SOCIAL DATA HELPING SCIENTISTS

Levels 7-8

These series of lessons were created in collaboration with the Digital Technologies Specialist Teacher at Peace Lutheran College, Cairns, Queensland

Unit Overview

Marine Scientists have looked towards social media to assist in the data collection of marine life. This unit investigates using social media as a tool to acquire data. Students will develop their skills in spreadsheet programs which will help them to collate and analyse the data that has been extracted from social media. After their hands-on experience of collecting, collating and analysing data, students will design a social media platform that is specifically for data collection on marine likes. These designs will consider the type of data that would be appropriate for scientists to continue their research into marine life.

Other Curriculum Targeted Areas

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

- Science
- Design and Technology

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. 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.

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Key Preparation

Students will need to access to a software program that will help them analyse and interpret data. A common software program to collate and interpret data is spreadsheets. Programs such as Microsoft Excel, Google Sheets and Apple Number all contain the capacity to manipulate and present data. GCFLearnrfree.Org has a plethora of videos to support knowledge development to use spreadsheet software. It should be noted that other spreadsheet software (such as Google Sheets, Apple's Sheets and) use a similar layout to Microsoft Excel and these videos can be adapted to suit your needs.

The design of their new social media platform is completed unplugged. Students will not be creating a digital prototype of their digital solution.

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:

- Define social media and social data and explain how social media is a tool to acquire data.
- Evaluate Social media apps and platforms for their use to collect social data.
- Develop skills in using spreadsheet software programs to analyse and visual data.
- Design and evaluate a new social media digital platform with the intention to support scientists to collect

Key Questions

- What social apps and platforms do you know and use and what is their prime function?
- How can social media support the wider community?
- How are scientists using social media to gather more data about marine life?
- How is data collected and analyzed?
- How can you use spreadsheets to collect and analyse social media data?
- If you could create a social media platform to help marine life what would it look like?
- What type of data would need to be included to help scientists?

Key Vocabulary

Collaboration, protocols (ethical, social and technical protocols), social media, data collection, social data, analysing data, digital solutions, user experience functional requirements, student solutions, digital systems meeting needs, innovative ideas

