PRE-PLANNING TEMPLATE 1

	F	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
What needs are you addressing?							
Mindset motto							

RESEARCH ORGANISER

Research question:

Cut and paste your source information here:	Key words in source information:
Rewrite source information in your own words:	Reference:

PRE-PLANNING TEMPLATE 2

	F	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Key general capabilities aspects to develop							
Habitual practices we want students to develop							
Norms and agreements							
Possible strategies							

LEARNING LADDER TEMPLATE

Learning ladder:				
Year Level	**Foundation**	**Years 1/2**	**Years 3/4**	**Years 5/6**
Stage of development				
Focus				

TRANSDISCIPLINARY UNIT MAPPING TEMPLATE

Term, theme and Australian Curriculum areas	Term 1:	Term 2:	Term 3:	Term 4:
Foundation				
Year 1				
Year 2				
Year 3				
Year 4				
Year 5				
Year 6				

CURRICULUM-MAPPING TEMPLATE

Curriculum area	Term 1	Term 2	Term 3	Term 4
Unit name				
English				
Mathematics				
Science				
HASS				
The arts				
Health and PE				
Digital technologies				
Design and technologies				
Languages				
Literacy capability				
Numeracy capability				
Personal and social capability				
Critical and creative thinking				
Intercultural understanding				
Ethical understanding				
Digital literacy				

DECONSTRUCTING THE CURRICULUM TEMPLATE

Unit: **Year:** **Term:** **Week(s):**		
Descriptor and elaborations	**Potential misconceptions and roadblocks to learning**	**Learning intentions and success criteria**

A LOGICAL SEQUENCE OF KEY UNDERSTANDINGS TEMPLATE

Learning intention and success criteria	Key understandings
We are learning: ▪ I can ▪ I can ▪ I can	

SAMPLE LOGICAL SEQUENCES OF KEY UNDERSTANDINGS

YEAR 2–3 HASS, ENGLISH AND MATHEMATICS UNIT

Learning intention and success criteria	Key understandings
We are learning to use a map to identify major geographical features of the world so we can create a map showing where our families are from	We use maps in many ways in our lives.

▪ I can name and label key features on a map of the world
  ▪ Northern and Southern Hemispheres
  ▪ North and South Pole
  ▪ the equator
  ▪ 7 continents
  ▪ 7 oceans.
	Maps have features that guide us in reading the map.

▪ I can label the points of a compass. ▪ I can identify the direction and distance of the continents relative to Australia.	Maps of the world have key features that help us learn about the names, locations and geography of different places.
▪ I can name and label the states and territories of Australia. ▪ I can locate on a map where my family and friends have come from and been to.	By understanding how to read and use maps we can create maps that have meaning to ourselves and others.

This unit addresses the following Australian Curriculum content descriptors:

- how places can be spatially represented in geographical divisions from local to regional to state/territory, and how people and places are interconnected across those scales (AC9HS2K03)
- locate positions in two-dimensional representations of a familiar space; move positions by following directions and pathways (AC9M2SP02)
- interpret and create two-dimensional representations of familiar environments, locating key landmarks and objects relative to each other (AC9M3SP02)
- create and edit short imaginative, informative and persuasive written and/or multimodal texts for familiar audiences, using text structure appropriate to purpose, simple and compound sentences, noun groups and verb groups, topic-specific vocabulary, simple punctuation and common 2-syllable words (AC9E2LY06)
- plan, create, edit and publish imaginative, informative and persuasive written and multimodal texts, using visual features, appropriate form and layout, with ideas grouped in simple paragraphs, mostly correct tense, topic-specific vocabulary and correct spelling of most high-frequency and phonetically regular words (AC9E3LY06)
- create, rehearse and deliver short oral and/or multimodal presentations for familiar audiences and purposes, using text structure appropriate to purpose and topic-specific vocabulary, and varying tone, volume and pace (AC9E2LY07)
- plan, create, rehearse and deliver short oral and/or multimodal presentations to inform, express opinions or tell stories, using a clear structure, details to elaborate ideas, topic-specific and precise vocabulary, visual features, and appropriate tone, pace, pitch and volume (AC9E3LY07).

YEAR 3 HASS, ENGLISH AND DIGITAL TECHNOLOGIES UNIT

Learning intention and success criteria	Key understandings
We are learning to explain how symbols are used in Australian events of significance so we can appreciate what has shaped our country and who we are.	
▪ I can list various Australian celebrations. ▪ I can recall my experience of an Australian celebration. ▪ I can create a timeline of Australian celebrations over the year.	Every year we celebrate Australian events of significance.
▪ I can discuss why we celebrate Anzac Day and its importance to Australians. ▪ I can explain the origin of Anzac Day.	These events celebrate the contributions of people who have shaped our country and who we are.
▪ I can list a range of different symbols and emblems. ▪ I can classify given emblems and symbols into national, state and local categories. ▪ I can discuss why we have symbols and their meanings. ▪ I can identify and discuss the origin and meanings of Anzac Day symbols (including flags at half-mast).	We use symbols to remind us of these significant events and contributions.
▪ I can explain the origin of why Anzac Day is important to our school.	By understanding the origins and meanings of symbols and historical events we celebrate, we appreciate what has shaped our country and who we are.

This unit addresses the following Australian Curriculum content descriptors:

- causes and effects of changes to the local community, and how people who may be from diverse backgrounds have contributed to these changes (AC9HS3K01)
- significant events, symbols and emblems that are important to Australia's identity and diversity, and how they are celebrated, commemorated or recognised in Australia, including Australia Day, Anzac Day, NAIDOC Week, National Sorry Day, Easter, Christmas, and other religious and cultural festivals (AC9HS3K02)
- the ways First Nations Australians in different parts of Australia are interconnected with Country/Place (AC9HS3K04)
- recognise different types of data and explore how the same data can be represented differently depending on the purpose (AC9TDI4K03)
- use the core features of common digital tools to create, locate and communicate content, following agreed conventions (AC9TDI4P06)
- understand how the language of evaluation and emotion, such as modal verbs, can be varied to be more or less forceful (AC9E3LA02)
- use comprehension strategies when listening and viewing to build literal and inferred meaning, and begin to evaluate texts by drawing on a growing knowledge of context, text structures and language features (AC9E3LY05)
- plan, create, edit and publish imaginative, informative and persuasive written and multimodal texts, using visual features, appropriate form and layout, with ideas grouped in simple paragraphs, mostly correct tense, topic-specific vocabulary and correct spelling of most high-frequency and phonetically regular words (AC9E3LY06)
- plan, create, rehearse and deliver short oral and/or multimodal presentations to inform, express opinions or tell stories, using a clear structure, details to elaborate ideas, topic-specific and precise vocabulary, visual features, and appropriate tone, pace, pitch and volume (AC9E3LY07).

YEAR 6 HASS, ENGLISH AND DIGITAL TECHNOLOGIES UNIT

Learning intention and success criteria	Key understandings
We are learning to discuss and explain how Federation and Australia's system of government work so we can be informed and active citizens..	
▪ Federation ▪ I can describe what led to Federation (geography, events, shift in mindset). ▪ I can explain different perspectives that individuals and states had about Federation. ▪ I can explain the way that individuals influenced the formation of Federation. ▪ I can create a text that persuasively argues points for or against Federation. ▪ I can evaluate the significance of an individual's impact on Federation. ▪ I can discuss whose interests and opinions were not represented at the Federation conventions..	Significant people and events influence the formation of nations. People and events influence the identity and values through narratives, art and cultural symbols.
▪ Systems of government focus: ▪ I can compare and contrast key similarities and differences between Australia's and the Westminster systems of government. ▪ I can compare and contrast key similarities and differences between Australia's and the United States' systems of government. ▪ I can discuss how Australia's system of government reflects our nation's identity and values. ▪ I can identify key roles and responsibilities for each level of government. ▪ I can model how a law is initiated and passed in Australia.	To maintain and uphold our identity and values as a nation we have a democratic system of government. We can influence our nation by being informed and active citizens. To be informed and active citizens we need to understand the influence of significant people and events, and the systems of government on

This unit addresses the following Australian Curriculum content descriptors:

- significant individuals, events and ideas that led to Australia's Federation, the Constitution and democratic system of government (AC9HS6K01)
- changes in Australia's political system and to Australian citizenship after Federation and throughout the 20th century that impacted on First Nations Australians, migrants, women and children (AC9HS6K02)
- the key institutions of Australia's system of government, how it is based on the Westminster system, and the key values and beliefs of Western democracies (AC9HS6K06)
- the roles and responsibilities of the 3 levels of government in Australia (AC9HS6K07)
- develop questions to investigate people, events, developments, places and systems (AC9HS6S01)
- locate, collect and organise information and data from primary and secondary sources in a range of formats (AC9HS6S02)
- evaluate primary and secondary sources to determine origin, purpose and perspectives (AC9HS6S04)
- propose actions or responses to issues or challenges and use criteria to assess the possible effects (AC9HS6S06)
- present descriptions and explanations, drawing ideas, findings and viewpoints from sources, and using relevant terms and conventions (AC9HS6S07)

STEP 1 PLANNING SAMPLE (YEAR 3–4 MAPS AND ALGORITHMS)

Unit: Maps and algorithms	**Year level:** 3/4 **Term:** 4	**Weeks:** 3–4
Descriptor and elaborations	**Potential misconceptions and roadblocks to learning**	**Learning intentions and success criteria**
Year 3 Mathematics: Space **Interpret and create two-dimensional representations of familiar environments, locating key landmarks and objects relative to each other (AC9M3SP02):** ▪ designing the layout of a space; for example, a proposed games room or the classroom using a blank sheet of paper as the boundary and cut outs of shapes to represent furniture from a top view perspective ▪ locating themselves within a space such as a basketball court, an oval, stage or assembly hall, guided by a simple hand-held plan indicating the different positions of the participants in the activity.	▪ Students incorrectly identifying the closer points of coordinates (e.g., graphing (3,4) instead of (4,3)). ▪ Students may not understand how to interpret a map. ▪ Vocabulary may be insufficient.	**We are learning to interpret places and positions on a simple grid map.** I can: ▪ locate places and positions on a map ▪ identify key features of a map (including rows and columns to easily identify locations of places and positions, and use of grid reference (letters/numbers in rows and columns).
Year 4 Mathematics: Space **Create and interpret grid reference systems using grid references and directions to locate and describe positions and pathways (AC9M4SP02):** ▪ interpreting a grid reference map of a familiar location of interest, such as a map of the showgrounds, a food festival, botanical garden, a park in the local area or a train station, and writing instructions using grid references for a friend to find them at a specified location ▪ comparing and contrasting, describing and locating landmarks, people or things in a bird's eye picture of a busy scene, such as people in a park, initially without a transparent grid reference system overlaid on the picture, and then with the grid overlaid; noticing how the grid helps to pinpoint things quickly and easily.	▪ Students incorrectly naming points or spaces on a coordinate grid. Students may confuse the X and Y coordinates, ending up at the wrong point. ▪ Students incorrectly identifying a location on the coordinate grid as the space instead of where there two lines meet. ▪ Vocabulary may be insufficient.	**We are learning to create a map using scale, legends and directions to interpret places and positions of our classroom in a basic map.** I can: ▪ draw and label different areas in the classroom ▪ locate classroom objects (e.g., desks, chairs) on a map ▪ create a legend (key) ▪ interpret location of objects and places using the completed map.
Follow and describe algorithms involving sequencing, comparison operators (branching) and iteration (AC9TDI4P02): ▪ following the steps and decisions of algorithms and knowing what step they are up to, for example following rules to form the past tense of regular verbs such as create to created, try to tried and cook to cooked, and checking off items on a list as they are completed ▪ describing algorithms using representations such as a list of steps or a diagram, for example drawing a diagram of a recipe involving decisions ▪ understanding there can be more than one sequence of steps to solve a problem, some are better than others, and the steps should be unambiguous, for example describing two different ways to get to the same location ▪ describing the decisions needed to solve a problem, including numerical and text comparisons, for example if the UV index is above 3, put on sunscreen and a hat.	▪ Students cannot define what the problem may be. ▪ Students cannot describe or follow sequences of steps. ▪ Students cannot solve problems. ▪ Vocabulary may be insufficient.	**We are learning to define a problem with design criteria that we want to solve** I can: ▪ identify familiar problems i experience ▪ identify design criteria for a solution to those familiar problems ▪ write a user story using guiding questions ▪ use criteria to come up with a solution to a problem. **We are learning to move BeeBots/OzoBots around a map with coordinates.** I can: ▪ create a simple grid map with a legend (for OzoBots) ▪ identify the problem i am wanting to solve ▪ develop tasks for bots to perform ▪ locate objects (desks/chairs) on a map ▪ repeat locating objects and places on a map. **We are learning to navigate a student through a path following directions (forward, backward, left and right).** I can: ▪ create a grid with column and rows on the classroom floor ▪ identify the problem i am wanting to solve ▪ identify and develop clear paths through the map ▪ locate specific places and objects on the map ▪ identify the quickest and most direct route through the map ▪ write the algorithm to guide a student through the identified path.

STEPS 1–3 PLANNING SAMPLE (YEAR 1 LITERACY)

Descriptor and elaborations	Learning intentions and success criteria
Language	
Text structure and organisation Level 1 **Explore how texts are organised according to their purpose, such as to recount, narrate, express opinion, inform, report and explain (AC9E1LA03):** ▪ discussing and comparing the purposes and organisation of familiar texts ▪ becoming familiar with the typical stages of types of texts; for example, recount and procedure ▪ recognising that the structure of a text may include words and pictures; for example, an informative text may include words, illustrations and diagrams.	**We are learning to identify how texts are organised and their language features so we can understand the purpose of a text.** Level 1 I can: ▪ share what I think the purpose is of a book/text I seen before ▪ compare the purpose of one book/text to another ▪ identify what the typical stages are for recount and procedure ▪ identify the structures of a text which could include words, illustrations and diagrams.
Understand how print and screen texts are organised using features such as page numbers, tables of content, headings and titles, navigation buttons, swipe screens, verbal commands, links and images (AC9E1LA05): ▪ comparing the layout of print and digital texts; for example, the layout of print and images in an information book and the layout of information in an online text.	I can: ▪ identify the front and back of books ▪ identify the title and subtitles in a book ▪ identify headings and page numbers ▪ identify navigation buttons, bars and links in digital texts ▪ scroll down a digital page.
Level 2 **Identify how texts across the curriculum are organised differently and use language features depending on purposes (AC9E2LA03):** ▪ identifying the typical features of a text; for example, a typical introduction to a narrative or the use of dot points in instructions ▪ identifying that different types of texts might have different forms; for example, an expression of opinion might be in the form of a poster, email or brochure ▪ identifying the organisation and language features in texts such as narratives, recounts, information reports, simple procedures, expression of opinion and responses to texts (including poetry), and discuss their purposes.	I can: ▪ identify the topic and type of text from the way it is presented ▪ identify what the typical features are for ° narratives ° instructions ° recounts ° simple procedures ° information reports ° responses to texts ▪ discuss the purpose of the organisation and language features in a text.
Navigate print and screen texts using chapters, tables of contents, indexes, side-bar menus, drop-down menus or links (AC9E2LA05): ▪ recognising how numbered chapters, organisation of tables of content and alphabetical order of indexes operate to support access to information ▪ exploring how the navigation tools of different websites can be used to locate information.	I can: ▪ use a table of contents to find a page ▪ use an index to find a specific topic in a book ▪ use the glossary to learn about the meaning of a word ▪ explain why a book is broken up into chapters ▪ use the features of screen texts (menu buttons, drop down menus, links and so on).
Literacy	
Interpreting, analysing, evaluating **Use comprehension strategies such as visualising, predicting, connecting, summarising and questioning when listening, viewing and reading to build literal and inferred meaning by drawing on vocabulary and growing knowledge of context and text structures (AC9E1LY05):** ▪ identifying information and details from spoken informative texts ▪ building topic knowledge and learning new vocabulary before and during reading ▪ making predictions from the cover, from illustrations and at points in the text before reading on, and confirming and adjusting understanding after reading ▪ drawing inferences and explaining inferences using clues from the text ▪ making connections with existing knowledge and personal experiences.	**We are learning to use various comprehension strategies so we can make sense of what we read.** I can: ▪ look at the pictures and words to make sense of what I read ▪ use the pictures on the cover and in illustrations to predict what the text will say ▪ use the words and pictures in a book to explain what I read ▪ share what the story reminds me of ▪ share what I think the characters feel ▪ share what I think are the reasons why a character did what they did ▪ predict and retell the story using pictures as prompts ▪ explain what a word means.
Read decodable and authentic texts using developing phonic knowledge, phrasing and fluency, and monitoring meaning using context and grammatical knowledge (AC9E1LY04): ▪ recognising most high-frequency words when reading a text ▪ self-correcting or asking for assistance when meaning breaks down.	**We are learning to use various reading strategies so we can read aloud and clearly to others.** I can: ▪ recognise words that I have seen and read before ▪ back up and re-read a sentence when it doesn't make sense to me ▪ ask for help when I don't understand the meaning of a word or sentence ▪ re-read a sentence to help me understand it better ▪ re-read a word or sentence when I make a mistake ▪ re-read a sentence to read more smoothly ▪ read a sentence with expression ▪ use the words and pictures in a book check that the words look and sound right.

