple functions. This could be what the physical system does or what the software looks like at different stages.
Session Resources	Student Resources		Teacher Resources	
6.	Computational thinking	<p>Learning Intention Explain the digital system that operates using algorithms in the form of explicit English statements.</p> <p>Success Criteria I can explain how my design would operate through explicit English statements that includes branching, iteration and user input.</p>	Breaking down an 'overall idea' of thinking about how a user will interact with the system	After students have completed the design, they will write out English the steps and actions required for the system to operate. These will be written in English language that will detail the operation of the digital system.
Session Resources	Student Resources		Teacher Resources	
7.	Flowchart	<p>Learning Intention Students explain the digital system that operates using algorithms in the form of a flowchart.</p> <p>Success Criteria I can explain how my design would operate through a flowchart that includes branching, iteration and user input.</p>	They transfer the written English statements in to a flow chart. Ensuring that repeats (iteration) and multiple options (branching) are found within the instructions.	There is an option to create the flow chart with or without digital technology. In the Key Preparation section, you will find a selection of suggestions of programs to use.
<ul style="list-style-type: none"> ACS Student Resource: Algorithms 		<ul style="list-style-type: none"> ACS Teacher Resource: Algorithms 		



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Levels 5-6



Session Resources	Student Resources		Teacher Resources	
8.	Going further	<p>Learning Intention Students will act on their learning by engaging with solar buddy or like organisation.</p> <p>Success Criteria I can actively help a community that is less fortunate by building a solar buddy light.</p>	What can we do right now that will help others by using technology?	<p>Use the solar buddy as an example on how students of today can use technology to help those that are less fortunate.</p> <p>Read the ACS article on how students are actively helping those less fortunate.</p> <p>Students brainstorm how they can raise money to buy solar buddy and build them then send off to another country.</p>
Session Resources	Student Resources		Teacher Resources	
			<ul style="list-style-type: none"> • Solar Buddy • ACS Information Article on Solar Buddies 	

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY



Levels 5-6

Work Examples

Save Money
Welcome to Save Money! To order to get money you must use our app. Thank You.

Privacy
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Job Finder
Name: []
Age: []
Gender: []
Result: []

Budget and Tracker
Name: []
Budget: []
Tracker: []

HUNTER
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Police
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Click for Tracker
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Money in Need
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Software
- Router: A networking device that links data points between computer networks and controls traffic flow.
- WiFi: A thing you can use to connect to the internet without wires.
- Server (cloud): A computer that manages network traffic.
- Switch: A computer networking device that connects devices on a computer network.

Hardware
- Mouse: The gear you use with a computer.
- PC: A general purpose computer is used to give you the opportunity to use the internet and to use the computer to give you the opportunity to use the internet.
- Printer: A device that lets you print out documents and photos from a computer or tablet.
- PlayStation: To game on with a computer.

How does this help people in need?
Our app helps people that are really poor or bankrupt. It gives them options to work in an area and receive money for successfulness. The app can keep track of how much money they have earned over the months and how much more money they need for their goals.

How does this help people in need?
Our app helps people that are really poor or bankrupt. It gives them options to work in an area and receive money for successfulness. The app can keep track of how much money they have earned over the months and how much more money they need for their goals.

Police
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Click for Tracker
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Money in Need
Name: []
Age: []
Address: []
Phone: []
Email: []
Password: []

Job Finder
Name: []
Age: []
Gender: []
Result: []

Save Money
Welcome to Save Money! To order to get money you must use our app. Thank You.

Budget and Tracker
Name: []
Budget: []
Tracker: []

How Does This App Help People In Need?
Our app, Edupro, helps people who are in need because it gives knowledge about different countries in Africa who are not as well educated as us. It gives people the opportunity to donate to the poor and give them a chance at education. Some people who really express these qualities are Nelson Mandela and Moira Kelly. Our app is developed to support the people who are less fortunate than us. It tells people that they should be thankful for what they have.

