These series of lessons were created in collaboration with the Digital Technologies teacher from Peace Lutheran College, Queensland

Unit Overview

Students will investigate and explore the hardware, software and processes that are required to build and create a network and allow users to have access to the internet. Once students have the initial knowledge they will commence putting their knowledge into a real-life application. Students will explore communities around Australia and globally that do not have access to the internet. They will research these communities and create profiles of these communities – creating an understanding of the needs of the communities and how they can support their needs. In small groups, they will use the profiles to help design and create the community and include information on how they can support the community and provide them with fast, reliable internet speed.

Students will initially design the community through drawings and sketches. Once they have an outline of the community and how they intend to solve the problem of connecting the community, students will move the project into Minecraft. Here they will use Minecraft to create a design of the community and showcase their ideas and designs on helping the community have access to the internet.

Australian Curriculum Alignment
The following sessions have been created using the Australian Curriculum: Digital Technologies Curriculum. Tasks may need to be modified to ensure state Digital Technologies Curriculum content descriptions and achievement standards 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 the teacher to drive the duration of the task and make modifications if necessary. Sessions can be merged into one set period or one session may run over multiple periods.

GETTING CONNECTED
Levels 7-8

Key Preparation

Minecraft Education Version

This unit of work includes the Minecraft platform for students to create a community. If you intend on completing this project with Minecraft, you may need to ensure it can be downloaded and student can access Minecraft education on devices. Some set up may be required if this platform has not been used before. IIf Minecraft is not an option, then students have the option of designing the community through sketching and drawings.

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.

Key Understandings

Students will:
- Explain how the internet and networks are form
- Explain how data is transmitted through the network
- Explain how binary code is the representation of data when data is transmitted and stored
- Evaluate existing digital solutions to connect using a set questions and prompts
- Design a digital solution to provide a remote community access to the internet and networks.
- Evaluate student digital solution using a set questions and prompts

Key Questions

- How do you access the internet?
- What resources and devices do you need?
- What happens in parts of the
- How can you increase the speed of a network
- Why is it important to connect remote communities? How does it benefit the remote communities?
- What would you do if you needed to provide a community with a network and connection?
- What would that network connection look like?
- How does a network connection benefit a remote community?

Key Vocabulary

Collaboration, networks, data transmission, routers, hubs, switches, cellular towers, mobile networks, wireless networks, wired networks binary code, digital solutions, functional requirements, constraints (social, technical, economic environmental)