SAMPLE SEQUENCE OF KEY UNDERSTANDINGS

Learning intention and success criteria	Key understandings
We are learning to identify how texts are organised and their language features so we can understand the purpose of a text.	Texts and books tell stories and are written for a purpose. Different types of texts have different structures.
We are learning to use various comprehension strategies so we can make sense of what we read.	We can use the text structure and various comprehension strategies to make sense of what we read.
We are learning to use various reading strategies so we can read aloud and clearly to others.	We can use various reading strategies to read out loud and clearly to others. The more we use text structures, comprehension and reading strategies the better we can tell stories. **Culminating task: Students create and read a story to their parents/guardians at a storytelling afternoon.**

SAMPLE UNIT PLAN USING THE GRASPS MODEL

Goal	To read a storybook you created aloud and with expression to your parents/guardians.
Role	Story writers and tellers
Audience	Parents/guardians
Situation	**Logical sequence of key understandings:** 1. Texts and books tell stories and are written for a purpose. 2. Different types of texts have different structures. 3. We can use the text structure and various comprehension strategies to make sense of what we read. 4. We can use various reading strategies to read out loud and clearly to others. 5. The more we use text structures, comprehension and reading strategies the better we can tell stories.
Product/ performance	Create a story and read it aloud and with expression to your parents/guardians at the storytelling afternoon in book week. Your story must include: ▪ front and back cover ▪ headings ▪ pictures and sentences that match the pictures ▪ a purpose for the story. When you read you must: ▪ share the purpose of the story ▪ read what you have written ▪ explain what how your pictures help the story ▪ use your reading strategies as you read.
Standards	Simple rubric to be used by parents and students for creating and reading the story

STEPS 1–3 PLANNING SAMPLE (YEAR 4 MATHS)

Descriptor and elaborations	Learning intentions and success criteria
Mathematics: Data representation and interpretation	
Conduct statistical investigations, collecting data through survey responses and other methods; record and display data using digital tools; interpret the data and communicate the results (AC9M4ST03): ▪ creating a survey to collect class responses to a preferred movie choice, and recording data responses using spreadsheets; graphing data using a column graph or other appropriate representations and interpreting the results of the survey reporting findings back to the class ▪ conducting a statistical investigation and acquiring data from different online sources; for example, using online query interfaces to select and retrieve data from an online database such as weather records, Google Trends or the World Health Organization ▪ investigating different contexts in which statistical investigations can take place and the types of questions to ask to collect data relevant to the context; for example, investigating supermarket customer complaints that breakfast cereals with the most sugar are positioned at children's eye level, discussing what questions they would need to ask and answer. **Acquire data for categorical and discrete numerical variables to address a question of interest or purpose using digital tools; represent data using many-to-one pictographs, column graphs and other displays or visualisations; interpret and discuss the information that has been created (AC9M4ST01):** ▪ investigating many-to-one data displays using digital tools and graphical software, interpreting and discussing key features ▪ understanding that data can be represented with one symbol representing more than one piece of data, and that it is important to read all information about a representation before making judgements ▪ constructing graphs of data collected through observation during science experiments, recording, interpreting and discussing the results in terms of the scientific study ▪ acquiring samples of data using practical activities, observations or repeated chance experiments, recording data using tally charts, digital tables or spread sheets, graphing, discussing and comparing the results using a column graph. **Analyse the effectiveness of different displays or visualisations in illustrating and comparing data distributions, then discuss the shape of distributions and the variation in the data (AC9M4ST02):** ▪ suggesting questions that can be answered by a given data display and using the display to answer these questions ▪ interpreting data representations in the media and other forums where symbols represent one-to-many relationships and how this can be challenging when the representations use part-whole representations ▪ comparing different student generated diagrams, tables and graphs, describing their similarities and differences and commenting on the usefulness of each representation for interpreting the data.	**We are learning to identify how texts are organised and their language features so we can understand the purpose of a text.** **Level 1** I can: ▪ share what I think the purpose is of a book/text I seen before ▪ compare the purpose of one book/text to another ▪ identify what the typical stages are for recount and procedure ▪ identify the structures of a text which could include words, illustrations and diagrams. I can: ▪ identify the front and back of books ▪ identify the title and subtitles in a book ▪ identify headings and page numbers ▪ identify navigation buttons, bars and links in digital texts ▪ scroll down a digital page. **Level 2** I can: ▪ identify the topic and type of text from the way it is presented ▪ identify what the typical features are for ° narratives ° instructions ° recounts ° simple procedures ° information reports ° responses to texts ▪ discuss the purpose of the organisation and language features in a text. I can: ▪ use a table of contents to find a page ▪ use an index to find a specific topic in a book ▪ use the glossary to learn about the meaning of a word ▪ explain why a book is broken up into chapters ▪ use the features of screen texts (menu buttons, drop down menus, links and so on).

Source: Adapted from ACARA (n.d.-k, -n)

Descriptor and elaborations	Learning intentions and success criteria
Digital Technologies: Data Representation	
Recognise different types of data and explore how the same data can be represented differently depending on the purpose (AC9TDI4K03): ▪ describing different types of data and how they can be used, for example numbers, letters, symbols and pictures ▪ explaining how the same data can be represented in different ways and why some representations are better than others in certain contexts, for example four vs 4 vs IV vs |||| vs quatre, and that numerals are better for calculation than words ▪ explaining that the same information can be represented differently, for example the term stop can also be represented with an octagon-shaped red sign or a hand icon ▪ identifying rock paintings and other cultural expressions to understand that images are used to encode and represent ethnobotanical knowledge, for example the representation of plant use in the Kimberley cave paintings and ancient engravings including important data on medicinal and food plant classification and their usable parts.	**We are learning to present data so we can show what informed a decision.** I can: ▪ recognise how digital systems represent data ▪ discuss how different symbols (numbers, letters, symbols and pictures) are used to present additional information ▪ recognise how different cultures represent data using code and symbols.
Digital Technologies: Collaborating and managing	
Use the core features of common digital tools to create, locate and communicate content, following agreed conventions (AC9TDI4P06): ▪ discussing and creating as a class a set of steps they need to follow to safely find information online ▪ using an online search engine to find suitable sources to create and communicate information, following agreed steps, for example creating a presentation on life cycles. Use the core features of common digital tools to share content, plan tasks, and collaborate, following agreed behaviours, supported by trusted adults (AC9TDI4P07): ▪ demonstrating safe sharing of content with a select audience, for example sharing a holiday adventure without revealing exact dates, specific names or other personal information ▪ listening to others when participating in online environments to share content, for example respecting the rights of others by taking turns to suggest and add words or images to a factual slide deck to share with the teacher ▪ interacting cooperatively in a group in an online environment to plan and complete a task, for example writing and responding to others' views on canteen products ▪ using digital tools to plan an event as a class, for example jointly creating a class survey to help plan an end-of-year party, where responses conform to the class's accepted behavioural expectations.	**We are learning to present data so we can show what informed a decision.** I can: ▪ discuss how to safely find information online ▪ follow agreed upon steps to safely find information online ▪ collect appropriate data from different online sources. **We are learning to present data so we can show what informed a decision.** I can: ▪ work with others to plan a presentation of data we have collected so we can explain why we made a decision ▪ publish the data we have collected online so that others can see our reasoning
Mathematics: Number	
Use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate the problems using number sentences and choose efficient calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation (AC9M4N08): ▪ modelling practical problems involving money, such as a budget for a large event, as requiring either addition, subtraction, multiplication or division and justifying the choice of operation in relation to the situation ▪ modelling and solving multiplication problems involving money, such as buying 5 toy scooters for $96 each, using efficient mental strategies and written jottings to keep track if needed; for example, rounding $96 up to $100 and subtracting 5 x $4 = $20, so 5 x $96 is the same as 5 x $100 less $20, giving the answer $500 – $20 = $480.	**We are learning to make informed financial decisions.** I can: ▪ identify the cost of potential purchases ▪ compare the costs of different potential purchases ▪ calculate a budget based on recurring costs ▪ explain why one purchase is better than another.

Source: Adapted from ACARA (n.d.-k, -n)

User note: The colour scheme applied to content descriptors in this planning document corresponds with the related learning intentions in the table that follows. This is to demonstrate the capacity for a learning intention to address multiple content descriptors

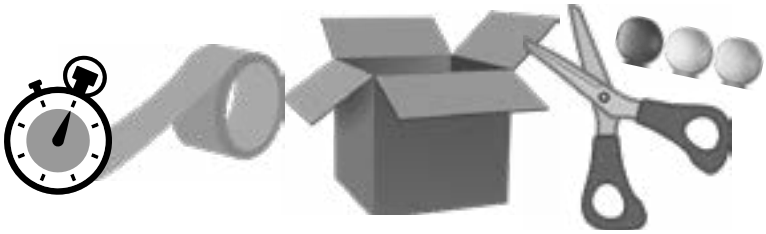
Learning intention and success criteria	Key understandings
We are learning to collect and interpret data so we can make informed decisions. I can: ▪ identify what data I want to collect so I can be informed ▪ design questions to collect specific data ▪ discuss how these questions will provide me with the data I need to make an informed decision ▪ trial different methods for collecting data ▪ compare and contrast the methods I used to determine what is the most effective way ▪ explain why I chose a particular data collection method for my investigation ▪ record collected data in a spreadsheet ▪ discuss how to safely find information online ▪ follow agreed upon steps to safely find information online ▪ collect appropriate data from different online sources ▪ compare my data to data acquired from different online sources. We are learning to present data so we can show what informed a decision. I can: ▪ discuss different ways that data is presented in the media and elsewhere ▪ recognise how different cultures represent data using code and symbols ▪ recognise how digital systems represent data ▪ explain how the way data is displayed answers particular questions ▪ discuss how different symbols (numbers, letters, symbols and pictures) are used to present additional information ▪ evaluate the effectiveness of different data presentations on making an informed decision including many-to-one pictographs, column graphs and other displays or visualisations ▪ trial different ways of presenting data that I am given ▪ trial different ways of presenting data that I collected ▪ select an appropriate format to present data I have collected ▪ explain why I chose a particular data representation for my investigation ▪ discuss the shape of distributions and the variation in the data from my investigation ▪ discuss and give feedback on the effectiveness of the data presentations of my peers ▪ work with others to plan a presentation of data we have collected so we can explain why we made a decision ▪ publish the data we have collected online so that others can see our reasoning. We are learning to make informed financial decisions. I can: ▪ identify the cost of potential purchases ▪ compare the costs of different potential purchases ▪ calculate a budget based on recurring costs ▪ explain why one purchase is better than another.	We base many of our decisions on data We can represent data in different ways Some ways of representing data are easier to interpret and use to make decisions than others. Being able to represent and interpret data is important because we then can make informed decisions. **Culminating task: Students use data to make an informed decision about mobile phone plans**

Year 4 Mathematics Unit – Data (Making Informed Decisions)	
Goal	To create a persuasive presentation based on research and data that will convince your friend's parents to purchase a particular mobile
Role	Financially responsible consumers
Audience	Peers and parents/guardians
Situation	Your friend has been trying to convince their parents that they need a better mobile phone plan. Logical sequence of key understandings: 1. We base many of our decisions on data. 2. We can represent data in different ways. 3. Some ways of representing data are easier to interpret and use than others. 4. Being able to represent and interpret data is important because we then can make informed decisions.
Product/ performance	Your presentation must include: ¨ presentation of data on your friend's needs and phone usage ¨ presentation of the comparison of your friend's needs and phone usage to those of other similar students ¨ comparison of different mobile phone plans from different providers ¨ persuasive pitch that explains why your friend needs a particular phone plan
Standards	Rubric to assess quality of data representation and presentation

DESIGN BRIEF: MARBLE RUN CHALLENGE

Aim: Use the materials provided to create a marble run.

Goal: Create a marble run with the longest run time.



Materials:

- cardboard box
- miscellaneous cardboard
- scissors
- masking tape
- marbles
- stopwatch.

Considerations:

- Use only the outside of the cardboard box.
- Do not pierce or cut the large cardboard box in any way.
- The marble must not stop moving once on its run.
- Use as much or little of the materials as you want.
- You have 20 minutes to complete your prototype.

DESIGN BRIEF: MARSHMALLOW CHALLENGE

Aim: Use the materials provided to create a tall structure.
Goal: Design and build the tallest freestanding structure measured from the foundation surface to the top of the marshmallow.

Materials:

- 20 sticks of spaghetti
- one metre of tape
- one metre of string
- one marshmallow
- measuring tape.

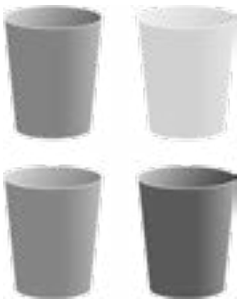
Considerations:

- The entire marshmallow must be on top. (Cutting or eating the marshmallow disqualifies the team.)
- Feel free to break up the spaghetti, string or tape.
- Use as much or little of the materials as you want.
- The structure must not be suspended, supported or held onto in any way when the time runs out.
- You have 15 minutes to complete your prototype.

DESIGN BRIEF: 100-CUP TOWER CHALLENGE

Aim: Use 100 cups to construct the highest tower in 10 minutes that does not fall down without intervention.

Goal: Use the cups to create a strong structure that can be measured in terms of height and stability.



Materials:

- 100 large plastic cups
- 100 small plastic cups
- measuring tape.

Considerations:

- The tower will be measured from the lowest point of the lowest cup to the highest point of the highest cup.
- The tower can only be built from the cups provided (no external reinforcing materials).
- The tower must be freestanding (not leaning against or suspended from anything). You will need to step away from and not be in contact with the tower while it is being measured or height and stability.
- The tower can only be built using one size of cup (no mixing of sizes).
- Use as many or few of the provided cups as you want.
- You have 10 minutes to complete your tower.

Some questions:

- Does it matter where or on what surface you build your tower?
- Does the size of the cups make a difference?
- Does the way you stack the cups matter?

ASSESSMENT TASK PLANNING TEMPLATE (GRASPS)

Goal Goal, problem, challenge or obstacle for the task	
Role Role of the students in the scenario and what they are being asked to do	
Audience The target audience the students will be presenting to	
Situation Context and explanation of the situation	
Product/performance The product or performance that needs to be created and its larger purpose	
Standards The specific standards for success that must be met and how the work will be judged	

SAMPLE UNIT PLANS USING THE GRASPS MODEL AND DESIGN-PROCESS TEMPLATES

'MAKING MOVING MUSIC' UNIT PLAN USING THE GRASPS MODEL

Goal Establish the goal, problem, challenge or obstacle in the task	When we first learn music we often focus on how to play certain notes. How can we use music to tell a story and feel emotions?
Role Define the role of the students.	Your goal is learn how to play violin and a range of other musical instruments and tell a story through music.
Audience Identify the target audience.	You are a group of musicians who are committed to encouraging young children to read through the use of music!
Situation Explain the situation, the background.	▪ Music has the power to stimulate strong emotions within us. It is probably rare not to be somehow emotionally affected by music. Most of us also listen to music in order to experience emotions. ▪ Music is used to tell stories (www.youtube.com/watch?v=P6ErW41G3zk). ▪ Composers use pitch, tone and tempo in movies to set scenes and create different feelings and emotions. ▪ As musicians the more we understand the effects that music can have on us the more we can use it use it to communicate and evoke emotions and feelings.
Product/ performance Clarify what the students will create and why.	By the end of the academy program in music you will be involved in creating two musical pieces 1. the soundtrack for short movie scene 2. the backing track for a storybook that will be read to students in the junior school. To aid you in this you will be learning to play the violin as well as experimenting with a range of different musical instruments (e.g., percussion instruments; cymbals, triangle, drums, shakers, pan pipes, glockenspiel, guiro etc.) to create the different tones, pitches and tempos to make music that moves people.
Standards Identify specific standards for success. Issue rubrics to the students or develop them with the students.	Co-construct a rubric for the assessment. Have students use the design process rubric to self and peer assess.

‘MAKING MOVING MUSIC’ DESIGN PROCESS

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research	4 weeks	▪ Learning violin is done in all lessons with music teacher. ▪ Introduce students to the idea that music can portray different images/stories/emotions, and that the images/stories/emotions, and that the images/stories/emotions portrayed will be different for every person: 1. Show video examples. 2. Have students go home and find examples they like amongst their favourite songs and movies. ▪ Encourage empathy and building of peer-to-peer communication and friendships via discussion regarding the ways in which music can represent identity: ▪ From the examples that the students bring back, work with them (large group, small group, pairs) to articulate what various pieces of music communicate images/stories/emotions. ▪ Build up a vocabulary of musical terms and identify what sounds create what feelings and emotions. ▪ Have students experiment using a range of different musical instruments (e.g., violin, percussion instruments; cymbals, triangle, drums, shakers, pan pipes, glockenspiel, guiro etc.) to get a sense of what sounds they can create.
Define Includes mind-mapping	4 weeks	▪ What is a symphony? What is an orchestra? ▪ Listen to different symphony pieces and reflect on the story being told. Questions to reflect on: what pitch, tone, tempo and instruments are used? ▪ Define what the problem is asking and watch different movie scenes and reflect on what pitch, tone, tempo and instruments are used. Why have they been used?
Ideate–prototype–test	1 week 2 weeks 2 weeks	▪ Analyse scene and identify key points and what emotions are evoked/experiment with different instruments and which ones suit best. ▪ Experiment with different instruments and reflect on which ones create the most appropriate sounds/effects for chosen scenes. ▪ Use GarageBand or similar software to record and experiment with different sounds.
Deliver Preparing for and delivering presentation	3 weeks 1 week	▪ Practise backing music and refine where necessary (seek feedback and actively implement). Both peer and teacher. Use GarageBand or similar software to record. ▪ Present final pieces of music to backing movie.

'ROBOTICS ACADEMY PROGRAM: RESCUE ME!' UNIT PLAN USING THE GRASPS MODEL

Goal Establish the goal, problem, challenge or obstacle in the task	There are some real-life problems such as a ball stuck up a really tall tree, or an injured person lying on the road, how can we use robots to help us? Or …. There might be hazardous materials in the room, how can we check without harming ourselves? Or … There are many real-life situations where it is dangerous for humans to involved. How can we use robots to help humanity? Your goal is to design and program a robot to be helpful in the community or tackling human problems.
Role Define the role of the students.	Students will be robotic engineers and programmers who are building robots using the available parts and to help out with situations where humans cannot go.
Audience Identify the target audience.	Students will showcase why their robots are helpful in the community or human problems to the school and parent community at the end of term 3
Situation Explain the situation, the background.	▪ Robots are often portrayed in movies as quite intelligent but also threatening to humans. In industry robots aren't necessarily as smart as in the movies but they are most used to replace human effort in repetitive boring work. In recent years robots have been used in disaster response situations – searching for lost individuals in tough terrains, or going places where people or dogs can't go. Robots can (and have) been used in many ways to meet a perceived need to make our lives safer and easier. ▪ For the Robotics Academy Program you will be developing your robotics and coding knowledge and skills by being a group of robotic engineers and programmers who are building robots using the available parts and to help out with situations where humans cannot go. Your goal is to design and program a robot to be helpful in the community or tackling human problems. The four tasks are: *1.* Movement Navigate known course with known obstacles and no need for sensors. Robot will have to manoeuvre around obstacles on a flat surface to explore basic skill and tinkering. *2.* Follow the line Use sensors to stick to the path defined by a line. *3.* Colour recognition Use sensors to distinguish between red, green and blue (for example, find water in a green area while avoiding toxic red areas). *4.* Unstructured challenge. **Showcase real-life problem and robotics solution** – students can think of a problem or situation where their robots can come and help.
Product/performance Clarify what the students will create and why.	Students will showcase why their robots are helpful in the community or human problems.
Standards Identify specific standards for success. Issue rubrics to the students or develop them with the students.	Students to reflect (self and peer) ▪ against the focus skill areas ▪ successes ▪ challenges ▪ what they would do differently. Share their programs with one another and note the different ways they did their programming

'ROBOTICS ACADEMY PROGRAM: RESCUE ME!' DESIGN PROCESS

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research	Term 2, Weeks 1–7	**Term 2, Weeks 1–3** • Pre-test Blockly, Code.org , Scratch and Javascript: ° Students to experience a range of (4) coding software. ° Students to demonstrate current knowledge of coding and reflect upon experience in a PMI. ° Students to reflect goals and limitations such as fear or hopes and self-regulation skills (e.g., POOCH). • Students to try a sequence of coding and reflect on their experience. • Students to try different coding software and reflect on their experience. **Term 2, Weeks 4–7** • Brainstorm the design constraints and understand the challenge: ° The prototyping common emergency/problematic obstacle course will be designed and built to students can test and refine their robot rovers. ° Students will need to understand their robots (Lego EV3s): i. scaffolded gradual release of responsibility lessons on the EV3s so they can play around and understand the capacity of the robot ii. scaffolded gradual release of responsibility lessons on the various components and their effects on the design of their robot. • Identify the components your robots needs to complete the project.
Define Includes mind-mapping	Term 2, Weeks 8–10	• Identify the key aspects involved in each task that you would need to address ° The 'Rescue me!' project: i. Identify team and role expectations. ii. Set SMART goals. iii. Design process to identify what the teams will show case in their final products. Identify mini steps for Term 3.
Ideate–prototype–test	Term 3, Weeks 1–6	• Create and program the robot to solve problems: ° use the design thinking process to develop and iteratively refine the program for each task so your robot can complete it successfully ° testing on the prototyping obstacle course. • Put the program together for all four tasks and test and refine it.
Deliver Preparing for and delivering presentation	Term 3, Weeks 7–10	• Test the robots. • Trial run of the presentation. • Reflect on learnings.