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
1.	Online collaboration	**Learning Intention** Students will generate and adhere to protocols when working in online spaces. **Success Criteria** I can create a guideline that I will abide by when using digital technology to work on my app.	Introduce students to a digital collaborative space. Discuss the right and wrong way to use this space.	In small groups, students create a set of guidelines when working in a group in collaborative environments.
Session Resources	• ACS Teacher Resource: Online Collaboration • ACS Student Resource: Online Protocols			
2.	Social Media	**Learning Intention** Students will define the term social media and explain the purpose of common social media platforms. **Success Criteria** I can identify and explain common social media platforms.	Together identify a range of common social media platforms that are used by the students. Discuss as a class the purpose of social media.	In a group, discuss the term 'social media'. Students write down what makes the platforms grouped as social media. Students will identify and explain common social media platforms. They will create a definition of social media. They will focus on answering a set of questions to assisting in evaluating and analysing a selection of platforms.
Session Resources	**Student Resources** • Social Media Deep Dive Evaluation • https://www.education.vic.gov.au/Documents/about/programs/bullystoppers/smsocial.pdf • https://www.commonsense.org/education/top-picks/social-networks-for-students-and-teachers		**Teacher Resources** • https://www.thesocialmediahat.com/blog/social-media-active-users-by-network-infograph/ • https://www.esafety.gov.au/key-issues/esafety-guide • https://au.oberlo.com/blog/social-media-marketing-statistics • https://wearesocial.com/au/blog/2020/10/social-media-users-pass-the-4-billion-mark-as-global-adoption-soars • https://www.slideshare.net/DataReportal/digital-2021-australia-january-2020-v01	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
3.	Defining and decomposing real world problems	**Learning Intention** Students will explore and evaluate how scientists are utilising social data (data collected from social media platforms). **Success Criteria** I can evaluate the advantages and disadvantages for using social media.	Pose the question to the class – what other functions and purposes can social media be used? How can it benefit the wider community?	Provide students with the opportunity to read through the article 'Tweet Streams: How Social Media Can Help Keep Tabs on Ocean Health'. In small groups, students will choose another article to research and evaluate. In small groups, students will answer the question again. They will comp
Session Resources	**Student Resources** • Tweet Streams: How Social Media Can Help Keep Tabs on Ocean Health • https://towardsdatascience.com/how-to-use-data-science-for-social-impact-e9b272b1a4b3 • https://news.mongabay.com/2017/09/citizen-scientists-use-mobile-apps-to-green-the-ocean/ • https://www.americanscientist.org/article/social-media-monitors-the-largest-fish-in-the-sea • https://www.discoverwildlife.com/people/meet-the-scientist/monitoring-new-species-to-britain-through-social-media/		**Teacher Resources** • ACS Teacher Resource: Real World Problems • Evaluation questions • https://campus.sagepub.com/blog/what-is-social-data-science • https://www.sciencedirect.com/science/article/pii/S0006320718317609 • https://news.mongabay.com/2017/09/citizen-scientists-use-mobile-apps-to-green-the-ocean/ • https://tos.org/oceanography/article/science-outreach-using-social-media-oceanography-from-the-lab-to-the-public • https://www.frontiersin.org/articles/10.3389/fenvs.2015.00063/full •	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
4.	Introduction to spreadsheets	**Learning Intention** Students will complete a set of activities that will increase their skill level when using spreadsheet programs. **Success Criteria** I can complete a set of activities that help me increase my knowledge and skills to use spreadsheet programs.	Introduce students to Excel. Allow them to explore the platform themselves without too much direction. Discuss with students the purpose of spreadsheet programs and identity functions the students have recognised while exploring the platform.	Students will complete a range of activities to upskills their knowledge and development of spreadsheet based software programs. Students are provided with a dataset specific to the skills to they will be learning throughout the series of lessons specific to spreadsheets.
Session Resources	**Student Resources** • GCFLearnrfree.Org		**Teacher Resources** • ACS Teacher Resource: Data and Information • ACS Teacher Resource: Data and Information Presentation • GCFLearnrfree.Org • https://www.digitaltechnologieshub.edu.au/teachers/lesson-ideas/integrating-digital-technologies/data-science-stem-resources	
5.	Data collection	Learning Intention Success Criteria		Students look at different platforms and ways to collect and extract data from social media websites. They investigate how these sites have collected data. And look at the type of data that is being collected. Students evaluate the acquisition of this data by discussing
Session Resources	**Student Resources** • https://onemilliontweetmap.com/		**Teacher Resources** • https://www.frontiersin.org/articles/10.3389/fenvs.2015.00063/full • https://developer.twitter.com/en/docs/tutorials/analyze-past-conversations	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
6.	Data collection	**Learning Intention** Explore the type of data that is collected on social media platforms **Success Criteria** I can explore how data is collected on social media platforms.	Discuss how data is collected in different platform. Brainstorm the term data in reference to the type of data that is crated when users post on social media platforms.	Students look at different platforms and ways to collect and extract data from social media websites. They investigate how these sites have collected data. And look at the type of data that is being collected. Students evaluate the acquisition of this data by discussing
Session Resources	**Student Resources** • https://onemilliontweetmap.com/		**Teacher Resources** • https://www.frontiersin.org/articles/10.3389/fenvs.2015.00063/full • https://developer.twitter.com/en/docs/tutorials/analyze-past-conversations	
7.	Data analysis	**Learning Intention** Students will complete a range of activities to sort, analyse and present data. **Success Criteria** I can sort, mange and analyse the data to present insights and findings.	Together explore a dataset that was created through extracting data from social media platforms. Discuss with the class the types of techniques that students may use to analyse, interpret and present the data. Refer to skills they have acquired by completing spreadsheet activities.	Students are provided with a data set that was taken from a social media platform. They sort, manage and interpret the data to give a short presentation on the findings that have come from the social media dataset. Students are provided with a brief which explains the types of analysis they need to present to the class.
Session Resources	**Student Resources** • Data Analysis Brief		**Teacher Resources**	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
8.	User Experience	**Learning Intention** Students will evaluate the experience and purpose of different social media apps to support marine sustainability. **Success Criteria** I can evaluate the user experience of a platform to help collect data to support marine sustainability.	As a whole class, look at how apps have been specially designed and created to collect data to support the sustainability and growth of marine animals. Create a discussion around the evaluation questions that students will use in their independent activity.	Students are provided with screen shots of apps and video walk throughs of platforms that have been specifically designed to help marine life and animals. They evaluate the app (through answering targeted questions found in the Platform Evaluation Questions) and investigate how data is collected, collated and analysed to support marine life.
Session Resources	**Student Resources** • Platform Evaluation Questions (located at the end of the document). • App examples wireframes (not provided)		**Teacher Resources** • https://tos.org/oceanography/article/science-outreach-using-social-media-oceanography-from-the-lab-to-the-public • https://news.mongabay.com/2017/09/citizen-scientists-use-mobile-apps-to-green-the-ocean/	

