

OUR SOLAR SYSTEM

Levels 5-6



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

Unit Overview

These lessons will complement a unit of work that investigates our Solar System. Students will integrate design thinking by creating a digital interactive information report. Students commence by identifying types of data they can collect about the planets (e.g. temperature, average rotation, elements it is made up of). Students will use different types of methods to gather data and then use software program to represent the data to interpret it. They will consider user experience to ensure the users of their slide show have a positive experience. The slideshow will be a nonlinear presentation. Before creating the digital slide show, they will plan out key slides and flowcharts to demonstrate how slides are connections to functions and links students have created. They will articulate how the user will interact with the functions and information within the slide show. This will give the user full control over how they interact with the information.

Other Curriculum Targeted Areas

Other curriculum areas can be targeted and assessed within this unit. Other areas of interest may include:

- Science (Earth Science)
- Mathematics (Data)

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.

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Key Preparation

A selection of digital devices will be needed for students to gather data about the solar system and transfer that data into a digital format to be displayed in their slide show. These devices can vary depending on the availability for the students.

The program to create the interactive information report will depend on the school's resources and the teachers' use of digital technology.

Flow charts

Flow charts are a way to organise and present algorithms in English. The flow charts can either be generated by hand writing the commands, this will suffice the curriculum requirements.

Key Understandings

Students will:

- Collect data about the Solar System and use digital technologies to interpret and present the data.
- Design their interactive Solar System report by using a slide show presentation digital platform.
- Articulate how the slide show will work using explicit written sentences (algorithms).
- Transfer the explicit written sentences (algorithms) into a flow chart.
- Create a digital interactive slide show from their design.

Key Questions

- What digital technologies can you use to support the collecting, interpreting and displaying information about the Solar System?
- What can we find out about the planets?
- How can you create a slide show presentation that is interactive for the user?
- What are the instructions to use your slide show presentation? What options are available for the user?
- What digital skills do you need to develop to have an enticing, user driven, interactive slide show?

Key Vocabulary

Digital Technology, data, data collection, design thinking, user experience, user interface, computational thinking, algorithms, flowcharts, branching, iteration, user input hyperlinks.

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
1.	Data collection	<p>Learning Intention Students will collect relevant data about the Solar System from a range of sources (people and information).</p> <p>Success Criteria I can collect different types data about the solar system and use digital technology to interpret and present the data.</p>	<p>Pose the question: What do we want to find out about the solar system?</p> <p>Brainstorm different types of data that can be collected (temperature, duration of a full rotation, distance from the sun) and discuss the most suitable way to display the data.</p>	<p>Students choose different types of data they will collect about different planets and decide on the way to display the data. They can collect different forms. They can collect photographs, video, audio etc. that will help form data about the solar system. Discuss the following topics: Acquiring data – how do I get the data? Validating data – how do I know it's correct? Storing – where do I keep the data? How will I show the data so it's easy to interpret?</p>
Session Resources	<ul style="list-style-type: none"> ACS Teacher Resource: Data 			
2.	Design Thinking	<p>Learning Intention Students will incorporate design thinking into their Solar System Presentation</p> <p>Success Criteria I can create a design that shows the placement of titles, images, texts, video, audio recordings to make up my digital report.</p>	<p>Pose the question what makes a good slideshow? What makes an ineffective slide show?</p> <p>Students read through the information found in the student resource section for this session and create common 'rules' to apply to their slide shows.</p>	<p>Students will design the layout of their slides. Considerations for their design include:</p> <ul style="list-style-type: none"> Consistency of the buttons Having buttons to take them to different slides Layout and placement of text and images. <p>Students need to consider the type of data they have collected and how they aim to present the data (eg: graph for numerical data, image or video).</p>
Session Resources	<ul style="list-style-type: none"> ACS Teacher Resource: User Interface A3 paper to design first 4 slides Articles that has hints and tips for slideshow presentations: https://blog.ted.com/10-tips-for-better-slide-decks/ https://elearningindustry.com/top-10-tips-create-effective-elearning-presentations-and-slideshows https://www.youtube.com/watch?v=ex67_R6vC8c 			