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
1.	Introductions to networks	**Learning Intention** Students will explain the internet and equipment that is needed to connect to the internet. **Success Criteria** I can work with my group to explain the internet the equipment used to connect to the internet.	Pose questions such as: What is the internet? What do you need to get connected to the internet? What might stop you from getting connected to the internet? In small groups, students attempt to answer the question then present ideas to the class.	Provide students with information from the ACS Digital Deck to learn about the internet. Students will form small groups and investigation prompts to learn about the internet. They will collaborate online to complete the task.
Session Resources	**Student Resources** • ACS Teacher Resource: Data Transmission • ACS Teacher Resource: Binary Code • ACS Student Resource: HTML and Websites		**Teacher Resources** • ACS Student Resource: Online Protocols • Networks: Student Investigation Prompts	
2.	Networks	**Learning Intention** Students will how data is transited through a network. **Success Criteria** I can work with my groups to explain how data is Transmitted via a network.	Students report back in their group using the model 1,2 3. Explain 1 thing they already knew. Explain 2 new pieces of information they have learnt. Ask 3 new questions to continue learning.	Use questions that were formulated by the students to continue investigation. Provide students with information from the ACS Digital Deck to learn about the internet. Students will continue working in small groups to learn about networks and mobile data.
Session Resources	**Student Resources** • Networks: Student Investigation Prompts		Teacher Resources	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
3.	Binary Code	**Learning Intention** Students will explain how binary code is a representation of data in a digital system. **Success Criteria** I can explain how binary code represent data in a network	Students report back in their group using the model 1,2 3. Explain 1 thing they already knew. Explain 2 new pieces of information they have learnt. Ask 3 new questions to continue learning.	Use questions that were formulated by the students to continue investigation. Provide students with information from the ACS Digital Deck to learn about the binary code. Students continue to working in small groups to learn about binary code.
Session Resources	**Student Resources** • ACS Student Resource: RGB		**Teacher Resources** • ACS Teacher Resource: Binary Code	
4.	Evaluating Existing Digital Solutions	**Learning Intention** Students will describe evaluate an existing solution to connect remote communities. **Success Criteria** I can evaluate a current digital solution that has connected remote communities	Pose the question how can we provide remote communities with access to the internet and digital technologies? Look at current solutions around the globe about different networks of remote communities.	In their group, students will choose a digital solution that has helped a community 'get connected'
Session Resources	**Student Resources** • https://www.ruralhealth.org.au/sites/default/files/publications/nrha-factsheet-connectivity.pdf • http://accan.org.au/component/content/article?id=345 •		**Teacher Resources** • ACS Teacher Resource: Real World Problems • Existing Digital Solution Evaluatio • Cape York Digital Network, • Torres Strait Telecommunications Network • Black Star Radio network • Indigenous Knowledge Centre	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
5.	Community needs	**Learning Intention** Students will research and create profiles of communities that are looking to access the internet. **Success Criteria** I can create a profile of a community that is in need of connectivity.	Together discuss with students they type of limitations and advantages the internet would have in remote communities. Discuss the different possibilities for the people living in the community. Create a list of pros and cons and discuss these as a class.	Provide students with a range of examples of different profiles and examples of communities. In small groups, students brainstorm how they can support the community by enabling network connections. Students will choose one of the profiles to expand and design further.
Session Resources	**Student Resources** • Community Profile		**Teacher Resources** • https://webfoundation.org/ • https://zeroconnect.defindia.org	
6.	Designing a Digital solution	**Learning Intention** Students will design a network that will provide internet access to a remote community. **Success Criteria** I can design a digital solution to provide internet and connectivity to a remote community.	Students will share the community they have chosen to design a network connection for. They will summarise what they hope to design and build and how they aim to provide the community with internet access	Students will plan out their design in hard copy form using pen and paper. They will include important landmarks in their design (schools, hospitals, places that will need internet coverage). This ensures the design they have created allows access for all and access for those places that need internet and networks access more.
Session Resources	**Student Resources** • Designing materials		**Teacher Resources** • ACS Teacher Resource: Evaluating Digital Solutions	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
7.	Creating a digital solution	**Learning Intention** Students will investigate how Minecraft is a platform that is used to help design community areas. **Success Criteria** I can examine different communities that have been built using Minecraft.	Students share their designs with their peers. They identify and discuss advantages and disadvantages of their network (it may have limitations and that's ok).	Discuss with students how Minecraft can be used as a platform to create a design of a community. Introduce students to the organisation Block By Block. And explain the role of Minecraft to design communities. Students explore Minecraft worlds created with Block By Block. They use these designs to help their ideas and prepare to use Minecraft.
Session Resources	**Student Resources** • https://sketchfab.com/blockbyblock • Minecraft Projects Questions and Prompts		**Teacher Resources** • https://www.blockbyblock.org/ •	
8.	Creating a Digital Solution	**Learning Intention** Students will use Minecraft to build the community and present their design of a network to connect the community. **Success Criteria** I can create a prototype of my network design and of the community using Minecraft	Introduce students to the Minecraft and simple ways to build in Minecraft.	Students build their community and network in Minecraft. They use their design and evaluations of Minecraft worlds to create a digital community.
Session Resources	**Student Resources** •		**Teacher Resources** • https://education.minecraft.net/ • https://education.minecraft.net/how-it-works/what-is-minecraft • https://educommunity.minecraft.net/hc/en-us/categories/360003796991-Learn-to-play • https://education.minecraft.net/blog/12-tips-for-getting-started-with-minecraft-education-edition	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
9.	Evaluating Digital Solutions	**Learning Intention** Students will evaluate their design based on a set criterion and questions. **Success Criteria** I can evaluate my network design by answering a set of questions and prompts.	Students share their communities with each and explain how they created	To evaluate their design, students will screen their community they have created in Minecraft. Their recording will include a tour of their world and answer questions and prompts provided by the teacher.
Session Resources	• [ACS Teacher Resource: Evaluating Digital Solutions](#)		**Teacher Resources** Final Evaluation: Student Digital Solution Evaluation	