YEARS 4–6 'FOOD PRODUCTION' UNIT PLAN USING THE GRASPS MODEL

Goal Establish the goal, problem, challenge or obstacle in the task	To demonstrate understanding of plant needs and food production and how microbits can be used to automatically support this production
Role Define the role of the students.	Agricultural advisors to principal
Audience Identify the target audience.	Agriculture teacher, school community and the principal
Situation Explain the situation, the background.	The school has a greenhouse and outdoor garden area that is used during the school year to teach students about horticulture and building. The vegetables from the gardens are used in the school canteen. The challenge though is that many of the vegetables planted are summer vegetables. Because no students or teachers are around over summer anything planted dies due to lack of water and nutrition thus going to waste plus causing a mess for the school the following year. The principal has asked the Year 4–6 class to study the situation and advise her on creating an effective automatic watering system for the summer holidays. • Plants require a certain amount of water, warmth and light to meet their needs. • Block coding can program probes to make measurements (temperature, water, light). • Our vegetables in the nursery need to be watered over the summer holidays.
Product/performance Clarify what the students will create and why.	1. Design of a rain gauge. 2. Report on the best vegetables to plant. 3. Graph rainfall, soil temperature, pH, light over a period of weeks. 4. Discuss pH, temperature and rain. 5. Design a self-watering device. 6. Build a working model of the self-watering device with input from measuring devices. 7. Prepare a 2-minute oral presentation for an F–2 audience (explain to the younger students how the device works) and for the principal.
Standards Identify specific standards for success. Issue rubrics to the students or develop them with the students.	The checklist for block coding a number of targets need to be met before moving forward. Rubric provided for the design of the rain gauge, rainfall data report and vegetable planting guide. Peer and self-assessment for 2-minute oral presentation.

YEARS 4–6 'FOOD PRODUCTION' DESIGN PROCESS

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research	Term 2, Weeks 1–3	• Introduction to water as a resource and our problem of watering the plants over the summer when no-one is at school (use videos from Crash Course Kids as a hook): ° brainstorming the historical ways of self-watering ° use historical data to map rainfall during summer ° students design and create a rain gauge ° measure rainfall over a period of 2 weeks and display graphically. • Design a planting guide for a vegetable (including research): ° experiment growing alfalfa sprouts and changing one variable (science teaching) ° measure plant growth over time and display graphically ° summative task with rubric. • Students to be immersed in coding programs micro:bit. • Students participate in coding tutorials to block code.
Define Includes mind-mapping	Term 2, Weeks 3–6	• Define the needs of vegetables and how they can be met. • Identify the coding needs for the probes: ° Complete a variety of micro-bit tutorials to design code Using 'soil moisture' and 'plant watering' self-guide coding tutorials to help students get started. ° Use the probes to measure soil temperature, soil pH and rainfall over 2 weeks and present in a graphic organiser (this is a summative task with a rubric). ° Use the data to support the creation of the code for the probes.
Ideate–prototype–test	Term 2, Weeks 6–9	Use the design-thinking process to create a code for the garden beds: • Create a code for the self-watering devise and build a prototype (working model of the self-watering device with input from measuring devices). • Plant the vegetables and take measurements over time to observe the changes created by the programming.
Deliver Preparing for and delivering presentation	Term 2, Week 10	• Test the students coding ability using the probes in the vegetable beds. • Prepare a 2-minute oral presentation (in any format) about how their device works and why it is important for a F–2 audience and the principal. • Self-assessment and peer-assessment on presentations.

YEARS 3–6 'DESIGN A PLAYGROUND' UNIT PLAN USING THE GRASPS MODEL

Goal Establish the goal, problem, challenge or obstacle in the task	To demonstrate your ability to design an actual playground and persuade others to fund it to be built.
Role Define the role of the students.	Designers and architects
Audience Identify the target audience.	Peers, teachers, principal, assistant principal, school association and potential grants team
Situation Explain the situation, the background.	As all students know, the current school upper primary playground consists of 2 basic structures and is quite pathetic. It doesn't have any swings, monkey bars, or anything that is fun and exciting to play with. Even worse it is rusting away and falling apart. No one wants to play on it. Three years ago, the principal asked students to design a new playground but unfortunately, she didn't have the funding at the time and has since lost the previous planning. The playground desperately needs an upgrade and the principal has asked the Year 3–6 students to create a playground design that she will have builders build next year.
Product/performance Clarify what the students will create and why.	1. To design an upper primary playground to replace the current one. Includes: 2. a discussion of the PMI of the current playground 3. a report on the key features desired 4. a 2D map of the playground with a legend 5. a 3D model of the playground 6. an explanation of the benefits of your playground.
Standards Identify specific standards for success. Issue rubrics to the students or develop them with the students.	Pre-assessment map Co-constructed rubric for assessment PMI graphic organiser evaluation

YEARS 3–6 'DESIGN A PLAYGROUND' DESIGN PROCESS

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research	Term 4, Weeks 3–5	• Students to be introduced to interpreting simple maps. • Students to create a map of the classroom (pre-assessment). • Students to create classroom map grid on the carpet and direct each other through a path using key vocabulary. • Students to develop algorithms for moving around a map (with coordinates) using Bee-Bot or Ozobot devices. • Students given the design brief from the principal. • Students to co-construct the rubric for assessment (scaffolded with teacher). • Students to have a local excursion visiting local playgrounds (skate park, main playground, our school playground). • Students will complete a PMI evaluating the playgrounds. • Students will research playground materials and Year 5/6 students will gather costs for projects.
Define Includes mind-mapping	Term 4, Week 5	• Student will define the problems of our current playground (using PMI evaluation from the empathise phase).
Ideate–prototype–test	Term 4, Weeks 5–8	• Students will begin to resolve the playground issue, through looking for solutions to their problem. • Students will design their upgraded playground by creating a 2D map with legend. • Students to use SPLAT 3D tools to create a 3D model of their playground (draft before 3D print). • Students to use SketchUp to create a 3D model of their playground to be 3D printed. • Students to print 3D model.
Deliver Preparing for and delivering presentation	Term 4, Week 9	• Presentation of students' models and solutions to class • Teams to self and peer assess using the rubrics • Refinement of presentations • Present to teachers, principal, assistant principal, school association and potential grants team

YEARS 3–6 'ROBOT RUBBISH RUN' UNIT PLAN USING THE GRASPS MODEL

Goal Establish the goal, problem, challenge or obstacle in the task	To demonstrate your ability to design and create a town map, then apply your understanding of design to create a system for an Ozobot robot to navigate around the town map to clean up the streets.
Role Define the role of the students.	Designers, coders and architects for the West Coast Council
Audience Identify the target audience.	Peers, teachers, principal, assistant principal, STEM expo attendees
Situation Explain the situation, the background.	We have noticed the influx of rubbish located around our town. Each morning, council workers can be seen removing people's discarded litter from the paths and roads in our town. This takes council members a considerable amount of time each morning to complete this task and we have decided that their time could be better spent on other projects. Robots build cars, make our electronics and even vacuum our houses. So why can't we have robots collect rubbish in our streets? Students will have the opportunity to design and create a system to attach to the Ozobot to collect rubbish around the town. Students will then code Ozobots to go around a town map, collecting the rubbish. Students will demonstrate how time management can be improved for council workers collecting rubbish around local towns.
Product/performance Clarify what the students will create and why.	• To design a town map for the Ozobot rubbish run. • To code an Ozobot to move around the map. • To create a system for the Ozobot to remove the rubbish: 1. Evaluate existing town litter (sample and collection of rubbish presented in a data graph (line transects). 2. Create a map of the town on a board. 3. Create a system for the Ozobot to collect rubbish from the streets. 4. Code an Ozobot to move around the map, through the streets. 5. Create a video explaining the project to an audience to commit to a specific town design, justifying their choices and equipment, and detailing the process of learning. Students can share their designs and 3D model. Culminating event: Videos shown to audience at a STEM expo and presented in a whole-school assembly.
Standards Identify specific standards for success. Issue rubrics to the students or develop them with the students.	• Rubric assessing specific design process phases – define, prototype/test and plan/collaborate; the critical and creative thinking general capability will also be assessed • Formative assessment • Self- and peer-reflection • Video documentation – evidence gathered on seesaw • Share and present work (rubric could contain an aspect about quality of videos)

YEARS 3–6 'ROBOT RUBBISH RUN' DESIGN PROCESS

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research	Term 1, Week 5–6	• Students to be introduced to coding an Ozobot. • Students to develop code to move their Ozobot around a path and/or obstacles. • Students will document their learning journey for a presentation video. • Students given the design brief. • Students to complete town rubbish collection using line transects. • Students will document their learning journey for a presentation video. • her costs for projects.
Define Includes mind-mapping	Term 1, Week 6	• Student will define the problems of our current rubbish collection methods (analysing data discovered in the empathise phase). • Students will document their learning journey for a presentation video.
Ideate–prototype–test	Term 1, Week 7–10 Term 2, Week 1	• Students will create a map of town for the Ozobot board. • Students will create the system for the Ozobot rubbish collection. • Students will create the coding to collect the rubbish around the town map. • Students will document their learning journey for a presentation video.
Deliver Preparing for and delivering presentation	Term 2, Weeks 2–6	• Students to create a video that documents and shares their learning and understanding. Students will later share the video with parents and others (e.g., staff). • Students to refine their videos based on the feedback from those who have viewed the video. • Students to present their learning videos at the STEM expo (Week 6) and in a whole-school assembly.

DESIGN-PROCESS TEMPLATE

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research		
Define Includes mind-mapping		
Ideate–prototype–test		
Deliver Preparing for and delivering presentation		

CHECKLIST OF STEPS TEMPLATE

Unit title		**Starting date**	
Steps you need to take to complete your STEM assessment task		**Date to be completed**	**Done**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

SAMPLE CHECKLISTS OF STEPS

Paddock to plate **Year 1 transdisciplinary unit checklist**		**Starting date**	
Steps you need to take to complete your STEM assessment task		**Date to be completed**	**Done**
1	Identify your favourite food made at home and get a copy of the recipe. [*Put in homework sheet.*]		
2	Choose one of the main ingredients used to make your favourite food. [*Done in class.*]		
3	Prepare a list of questions about the ingredient you want to know more about. [*Activity: Work with students to formulate questions.*]		
4	With a parent or guardian's help, find information that can be used to answer your questions. Use the t-chart provided to organise your questions and information. [*Have guide to send home, model it in class.*]		
5	Ask your parents, guardians or grandparents about what is different about how they got their food when they were children. [*Homework task: Venn diagram – do a refresher.*]		
6	Show your t-chart to your teacher and get it approved before moving on. [*Mini-conference with students about understanding of t-chart.*]		
7	Identify the important steps for your ingredient to get from the paddock to the plate. Highlight them on your t-chart. [*Done in conference, model organising information with students.*]		
8	Sequence the important steps into order from paddock to plate. Add any interesting facts in each of the steps. [*Model organising information with students.*]		
9	Create a flow chart of the process the ingredient went through from paddock to the plate. [*Model flow chart.*]		
10	If you have interesting facts add them to the flowchart.		
11	Practice sharing the process shown in your flowchart with at least two other students in your class. Answer any questions asked of you. [*Model the W questions with students.*]		
12	Practise sharing the process shown in your flowchart at least three times with your parents or guardians. Answer any questions asked of you. [*Put in homework sheet, guide to parents and guardians.*]		
13	Share the process shown in your flowchart with the whole class on your designated day. Answer any questions asked of you.		
14	With your parents help, make your favourite food. Bring the food on the 'Paddock to the plate' food day to share.		

Australian democracy– respecting all cultures and viewpoints Year 6 transdisciplinary unit checklist		**Starting date**	
Steps you need to take to complete your STEM assessment task		**Date to be completed**	**Done**
1	Use graphic organisers to explore the themes of systems, culture and democracy.		
2	Create and continually update a glossary of terms to help support your future research and understanding of the unit.		
3	Participate in 'super speak' workshops to develop confidence and skill in planning, structuring and delivering speeches/presentations.		
4	Create flow charts to represent levels of government and processes to making a law.		
5	Research, using literature such as My Place, the history of immigration in Australia. Plot your findings on timeline, starting at European settlement.		
6	Work with others to produce a list of issues that have affected different cultures living in Australia (including Indigenous cultures).		
7	Plan and participate in inter-class debates.		
8	Use a role-plays to describe the preferential voting system.		
9	Begin working with your team towards the end of unit event: the election.		
10	Participate in a range of workshops to help develop your understanding of political advertising, speech writing, research and referencing skills, effective teamwork and so on.		
11	Research and develop a campaign around a selected issue/s.Sort out all your findings and choose a plan of action. Create supporting materials to assist your teams campaign.		
12	Present findings and supporting materials to other members of the year level as a rehearsal for the culminating event. Make use of self and peer reflection tools in order to assess and refine your work.		
13	Culminating event: the election!		
14	Personal reflection of the unit. What skills and understanding have you gained? What questions do you still have? Is there any further action you will take as a product of your learning throughout this unit?		

Can you really play? Year 6 transdisciplinary unit checklist		**Starting date**	
Steps you need to take to complete your STEM assessment task		**Date to be completed**	**Done**
1	Using the given map of the school, plus by walking around the school, identify 3 possible sites where you could place a playground.		
2	Measure the length and width of each site and calculate the perimeter and available area for each site.		
3	For each site, use a PMI chart (or another graphic organiser) to analyse and list the plus, minuses and interesting elements and features of each site.		
4	Construct a survey to find out from students and staff what type of equipment and the best site for the playground. You must survey at least 10 students and 3 staff (the more surveys the more accurate the planning).		
5	Evaluate the survey by ranking the results from most desired equipment to least. You can do this using the chart on page # of the 'Playground planning handbook'. Also, identify the most chosen site for the playground and write a paragraph explaining why people thought this site is the best option.		
6	Using the survey results, and the playground equipment list found in the Handbook (or your own researched list) choose at least 5 different types of equipment to include in your chosen site. You have a budget of $25,000.		
7	Use the table on page # of the Handbook to calculate the total cost of the equipment and areas in square metres for each item. Complete all the questions on page # and #.		
8	Using the graph paper on pages #–# and a ruler, complete the task shown on page # (donation of pine sleeper edging).		
9	Choose 2 of the layouts (or design another if you wish). Create 2 **different** designs of your playground, i.e. place the equipment in different ways. NOTE: A 3m space is needed between each piece of equipment for safety. Do draft sketches of your designs on graph paper. Submit these to your teacher for approval.		
10	For extra credit, complete the optional extension task on page #.		
11	Upon approval of draft designs choose one design and draw an accurate 2D scaled diagram on graph paper (scale 1cm = 1m). Show the measurements for each piece of equipment. Use a key, colour and landscaping (if you wish).		
12	Create the proposal for the principal. Make sure the proposal covers the elements outlined in the assessment sheet.		
13	Design/plan/edit a short persuasive presentation that sells your proposal. Rehearse the final presentation to family members and peers for feedback.		
14	Ensure all required materials/items/props are ready for the presentation.		

Fabulous fabrics **Year 3 transdisciplinary unit checklist**		**Starting date**	
Steps you need to take to complete your STEM assessment task		**Date to be completed**	**Done**
1	Brainstorm possible gift ideas for your special friend. Select 3 gifts to research. Confirm with your choices with your teacher.		
2	Investigate how you can make one of them and what fabrics you would need. Explain why you chose this gift and what fabric/s you will need to make it. You may need to provide your own fabric if it's not available in class.		
3	Draw a sketch of your design as homework. Bring your display book with the design, reasons, fabrics and sketches.		
4	Make the product at school.		
5	Research the answers to these questions at home and present your research in a poster, booklet or any other interesting and creative format. ☐ What is your gift? ☐ Who is it for? ☐ How are you going to make it? Set this out in a procedure text. ☐ What fabric do you need to make this gift? Is it natural or synthetic? How is this material produced e.g. from fleece to wool? ☐ Why do you choose this fabric? ☐ What are the special features of your gift? ☐ After making your gift, evaluate it by explaining how you can improve on it? Note: All information must be written in your own words.		
6	You will be required to do a 2-minute oral presentation as part of this assessment. Prepare relevant cue cards to assist you in delivering your brief talk.		
7	Presentation of project.		
8	Open afternoon for parents.		

EMPATHISE-PHASE PLANNING TEMPLATE

Research resources

Useful websites and articles
Research report – Rapid assessment of pollinators' status (2008): www.fao.org/3/a-iResearch resources

Research and capture the links to websites, articles, videos, images, organisations and contacts that could provide background information for students to empathise (come to a deeper understanding) of the challenge.

Useful videos
-
-

Useful organisations and contacts
-
-

Situation description
Use the information gathered during the research stage to describe the background of the challenge.
-
-

What are the needs of the users?
Speculate on who may be the stakeholders (those impacted by the issue) and their possible needs.
-
-

What are the challenges that we want to address?
Speculate on the potential challenges, causes of why the problem or issue exists and the impact of competing needs.
-
-

Potential questions that could be asked:
Brainstorm a range of potential questions that could be asked.
-
-

Why is this important for students?
Why should students care? How is their behaviour causing the situation? How can they become personally and emotionally connected to the situation?
-
-

SAMPLES OF EMPATHISE-PHASE PLANNING

EMPHASISE-PHASE PLANNING FOR THE 'THROW-AWAY FASHION' UNIT

Research resources

Useful websites and articles

1. Every 10 minutes, 6 tonnes of clothing goes to Aussie landfills (Apr 2018): hwww.ragtrader.com.au/news/every-10-minutes-6-tonnes-of-clothing-goes-to-aussie-landfills
2. Fast fashion: We all have to face up to clothes' climate impact (Oct 2021): www.bbc.com/news/uk-wales-59055817
3. The paradox of choice. Why made-to-order might not solve the fashion industry's problems (Sept 2018): https://theconversation.com/the-paradox-of-choice-why-made-to-order-might-not-solve-the-fashion-industrys-problems-102442
4. Fixing our throwaway fashion culture will take far more than a 1p tax (Feb 2019): https://theconversation.com/fixing-our-throwaway-fashion-culture-will-take-far-more-than-a-1p-tax-112047
5. What she makes is keeping her in poverty (2017): https://whatshemakes.oxfam.org.au/
6. Zara and H&M back in-store recycling to tackle throwaway culture (May 2017): www.theguardian.com/sustainable-business/2017/may/26/zara-hm-step-up-instore-recycling-tackle-throwaway-culture
7. Landfill becomes the latest fashion victim in Australia's throwaway clothes culture (Dec 2017): www.theguardian.com/fashion/2017/dec/06/landfill-becomes-the-latest-fashion-victim-in-australias-throwaway-clothes-culture
8. Wearing vintage clothes is recycling at its most stylish (May 2017): www.timeslive.co.za/sunday-times/lifestyle/fashion-and-beauty/2018-05-12-wearing-vintage-clothes-is-recycling-at-its-most-stylish/
9. Trending recycled fashion (Jan 2019): www.noosanews.com.au/news/trending-recycled-fashion/3630140/
10. Destroying unsold clothes is fashion's dirty secret and we're complicit (2018): https://www.huffpost.com/entry/burberry-burn-clothes-fashion-industry-waste_n_5bad1ef2e4b09d41eb9f7bb0
11. Can a circular fashion system save us all? (Jan 2019): www.vogue.com.au/fashion/news/can-a-circular-fashion-system-save-us-all/news-story/b0b0f8b39e667923d088b159ddcec606
12. War on waste: It's time to step off the fashion trend-mill: https://about.abc.net.au/war-on-waste-its-time-to-step-off-the-fashion-trend-mill/
13. Recycled and upcycled clothing brands to know in 2020: https://compareethics.com/9-recycled-and-upcycled-clothing-brands-you-shouldnt-pass-in-2018/
14. Here's what you can do with old clothes you can't donate (Apr 2019): https://www.abc.net.au/triplej/programs/hack/recycling-clothes-you-cant-donate/11005522
15. Fixing fashion: clothing consumption and sustainability (Feb 2019): https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/full-report.html