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
3.	User Input	<p>Learning Intention Students will incorporate user input by creating links between slides.</p> <p>Success Criteria I can turn my slide show into an interactive slide show that becomes user centred and is controlled by the user.</p>	<p>Discuss with students how they can change from have having a linear slide show to one that can be controlled by the user.</p> <p>Instruct and demonstrate how to create hyperlinks in documents. Create a hyperlink to:</p> <ul style="list-style-type: none"> • Another slide within the presentation • An external document • A website • A video • A video – embed video rather than hyperlink it. 	Students will change their design from a linear slide show to an interactive, user centred design. They will add buttons that allow the user to change to a chosen slide. Students will include the features to their presentation. They will add arrows to show the movement between the slides they have designed. If needed students can design more slides to allow for more interaction and movement within the presentation.
Session Resources	<ul style="list-style-type: none"> • Previous slide design • ACS Teacher Resource: Algorithms (explains user input) 			
4.	Algorithms (written instructions)	<p>Learning Intention Students will explain the digital system that operates using algorithms in the form of explicit English statements.</p> <p>Success Criteria I can explain how my presentation will operate using explicit instructions that includes branching, user input and iteration.</p>	<p>After the design is finished, students break off into small groups. In the groups they verbalise the design to their peers. They explain how each slide operates.</p> <p>Focus questions may include: How does your design work? Where does the user decide which slide to go to next?</p>	<p>Taking the designs of the slides, students articulate the operations of the slide show. They write out in English sentences, incorporating sentences like: If the user clicks 'Mars' on slide 1 then they will be taken to Slide 4. When the user clicks 'home' they will be taken back to the first slide. Repeat the same function for every slide that has the button 'home'. The focus is building in options for the user and repeating functions that will occur multiple times.</p>
Session Resources	<ul style="list-style-type: none"> • ACS Teacher Resource: Algorithms • ACS Student Resource: Algorithms 			

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
5.	Algorithms (flowcharts)	<p>Learning Intention Students will explain the digital system that operates using algorithms in the form of a flowchart.</p> <p>Success Criteria I can create a flowchart explains how a user will navigate through my slide show. It will include branching, user input and iteration.</p>	<p>Introduce students to a flowchart as an option to present the commands and actions within their presentation. Using the example provide follow the flowchart. Note: some arrows are missing, this allows for discussion to add these in.</p> <p>Students break into groups again, this time working with different peers from the previous session. They read through their commands to each other and ensure the instructions are clear and will perform the correct command.</p>	<p>Using the written English sentences and discussions they have had with their peers, students transfer the written sentences into a flowchart.</p> <p>The focus of the flow chart is to ensure:</p> <ul style="list-style-type: none"> • There are multiple options (branching) • Those options are decided on by the user • Where, possible repeat instructions that are the same.
Session Resources	<ul style="list-style-type: none"> • ACS Flowchart example (see end of document) • ACS Teacher Resource: Algorithms • ACS Student Resource: Algorithms 			
6.	Digital Solution	<p>Learning Intention Students will create a digital solution in the form of an interactive report.</p> <p>Success Criteria I can create an interactive report about the Solar System.</p>	<p>Students take the design of the slides and flowchart and use those documents to create their interactive report on the Solar System.</p> <p>Once they have completed the report, they evaluate how the initial design and flowchart helped them and evaluate how their actual presentation changed. The look the difference between creating a linear slide show and user focused slide show.</p>	
	<ul style="list-style-type: none"> • ACS Teacher Resource: Evaluating Digital Systems 			

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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)	N/A		
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)	1	Collecting data about planets and the Solar System	Students collected different forms of data (numerical or text) and used different software programs to present and interpret this data.
Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)	N/A		
Design a user interface for a digital system (ACTDIP018)	2	Design of their slide show	Students created a design of their slide show that showed consistent placements of titles, buttons, images, texts, video, audio recordings to make up their digital family tree.
Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) ACTDIP019	3, 4 & 5	Instructions and/or Flowchart	Students created write explicit instructions in the form of algorithms and a flowchart to explain the navigation features of an interactive presentation. The functions included branching (providing multiple options for the user, user input and iteration (repeats).
Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020)	N/A		
Explain how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021)	N/A		
Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols. (ACTDIP022)	N/A		

FLOWCHART OF MY SOLAR SYSTEM

