Year 10 – Digital Technologies

2024 PROGRAM - Semester 2

NARROGIN SENIOR HIGH SCHOOL

Term 3

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Lesson** | | |
|  | **SCSA** Curriculum descriptors | **Topic** | **Objectives** |
| **1** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041**: Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions | **Catch up Lesson**  Submit webdesign task from Term 2. | **LI**  understand fundamental principles of digital technologies and effective web design techniques.  **SC**  Submit WebDesign task from Term 2 |
| **2** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Topic:**  Algorithms. Introduction | **LI**  develop an understanding of algorithms and their role in digital technologies, and apply this knowledge to create and analyze algorithms for specific tasks.  **SC**  Define what an algorithm is and explain its importance in digital technologies.  Identify common examples of algorithms in everyday contexts and digital applications. |
| **3** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Topic:**  Solutions and Choices (Selection and Branching) | **LI**  Students will understand the concept of selection and branching in programming and digital technologies, and apply this understanding to create basic decision-making structures.  **SC**  Define what selection and branching are in the context of programming.  Explain the importance of selection and branching in controlling the flow of a program based on conditions. |
| **4** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Topic:**  Solutions and Choices (Selection and Branching) | **LI**  Understand how to use nested if/then statements to handle multiple conditions and decision levels in a program.  **SC**  Combine if./then statements effectively to solve complex programming challenges. |
| **5** | **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions.  **ACTDIP042:** Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account. | **Topic:**  Modularisation | **LI**  Students will understand the concept of modularisation in programming and digital technologies, and apply this knowledge to create modular programs.  **SC**  Define what modularisation is and explain its importance in programming.  Identify the benefits of using modular programming techniques in developing software solutions.  Break down a complex problem into smaller, manageable modules or functions. |
| **6** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Assessment 4**  That’s Amazing – Algorithm Game Creation | **LI**  Students will demonstrate their understanding of algorithms by designing and developing a simple game using computational thinking principles and programming concepts.  **SC**  -Define the objective and rules of the game clearly.  -Create a flowchart or pseudocode outlining the sequence of actions and decisions in the game.  -Implement algorithms using a programming language (e.g., Python, Scratch) to control game mechanics such as player movement, scoring, and game progression.  -Include conditional statements (if, else if, else) to manage game logic and decision-making. |
| **7** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Assessment 4**  That’s Amazing – Algorithm Game Creation | **LI**  Students will demonstrate their understanding of algorithms by designing and developing a simple game using computational thinking principles and programming concepts.  **SC**  -Define the objective and rules of the game clearly.  -Create a flowchart or pseudocode outlining the sequence of actions and decisions in the game.  -Implement algorithms using a programming language (e.g., Python, Scratch) to control game mechanics such as player movement, scoring, and game progression.  -Include conditional statements (if, else if, else) to manage game logic and decision-making. |
| **8** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Assessment 4**  That’s Amazing – Algorithm Game Creation | **LI**  Students will demonstrate their understanding of algorithms by designing and developing a simple game using computational thinking principles and programming concepts.  **SC**  -Define the objective and rules of the game clearly.  -Create a flowchart or pseudocode outlining the sequence of actions and decisions in the game.  -Implement algorithms using a programming language (e.g., Python, Scratch) to control game mechanics such as player movement, scoring, and game progression.  -Include conditional statements (if, else if, else) to manage game logic and decision-making. |
| **9** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Assessment 4**  That’s Amazing – Algorithm Game Creation | **LI**  Students will demonstrate their understanding of algorithms by designing and developing a simple game using computational thinking principles and programming concepts.  **SC**  -Define the objective and rules of the game clearly.  -Create a flowchart or pseudocode outlining the sequence of actions and decisions in the game.  -Implement algorithms using a programming language (e.g., Python, Scratch) to control game mechanics such as player movement, scoring, and game progression.  -Include conditional statements (if, else if, else) to manage game logic and decision-making. |
| **10** | **ACTDIP040:** Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors.  **ACTDIP041:** Implement modular programs, applying selected algorithms and data structures including using an integrated development environment to interpret specifications and validate and test proposed solutions. | **Assessment 4**  That’s Amazing – Algorithm Game Creation | **LI**  Students will demonstrate their understanding of algorithms by designing and developing a simple game using computational thinking principles and programming concepts.  **SC**  -Define the objective and rules of the game clearly.  -Create a flowchart or pseudocode outlining the sequence of actions and decisions in the game.  -Implement algorithms using a programming language (e.g., Python, Scratch) to control game mechanics such as player movement, scoring, and game progression.  -Include conditional statements (if, else if, else) to manage game logic and decision-making. |