Useful videos

16. Fast fashion to landfill pollution — push for zero-waste (Jun 2020): www.youtube.com/watch?v=-MUqsWrrb8A&ab_channel=ABCAustralia
17. Fast fashion: The dumping ground for unwanted clothes (Oct 2021): www.youtube.com/watch?v=MHnDqelUh-4&ab_channel=BBCNews
18. The true cost of fast fashion (Nov 2018): www.youtube.com/watch?v=tLfNUD0-8ts&ab_channel=TheEconomist
19. The environmental disaster that is fuelled by used clothes and fast fashion (Sept 2021): www.youtube.com/watch?v=bB3kuuBPVys&ab_channel=ABCNewsIn-depth
20. TED talk: 3 creative ways to fix fashion's waste problem (2017): www.ted.com/talks/amit_kalra_3_creative_ways_to_fix_fashion_s_waste_problem
21. TED talk: Where do your online returns go? (2018) : www.ted.com/talks/aparna_mehta_where_do_your_online_returns_go
22. TED talk: Fashion has a pollution problem — can biology fix it? (2017) : www.ted.com/talks/natsai_audrey_chieza_fashion_has_a_pollution_problem_can_biology_fix_it
23. How many clothes do you really need? (2015): https://www.youtube.com/watch?v=Q35-0aIb3AA
24. Something Borrowed, Something New, The most magical 'borrowed' dresses you've ever seen! (2018): www.youtube.com/watch?v=FfwqyIABxMA
25. War on Waste, Craig piles up 6,000kg of clothes in Martin Place (2018): www.facebook.com/watch/?v=1722650437757594

Useful organisations and contacts

26. Planet Ark https://recyclingnearyou.com.au/clothing/
27. Unsustainable Magazine www.unsustainablemagazine.com/sustainable-fashion-a-list-of-organizations-certifications-terms-and-fabrics/
28. Upparel https://upparel.com.au/clothing-recycling/

Situation description

- Around the world:
    - Millions of tonnes of clothing were discarded last year by the companies that design and produce them.
    - Fewer than one in ten items were worn out.
    - One third of unwanted clothing was sent to landfill or incinerated or bleached.
    - Fashion contributes up to 10% of global carbon emissions.
- According to WWF is that it takes 2,700 litres of water to make one cotton T-shirt, that's enough for one person to drink for 900 days.
- Australians are currently disposing of 6,000 kilograms of fashion and textile waste every 10 minutes.
- 75% of Australian adults have thrown clothes away in the past year; 30% tossed more than 10 garments.
- Millennials are more likely to toss items because they are sick of wearing them (24%), they have become unfashionable (19%) or are more than a few seasons old (18%).
- Fast fashion is pushing all prices down to the bare minimum, which is bad news for those who depend on the industry for their wages. An Oxfam report found that just 4% of the amount Australians spend on clothing goes to the garment workers.

What are the needs of the users?

- Need to look fashionable, to look 'good' – consumers
- need for clothing that wears slowly – consumers
- need to have clothing that fits their body shape - consumers
- need to have an income – business and garment makers
- need to be sustainable and environmentally sound for the planet – consumers, businesses. government
- need to minimise the throwing away of clothing and reduce unnecessary waste – government, ethical consumers.

What are the challenges that we want to address?

- Impact on garment makers livelihood – while fast fashion provides a continuous stream of income the money they make is very little
- impact on the environment and climate change – the consumption of fossil fuels to make and ship the fashion, the gases released to get rid of unused fashion
- impact on landfill – the waster produced
- impact on the businesses – constant marketing and need to have fashion that doesn't last
- impact on fashion – cheap, quick to produce, driving exploitation
- impact of social media on fashion trends – how social media drives the 'looking good' industry and the need to be in the latest fashion to be cool.

Potential questions that could be asked?

- Why do businesses throw their unused fashion away?
- What if they didn't burn or throw away those clothes away – what would could they do?
- Who could need the clothing that is thrown away?
- How can we encourage more ethical and sustainable fashion?
- Are we destroying our future by our demand for the latest fashion and to look "good"?
- What is the impact on the global climate of the fast fashion trend?
- Will consumerism be the end of us all?
- Can we start a global Instagram trend to show how recycling fashion is cool as well as sustainable?
- What actions can we take to minimize our throwing away of clothing and look after our future?
- Can we come up with a way of making money from throw away fashion whilst saving the world?

Why is this important for the students?

- Our students are consumers of fashion.
- Young people have the highest proportion of new clothing in a family.
- They are also more likely to throw away clothes than older generations.
- The throwing away of clothing impacts landfill and the environment – it is not sustainable.
- Our consumerism is environmentally destructive in the long term.

Note: The empathise phase planning for Throw Away Fashion unit was the result of about an hour of lively discussion and thinking by a small group of teachers. Many of the articles were taken from newspaper sites from around the world with the intent to give a broad view of the drivers, challenges and possibilities engendered by the current throw away fashion industry. The articles not only provide different perspectives on the range of issues and sustainability problems with the current throw away fashion, some were chosen because they provide possible solutions. A number of the videos were TED talks from experts and from national broadcasters who engagingly present possible solutions but also question our own behaviours around fashion. The situation description involved garnering key information from the various articles and attempting to show the urgency of the challenge – globally as well as locally. The needs and challenges statements were created by thinking about some of the stakeholders in the fashion industry pipeline and what were the considerations that could be there for them. This could be a great empathising activity for students because you could have them stand in the shoes of each stakeholder and think about their specific needs. The listed questions arose as the teachers discussed the issues and challenges and this easily led into identifying why the students should care

EMPATHISE-PHASE PLANNING FOR A 'PAUCITY OF POLLINATORS' UNIT

Research resources

Useful websites and articles

1. Research report – Rapid assessment of pollinators' status (2008): www.fao.org/3/a-i1046e.pdf
2. Honeybees hog the limelight, yet wild insects are the most important and vulnerable pollinators (April 2018): https://theconversation.com/honeybees-hog-the-limelight-yet-wild-insects-are-the-most-important-and-vulnerable-pollinators-93247
3. Loss of wild pollinators could substantially reduce soybean yields (European Commission, March 2014): http://ec.europa.eu/environment/integration/research/newsalert/pdf/367na1_en.pdf
4. 9 ways you can help bees and other pollinators at home (May 2015): www.nationalgeographic.com/animals/article/150524-bees-pollinators-animals-science-gardens-plants/
5. Bees are dying. What can we do about it? (Jun 2018): www.abc.net.au/news/2018-06-25/bees-are-dying-are-we-next/9904464
6. Getting the buzz on the value of bees: www.science.org.au/curious/everything-else/bees
7. Pollination of crops in Australia and New Zealand (2012): www.agrifutures.com.au/wp-content/uploads/publications/12-059.pdf
8. What's the buzz about bees? (Dec 2017): www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/FlagPost/2017/December/Whats_the_buzz_about_bees
9. Pollination (Nov 2018): https://australianmuseum.net.au/learn/animals/insects/pollination/
10. What is it about bees? Three experts on why they're fascinating, why they're dying, what can save them (Sept 2013): https://blog.ted.com/what-is-it-about-bees-three-experts-discuss-why-theyre-fascinating-why-theyre-dying-and-what-can-save-them/
11. Plummeting insect numbers 'threaten collapse of nature' (Feb 2019): www.theguardian.com/environment/2019/feb/10/plummeting-insect-numbers-threaten-collapse-of-nature?

Useful videos

12. A plea for bees (2008): www.ted.com/talks/dennis_vanengelsdorp_a_plea_for_bees
13. People, plants and pollinators – Nat Geo Live (Sept 2011): www.youtube.com/watch?v=rmL_XTrPOMw
14. Every city needs healthy honey bees (2012): www.ted.com/talks/noah_wilson_rich_every_city_needs_healthy_honey_bees
15. Why bees are disappearing (2013): www.ted.com/talks/marla_spivak_why_bees_are_disappearing
16. A world without bees – History (Jun 2014): www.youtube.com/watch?v=7X1xIIyZw3M
17. What happens if all the bees die? – AsapSCIENCE (March 2015): www.youtube.com/watch?v=JilYBVrFiLA
18. Bee extinction: Why we're saving the wrong bees (May 2021): www.youtube.com/watch?v=VSYgDssQUtA&ab_channel=DWPlanetA
19. How to increase food production by using native pollinators (Nov 2015): www.youtube.com/watch?v=eCLbmOEsrb0
20. How to attract more bees and pollinators to your garden (Aug 2017) www.youtube.com/watch?v=6yv7l-Ifxcw Pollination for kids (Sept 2017): www.youtube.com/watch?v=CUPzbTuJlgc
21. Providing a pollination service – a 'how to' video from the Honey Bee & Pollination Program (Sept 2015): www.youtube.com/watch?v=JEylihp9DX4

Useful organisations and contacts

22. Wheen Bee Foundation: https://www.wheenbeefoundation.org.au/about-bees-pollination/
23. Australian Honey Bee Industry Council: https://honeybee.org.au/organisation/
24. Save the Bees: https://www.beethecure.com.au/
25. Australian Native Bee Association: https://australiannativebee.org.au/
26. Australian Pollinator Week: https://www.australianpollinatorweek.org.au/

Situation description

- A pollinator is an animal that causes plants to make fruit or seeds. (2, 6, 7, 9, 17, 27)
    - Insects, birds and bats pollinate plants - Plants and animals interact in their search for food. Bees and other insects, as well as some birds and bats, transfer pollen from plant to plant. While stopping at a flower for a sip of sweet nectar, the animals or insects get dusted with pollen.
    - When the animals or insects fly to another flower of the same or similar species, some of that pollen brushes off and the pollinated flowers are then able to produce seeds.
    - Pollination is important not only for wild plants, but also for crop plants.
- It is estimated that 65% of all flowering plants and some seed plants (e.g. cycads and pines) require insects for pollination. This percentage is even greater for economically important crops that provide fruits, vegetables, textile-related fibres and medicinal products. (9, 17)
- Pollinating insects like bees, butterflies and flies have had a rough time of late. Evidence suggests there has been a widespread decline in their abundance and diversity since the 1950s. This matters because such insects are critical both for the reproduction of wild plants and for agricultural food production. (2, 27)
- The decline of these pollinators is linked with destruction of natural habitats like forests and meadows, the spread of pests such as Varroa mite and diseases like foulbrood, and the increasing use of agrochemicals by farmers. Although there have been well-documented declines in managed honey bees, non-Apis (non-honeybee) pollinators such as bumblebees and solitary bees have also become endangered. (2,8)
- The loss of bees and other pollinators would have an enormous impact on food production and therefore the viability of resources that humanity relies on. (17).

What are the needs of the users?

- Need to keep genetic diversity in plants – growers, farmers, government
- need pollinators for the production of food – growers, farmers, consumers, government
- need to eliminate pests and weeds to minimise loss of agricultural products – growers, farmers
- need to have land for the growing demand of meat and raw materials such as coffee, cotton, canola etc. – government, farmers, businesses
- need for fast food – consumers.

What are the challenges that we want to address?

- Loss of forests and brush due to land clearing for meat producing animals (sheep, cows, etc.)
- impact of droughts and floods on production of food to meet demands – government, farmers, growers
- growing population and increase in wealth of people in developing countries – government, consumers
- consumers are eating more meat and thus need more land
- use of pesticides to kill pests is also killing pollinators
- introduced species could be killing the pollinators
- issues with monoculture farming
- loss of appropriate indigenous flora
- students could approach council and appropriate organisations to source specific local challenges to pollinators.

Potential questions that could be asked?

- How are plants pollinated?
- Why are bees and other pollinators dying?
- How are we contributing to the loss of pollinators?
- How can we use the area of the school to improve the survival of pollinators?
- What things do we need to consider if we improve the survival of pollinators?
- Why are some people allergic to bees?
- Are the needs of pollinators different in different parts of the world compared to Australia?
- Can we encourage certain pollinators?
- Is our behaviour as humanity destroying the future of the world?
- How can we use our brilliance to create a safe world for pollinators?
- How can we maintain a thriving environment for pollinators whilst meeting humanity's needs?

Why is this important for the students?

- They are the future generation/protectors of the environment.
- If pollinators die out, they are the ones who will be most impacted.
- Our demand for particular foods and products is driving the situation. (6)
- Without pollinators, most of our food sources will disappear. (2, 8 ,9, 27)

EMPATHISE-PHASE PLANNING FOR THE 'PLASTIC-FREE LIFE' UNIT

Research resources

Useful websites and articles

1. Here's what happens to our plastic recycling when it goes offshore (Jan 2019): https://theconversation.com/heres-what-happens-to-our-plastic-recycling-when-it-goes-offshore-110356
2. Definition of plastic pollution (Nov 2021): www.britannica.com/science/plastic-pollution
3. British Plastics Federation - Why do we need plastic packaging? http://www.bpf.co.uk/packaging/why-do-we-need-plastic-packaging.aspx
4. UK ocean plastic pollution crisis: Every seal, dolphin and whale washed up on British shores had plastic in their stomachs, report says (Jan 2019): www.standard.co.uk/futurelondon/theplasticfreeproject/plastic-pollution-single-use-plastic-a4053361.html
5. EU proposes ban on 90% of microplastic pollutants (Jan 2019): www.theguardian.com/environment/2019/jan/30/eu-european-union-proposes-microplastics-ban-plastic-pollution
6. Our world in data aggregator – plastic pollution (2018): https://ourworldindata.org/plastic-pollution
7. A running list of action on plastic pollution (Jun 2019): www.nationalgeographic.com/environment/article/ocean-plastic-pollution-solutions
8. Victorian State Government single-use plastics: https://www.vic.gov.au/single-use-plastics#
9. Plastic pollution is killing our marine wildlife. Here are a few ways you can help (April 2018): www.abc.net.au/news/2018-04-12/what-you-can-do-to-reduce-plastic-pollution/9642352
10. Is the beauty industry doing enough to tackle plastic pollution? (Feb 2019): www.independent.co.uk/news/long_reads/beauty-industry-plastic-pollution-environment-climate-change-cosmetics-a8697951.html
11. The young woman and her mum waging war on plastics (Jan 2019): www.smh.com.au/lifestyle/life-and-relationships/there-are-so-many-amazing-people-who-have-started-doing-something-20190131-p50urk.html
12. The zero-waste movement is coming for your garbage (Jan 2019): www.vox.com/the-goods/2019/1/28/18196057/zero-waste-plastic-pollution
13. Plastic pollution: Skipper describes horror at seeing 'endless' ocean of rubbish on Pacific research expedition 9Jul 2018): www.independent.co.uk/climate-change/news/plastic-pollution-great-pacific-garbage-patch-microplastics-research-exxpedition-emily-penn-a8436821.html

Useful videos

14. Behind the News – Plastic pollution problems (Jun 2018): www.abc.net.au/btn/classroom/plastic-pollution-problems/10488932
15. Plastic pollution crisis: How waste ends up in our oceans (Jun 2018): www.youtube.com/watch?v=MNFUwVcpZAI&ab_channel=GlobalNews
16. Effects of plastic pollution (Jul 2017): www.youtube.com/watch?v=NueSlu_PWXc&ab_channel=DHIGroup
17. Plastic pollution: How humans are turning the world into plastic (Jul 2018): www.youtube.com/watch?v=RS7IzU2VJIQ&t=2s&ab_channel=Kurzgesagt%E2%80%93InaNutshell
18. The last straw - ft. Steve Connell and the #Strawpocalypse: www.youtube.com/watch?v=2AM3x8z9xjE&t=2s&ab_channel=VonWong

Useful organisations and contacts

19. World Wildlife Fund Australia – Ending Single Use Plastics campaign: www.wwf.org.au/get-involved/plastics
20. Plastic Pollution Coalition is a global alliance of more than 1,200 organisations, businesses, and thought leaders in 75 countries working toward a world free of plastic pollution: www.plasticpollutioncoalition.org/
21. Coastal Care – collation of the most recent news on plastic pollution worldwide: https://coastalcare.org/sections/plastic-pollution-news/
22. Greenpeace campaigns: www.greenpeace.org.au/what-we-do/end-plastic/
23. Australian Marine Conservation Society: www.marineconservation.org.au/

Situation description

- The world is being polluted by an increasing amount of plastic waste. This waste is making its way into the ecosystem and impacting the entire food chain. Marine animals like turtles can choke on plastic bags mistaken for jellyfish, seabirds get entangled and larger animals like whales can starve because their stomachs are so full of plastic they've eaten. (2, 4, 9, 13, 19, 22)
- On average, Australians use 130kg of plastic per person each year. Less than 12% of that's recycled. More frightening still, up to 130,000 tonnes of plastic will find its way into our waterways and into the ocean. (19)
- 85% of Australian seabirds are affected by plastic pollution. (19)
- 95% of plastic packaging is discarded after a single use. (19)
- Only 9% of all plastic waste on Earth has been recycled. (12)
- Every seal, dolphin and whale washed up on British shores had microplastic in their stomachs. (4)
- Because plastic packaging is so durable, plastic packaging can be very thin. This means it uses fewer resources and takes up less space for transport which means fewer trucks, trains or planes are needed to transport it. (3)

What are the needs of the users?

- Wildlife and ecology – to eat, to survive, to grow
- businesses – ability to transport goods long distances and be kept fresh, keep goods safe from damage, ability for consumers to carry goods easily (e.g. supermarket bags, etc), cost to find alternatives
- consumers – lifestyle, fresh food, products delivered without damage, consumables like beauty products, convenience of plastic to be used in fast food stores, supermarkets etc.
- government – economic activity, waste.

What are the challenges that we want to address?

- Plastic waste not being recycled
- plastic waste finding its way into the environment including landfill, oceans, landscape
- breaking down of plastic products into microplastics
- ease and cheapness of plastics versus damage caused
- lifestyle of consumers versus life of wildlife and environment
- impact on wildlife and oceans
- throwaway lifestyle of consumers (convenience economy)
- unconsciousness of impact of lifestyle on the environment
- fossil fuel usage to create plastics.

Potential questions that could be asked?

- Why do we use plastics so much?
- What are the benefits of plastic to our lifestyle?
- Could we maintain the benefits but reduce plastic usage?
- Could we find other, more sustainable ways, to achieve these benefits?
- What is the immediate impact of plastic on our lifestyles? On the ecology?
- What are the long term impacts on our lifestyle? On the ecology?
- How does our lifestyle inform our ethics and mindset about the world?
- How much plastic do we use personally? As a school?
- What questions can we ask in each of the key discipline areas? Science (ecosystems), RE (ethics), HASS (geography), English (current issues), maths (quantities), engineering etc.

Why is this important for the students?

- We have unconsciously bought into the convenience economy and don't think of the effects.
- Loss of wildlife and damage to the environment leading to extinction of many species.
- Destruction of the food chain and natural beauty.
- It is possible to live sustainably but we need to change our habits.