Taken with permission from students from St Francis Assis Primary School, Mill Park, Victoria

Assessment – Australian Digital Technologies Curriculum



HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



Content Description	Session Number	Assessment Piece	Assessment Statement
Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014)	2	Evaluation of current system	Students explained how a current system works. They identify how it connects to a network and transmits data to provide assistance for those less fortunate.
Examine how whole numbers are used to represent all data in digital systems (ACTDIK015)	N/A		
Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016)	N/A		
Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)	4	Creation of their digital solution	Students created a new digital solution based on pre-existing solutions that help people in need.
Design a user interface for a digital system (ACTDIP018)	4	Creation of their digital solution	Students created a digital interface for their digital solution and ensured their design was consistent and easy to navigate.
Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) (ACTDIP019)	5 & 6	Algorithms and flowchart that explains their digital solution.	Students created a flowchart that explained their digital solution, they included branching, user input and iteration.
Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user (ACTDIP020)	N/A		
Explain how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021)	4	Evaluating how their digital solution meets needs	Students explained their digital solution has the impact to positively impact communities that are less fortunate.
Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social (ACTDIP022)	N/A		

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



Assessment – Victorian Digital Technologies Curriculum			
Content Description	Session Number	Assessment Piece	Assessment Statement
Examine the main components of common digital systems, and how such digital systems may connect together to form networks to transmit data (VCDTDS026)	2	Evaluation of current system	Students explained how a current system works. They identify how it connects to a network and transmits data to provide assistance for those less fortunate.
Examine how whole numbers are used as the basis for representing all types of data in digital systems (VCDTDI027)	N/A		
Acquire, store and validate different types of data and use a range of software to interpret and visualise data to create information (VCDTDI028)	N/A		
Plan, create and communicate ideas, information and online collaborative projects, applying agreed ethical, social and technical protocols (VCDTDI029)	N/A		
Define problems in terms of data and functional requirements, drawing on previously solved problems to identify similarities (VCDTCD030)	4	Creation of their digital solution	Students created a new digital solution based on pre-existing solutions that help people in need.
Design a user interface for a digital system, generating and considering alternative design ideas (VCDTCD031)	4	Creation of their digital solution	Students created a digital interface for their digital solution and ensured their design was consistent and easy to navigate.
Design, modify and follow simple algorithms represented diagrammatically and in English, involving sequences of steps, branching, and iteration (VCDTCD032)	5 & 6	Algorithms and flowchart that explains their digital solution.	Students created a flowchart that explained their digital solution, they included branching, user input and iteration.
Develop digital solutions as simple visual programs (VCDTCD033)	N/A		
Explain how student-developed solutions and existing information systems meet current and future community and sustainability needs (VCDTC034)	4	Evaluating how their digital solution meets needs	Students explained their digital solution has the impact to positively impact communities that are less fortunate.

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



Assessment – New South Wales Science and Technology Syllabus (Stage 3)			
Outcomes and Objectives	Session Number	Assessment Piece	Assessment Statement
Explains how digital systems represent data, connect together to form networks and transmit data (ST3-11DI-T)	2	Evaluation of current system	Students explained how a current system works. They identify how it connects to a network and transmits data to provide assistance for those less fortunate.
Acquire, store, access and validate different types of data, and use a range of software to present, interpret and visualise data (ACTDIP016)	N/A		
Examine and critique needs, opportunities or modification using a range of criteria to define a project define a need or opportunity according to functional and aesthetic criteria Consider availability and sustainability of resources when defining design needs and opportunities Examine and determine functional requirements to define a problem	4	Creation of their digital solution	Students created a new digital solution based on pre-existing solutions that help people in need.
Identify data required to formulate algorithms to improve a process (ACTDIP017)	4	Creation of their digital solution	Students created a new digital solution based on pre-existing solutions that help people in need.
Defines problems, and designs, modifies and follows algorithms to develop solutions (ST3-3DP-T) Design, modify and follow simple algorithms extend sequences of steps to provide a series of possibilities through branching Develop solutions through trialling and refining using iterations (ACTDIP019)	5 & 6	Algorithms and flowchart that explains their digital solution.	Students created a flowchart that explained their digital solution, they included branching, user input and iteration.
Implement digital solutions as visual programs involving branching, iteration and user input (ACTDIP020)	N/A		
Plans and uses materials, tools and equipment to develop solutions for a need or opportunity (ST3-2DP-T) negotiate criteria for success, based on defined needs, sustainability and aesthetics Develop appropriate and fair processes to test a designed solution according to criteria	4	Creation of their digital solution	Students created a digital interface for their digital solution and ensured their design was consistent and easy to navigate.
Explain how students' solutions and existing information systems meet current and future local community needs (ACTDIP021)	4	Evaluation	Students explained their digital solution has the impact to positively impact communities that are less fortunate.
Work collaboratively to share, appraise and improve ideas to achieve design purposes Identify, organise and perform strategic roles within a group to solve a problem	N/A		