Networks: Student Investigation Prompts
Internet
• What is the internet?
• What do you need to get connected to the internet?
• What might stop you from getting connected to the internet?
• What is html?
• What does HTTP stand for?
• What is the difference between world wide web and the internet?
• What benefits do experience by being connected to the internet?
• What is the average speed of the internet at school? What is the average speed of the internet at your house? Why might they be different? When measuring the speed what does it mean?
Cloud Storage
• What is cloud storage? How does it work? Why might someone need and use cloud storage?
Mobile Networks
• How are mobile phones connected to the internet?
• How is data transmitted between mobile phones?
Binary Code
• How is data represented in a digital system? How are images, test and sound represented?
• Identify the capacity of 3 different files – how does the file size influence the amount of storage you have on a device?

Existing Digital Solution Evaluation		
Topic	**Questions**	**Evaluation**
Explanation	In 3 sentences or less explain the idea behind the network and digital solution. What is the primary function of this cause?	
Problem solving	What problem is this digital solution trying to solve? What need is it meeting? How is this innovative?	
Functional requirements	Briefly explain how the network was created. Including information on the equipment (hardware and software) and identify speeds and how data is moved.	
Technical constraints	What are some of the issues that might be present with this type of solution.	
Reflection	What will you take away from this design and use in your design?	

Community Profile	
Topic	**Questions and Prompts**
Introduction to the Community	Where is the location of the community? What is the population? Identify and describe any main buildings, playgrounds, housing. What's the type of climate for the community? Do you think this could impact
Access to technologies	Do they have access to mobile phone technology? Do they have access to any technology? This might be hard to find so provide your own opinion too What type of internet do they have access to? Do you think that is enough?
Developments of technologies	What do you think will work best for this community? How could you improve on what they already have?

Minecraft & Block By Block Projects Questions and Prompts	
Topic	**Question and Prompt**
Introduction	Summarise the project and the purpose of creating a Minecraft world. Where is this located in the world? What problem in the community are they trying to solve with Minecraft?
Minecraft World	Describe the world. Any interesting ways parts of the community have been built? Anything in the world you can take away and remix or reuse in your design? How does the use of Minecraft support the local community? How is this use of Minecraft innovative? What is your opinion about the world? How well is the world built? Give it a rating our of 10 and explain your answer. Is it easy to navigate? What would you do differently?
Meeting Needs	How does something like building a Minecraft world support locals in the community? How has the Minecraft project had a positive impact to the community? How can a this project support future locals?
User Experience	Is it easy or hard t navigate the world? What are 3 things you will take away from investigating and examining this design?

Student Digital Solution Evaluation	
Questions	**Evaluation**
Explanation Explain your community and explain the different features you have included. Explain your networked connection. Explain and validate why you chose position and the materials. What would be the benefits of completing something like this in a real life scenario? **Self-Evaluation** How does your design and network meet the needs of others? What challenged you? How did you overcome those challenges? What excited you? What didn't work out for you? How did you adapt your learning and project to overcome any hurdles? If you were to design a project like this again, what would you do differently? When technical concepts have learnt about the internet and networks? What the most interesting fact you learnt through the project?	