EMPATHISE-PHASE PLANNING FOR THE 'DRIVING THE FUTURE' UNIT

Research resources

Useful websites and articles

1. How driverless cars will change our world (Nov 2021): www.bbc.com/future/article/20211126-how-driverless-cars-will-change-our-world
2. Uber plans to buy 24,000 autonomous Volvo SUVs in race for driverless future (Nov 2017): www.theguardian.com/technology/2017/nov/20/uber-volvo-suv-self-driving-future-business-ride-hailing-lyft-waymo
3. The Good, the Bad and the Ugly: How to Plan for a Driverless Future (Feb 29): https://knowledge.wharton.upenn.edu/article/driverless-cars-pros-and-cons/
4. Driverless cars could make transportation free for everyone – with a catch (Dec 2017): www.theatlantic.com/technology/archive/2017/12/self-driving-cars-free-future/548945/
5. You decide: Would you let a car determine who dies? (Jul 2018): www.abc.net.au/news/2018-07-05/driverless-cars-ethical-debate-you-decide/9836786
6. The everyday ethical challenges of self-driving cars (March 2018): https://theconversation.com/the-everyday-ethical-challenges-of-self-driving-cars-92710
7. Are autonomous cars really safer than human drivers? (Feb 2018): https://theconversation.com/are-autonomous-cars-really-safer-than-human-drivers-90202
8. Driverless cars really do have health and safety benefits, if only people knew (July 2018): https://theconversation.com/driverless-cars-really-do-have-health-and-safety-benefits-if-only-people-knew-99370
9. Self-driving cars: The technology, risks and possibilities (Aug 2017): https://sitn.hms.harvard.edu/flash/2017/self-driving-cars-technology-risks-possibilities/
10. Driverless cars are now tested on our roads, so should we be worried? (Mar 2018): www.abc.net.au/news/2018-03-23/should-we-worry-about-driverless-cars-being-tested-on-our-roads/9569056
11. Collection of articles on The Conversation about autonomous vehicles: https://theconversation.com/au/topics/autonomous-vehicles-1007
12. Australian Trade and Investment Commission: www.austrade.gov.au/future-transport/connected-automated-vehicles/

Useful videos

13. The future of self-driving cars (Jul 2018): www.youtube.com/watch?v=xHQM35uWrFQ
14. How will autonomous vehicles transform our cities? (Oct 2018): www.youtube.com/watch?v=tTOFMwKEg7o&ab_channel=TEDxTalks
15. How do self-driving cars actually work? (Tesla, Volvo, Google) (Nov 2017): www.youtube.com/watch?v=xMH8dk9b3yA&ab_channel=TheHUB
16. How a driverless car sees the road (Jun 2015): www.youtube.com/watch?v=tiwVMrTLUWg
17. The ethical dilemma of self-driving cars (Dec 2015): www.youtube.com/watch?v=ixIoDYVfKA0
18. How driverless cars will change cities (Jan 2016): www.youtube.com/watch?v=XEebyt6G5kM&ab_channel=CBCNews%3ATheNational
19. Beyond Tesla: Driverless startups promise next-level autonomous vehicles (May 2021): www.youtube.com/watch?v=UdOxt11ofjQ&ab_channel=WallStreetJournal

Useful organisations and contacts

20. ADVI – ANZ Driveless Vehicle Initiative: https://advi.org.au/
21. Transport Accident Commission: www.tac.vic.gov.au/
22. National Transport Commission: www.ntc.gov.au/transport-reform/automated-vehicle-program

Situation description

- More than 90% of car crashes in the US are thought to involve some form of driver error. (3, 7)
- Self-driving or autonomous vehicles are predicted to not only reduce the number of car crashes and loss of life, but be the cause of significant economic and societal impacts. (1, 3, 4, 7, 8, 12, 13, 14, 18)
- The autonomous vehicle (AV) and zero emission vehicle revolution are starting to affect Australia, and governments are assessing the opportunities and challenges. (2, 4, 8)
- One of the major challenges are ethical in the way that the cars operate when a collision is unavoidable. (3, 5, 6, 7, 16, 17)
- This is a historic and societal shift. Governments, transport agencies, policy makers and the wider industry must grapple with the implications while enabling a safe and timely transition. (10, 11, 12, 14, 18)

What are the needs of the users?

- Governments – safety, impact on productivity, economic impact, lessening of accidents and need to support injured individuals, ethics, societal behaviour, planning and design of roads
- consumer – safety, change in lifestyle, car ownership, ease of travel, ethics, health benefits
- society – change in societal behaviour, change in public transport, reduction in use of fossil fuel
- car companies – research, selling of products, profit, issues if there is a failure in their car.

What are the challenges that we want to address?

- Dangers: hacking? computer crashing? terrorism?
- ethics of choosing what to do when a collision is unavoidable
- the impact on the amount of planning and design of public infrastructure to support the conversion to autonomous vehicles
- impact on real estate prices and design of cities due to changes in where cars will park
- result in an increase or decrease in congestion?
- in cities there will be a high coverage of high speed internet (which helps autonomous vehicles) but what will happen in the country and outback?
- reduce or increase use of fossil fuels?
- change how we think about transportation and ownership of vehicles.

Potential questions that could be asked?

- Will big corporations allow this technology to happen?
- Will it make Australia a closer community?
- Will parents put kids in a car to take them to school?
- How will you get around in 20 years' time?
- Autonomous vehicles – a wolf in sheep's clothing or the start of a new future?
- Will society really be better off in the future if we had autonomous transport?
- What will their impact be on our cities and regional communities?
- How can we limit the risks of criminal use?
- How will public transport systems be affected?
- How will the lives of the elderly and disabled be affected?

Why is this important for the students?

- In many areas the lack of timely public transport limits the ability of kids to get places (4)
- Autonomous vehicles can reduce parking and allow for more open spaces (3)
- The safety of the students – as pedestrians and as passengers (3, 9)
- This is the future and it is coming quickly (13)

DEFINE-PHASE PLANNING TEMPLATE

Driving or essential questions
What possible driving or essential questions could be asked that are meaningful and actionable?

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What student outcomes do we want from students grappling with this topic?
List the specific curriculum knowledge, skills and thinking that could be addressed in this open-ended challenge. Use the Australian Curriculum and the General Capabilities as a guide.

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Goal Goal, problem, challenge or obstacle for the task	
Role Role of the students in the scenario and what they are being asked to do	
Audience The target audience the students will be presenting to	
Situation Context and explanation of the situation	
Product/performance The product or performance that needs to be created and its larger purpose	
Standards The specific standards for success that must be met and how the work will be judged	

Design phase	Approx. time to complete	Checklist steps
Empathise Includes research		
Define Includes mind-mapping		
Ideate–prototype–test This is the iterative improvement cycle		
Deliver Preparing for and delivering presentation		

SAMPLES OF DEFINE-PHASE PLANNING

DEFINE-PHASE PLANNING FOR THE 'PAUCITY OF POLLINATORS' UNIT

Driving/essential questions:

- What possible driving/essential questions could be asked that are meaningful and actionable?
- Human activities are destroying the population of pollinators globally and this could lead to the loss of most of our food sources. How can we maintain a thriving environment for pollinators while meeting humanity's needs?

What curriculum outcomes do we want from students grappling with this topic?

- List the specific curriculum knowledge, skills and thinking that could be addressed in this open ended challenge. Use the Australian Curriculum and the General Capabilities as a guide.

Science

- Year 4
  - explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships (AC9S4U01)
  - consider how people use scientific explanations to meet a need or solve a problem (AC9S4H02)
- Year 5
  - examine how particular structural features and behaviours of living things enable their survival in specific habitats (AC9S5U01)
  - investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions (AC9S5H02)
- Year 6
  - investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions (AC9S6U01)
  - investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions (AC9S6H02)
- Year 4–6 Science inquiry skills

HASS – geography

- Year 4
  - the importance of environments, including natural vegetation and water sources, to people and animals in Australia and on another continent (AC9HS4K05)
  - sustainable use and management of renewable and non-renewable resources, including the custodial responsibility First Nations Australians have for Country/Place (AC9HS4K06)
- Year 5
  - the influence of people, including First Nations Australians and people in other countries, on the characteristics of a place (AC9HS5K04)
  - the management of Australian environments, including managing severe weather events such as bushfires, floods, droughts or cyclones, and their consequences (AC9HS5K05)

HASS – economics and business

- Year 5
  - types of resources, including natural, human and capital, and how they satisfy needs and wants (AC9HS5K08)
- Year 6
  - influences on consumer choices and strategies that can be used to help make informed personal consumer and financial choices (AC9HS6K08) **Design and technology**
- Year 3/4
  - describe the ways of producing food and fibre (AC9TDE4K03)
- Year 5/6
  - Explain how and why food and fibre are produced in managed environments (AC9TDE6K03).
- Year 4–6 Design and technology: Processes and production skills

General capabilities

- Critical and creative thinking (generating)
- Personal and social capability (collaboration, communication and decision-making)
- Ethical understanding (explore ethical concepts; making and reflecting on ethical decisions)

Goal and Driving Question	Question: Human activities are destroying the population of pollinators globally and this could lead to the loss of most of our food sources. How can we maintain a thriving environment for pollinators whilst meeting humanity's needs? Demonstrate your ability to use science and design to communicate and persuade people to take actions to improve the environment for pollinators
Role	Environmental scientists You are a community of concerned environmental scientists and activists who are committed to creating a sustainable future for pollinators, yourselves and your children.
Audience	Peers, the principal, and parents and guardians.
Situation	Logical sequence of understandings: 1. Over 65% of plants on earth require pollination by a variety of species like bees, birds, butterflies and flies to be able to reproduce. 2. Humans rely on many of these plants for food and a sustainable ecology 3. Humans have a profound impact on the sustainability of pollinators in the environment 4. We have a responsibility to create a safe world for pollinators to secure the future of the environment and ourselves.
Product/performance	Your goal in this project is to come up with one way to: 1. change people's perception about pollinators 2. encourage pollinators in our school environment 3. create a community action to improve the environment for pollinators.
Standards	Rubrics to be designed for the identified skills and knowledge elements.

Design phase	Approx. time to complete	Checklist steps
Empathise		1. Over 65% of plants on earth require pollination by a variety of species like bees, birds, butterflies and flies to be able to reproduce. • Excursion outside where they look at plants and the environment • Taste honey • Activity – match the plant to the pollinator? • Activity – which of these common plants need pollinators to reproduce? 2. Humans rely on many of these plants for food and a sustainable ecology • Bring basket of different fruits and ask where this food comes from. • Activity – which foods require pollination? • Activity – Food web: What would happen if we lost our pollinators? • Speculative brainstorm • Video shows what would happen
Define		3. Humans have a profound impact on the sustainability of pollinators in the environment • Research task: How do our actions impact pollinators? ° Research as teams ° Discussion as class (what are we doing that impacts the pollinators) ° Draw mind map showing relationship between our actions and the pollinators • Research task: What are humanity's needs that must be met? ° Research as teams ° Discussion (ethics, what needs must be met) ° Create a refined mind map • Research task: What are some of the ways we make a difference to the pollinators' environment? • Research as teams what can be some of the local, national and global actions that could be taken • Discuss potential examples ° Insect hotels ° Pollinator attractors ° Flora to plant in school/Woodlands to attract more pollinators ° Elevated Bird baths ° Bee Hospital ° Colours that attract different pollinators • Student teams to ° Define what challenge they are going to tackle ° Create a persuasive presentation which addresses the challenge, the needs and potential solutions ° Identify what they are going to design and build to improve the pollinator's environment either within the school or at home
Ideate prototype–test		4. We have a responsibility to create a safe world for pollinators to secure the future of the environment and ourselves. • Students to iterate through the design process to plan, prototype and build the chosen design • Time to test and gather evidence of the influence of the design in improving the environment for pollinators?.
Deliver		• Update and refine their persuasive presentation • Practice the presentation • Culminating event where students present to peers, parents and the Principal

DEFINE-PHASE PLANNING FOR THE 'PLASTIC-FREE LIFE' UNIT

Driving/essential questions:

- Plastics are produced using fossil fuels and end up damaging and destroying the environment when incorrectly disposed.
  - How can we live a more ethical and sustainable plastic-free life?
  - Are we destroying the earth's food chain and our future by our laziness and ignorance around plastic?
  - What can we do to minimise our plastic use and live more sustainably and in harmony with the earth's ecology?
  - Do we need plastic for our lifestyle?
  - What actions can we take to minimise our usage of plastics and look after our future?

What curriculum outcomes do we want from students grappling with this topic?

Science

- Year 4
  - explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships (AC9S4U01)
  - examine the properties of natural and made materials including fibres, metals, glass and plastics and consider how these properties influence their use (AC9S4U04)
  - consider how people use scientific explanations to meet a need or solve a problem (AC9S4H02)
  - Year 4 science inquiry skills (AC9S4I01, AC9S4I02, AC9S4I03, AC9S4I04, AC9S4I05, AC9S4I06)

HASS – geography

- Year 4
  - interpret information and data displayed in different formats (AC9HS4S03)
  - analyse information and data, and identify perspectives (AC9HS4S04)
  - propose actions or responses to an issue or challenge that consider possible effects of actions (AC9HS4S06)
  - the importance of environments, including natural vegetation and water sources, to animals and people in Australia and on another continent (AC9HS4K05)
  - sustainable use and management of renewable and non-renewable resources, including the custodial responsibility First Nations Australians have for Country/Place (AC9HS4K06)

HASS – English, persuasion focus

- Year 4
  - identify the subjective language of opinion and feeling, and the objective language of factual reporting (AC9E4LA02)
  - identify how texts across the curriculum have different language features and are typically organised into characteristic stages depending on purposes (AC9E4LA03)
  - identify how text connectives including temporal and conditional words, and topic word associations are used to sequence and connect ideas (AC9E4LA04)
  - explore the effect of choices when framing an image, placement of elements in the image and salience on composition of still and moving images in texts (AC9E4LA10)
  - listen for key points and information to carry out tasks and contribute to discussions, acknowledging another opinion, linking a response to the topic, and sharing and extending ideas and information (AC9E4LY02)
  - identify the characteristic features used in imaginative, informative and persuasive texts to meet the purpose of the text (AC9E4LY03)
  - plan, create, edit and publish written and multimodal imaginative, informative and persuasive texts, using visual features, relevant linked ideas, complex sentences, appropriate tense, synonyms and antonyms, correct spelling of multisyllabic words and simple punctuation (AC9E4LY06)
  - plan, create, rehearse and deliver structured oral and/or multimodal presentations to report on a topic, tell a story, recount events or present an argument using subjective and objective language, complex sentences, visual features, tone, pace, pitch and volume (AC9E4LY07)

Design technologies

- recognise different types of data and explore how the same data can be represented differently depending on the purpose (AC9TDI4K03)

General capabilities

- digital literacy (investigating, creating and exchanging)
- personal and social capability (collaboration, communication)
- ethical understanding (understanding ethical concepts and perspectives)

Goal and Driving Question	Question: Are we destroying the earth's food chain and our future by our laziness and ignorance around the use and disposal of plastic? Demonstrate your understanding of science knowledge, the science inquiry process, and using evidence to persuade and propose solutions that reduce or eliminate plastic usage in our community.
Role	You are concerned scientists and activists who are committed to creating a sustainable future for yourselves and your community.
Audience	Peers, school board, local councillors and environmental experts.
Situation	1. Logical sequence of understandings: 2. 1. We use a lot of plastic because it is so beneficial to being able to operate in a global economy. 3. 2. The world is being polluted by an increasing amount of plastic waste because we are not responsibly managing its usage and disposal/recycling. 4. 3. We can create a sustainable future for the environment and the world by taking actions to manage our plastic usage and disposal/recycling. 5. Assessment sheet description: 6. We use a lot of plastic because it is so beneficial to being able to operate in a global economy. Since plastic packaging is so durable it can be very thin. This means it uses fewer resources and takes up less space for transport, which means fewer trucks, trains or planes are needed to transport items. Plastic can also be recycled many times to create new products. 7. However, the world is being polluted by an increasing amount of plastic waste because we are not responsibly managing its usage and disposal/recycling. This waste is making its way into the ecosystem and impacting the entire food chain. Marine animals like turtles can choke on plastic bags mistaken for jellyfish, seabirds get entangled and larger animals like whales can starve because their stomachs are so full of plastic they've eaten: 8. 85% of Australian seabirds are affected by plastic pollution. 9. 95% of plastic packaging is discarded after a single use. 10. Every seal, dolphin and whale washed up on British shores had microplastic in their stomachs. 11. We can create a sustainable future for the environment and the world by taking actions to manage our plastic usage and disposal/recycling.
Product/performance	12. By the end of this challenge you will take a tangible action to reduce or eliminate plastic usage and/or improve plastic disposal/recycling in your personal lives and in the school community. You will present the results of your personal actions and also your proposal for actions for the school community. 13. The project will have two deliverables: 14. 1. scientific action-research report with data presentations including: 15. benefits and challenges of plastic 16. your family's usage of plastic and its disposal/recycling prior to action 17. list of actions you are taking to reduce or eliminate plastic usage or disposal/recycling 18. tracking of the effect of these actions on the family usage and disposal/recycling. 19. 2. persuasive presentation of a possible solution to reduce or eliminate plastic usage and/or improve plastic disposal/recycling in school environments.
Standards	Rubrics to be designed for the identified skills and knowledge elements.

Design phase	Approx. time to complete	Checklist steps
Empathise		1. We use a lot of plastic because it is so beneficial to being able to operate in a global economy • Why and where is plastic used? • Brainstorm with students. • Use images from magazines and online to spark thinking (cups, plastics bottles, plates, toiletries, cling wrap, pens, cords, etc.). ° Set a homework task that has the students identify the plastics in each room of their house with their parents help. » Also go to the supermarket and identify what items have plastic on them. ° Mind-map where plastic is used in our lives, and in the school. ° Share videos and articles of benefits. • Milestone deliverable: ° benefits and challenges of plastic ° explicitly teach ° students about collecting data and how to present data in various ways ° explore opinions versus facts ° how to research ° science and HASS elements. 2. The world is being polluted by an increasing amount of plastic waste because we are not responsibly managing its usage and disposal/recycling. • Tune in – explore global impact: ° turtle with straw up its nose ° pictures – before and after ° videos – people throwing away stuff, garbage patch, war of waste video ° group research task on the ways that plastic affects our planet (environment, oceans, landfill, animals, etc). • Explicit teaching of science and HASS aspects: ° food cycles, sustainability, environment ° effect of human actions on the environment ° classroom discussions ° cause and effect games. • Personal behaviour once plastic is used or broken: ° Have the students engage with what do they do when they finish with plastic. ° Homework assignment – count the plastic in their bins? How do they use, recycle or dispose of plastic? Discussion with parents. ° Incursion from local council waste/environmental person. ° What are the behaviours that lead to the plastic pollution? ° Goal of this section is for the kids to get that it is a real problem and they are the cause of the problem (thus they can do something about it). • Milestone deliverable: ° your family's usage of plastic and its disposal/recycling prior to taking action ° opportunities to refine and improve report using feedback and bump it up walls. • Personal mini action-research project: ° Students identify the family behavioural causes of plastic pollution. ° Brainstorm potential actions they can take as a family to reduce usage and improve recycling and disposal of plastics at home. ° Take action over several weeks and collect data. ° While doing the personal project the students can be collecting data form plastic usage and recycling/ disposal around the school. • Milestone deliverable: ° list of actions you are taking to reduce or eliminate plastic usage or disposal/recycling ° tracking of the effect of these actions on the family usage and disposal/recycling ° opportunities to refine and improve report using feedback and bump it up walls.
Define		• Milestone deliverable: • presentation of shortened version of reports to class. • discussions and identification of personal behaviour (thinking and action) that leads to unsustainable plastic usage and disposal/recycling • discussions and presentation of data of plastic usage and recycling/disposal around the school • identification of areas and behaviours that could tackle around the school.