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
9.	User Experience	**Learning Intention** Students will design a new social platform to help scientist gather data on marine animals and help improve marine life. **Success Criteria** I can design a new social media platform that will collect data to help scientists improve marine life and oceans.	As a whole class discuss with the features of a social media platform that would be used to collect social data. Discuss ideas on what data would be needed to collect social data.	Students will design (by drawing) a social media platform that is specifically designed to provide social data to marine scientists. Students can make their platform, either a generalised platform or target one animal or one marine issue (endangered habits, low numbers). They will take design aspects from different social media In their design students will include: What type of data in needed (animal, location, time of year), how would you group the data (hashtags) What would you want your users to post? Draw, label and create a social media post of your platform would contain.

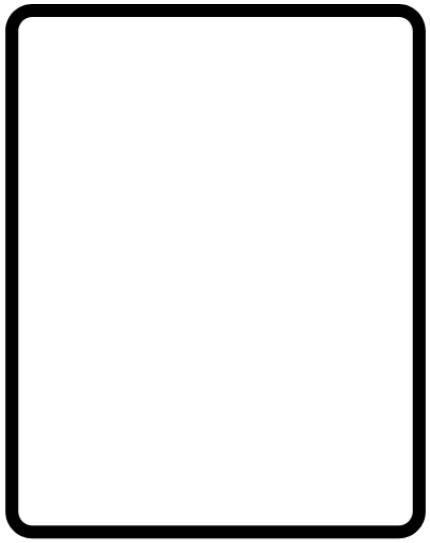
Session Resources	Student Resources	Teacher Resources
	• Storyboard Design	• https://tos.org/oceanography/article/science-outreach-using-social-media-oceanography-from-the-lab-to-the-public • https://news.mongabay.com/2017/09/citizen-scientists-use-mobile-apps-to-green-the-ocean/

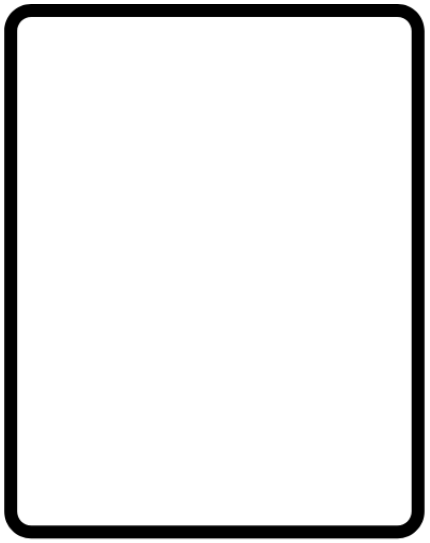
Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
10.	Binary Code	**Learning Intention** Students investigate and explain how images, text and sounds are represented in social media platforms. **Success Criteria** I can explain how images, texts and sounds are represented on a social media platform.	Pose the question to the whole class – how are images, sounds and text represented in a digital solution like a social media platform? Students discuss how images and sounds are represented in digital solutions and allow the conversation to come from students.	Students complete research in to RGB and binary code and create short explanations of binary code and the representation of data within the social media platforms.
Session Resources	**Student Resources** • ACS Student Resource: RGB and Binary Code		**Teacher Resources** • ACS Teacher Resource: Binary Code • ACS Teacher Resource: Binary Code Presentation	
11.	Evaluation	**Learning intention** Students will evaluate their new design based on a set criterion of questions and prompts. **Success Criteria** I can evaluate my social media design by answering a set of questions and prompts.	Students will share their designs and ideas with their peers.	Students will independently complete an evaluation of their design for a new social media app. They will answer a set of questions and prompts to help them articulate the purpose of their digital solution.
Session Resources	**Student Resources** • Student Design Evaluation		**Teacher Resources**	