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



Assessment – Western Australian Digital Technologies Syllabus

Year 5

Content Description	Session Number	Assessment Piece	Assessment Statement
Digital systems have components with basic functions that may connect together to form networks which transmit data (ACTDIK014)	2	Evaluation of current system	Students explained how a current system works. They identify how it connects to a network and transmits data to provide assistance for those less fortunate.
Data is represented using codes (ACTDIK015)	N/A		
Collect, store and present different types of data for a specific purpose using software (ACTDIP016)	N/A		
Design solutions to a user interface for a digital system (ACTDIP018)	4	Creation of their digital solution	Students created a digital interface for their digital solution and ensured their design was consistent and easy to navigate.
Design, follow and represent diagrammatically, a simple sequence of steps (algorithm), involving branching (decisions) and iteration (repetition) (ACTDIP019)	5 & 6	Algorithms and flowchart that explains their digital solution	Students created a flowchart that explained their digital solution, they included branching, user input and iteration.
Implement and use simple programming environments that include branching (decisions) and iteration (repetition) (ACTDIP020)	N/A		
Create and communicate information, including online collaborative projects, using agreed social, ethical and technical protocols (codes of conduct) (ACTDIP022)	N/A		
Define a problem, and set of sequenced steps, with users making a decision to create a solution for a given task (WATPPS27)	4	Creation of their digital solution	Students created a digital interface for their digital solution and ensured their design was consistent and easy to navigate.
Identify available resources (WATPPS28)	N/A		
Develop and communicate alternative solutions and follow design ideas, using annotated diagrams, storyboards and appropriate technical terms (WATPPS29)	4	Storyboard of their digital solution	Students created a storyboard that featured diagrams to show how their digital system operate.
Select, and apply safe procedures when using components and equipment to make solutions (WATPPS30)	N/A		
Develop negotiated criteria to evaluate and justify design processes and solutions (WATPPS31)	4	Evaluating how their digital solution meets needs	Students explained their digital solution has the impact to positively impact communities that are less fortunate.
Work independently, or collaboratively when required, to plan, develop and communicate ideas and information for solutions (WATPPS32)	N/A		

HELPING THOSE LESS FORTUNATE THROUGH DIGITAL TECHNOLOGY

Levels 5-6



Assessment – Western Australian Digital Technologies Syllabus

Year 6

Content Description	Session Number	Assessment Piece	Assessment Statement
Digital systems have components with basic functions and interactions that may be connected together to form networks which transmit different types of data (ACTDIK014)	2	Evaluation of current system	Students explained how a current system works. They identify how it connects to a network and transmits data to provide assistance for those less fortunate.
Whole numbers are used to represent data in a digital system (ACTDIK015)	N/A		
Design, modify, follow and represent both diagrammatically, and in written text, simple algorithms (sequence of steps) involving branching (decisions) and iteration (repetition) (ACTDIP019)	5 & 6	Algorithms and flowchart that explains their digital solution.	Students created a flowchart that explained their digital solution, they included branching, user input and iteration.
Implement and use simple visual programming environments that include branching (decisions), iteration (repetition) and user input (ACTDIP020)	N/A		
Manage the creation and communication of information, including online collaborative projects, using agreed social, ethical and technical protocols (ACTDIP022)	N/A		
Define a problem, and a set of sequenced steps, with users making decisions to create a solution for a given task (WATPPS33)			
Identify available resources (WATPPS34)	N/A		
Design, modify, follow and represent both diagrammatically, and in written text, alternative solutions using a range of techniques, appropriate technical terms and technology (WATPPS35)	5 & 6	Algorithms and flowchart that explains their digital solution.	Students created a flowchart that explained their digital solution, they included branching, user input and iteration.
Select, and apply safe, procedures when using a variety of components and equipment to make solutions (WATPPS36)	N/A		
Develop collaborative criteria to evaluate and justify design processes and solutions (WATPPS37)	4	Evaluating how their digital solution meets needs	Students explained their digital solution has the impact to positively impact communities that are less fortunate.
Work independently, or collaboratively when required, considering resources, to plan, develop and communicate ideas and information for solutions (WATPPS38)	N/A		