Design phase	Approx. time to complete	Checklist steps
Ideate–prototype–test		▪ We can create a sustainable future for the environment and the world by taking actions to manage our plastic usage and disposal/recycling. ▪ Brainstorm possible solutions to the behaviours: a. ad campaign? b. sorting bins and education program? c. organising the school bins and separate into different types? d. naked food days? e. advertising jingles for bells talking about waste? f. student duty roster to pick up plastic rubbish? g. removal of plastics from canteen? h. a movement/environmental action group? i. a new product? j. an alternative material? k. social media campaign? l. other? • Students to iterate through mini experiments that test their chosen whole school solutions with small groups: • Focus on science inquiry process. • Ensure there is sufficient time to test ideas and gather evidence of the impact of different experiments on the behaviour of different stakeholders. • Conference with students each 1–2 lessons so they can develop collaborative skills but also learn how to use the science inquiry process appropriately to gather evidence of impact of their experiments.
Deliver		• Creation of persuasive presentation using general data, personal data and school data - multiple opportunities to refine and improve based on feedback. • Practice the presentation – multiple opportunities to practice with peers and environmental experts receive feedback. • Culminating event where students present to school board and local councillors with a request for funding to support actions.

Note: The empathise phase planning for Throw Away Fashion unit was the result of about an hour of lively discussion and thinking by a small group of teachers. Many of the articles were taken from newspaper sites from around the world with the intent to give a broad view of the drivers, challenges and possibilities engendered by the current throw away fashion industry. The articles not only provide different perspectives on the range of issues and sustainability problems with the current throw away fashion, some were chosen because they provide possible solutions. A number of the videos were TED talks from experts and from national broadcasters who engagingly present possible solutions but also question our own behaviours around fashion. The situation description involved garnering key information from the various articles and attempting to show the urgency of the challenge – globally as well as locally. The needs and challenges statements were created by thinking about some of the stakeholders in the fashion industry pipeline and what were the considerations that could be there for them. This could be a great empathising activity for students because you could have them stand in the shoes of each stakeholder and think about their specific needs. The listed questions arose as the teachers discussed the issues and challenges and this easily led into identifying why the students should care

SAMPLE LESSON-PLANNING TEMPLATE

Design thinking stages	Learning intention and success criteria	Learning experiences and instruction	Formative assessment / feedback strategy
Empathise Plan motivational learning experiences that immerse students and have them gain a deeper appreciation and understanding of the needs, behaviours and dimensions of the issues that are involved	We are learning to … I can ▪ ▪	**Lesson 1:** **Lesson 2:**	
	We are learning to … I can ▪ ▪	**Lesson 3:** **Lesson 4:** **Lesson 5:** **Specialist lesson**:	
Define Plan learning activities that take students through a synthesis process (creatively piecing together the puzzle together to form whole ideas) with the aim of identifying the problem they want to solve. Younger students may need direction. (Update curriculum links based on student identified problems)	We are learning to … I can ▪ ▪	**Lesson 6:** **Lesson 7:**	
Iterative improvement cycle **Ideate** Students brainstorm and develop creative solutions to solve the problem. They design their solution.. **Prototype** Students bring their designs to life by creating tangible objects/ solutions. **Test** Students check and test prototype and evaluate effectiveness.	We are learning to … I can ▪ ▪	**Lesson 8:** **Lesson 9:** **Lesson 10:** **Lesson 11**	
	We are learning to … I can ▪ ▪	**Lesson 12:** **Lesson 13:** **Lesson 14:** **Lesson 15:**	
	We are learning to … I can ▪ ▪	**Lesson 16:**	
Communicate Students communicate and or deliver on the Product or Performance	We are learning to … I can ▪ ▪	**Lesson 17:**	

CAN DO TEMPLATE

I have heard of this	I can do this with help	I can do this on my own	I have taught this to a peer	I CAN list items	Evidence of level
We are learning to:					

LEVELS A–C OF THE DECONSTRUCTED SELF-REGULATION PROGRESSION MAPPED TO ZIMMERMAN AND MOYLAN'S (2009) MODEL

Phase	Level A (teacher directed)	Level B (engage in class tasks if interested)	Level C (beginning to monitor approach to learning)
Forethought phase	When given a task by my teacher: ▪ I believe that the task might be too hard. ▪ I want my teacher to tell me I can do it. ▪ I want to have help from my teacher to have a go at the task.	When given a task by my teacher: ▪ I believe that the task might be hard, but could be interesting. ▪ I want my friends to think I am clever. ▪ I ask my teacher how I can have a go at the parts of the task I don't know how to do.	When given a task by my teacher: ▪ I believe that I can learn how to do the task. ▪ I want to have a go at the whole task because I want to learn how to always get the answers right. ▪ I can set goals related to the task with help.
Performance phase	As I work on the task: ▪ I follow the steps the teacher tells me to do for the task. ▪ I have a go at those parts I know I can do or I think aren't too hard. ▪ I sometimes hand in unfinished work or work that is not my best effort. ▪ I can become distracted easily. ▪ I rely on other students to model task-focused behaviour for me. ▪ I am motivated to work on the task because I want a good report or I want to please the teacher.	As I work on the task: ▪ I have a go at parts of the task by myself. ▪ I become distracted when I think the task is too difficult. ▪ I can recognise the learning strategies that work for me when doing difficult tasks. ▪ I focus only on the information provided. ▪ I am motivated to work on the task because I want to get it right.	As I work on the task: ▪ I have a go at the whole task with help from my teacher/ peers. ▪ I make an effort to ignore distractions when I am getting distracted. ▪ I am more comfortable doing tasks that I have done before because I know I can do them well. ▪ I hand in my best effort when I respond to a task.
Self-reflection phase	After I complete the task: ▪ I forget what I worked on. ▪ I don't ask for feedback. ▪ If I don't do well on a task I think it is because I am not good at it. ▪ I enjoy learning when I find the task easy.	After I complete the task: ▪ I don't reflect on or check my work. ▪ I don't use any feedback I have been given. ▪ If I don't do well on a task I don't think I can do much about it. ▪ I enjoy learning when I find the task interesting.	After I complete the task: ▪ I check my work with help from my teacher. ▪ I trust my teacher's advice and rely on them to give me feedback. ▪ If I don't do well on a task I think it is because the teacher didn't help me enough. ▪ I want to improve and will put in more effort next time. ▪ I enjoy learning because I want to do well at school.

Source: Adapted from Harding et al. (2018), and Zimmerman and Moylan (2009)

STEM CONFERENCING TEMPLATE

Name(s) and date	Topic/project	Design process stage
		☐ Empathise ☐ Define ☐ Ideate ☐ Prototype/test ☐ Evaluate
Prompting questions	**Student comments**	**Teacher notes**
▪ What have I learnt? ▪ What have I achieved? ▪ What is next and how will I get there? ▪ What changes do I need to make? ▪ What resources do I need? ▪ How can I work more effectively? ▪ What are my wonderings/questions?		
Future goal/s (to be negotiated by teacher and student)	**Strategies to improve**	

ACTION-RESEARCH PLANNING TEMPLATE

Challenges this action-research project is trying to address	**Research question** **What improvement is evident in** *[learning area where I desire improvement]* **when I implement** *[the strategies that I am researching the effect of]***?**

Outcomes **What is your vision of success? What do you expect to see as a result?** **How will you know you have succeeded?**			
Outcomes	**What evidence do I need to be gathering to measure progress towards this outcome? How will I gather it?**	**Strategies and possible actions to accomplish this outcome (what, who, by when)**	**What resources will I need to take these actions?** **Include $$, PD, research & human resources.**
Student outcomes: *1.* *2.* *3.*			
My outcomes: *1.* *2.* *3.*			

Actions **What are the actions required in each cycle to successfully accomplish the goal?** **(Include milestones.)**				
Outcomes	**First 5-week cycle**	**Second 5-week cycle**	**Third 5-week cycle**	**Fourth 5-week cycle**
Student outcomes: *1.* *2.* *3.*				
My outcomes: *1.* *2.* *3.*				

Challenges/obstacles to achieving the outcomes	**Potential solutions**

GUIDING COALITION ACTION-RESEARCH PROJECT PLANNING TEMPLATE

Action-research project planning template

Name:	**Role:**

Guiding coalition members

Name:	Role:
Name:	Role:
Name:	Role:
Name:	Role:
Name:	Role:

Vision and mission for the project

Vision: We are deeply passionate about …   Mission: We want to be known for …

Challenges this action-research project is trying to address	**Research question** **What improvement is evident in** ***[learning area where I desire improvement]*** **when I implement** ***[the strategies that I am researching the effect of]*****?**

Outcomes **What is your vision of success? What do you expect to see as a result?** **How will you know you have succeeded?**			
Outcomes	**What evidence do I need to be gathering to measure progress towards this outcome? How will I gather it?**	**Strategies and possible actions to accomplish this outcome (what, who, by when)**	**What resources will I need to take these actions? Include $$, PD, research & human resources.**
Student outcomes: *1.* *2.* *3.*			
My outcomes: *1.* *2.* *3.*			

Actions What are the actions required in each cycle to successfully accomplish the goal? (Include milestones.)				
Outcomes	**First 5-week cycle**	**Second 5-week cycle**	**Third 5-week cycle**	**Fourth 5-week cycle**
Student outcomes: *1.* *2.* *3.*				
My outcomes: *1.* *2.* *3.*				

Challenges/obstacles to achieving the outcomes	**Potential solutions**

ADDITIONAL ONE-PAGE ASSESSMENT SHEETS AND DESIGN BRIEFS

Design brief: Design a playground

As all students know, the current upper primary playground consists of two basic structures and is quite pathetic. It doesn't have any swings, monkey bars, or anything that is fun and exciting to play with. Even worse it is rusting away and falling apart. No-one wants to play on it.

Three years ago, the principal asked students to design a new playground, but unfortunately she didn't have the funding at the time and has since lost the previous planning. The playground desperately needs an upgrade and the principal has asked the Years 3–6 students to create a playground design that she will have builders build in next year.

Culminating task: assessment requirements

To demonstrate your ability to design an actual playground and persuade others to fund it to be built you will be the designers and architects of an upper primary playground to replace the current one.

Your final design report should include:

- a discussion of the PMI of the current playground
- a report on the key features desired
- a 2D map of the playground with a legend
- a 3D model of the playground
- an explanation of the benefits of your playground.

You are also to create a short (no longer than 2 minutes) persuasive presentation that highlights the benefits and opportunities of your proposal. Make sure you practise this with your family and friends before the presentation date.

This is a creative task and will require you to not only complete the assigned tasks, but try to think outside the square!

Support material:

You will be given a pre-assessment map, co-construct a rubric for assessment with your teacher, and use a PMI graphic organiser evaluation as part of the design process. All of these must be completed and submitted at the end of the unit. Remember it is your job to provide evidence that you have achieved the required progression points for each skill.

Due date and audience:

There are two stages of presenting in this project. You will be presenting your models and solutions to your classroom peers at the start of Week 9 of Term 4. They will use the rubric you co-construct with your teacher to assess the strengths and areas of development in your presentation. You will then have the opportunity to refine your presentation. Towards the end of Week 9 you will present to your refined version to the teachers, principal, assistant principal, school association and a community grants team.

Engineering Academy Program: Engineering the future

Engineering is used to solve real world problems and build our future. Many of the so-called 'wonders of modern science' are really wonders of modern engineering. For example, engineering is used to:

- protect the world's natural resources and enable them to be used more efficiently
- invent new types of diagnostic medical scanners
- design and build safer, faster, quieter, more fuel-efficient transport
- create smaller smartphones that are easier to use
- synthesise biologically compatible materials for artificial limbs
- replace railroad crossings to improve traffic flow.

Engineers use science combined with the design process to solve problems and create new designs that benefit humanity. As part of the design process engineers test their ideas cheaply and quickly by making prototypes using a variety of materials and techniques. The more we understand the design process and how to prototype our ideas, the more effective we will be at solving problems.

For the Engineering Academy Program you will be developing your knowledge and skills in maths, science and design by being a group of engineers who are using the design process to break down and solve everyday problems to make life easier. Your goal is to use engineering to solve real-world problems!

Culminating task: assessment requirements

By the end of the Engineering Academy Program you will have been involved in three phases of learning and action.

- In Phase 1 you will be exploring how engineering is used to solve real-world problems and how the design process is used to solve problems. You will be involved with a range of mini design challenges where you will work collaboratively to come up with practical solutions.
- In Phase 2 you will explore how to use a variety of materials and/or techniques to produce prototypes. A prototype is a draft version of a product that allows you to explore your ideas and show the intention behind a feature or the overall design concept to users.
- In Phase 3 you will bring all your learning and thinking together to come up with a solution to a real-life challenge.

Support material:

You will each be provided a planning checklist, a range of templates and resources, and a formative rubric. These will need to be completed and submitted at the end of the unit to demonstrate your growth in knowledge, skills and thinking throughout the unit. An online design portfolio will be set up to support your collection of the evidence of your thinking and planning. Remember it is your job to provide evidence that you have completed each checklist item and achieved the required progression points for each skill.

Due date and audience:

You will be presenting your solution to a real-life challenge and your design portfolio at an expo arranged for parents and students from other year levels in Week 8 of Term 4. More details will be provided at the start of Term 4.

Music Academy Program: Making moving music

Music has the power to stimulate strong emotions within us. It is probably rare not to be somehow emotionally affected by music. Most of us also listen to music in order to experience emotions. Music is used to tell stories and movie composers use pitch, tone and tempo to set scenes and create different feelings and emotions. As musicians the more we understand the effects that music can have on us the more we can use it use it to communicate and evoke emotions and feelings.

For the Music Academy Program you will be developing your music knowledge and skills by being a group of musicians who are committed to encouraging young children to read through the use of music. Your goal is learn how to play violin and a range of other musical instruments and tell a story through music.

Culminating task: assessment requirements

By the end of the Music Academy Program you will be involved in creating two musical pieces:

- the soundtrack for short movie scene
- the backing track for a storybook that will be read to students in the junior school.

To aid you in this you will be learning to play the violin as well as experimenting with a range of different musical instruments (e.g., percussion instruments; cymbals, triangle, drums, shakers, pan pipes, glockenspiel, guiro etc.) to create the different tones, pitches and tempos to make music that moves people.

Support material:

You will each be provided with your own violin and music book to support your development of playing the violin at home. You will also be given music reflection templates during the course of the unit for you to complete at home.

Due date and audience:

There are two performances as part of this project. The first soundtrack performance will be a small group performance, which will be given for our academy group at the end of Term 3.

The second backing track for a storybook will be presented in our final few weeks of school for the junior students.

EMPATHISE AND DEFINE SKILLS EXCERPTED FROM A DEVELOPMENTAL DESIGN PROCESS RUBRIC

Skill	Essential (below level standard; uni-structural)	Developing (at level standard, low; multi-structural)	Capable (at level standard, high; relational)	Proficient (above level standard; extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Empathise Process of completing the following to come to a deep understanding of a challenge and who you are designing for. **Elements** ▪ identifying goals and sub-goals of the challenge/task ▪ giving up assumptions ▪ gathering information and data about needs, opportunities and possible resources ▪ putting yourself in the shoes of the user. *Note: Empathise phase includes skills of decomposition (computational thinking) and the Investigating elements of Design and Technologies Strand: Production and Processes.*	▪ I can identify the overall goal of the task/challenge. ▪ I can adopt a 'beginner's mindset'. ▪ I can ask questions to find out information about the task/challenge. ▪ I can identify that I made certain assumptions as I gathered information. ▪ I can identify ways I can gather information.	**Plus:** ▪ I can break down the goal into small sub-goals/-tasks. ▪ I can ask questions to clarify information and to more deeply understand each sub-goal/-task and the resources that could be used. ▪ I can describe the assumptions I made as I gathered information. ▪ I can describe ways I could gather information to understand the sub-goals/-tasks.	**Plus:** ▪ I can use two or three strategies from the strategy document to gather information to understand the sub-goals/-task, the user and the resources that could be used. ▪ I can justify the assumptions I made as I gathered information and data.	**Plus:** ▪ I can use multiple further strategies from the strategy document to gather information that deepens my understanding of the sub-goals/-tasks, the current and future user(s) and the resources that could be used. ▪ I can compare and contrast the effectiveness of the strategies I used to gather information and data. ▪ I can reflect upon how the strategies I used to gather information can be used in other situations/areas.	Create a skill-level appropriate strategy document of approaches that can be used to gather background information. This should include: ▪ asking questions ▪ trialling ideas ▪ observations ▪ iterating ▪ expert knowledge ▪ collaborating with others ▪ identifying, gathering and playing with possible resources ▪ investigating and researching First Nations Australians' designs and resources ▪ experimenting with traditional and contemporary technologies ▪ examining tools, techniques, equipment and relationships of properties for complementary materials for product development. *Note: Resources includes materials, components, tools and equipment.*
Define Process of synthesising the information that was created during the empathise stage for the purpose of looking for patterns and gaining insight to articulate what to focus on or the problem that will be solved. **Elements** ▪ defining the needs and wants that need to be addressed ▪ identifying what is important or not ▪ strategies to recognise patterns & narrow down the design space ▪ defining specific problems and the causes of problems to be worked on ▪ identifying possible resources and techniques that could be used ▪ creating a design brief. *Note: Define phase includes skills of pattern recognition and abstraction (computational thinking) and the Defining elements of Design and Technologies Strand: Production and Processes.*	▪ I can identify the wants and needs that the end product/result must address. ▪ I can name possible categories that the information and data could be organised into. ▪ I can identify what is relevant to a topic and what is not. ▪ I can list some of the resources that may be required to create a solution.	**Plus:** ▪ I can describe the wants and needs that the end product/result must address and rate the importance of each one to the user. ▪ I can sort and classify the information and data I have collected into categories. ▪ I can identify patterns in the information and data. ▪ I can use the patterns I identified to discuss what is important and what is not. ▪ I can explore and test the suitability of a range of the resources and techniques that could be used to create a solution.	**Plus:** ▪ I can explain the possible causes of the wants and needs that the end product/result must address and discuss the opportunity a designed solution will present. ▪ I can use a range of ways to represent/visualise the information and data to help make sense of patterns, relationships and trends (e.g. mind maps, graphs, trends, cause and effect diagrams). ▪ I can investigate already existing designs & associated technologies and resources. ▪ I can explain how I selected the resources, technologies and techniques that could be used to create a solution that satisfies a design brief.	**Plus:** ▪ I can make generalisations and insights based on the data I have collected, organised, sorted and analysed. ▪ I can create a design brief that reflects the wants and needs to be addressed, identifying: ° the goals of design (needs and wants) ° target market ° constraints ° sustainability requirements ° resources, technologies and techniques to be used to create a solution ° budget and schedule.	Create a skill-level appropriate strategy document of approaches that can be used to narrow down and define the specific problem and needs that the designed solution will address. This should include: ▪ considering sustainability ▪ exploring tools that could be used ▪ exploring suitability and sustainability of potential materials ▪ exploring techniques to use to create models and product ▪ considering existing products and processes to inform thinking ▪ considering environmental and social impacts of manufacturing approach ▪ considering accuracy, quality, safety and efficiency of production processes. *Note: Resources includes materials, components, tools and equipment.*

DESIGN PROCESS FORMATIVE RUBRIC (AUSTRALIAN CURRICULUM 8.4)