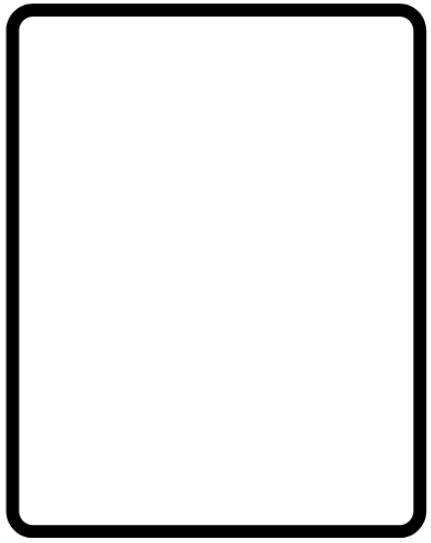
Social Media Deep Dive Evaluation	
Title	What's the tile of the of social media platform?
Use	What is it used for? Such as content sharing, entertainment, gaming, live streaming
Short Description	Write a short summary of the platform and describe how a user interacts with the platform. Do users have the capacity to upload/download files? What's the key feature of the platform? Describe a common/main screen.
Stats	How many users does it have? How many uploads occur each day, month or year? What are the costs to the user? Are there – monthly subscriptions, one off payments, purchases.
Functional Requirements	What are the functional requirements (what are the must haves of the platform) to make it work?
User Experience and Usability	What is your experience of using the platform? When examining the interface of the platform is there anything that looks out of place? Or should be moved to another area? Or functions (such as buttons) that get in the way of users having a positive experience? Does it have any glitches, freeze or random shut downs, broken links? To find out this information, look at reviews and ratings.
Personal opinions	Have you used or access this platform before? If so – rate it out of 10. Explain your rating If you could change something about the platform (being free not an option) what would you change?

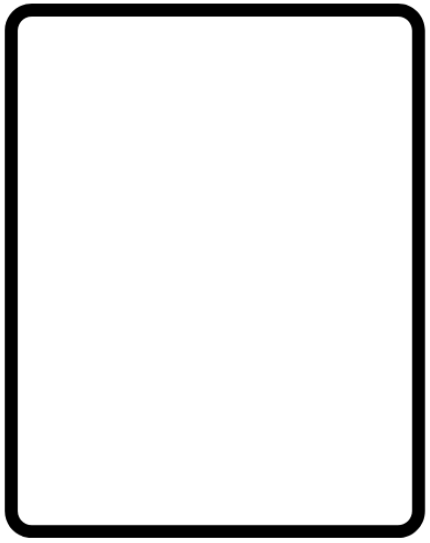
Social Media Evaluation	
Title	What's the tile of the of social media platform?
Use	What is it commonly used for? Such as content sharing, entertainment, gaming, live streaming.
Short Description	Write a short summary of the platform and describe how a user interacts with the platform.
Data Collection	What data is collected? How is this benefiting the scientists? How was the data collected? Do they tell you what they were looking for and any key words they were searching for? Create a list of advantages and disadvantages for using social media to support data collection on marine life. How can it benefit the wider community?
Functional Requirements	What are the functional requirements (what are the must haves of the platform) to make it work? How are they using these requirements to gather data?
Meeting Needs	What need is the technology meeting? Why would this be important?
Innovative	How is this technology contributing to marine sustainability?
Sustainability	What social objective is it trying to achieve? How successful do you think that is?
Personal opinion	What rating would you give to use social media this way? Do you think it will be effective?