Term 4

|  |  |  |  |
| --- | --- | --- | --- |
| **1** | **ACTDIK034:** Investigate the role of hardware and software in managing, controlling, and securing the movement of and access to data in networked digital systems.  **ACTDIK035**: Evaluate how data and processes are transformed into information and knowledge in digital systems, and create digital solutions using algorithms and programming languages. | **Topic**  Review / Catch up from Term 3  Or File Compression | **LI**  Students will explore the concept of file compression in digital technologies, understand its purpose, and examine different compression techniques.  **SC**  Define what file compression is and why it is used in digital technologies.  Explain the benefits of file compression in terms of storage space and data transmission efficiency. |
| **2** | ACTDIK034: Investigate the role of hardware and software in managing, controlling, and securing the movement of and access to data in networked digital systems.  ACTDIK035: Evaluate how data and processes are transformed into information and knowledge in digital systems, and create digital solutions using algorithms and programming languages. | **Topic:**  File Compression  (Lossy & Lossless compression) | **LI**  Students will understand the differences between lossy and lossless file compression techniques in digital technologies and explore their applications.  **SC**  Define lossy and lossless compression and explain their purposes in digital data storage and transmission.  Describe how each technique affects file size and quality of compressed data. |
| **3** | **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols.  **ACTDIP043:** Create and modify digital solutions, individually and collaboratively, that meet current and emerging needs, using algorithms, programming languages and data structures. | **Topic:**  Databases & Surveys | **LI**  Students will explore the fundamentals of surveys and databases in digital technologies, understanding their purpose, design, and applications.  **SC**  Define what a survey is and explain its purpose in collecting data.  Identify different types of survey questions (e.g., multiple-choice, open-ended) and their uses.  Explore the concept of databases as tools for organizing and managing survey data. |
| **4** | **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols.  **ACTDIP043:** Create and modify digital solutions, individually and collaboratively, that meet current and emerging needs, using algorithms, programming languages and data structures. | **Assessment 5:** Survey & Database assignment | **LI**  Students will demonstrate their understanding of surveys, databases, and data management by designing and conducting a survey on a chosen topic, and storing and analyzing the survey results using a database.  **SC**  Design a clear and concise survey with relevant questions.  Choose appropriate question types (e.g., multiple-choice, open-ended) for the survey.  Create a simple database to store the survey responses, accurately inputting the collected data. |
| **5** | **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols.  **ACTDIP043:** Create and modify digital solutions, individually and collaboratively, that meet current and emerging needs, using algorithms, programming languages and data structures. | **Assessment 5:** Survey & Database assignment | **LI**  Students will demonstrate their understanding of surveys, databases, and data management by designing and conducting a survey on a chosen topic, and storing and analyzing the survey results using a database.  **SC**  Design a clear and concise survey with relevant questions.  Choose appropriate question types (e.g., multiple-choice, open-ended) for the survey.  Create a simple database to store the survey responses, accurately inputting the collected data. |
| **6** | **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols.  **ACTDIP043:** Create and modify digital solutions, individually and collaboratively, that meet current and emerging needs, using algorithms, programming languages and data structures. | **Assessment 5:** Survey & Database assignment | **LI**  Students will demonstrate their understanding of surveys, databases, and data management by designing and conducting a survey on a chosen topic, and storing and analyzing the survey results using a database.  **SC**  Design a clear and concise survey with relevant questions.  Choose appropriate question types (e.g., multiple-choice, open-ended) for the survey.  Create a simple database to store the survey responses, accurately inputting the collected data. |
| **7** | **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols.  **ACTDIP043:** Create and modify digital solutions, individually and collaboratively, that meet current and emerging needs, using algorithms, programming languages and data structures. | **Assessment 5:** Survey & Database assignment | **LI**  Students will demonstrate their understanding of surveys, databases, and data management by designing and conducting a survey on a chosen topic, and storing and analyzing the survey results using a database.  **SC**  Design a clear and concise survey with relevant questions.  Choose appropriate question types (e.g., multiple-choice, open-ended) for the survey.  Create a simple database to store the survey responses, accurately inputting the collected data. |
| **8** | **ACTDIP033:** Design and manage a project using iterative processes that include digital solutions to address needs and meet specified constraints.  **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols. | **Topic:** Create a stop motion animation video | **LI**  Students will understand the basic principles of stop motion animation and explore different techniques and tools used in creating stop motion videos.  **SC**  Explain the fundamental principles of stop motion animation.  Identify different types of stop motion animation (e.g., claymation, object animation, pixilation).  Develop a simple storyboard for a short stop motion animation video.  Plan the necessary materials and equipment needed for the project. |
| **9** | **ACTDIP033:** Design and manage a project using iterative processes that include digital solutions to address needs and meet specified constraints.  **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols. | **Topic:** Create a stop motion animation video | **LI**  Students will create a stop motion animation video by taking a series of photographs and using digital tools to compile them into a cohesive animation.  **SC**  Capture a series of photographs, ensuring consistent lighting and positioning for each frame.  Use stop motion software to compile the photographs into an animation sequence.  Edit the animation to ensure smooth transitions between frames.  Add sound effects, music, or dialogue to enhance the animation. |
| **10** | **ACTDIP033:** Design and manage a project using iterative processes that include digital solutions to address needs and meet specified constraints.  **ACTDIP037:** Develop and modify digital solutions, individually and collaboratively, applying agreed ethical and social protocols. | **Topic:** Create a stop motion animation video | **LI**  Students will create a stop motion animation video by taking a series of photographs and using digital tools to compile them into a cohesive animation.  **SC**  Capture a series of photographs, ensuring consistent lighting and positioning for each frame.  Use stop motion software to compile the photographs into an animation sequence.  Edit the animation to ensure smooth transitions between frames.  Add sound effects, music, or dialogue to enhance the animation. |