Skill	Essential (below level standard; uni-structural)	Developing (at level standard, low; multi-structural)	Capable (at level standard, high; relational)	Proficient (above level standard; extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Empathise Process of: ▪ identifying goals and sub-goals of the challenge/task ▪ giving up assumptions ▪ gathering information and data ▪ putting yourself in the shoes of the user so as to come to a deep understanding of a challenge and who you are designing for. **Elements** ▪ goal and sub-goals of the challenge/task ▪ assumptions ▪ progressive depth of strategies to gather information and data. *Note: empathise phase includes skills of decomposition (computational thinking) and the Investigating elements of Design and Technologies Strand: Production and Processes.*	▪ I can identify the overall goal of the task/challenge. ▪ I can adopt a 'beginners mindset'. ▪ I can ask questions to find out information about the task/challenge. ▪ I can identify that I made certain assumptions as I gathered information. ▪ I can identify ways I can gather information.	**Plus:** ▪ I can break down the goal into small sub-goals/tasks. ▪ I can ask questions to clarify information and to more deeply understand each sub-goal/task. ▪ I can describe the assumptions I made as I gathered information. ▪ I can describe ways I could gather information to understand the sub-goals/task.	**Plus:** ▪ I can use two or three strategies from the empathise strategy document to gather information to understand the sub-goals/task and the user. ▪ I can justify the assumptions I made as I gathered information.	**Plus:** ▪ I can use multiple further strategies from the empathise strategy document to gather information that deepens my understanding of the sub-goals/task and the current and future user(s). ▪ I can compare and contrast the effectiveness of the strategies I used to gather information. ▪ I can reflect upon how the strategies I used to gather information can be used in other situations/areas.	Create a skill-level appropriate empathise strategy document of approaches that can be used to gather background information. Include: ▪ asking questions ▪ trialling ideas ▪ observations ▪ tinkering ▪ expert knowledge ▪ collaborating with others ▪ identifying, gathering and playing with materials, components, tools and equipment.
Define Process of: ▪ synthesising the information that was created during the empathise stage ▪ for the purpose of looking for patterns and gaining insight so as to articulate what to focus on or the problem that will be solved **Elements** ▪ defining the needs and wants that need to be addressed ▪ identifying what is important or not ▪ strategies to recognise patterns and narrow down the design space ▪ defining specific problems/causes of problems that will actually work upon ▪ resources, techniques possibly required ▪ design brief. *Note: define phase includes skills of pattern recognition and abstraction (computational thinking) and the Defining elements of Design and Technologies Strand: Production and Processes.*	▪ I can identify the wants and needs that the end product/result must address. ▪ I can name possible categories that the information/data could be organised into. ▪ I can identify what is relevant to a topic and what is not. ▪ I can list some of the resources that may be required to create a solution	**Plus:** ▪ I can describe the wants and needs that the end product/result must address and rate the importance of each one to the user. ▪ I can sort and classify the information/data I have collected into categories. ▪ I can identify patterns in the data/information. ▪ I can use the patterns I identified to discuss what is important and what is not. ▪ I can explore and test the suitability of a range of the resources and techniques that could be used to create a solution.	**Plus:** ▪ I can explain the possible causes of the wants and needs that the end product/result must address and discuss the opportunity a designed solution will present. ▪ I can use a range of ways to represent/visualise the information/data to help make sense of patterns, relationships and trends (e.g. mindmaps, graphs, trends, cause and effect diagrams, etc). ▪ I can investigate already existing designs and associated technologies and resources. ▪ I can explain how I selected the resources, technologies and techniques that could be used to create a solution that satisfies a design brief given to me.	**Plus:** ▪ I can make generalisations and insights based on the data I have collected, organised, sorted and analysed. ▪ I can create a design brief that reflects the wants and needs to be addressed. The design brief identifies: ▪ the goals of design (needs and wants) ▪ target market ▪ constraints ▪ sustainability requirements ▪ resources, technologies and techniques to be used to create a solution ▪ budget and schedule.	Create a skill-level appropriate define strategy document of approaches that can be used to narrow down and define the specific problem and needs the designed solution will address: ▪ considering sustainability ▪ exploring tools that could be used ▪ exploring suitability and sustainability of potential materials ▪ exploring techniques to use to create models and product ▪ considering existing products and processes to inform thinking ▪ considering environmental and social impacts of manufacturing approach ▪ considering accuracy, quality, safety and efficiency of production processes. *Note: resources include materials, components, tools and equipment.*

Skill	Essential (below level standard; uni-structural)	Developing (at level standard, low; multi-structural)	Capable (at level standard, high; relational)	Proficient (above level standard; extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Ideate Process of: ▪ generating a large quantity of ideas ▪ filtering down the ideas into the best, most practical or most innovative ones in order to inspire new and better design solutions and products **Elements** Generating: ▪ different strategies for generating a large quantity of design ideas. Developing: ▪ different strategies to assess and develop design ideas to assist in filtering down the ideas. Testing: ▪ different strategies to test the design ideas in the process of filtering the ideas into the best, most practical or most innovative one. Communicating: ▪ different strategies to document and communicate the design ideas to an intended audience. *Note: ideate phase includes skill of planning a series of steps (algorithm in computational thinking) and the Generating and Designing elements of Design and Technologies Strand: Production and Processes.*	Generating ▪ I can compare and contrast features of existing designed solutions to provide new ideas. Developing ▪ I can list what I like and dislike about a design idea Testing ▪ I can use at least one simple testing method to assess and record what I like and dislike about my design idea Communicating ▪ I can draw/sketch 2D drawings of my design idea(s). ▪ I can name and label my design idea(s). ▪ I can use a range of technologies to show different views (top view and side view) of design idea(s). ▪ I can describe how my design idea meet the needs of those who will use the solution.	**Plus:** Generating ▪ I can use prior knowledge or research to generate a range of design ideas. Developing ▪ I can list the pros and cons of a design idea ▪ I can develop several alternative versions of design ideas based on the listed pros and cons Testing ▪ I can identify the properties of materials needed for a design idea ▪ I can explore ways of successfully joining, connecting and assembling components of a design idea Communicating ▪ I can annotate my sketches/ design to clarify the pros and cons of each design idea. ▪ I can annotate my sketches/ design to explain features and modifications. ▪ I can use digital and/or paper based tools to document and share ideas. ▪ I can use basic modelling and drawing strategies when representing and communicating my design ideas.	**Plus:** Generating ▪ I can use a further one or two strategies from the Ideation Strategy Document: Generating Strategies section to generate innovative design ideas. Developing ▪ I can seek feedback on the benefits and drawbacks of design ideas. ▪ I can develop several alternative versions of design ideas based on the feedback. ▪ I can use a further one or two strategies from the ideation strategy document to identify which ideas to further explore and investigate. Testing ▪ I can identify the tools, equipment and processes that could be used in creating each design idea ▪ I can analyse and modify each design idea to improve its sustainability ▪ I can experiment with a range of materials, tools and equipment to refine each design idea Communicating ▪ I can produce annotated concept sketches and drawings using detailed modelling and drawing strategies. ▪ I can describe different design ideas and explain: ▪ the 'user experience' ▪ the instructions to operate the solution. ▪ I can create a portfolio that documents and communicates the generation and development of design ideas for an intended audience.	**Plus:** Generating ▪ I can use multiple strategies from the Ideation Strategy Document: Generating Strategies section to generate a range of innovative design ideas. Developing ▪ I can use multiple strategies from the ideation strategy document to analyse the functional, structural and aesthetic benefits and constraints of the design ideas. Testing ▪ I can develop models or samples using a range of materials, tools and equipment to test the functionality of design ideas ▪ I can considering competing variables that may hinder or enhance project development Communicating ▪ I can use comprehensive modelling and drawing strategies to explore design ideas and show an understanding of key aesthetic considerations in competing designs. ▪ I can further develop my portfolio by including appropriate technical terms, multiple models and prototypes, and justification of the decisions made.	Create a skill-level appropriate ideation strategy document of approaches that can be used to generate, develop, test and communicate design ideas. Generating strategies: ▪ critical and creative thinking strategies such as brainstorming, sketching, 3-d modelling and experimenting ▪ combining and modifying ideas ▪ exploring functionality. Developing strategies: ▪ feedback from users and others on the benefits and drawbacks of design ideas ▪ factors that could hinder or enhance the design idea ▪ appeal and acceptance of the design idea ▪ benefits and constraints of the design idea in different communities ▪ impact of emerging technology on the design idea. Testing strategies: ▪ variety of simple testing methods – taste, feel, see, smell, listen ▪ properties of materials that could be used ▪ processes that could be used ▪ considering the selection of materials and joining techniques to suit the purpose of a product ▪ consider competing variables such as weight, strength and price; laws; social protocols and community consultation processes. Communication strategies ▪ drawing/sketching ▪ various annotation techniques include thumbnail drawings, models, labels and notes ▪ software to show different views include; sketchup, tinkercad, minecraft, ms paint, iPad apps etc. ▪ digital tools to document and share ideas include; blogs, vlogs, collaborative documents etc. ▪ modelling and drawing strategies include: ° basic – scale; symbols and codes in diagrams; pictorial maps and aerial views using web mapping service applications, etc ° detailed – technical terms, production drawings, orthogonal drawings; patterns and templates to explain design ideas ° comprehensive – technical drawing techniques, digital imaging programs, 3d printers or augmented reality modelling software; producing multiple prototypes/ models, steps of the design process. *Note: design ideas include products, services, environments or systems at different year levels.*

Skill	Essential (below level standard; uni-structural)	Developing (at level standard, low; multi-structural)	Capable (at level standard, high; relational)	Proficient (above level standard; extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Prototype/test Iterative process of: ▪ creating a model, simulation or scaled down prototype of the product ▪ gaining a view of the product and its features ▪ gathering data to use to evaluate how well the product meets expectations, wants and needs with the aim of identifying the best possible solution using minimal time and effort. **Elements** Prototyping: ▪ different prototyping techniques to create a scaled down model or simulation. Making: ▪ different making techniques for a product, service, environment or system. Safety: ▪ different strategies to work safely and to identify, manage and reduce risk during the prototyping/testing process. *Note: prototype/test phase includes the skills of modelling and simulation (in computational thinking) and the Producing and Implementing elements of Design and Technologies Strand: Production and Processes.*	Prototyping ▪ I can make a model or prototype of a design idea by using every day and/or discarded materials in various ways Making ▪ I can assemble parts of a product, service, environment or system. ▪ I can demonstrate a range of technical making skills when using tools and equipment. ▪ I can check that the assembled components work as planned. Safety ▪ I can safely practise a range of technical skills using tools and equipment.	**Plus:** Prototyping ▪ I can explore ways of joining, connecting and assembling components for a model or prototype ▪ I can discuss the influence of digital technologies on prototyping processes Making ▪ I can use the appropriate terminology when I describe and share the procedures and techniques I used in the making process. ▪ I can use tools and equipment accurately when making. ▪ I can explain the importance of accuracy when designing and making. ▪ I can describe the environmental impact of the materials, components, tools, equipment and processes I selected and used in the making process. ▪ I can gather data to use to evaluate how well the designed solution meets my expectations. Safety ▪ I can demonstrate safe, responsible and cooperative work practices when making designed solutions. ▪ I can use appropriate personal protective equipment when making designed solutions.	**Plus:** Prototyping ▪ I can match material and joining techniques to the design intention ▪ I can practice prototyping techniques to improve my expertise ▪ I can compare and contrast the merits of different prototyping techniques Making ▪ I can use the appropriate tools, equipment and techniques to manipulate materials when making. ▪ I can independently develop technical making skills to produce quality designed solutions. ▪ I can explain how my solution is designed for sustainability. ▪ I can compare and contrast alternative making approaches that could be substituted to reduce waste or time. ▪ I can gather data to use to evaluate how well the designed solution meets the user wants and needs. Safety ▪ I can safely use a range of making approaches (traditional, contemporary, alternative). ▪ I can work safely, responsibly and cooperatively to ensure safe work areas. ▪ I can identify risks (including uncertainty, long-term health impacts, environmental impacts) in the development of various projects.	**Plus:** Prototyping ▪ I can experiment with innovative combinations of prototyping techniques ▪ I can experiment with ways of manipulating traditional and contemporary prototyping techniques ▪ I can evaluate and debate the merits of different prototyping techniques with my peers Making ▪ I can refine my technical making skills. ▪ I can independently use production skills to produce quality designed solutions. ▪ I can maximise sustainability in the making approaches that I use. ▪ I can modify production processes to respond to unforeseen challenges or opportunities. ▪ I can develop innovative ways of manipulating technologies using traditional and contemporary making approaches. Safety ▪ I can independently develop safe working practices when making designed solutions. ▪ I can manage and reduce risks (including uncertainty, long-term health impacts, environmental impacts) in the development of various projects. ▪ I can explain safe working practices required for a specific designed solution.	Create a skill-level appropriate prototype/test strategy document of approaches that can be used to safely prototype and make a designed solution. Prototyping techniques: ▪ range of traditional and contemporary materials, components, tools, equipment and techniques, including ▪ using discarded materials to design, make and model ▪ cutting and joining materials ▪ sewing ▪ gluing ▪ soldering. Making techniques for a product, service, environment or system: ▪ traditional, contemporary and emerging technologies, materials, components, tools, equipment and techniques ▪ Building – measuring, marking, cutting, joining techniques ▪ Garden – watering, mulching, cultivating, planting ▪ Food – preparing, measuring, cooking, baking ▪ Digital – using various coding and software approaches to design a product, service, environment, or system. *Note: designed solutions include products, services, environments or systems at different year levels; technologies include traditional, contemporary and emerging.*

Skill	Essential (below level standard; uni-structural)	Developing (at level standard, low; multi-structural)	Capable (at level standard, high; relational)	Proficient (above level standard; extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Evaluate Process of: ▪ using gathered data to evaluate how well the product meets expectations, wants and needs ▪ providing feedback to refine/improve the model, simulation or scaled down prototype with the aim of identifying the best possible solution using minimal time and effort. **Elements** Criteria for success: ▪ progressive levels of creating criteria for success to evaluate a designed solution. Evaluating/reflecting: ▪ progressive levels of evaluating how well the designed solutions and production processes meet expectations, wants and needs. Refining/revising: ▪ progressive levels of refining/revising designed solutions and production processes. *Note: evaluate phase includes the skills of evaluating the effectiveness of a solution to give feedback on refining solution (evaluation in computational thinking) and the evaluating elements of Design and Technologies Strand: Production and Processes.*	Criteria for success ▪ I can develop criteria for success to evaluate a designed solution with teacher guidance. ▪ I can include criteria for success to evaluate the impact of the design on the environment. Evaluating/reflecting ▪ I can record my judgements about what I like and dislike about the designed solution. ▪ I can record my experiences of the processes and challenges of designing and producing a solution. ▪ I can identify the criteria for success the designed solution meets and doesn't meet. ▪ I can share my judgements and experiences using digital technologies. Refining/revising ▪ I can suggest how the designed solution could be improved.	**Plus:** Criteria for success ▪ I can negotiate criteria for success to evaluate a designed solution with class or group members. ▪ I can discuss why each criteria of success is important. Evaluating/reflecting ▪ I can describe how well a designed solution meets the criteria for success. ▪ I can discuss the ethics, social values and the sustainability of selected designed solutions. ▪ I can discuss the functional and aesthetic qualities of selected designed solutions. ▪ I can compare the amount of waste that would be produced by different design and development options. ▪ I can discuss the suitability and the opportunities of selected designed solutions. Refining/revising ▪ I can revise and select design ideas to more effectively meet the criteria for success. ▪ I can revise selected designed solutions to reflect the ethics and social values of clients	**Plus:** Criteria for success ▪ I can independently and collaboratively identify criteria for success to evaluate a designed solution. ▪ I can include criteria to evaluate the success for processes and planning of a designed solution. ▪ I can explain how the criteria reflects the expectations, wants and needs of the user. Evaluating/reflecting ▪ I can analyse the suitability of materials, tools and equipment used in producing the designed solution. ▪ I can explain the ethics and sustainability of the technology used. ▪ I can evaluate how well the designed solutions meet the safety, wellbeing and needs of users and consumers from various cultures and communities. ▪ I can analyse the effectiveness of the processes used. ▪ I can discuss the potential for the waste to be recycled, reduced, or reused. Refining/revising ▪ I can refine/revise production processes to improve the costs and future use of designed solutions. ▪ I can refine/revise production processes to reduce environmental impact and improve the sustainability.	**Plus:** Criteria for success ▪ I can include criteria for success to evaluate the aesthetics, functionality and sustainability of a design solution. ▪ I can predict possible future criteria for success due to emerging technologies, materials, tools or equipment. Evaluating/reflecting ▪ I can justify the use and best combination of technologies during project development. ▪ I can evaluate the choices made at various stages of a design process. ▪ I can evaluate projects for their long-term application, functionality and impact. ▪ I can reflect on how to improve my technical expertise. Refining/revising ▪ I can modify production plans with consideration of criteria for success. ▪ I can identify and describe new knowledge and skills that could be transferred to future design projects.	Create a skill-level appropriate evaluation strategy document of approaches that can be used to create criteria for success, evaluate and refine or revise the designed solutions and their production processes. Evaluation strategies: ▪ personal likes and dislikes ▪ capturing user feedback about what they like and dislike ▪ capturing observations of how users use the designed solution ▪ capture how the designed solution appeals to the needs, emotions and behaviours of the people the designed solution was for ▪ rating how well the designed solution meets the criteria for success ▪ comparison between alternatives. *Note: designed solutions include products, services, environments or systems at different year levels; technologies include traditional, contemporary and emerging.*

Skill	Essential (below level standard; uni-structural)	Developing (at level standard, low; multi-structural)	Capable (at level standard, high; relational)	Proficient (above level standard; extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Collaborating and managing Process of working individually or in groups to: ▪ design and make a plan ▪ organise and monitor timelines, activities and the use of resources to effectively create designed solutions **Elements** Planning: ▪ progressive depth of designing and making a plan. Managing: ▪ progressive depth of managing and producing a designed solution. Collaborating: ▪ progressive depth of collaborative behaviour. *Notes: covers the Collaborating and Managing elements of Design and Technologies Strand: Production and Processes; links in parts to the Personal and Social Capability progression.*	Planning ▪ I can create a step by step list of actions or storyboard to take to make my designed solution. ▪ I can use the criteria for success to check that planned features have been included in design plans and drawings. Managing ▪ I can follow the procedure for making a designed solution. ▪ I can identify when materials, tools and equipment are required for making a designed solution. Collaborating ▪ I can contribute and work cooperatively in groups. ▪ We can identify roles for each member of a group when we work collaboratively.	**Plus:** Planning ▪ I can collaborate with others to create a plan of the processes to produce a designed solution. ▪ I can identify the steps in a mass production process. Managing ▪ I can set milestones for production processes. ▪ I can manage the time and resources to be used when producing a designed solution. Collaborating ▪ I can keep track of the things the team have to get done. ▪ I can model responsible behaviour. ▪ We can sequence steps to collaboratively produce a designed solution.	**Plus:** Planning ▪ I can use digital technologies to outline the planning and production steps needed to produce a designed solution. ▪ I can identify risks and how to avoid them when planning production. ▪ I can reflect on planned steps to see if improvements can be made. Managing ▪ I can organise and manage time, activities and resources to ensure successful project completion. ▪ I can manage the protection of the work space and local environment. ▪ I can investigate the time needed for each step of production. Collaborating ▪ I can be an active team member who can contribute ideas to achieve success. ▪ We can negotiate and allocate roles to team members. ▪ We can encourage each other and manage our time/tasks.	**Plus:** Planning ▪ I can use digital technologies to create drawings and plan production timelines to produce a designed solution. ▪ I can explain and interpret drawings, planning and production steps needed to produce designed solutions. ▪ I can analyse the essential features of processes to minimise risk and include safe work practices. ▪ I can use digital technologies to produce production flowcharts to ensure efficient, safe and sustainable sequences. Managing ▪ I can use digital technologies to establish materials and equipment needs. ▪ I can investigate various manufacturing processes to identify strategies to enhance production. Collaborating ▪ We can collaborate to develop production plans for equitable distribution of work. ▪ We can give, receive and use constructive feedback to work effectively as a team to achieve complex tasks.	Create a skill-level appropriate planning, managing and collaborating strategy document of approaches that can be used to plan and manage the process to effectively create a designed solution. Planning strategies: ▪ list of steps ▪ storyboard of steps ▪ timelines for steps ▪ activities in each step ▪ resources to use in each step ▪ tools, equipment, materials use in each step ▪ Gantt sharts. *Note: designed solutions include products, services, environments or systems at different year levels.*