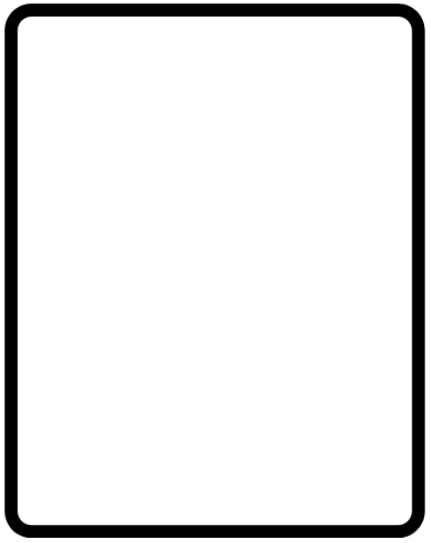
Social Platform Evaluation	
Title	What's the tile of the of the platform?
Use	What is it commonly used for?
Short Description	Write a short summary of the platform and describe how a user interacts with the platform.
Data Collection	What data is collected? How is this benefiting the scientists? How was the data collected? How is the data displayed? Does it look simple enough to interpret and analyse? Create a list of advantages and disadvantages for using social media to support data collection on marine life. How can it benefit the wider community?
Functional Requirements	What are the functional requirements (what are the must haves of the platform) to make it work? How are they using these requirements to gather data?
Meeting Needs	What need is the technology meeting? Why would this be important?
Innovative	How is this technology contributing to marine sustainability?
Sustainability	What social objective is it trying to achieve? How successful do you think that is?
Personal opinion	What rating would you give to use social media this way? Do you think it will be effective?











Student Design Evaluation	
Title	What's the tile of the of the platform?
Use	What is it commonly used for?
Short Description	Write a short summary of the platform and describe how a user interacts with the platform.
Data Collection	What data is collected? How is this benefiting the scientists? How was the data collected? How is the data displayed? Does it look simple enough to interpret and analyse? Create a list of advantages and disadvantages for using social media to support data collection on marine life. How can it benefit the wider community?
Functional Requirements	What are the functional requirements (what are the must haves of the platform) to make it work? How are they using these requirements to gather data?
Meeting Needs	What need is the technology meeting? Why would this be important?
Innovative	How is this technology contributing to marine sustainability?
Sustainability	What social objective is it trying to achieve?
Person reflection	If you were to design this again, what would you do differently? What is one thing that you liked about your design? What is one thing you would change? Would there be anything you'd like to add? What makes this app innovative? Could you see any limitations when using the platform? What makes this different to other platforms that already exist?

Assessment – Australian Digital Technologies Curriculum			
Content Description	**Session Number**	**Assessment Piece**	**Assessment Statement**
Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance (ACTDIK023)	N/A		
Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)	9	Explanation of the representation text imagines and audio	Students explained how text images and audio is represented in binary within digital solutions.
Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)	4, 5 & 6	Acquisition of data	Students evaluated the data that was collected through social media platforms.
Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)	4, 5 & 6	Activities to increase skill level in spreadsheet programs. Data analysis and presentation of dataset	Students completed a selection of activities to demonstrate their understanding of a software program, students analysed and presented information on a dataset.
Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)	3 & 7	Evaluation of platforms to support marine sustainability	Students
Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)	8	Design of a social media platform to support marine sustainability	Students
Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)	N/A		
Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)	N/A		
Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)	3 & 9	Evaluating of current social media platform exiting and student designed	Students evaluated digital solutions (existing and their own designs) that were created to support the sustainability and conservation of marine animals.
Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)	1	Examples of students working collaboratively throughout the unit	Students used an online platform to organise, communicate ideas to complete a project that examined the collection and analysis of data.