DESIGN PROCESS FORMATIVE RUBRIC (AUSTRALIAN CURRICULUM 9.0)

Skill	Essential (below level standard) (uni-structural)	Developing (at-level standard – low) (multi-structural)	Capable (at level standard – high) (relational)	Proficient (above level standard) (extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Empathise Process of completing the following to come to a deep understanding of a challenge and who you are designing for. **Elements** ▪ identifying goals and sub-goals of the challenge/task ▪ giving up assumptions ▪ gathering information and data about needs, opportunities and possible resources ▪ putting yourself in the shoes of the user. *Note: empathise phase includes skills of decomposition (computational thinking) and the Investigating elements of Design and Technologies Strand: Production and Processes.*	▪ I can identify the overall goal of the task/challenge. ▪ I can adopt a 'beginner's mindset'. ▪ I can ask questions to find out information about the task/challenge. ▪ I can identify that I made certain assumptions as I gathered information. ▪ I can identify ways I can gather information.	**Plus:** ▪ I can break down the goal into small sub-goals/-tasks. ▪ I can ask questions to clarify information and to more deeply understand each sub-goal/-task and the resources that could be used. ▪ I can describe the assumptions I made as I gathered information. ▪ I can describe ways I could gather information to understand the sub-goals/-tasks.	**Plus:** ▪ I can use two or three strategies from the strategy document to gather information to understand the sub-goals/-task, the user and the resources that could be used. ▪ I can justify the assumptions I made as I gathered information and data.	**Plus:** ▪ I can use multiple further strategies from the strategy document to gather information that deepens my understanding of the sub-goals/-tasks, the current and future user(s) and the resources that could be used. ▪ I can compare and contrast the effectiveness of the strategies I used to gather information and data. ▪ I can reflect upon how the strategies I used to gather information can be used in other situations/areas.	Create a skill-level appropriate strategy document of approaches that can be used to gather background information. This should include: ▪ asking questions ▪ trialling ideas ▪ observations ▪ iterating ▪ expert knowledge ▪ collaborating with others ▪ identifying, gathering and playing with possible resources ▪ investigate and research First Nations designs and resources they use ▪ experimenting with traditional and contemporary technologies ▪ examining tools, techniques, equipment and relationships of properties for complementary materials for product development. *Note: resources include materials, components, tools and equipment.*

Skill	Essential (below level standard) (uni-structural)	Developing (at-level standard – low) (multi-structural)	Capable (at level standard – high) (relational)	Proficient (above level standard) (extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Define Process of synthesising the information that was created during the empathise stage for the purpose of looking for patterns and gaining insight to articulate what to focus on or the problem that will be solved. **Elements** ▪ defining the needs and wants that need to be addressed ▪ identifying what is important or not ▪ strategies to recognise patterns and narrow down the design space ▪ defining specific problems and the causes of problems to be worked on ▪ identifying possible resources and construction techniques that could be used ▪ creating a design brief. *Note: define phase includes skills of pattern recognition and abstraction (computational thinking) and the defining elements of Design and Technologies Strand: Production and Processes.*	▪ I can identify the wants and needs that the end product/ result must address. ▪ I can name possible categories that the information and data could be organised into. ▪ I can identify what is relevant to a topic and what is not. ▪ I can list some of the resources that may be required to create a solution.	**Plus:** ▪ I can describe the wants and needs that the end product/ result must address and rate the importance of each one to the user. ▪ I can sort and classify the information and data I have collected into categories. ▪ I can identify patterns in the information and data. ▪ I can use the patterns I identified to discuss what is important and what is not. ▪ I can explore and test the suitability of a range of the resources and construction techniques that could be used to create a solution.	**Plus:** ▪ I can explain the possible causes of the wants and needs that the end product/result must address and discuss the opportunity a designed solution will present. ▪ I can use a range of ways to represent/visualise the information and data to help make sense of patterns, relationships and trends (eg. mind maps, graphs, trends, cause and effect diagrams). ▪ I can investigate already existing designs and associated technologies and resources. ▪ I can explain how I selected the resources, technologies and techniques that could be used to create a solution that satisfies a design brief.	**Plus:** ▪ I can make generalisations and insights based on the data I have collected, organised, sorted and analysed. ▪ I can create a design brief that reflects the wants and needs to be addressed, identifying: ° the goals of design (needs and wants) ° target market ° constraints ° sustainability requirements ° resources, technologies and techniques to be used to create a solution ° budget and schedule.	Create a skill-level appropriate strategy document of approaches that can be used to narrow down and define the specific problem and needs that the designed solution will address. This should include: ▪ considering sustainability ▪ exploring tools that could be used ▪ exploring suitability and sustainability of potential materials ▪ exploring techniques to use to create models and product ▪ considering existing products and processes to inform thinking ▪ considering environmental and social impacts of manufacturing approach ▪ considering accuracy, quality, safety and efficiency of production processes ▪ analysing the viability of using different techniques and materials in areas considered remote, isolated areas or less developed countries *Note: resources include materials, components, tools and equipment.*

Skill	Essential (below level standard) (uni-structural)	Developing (at-level standard – low) (multi-structural)	Capable (at level standard – high) (relational)	Proficient (above level standard) (extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Ideate Process of generating a large quantity of ideas and then filtering them down into the best, most practical or most innovative ones in order to inspire new and better design solutions and products. Generating ▪ different strategies for generating a large quantity of design ideas. Developing ▪ different strategies to analyse, develop, and improve design ideas to assist in filtering down the ideas into the best, most practical or innovative ones. Communicating ▪ different strategies to document and communicate the design ideas to an intended audience. *Note: ideate phase includes skill of planning a series of steps (algorithm in computational thinking) and the Generating and Designing elements of Design and Technologies Strand: Production and Processes.*	Generating ▪ I can compare and contrast features of existing designed solutions to generate new ideas.	Generating **Plus:** ▪ I can use prior knowledge, research or Safety by Design principles to generate a range of design ideas.	Generating **Plus:** ▪ I can use a further one or two strategies from the ideation strategy document to generate innovative design ideas.	Generating **Plus:** ▪ I can use multiple strategies from the ideation strategy document to generate a range of innovative design ideas.	Create a skill-level appropriate ideation strategy document of approaches that can be used to generate, develop and communicate design ideas. Generating strategies: ▪ critical and creative thinking strategies such as brainstorming, sketching, 3D modelling and experimenting ▪ combining and modifying ideas ▪ exploring functionality. Developing strategies: ▪ feedback from users and others on the benefits and drawbacks of design ideas ▪ ideas that could enhance and improve the sustainability of the product, service, environment or system ▪ factors that could hinder or enhance the design idea ▪ appeal and acceptance of the design idea ▪ benefits and constraints of the design idea in different communities ▪ impact of emerging technology on the design idea ▪ variety of simple testing methods (taste, feel, see, smell, listen) ▪ properties of materials that could be used ▪ processes that could be used ▪ considering the selection of materials and joining techniques to suit the purpose of a product ▪ considering competing variables such as weight, strength and price; laws; social protocols and community consultation processes. Communication strategies: ▪ drawing/sketching ▪ various annotation techniques including thumbnail drawings, models, labels and notes ▪ software to show different views including SketchUp, TinkerCAD, Minecraft, MS Paint, iPad apps etc. ▪ digital tools to document and share ideas including blogs, vlogs, collaborative documents etc. ▪ modelling and drawing strategies including ° basic: scale; symbols and codes in diagrams; pictorial maps and aerial views using web mapping service applications etc. ° detailed: technical terms, production drawings, orthogonal drawings; patterns and templates to explain design ideas ° comprehensive: technical drawing techniques, digital imaging programs, 3d printers or augmented reality modelling software; producing multiple prototypes/models, steps of the design process. *Note: design ideas include products, services, environments or systems at different year levels*
	Developing ▪ I can list what I like and dislike about a design idea.	Developing **Plus:** ▪ I can list the pros and cons of a design idea. ▪ I can develop several alternative versions of design ideas based on the listed pros and cons. ▪ I can identify the properties of materials needed for a design idea. ▪ I can explore ways of successfully joining, connecting and assembling components of a design idea.	Developing **Plus:** ▪ I can seek feedback on the benefits and drawbacks of design ideas. ▪ I can develop several alternative versions and models of design ideas based on the feedback. ▪ I can use a further one or two strategies from the ideation strategy document to identify which ideas to further explore and investigate. ▪ I can identify the tools, equipment and processes that could be used in creating each design idea. ▪ I can analyse and modify each design idea to enhance and improve its sustainability. ▪ I can experiment with a range of materials, tools and equipment to refine each design idea.	Developing **Plus:** ▪ I can use multiple strategies from the ideation strategy document to analyse the functional, structural and aesthetic benefits and constraints of the design ideas. ▪ I can develop models or samples using a range of materials, tools and equipment to test the functionality of design ideas. ▪ I can consider competing variables that may hinder or enhance project development.	
	Communicating ▪ I can draw/sketch 2D drawings of my design idea(s). ▪ I can name and label my design idea(s). ▪ I can use a range of technologies to show different views (top view and side view) of design idea(s). ▪ I can describe how my design idea meet the needs of those who will use the solution.	Communicating **Plus:** ▪ I can annotate my sketches/ design to clarify the pros and cons of each design idea. ▪ I can annotate my sketches/ design to explain features and modifications. ▪ I can use digital and/or paper based tools to document and share ideas. ▪ I can use basic modelling and drawing strategies when representing and communicating my design ideas.	Communicating **Plus:** ▪ I can produce annotated concept sketches and drawings using detailed modelling and drawing strategies. ▪ I can describe different design ideas and explain: ° the 'user experience' ° the instructions to operate the solution. ▪ I can create a portfolio that documents and communicates the generation and development of design ideas for an intended audience.	Communicating **Plus:** ▪ I can use comprehensive modelling and drawing strategies to explore design ideas and show an understanding of key aesthetic considerations in competing designs. ▪ I can further develop my portfolio by including appropriate technical terms, multiple models and prototypes, and justification of the decisions made.	

Skill	Essential (below level standard) (uni-structural)	Developing (at-level standard – low) (multi-structural)	Capable (at level standard – high) (relational)	Proficient (above level standard) (extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Prototype/test Iterative Process of ▪ creating a model, simulation or scaled down prototype of the product ▪ gaining a view of the product and its features ▪ gathering data to use to evaluate how well the product meets expectations, wants and needs with the aim of identifying the best possible solution using minimal time and effort. Prototyping: different prototyping techniques to create a scaled down model or simulation. Making: different making techniques for a product, service, environment or system. Safety: different strategies to work safely and to identify, manage and reduce risk during the prototyping/testing process. *Note: prototype/test phase includes the skills of modelling and simulation (in computational thinking) and the producing and implementing elements of Design and Technologies Strand: Production and Processes.*	Prototyping ▪ I can make a model of the design idea by exploring how available materials could be used or reused in various ways.	Prototyping **Plus:** ▪ I can explore ways of joining, connecting and assembling components for the design idea. ▪ I can discuss the influence of digital technologies on these prototyping processes.	Prototyping **Plus:** ▪ I can match material and joining techniques to the design intention. ▪ I can consider and practice prototyping techniques to improve my technical expertise. ▪ I can compare and contrast the merits of different prototyping techniques.	Prototyping **Plus:** ▪ I can experiment with innovative combinations of prototyping techniques. ▪ I can experiment with ways of manipulating traditional and contemporary prototyping techniques. ▪ I can evaluate and debate the merits of different prototyping techniques with peers.	Create a skill-level appropriate prototype/test strategy document of approaches that can be used to safely prototype and make a designed solution. Prototyping techniques: ▪ This includes a range of traditional and contemporary materials, components, tools, equipment and techniques. ▪ Consider using discarded materials to design, make and model; cutting and joining materials; sewing; gluing; soldering; and experimenting to determine most successful approach. Making techniques for a product, service, environment or system: ▪ Making approaches include traditional, contemporary and emerging technologies, materials, components, tools, equipment and techniques. ▪ Building could include measuring, marking, cutting and joining techniques. ▪ Garden could include watering, mulching, cultivating and planting. ▪ Food could include preparing, measuring, cooking and baking. ▪ Digital could include using various coding and software approaches to design a product, service, environment or system. *Note: designed solutions include products, services, environments or systems at different year levels; technologies include traditional, contemporary and emerging.*
	Making ▪ I can assemble the components of a system. ▪ I can demonstrate a range of technical making skills when using tools and equipment. ▪ I can check that the assembled components work as planned.	Making **Plus:** ▪ I can use the appropriate terminology when I describe and share the procedures and techniques I used in the making process. ▪ I can use tools and equipment accurately when making. ▪ I can explain the importance of accuracy when designing and making. ▪ I can describe the environmental impact of the materials, components, tools, equipment and processes I selected and used in the making process. ▪ I can gather data to use to evaluate how well the designed solution meets my expectations.	Making **Plus:** ▪ I can choose the appropriate tools, equipment and techniques to manipulate materials when making. ▪ I can practice technical making skills to produce quality designed solutions. ▪ I can explain how my solution is designed for sustainability. ▪ I can compare and contrast alternative making approaches that could be substituted to reduce waste or time. ▪ I can gather data to use to evaluate how well the designed solution meets the user wants and needs.	Making **Plus:** ▪ I can independently refine my technical making skills. ▪ I can independently use production skills to produce quality designed solutions. ▪ I can maximise sustainability in the making approaches that I use. ▪ I can modify production processes to respond to unforeseen challenges or opportunities.	
	Safety ▪ I can safely practise a range of technical skills using tools and equipment	Safety **Plus:** ▪ I can demonstrate safe, responsible and cooperative work practices when making designed solutions. ▪ I can use appropriate personal protective equipment when making designed solutions.	Safety **Plus:** ▪ I can safely use a range of making approaches (traditional, contemporary, alternative). ▪ I can work safely, responsibly and cooperatively to ensure safe work areas. ▪ I can identify risks (including uncertainty, long-term health impacts, environmental impacts) in the development of various projects.	Safety **Plus:** ▪ I can independently develop safe working practices when making designed solutions. ▪ I can manage and reduce risks (including uncertainty, long-term health impacts, environmental impacts) in the development of various projects. ▪ I can explain safe working practices required for a specific designed solution.	

Skill	Essential (below level standard) (uni-structural)	Developing (at-level standard – low) (multi-structural)	Capable (at level standard – high) (relational)	Proficient (above level standard) (extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Evaluate Process of using gathered data to evaluate how well a designed solution meets design criteria and providing feedback to refine/improve the design solution and/or production processes with the aim of identifying the best possible solution using minimal time and effort. Design criteria: progressive levels of developing design criteria to evaluate a designed solution. Evaluating/reflecting: progressive levels of evaluating how well the designed solutions and production processes meet expectations, wants and needs. Refining/revising: progressive levels of refining/revising designed solutions and production processes. *Note: evaluate phase includes the skills of evaluating the effectiveness of a solution to give feedback on refining solution (evaluation in computational thinking) and the evaluating elements of Design and Technologies Strand: Production and Processes.*	Design criteria ▪ I can describe how various design ideas meet the needs of those who will use the design solution. ▪ I can develop design criteria with others including considering universal design principles.	Design criteria **Plus:** ▪ I can discuss why each design criteria is important. ▪ I can collaboratively decide on design criteria to evaluate a designed solution.	Design criteria **Plus:** ▪ I can collaboratively develop design criteria to evaluate the suitability of materials, tools and equipment for specific purposes. ▪ I can develop design criteria to address Safety by Design principles.	Design criteria **Plus:** ▪ I can include design criteria to evaluate the aesthetics, functionality and sustainability of a design solution. ▪ I can establish specific design criteria for evaluating designed solutions.	Create a skill-level appropriate evaluation strategy document of approaches that can be used to create design criteria, evaluate and refine or revise the designed solutions and their production processes. Evaluation strategies: ▪ personal likes and dislikes ▪ capturing user feedback about what they like and dislike ▪ capturing observations of how users use the designed solution ▪ capture how the designed solution appeals to the needs, emotions and behaviours of the people the designed solution was for ▪ comparison between alternatives ▪ rating how well the designed solution meets the design criteria. *Note: designed solutions include products, services, environments or systems at different year levels; technologies include traditional, contemporary and emerging; design criteria can include personal preferences, environmental impacts, safety and well-being of users, meeting the needs of those who will use the solution, meeting the needs of communities or different cultures, Safety by Design principles, and aesthetics, functionality and sustainability.*
	Evaluating/reflecting ▪ I can reflect upon and record my judgements about what I like and dislike about the designed solution. ▪ I can reflect upon and record the challenges of designing and producing the designed solution. ▪ I can reflect upon the environmental impacts of producing the designed solution. ▪ I can consider alternative approaches to minimise future negative environmental impacts.	Evaluating/reflecting **Plus:** ▪ I can use the design criteria to evaluate and discuss how well a designed solution meets and doesn't meet the design criteria. ▪ I can compare the amount of waste that would be produced by different design ideas. ▪ I can discuss how well the designed solution meets design criteria such as safety, well-being of users, and the needs of various communities and cultures.	Evaluating/reflecting **Plus:** ▪ I can evaluate production processes to improve the costs and future use of designed solutions. ▪ I can evaluate production processes to reduce environmental impact and improve the sustainability. ▪ I can explain the potential for the waste to be recycled, reduced or reused.	Evaluating/reflecting **Plus:** ▪ I can justify the use and best combination of technologies during project development. ▪ I can evaluate the choices made at various stages of a design process. ▪ I can reflect on how to improve my technical expertise.	
	Refining/revising ▪ I can suggest how the designed solution could be improved.	Refining/revising **Plus:** ▪ I can revise and select design ideas to more effectively meet the design criteria.	Refining/revising **Plus:** ▪ I can refine/revise production processes to improve the costs and future use of designed solutions. ▪ I can refine/revise production processes to reduce environmental impact and improve the sustainability.	Refining/revising **Plus:** ▪ I can modify production plans with consideration of design criteria. ▪ I can identify and describe new knowledge and skills that could be transferred to future design projects.	

Skill	Essential (below level standard) (uni-structural)	Developing (at-level standard – low) (multi-structural)	Capable (at level standard – high) (relational)	Proficient (above level standard) (extended abstract)	Teacher practices/modelling/graphic organisers What strategies and approaches will you use to develop your students?
Collaborating and managing Process of working individually or in groups to design and make a plan and then organise and monitor timelines, activities and the use of resources to effectively create designed solutions. Planning: progressive depth of designing and making a plan. Managing: progressive depth of managing and producing a designed solution. Collaborating: progressive depth of collaborative behaviour. *Note: covers the collaborating and managing elements of Design and Technologies Strand: Production and Processes; links in parts to the Personal and Social Capability progression.*	Planning ▪ I/we can create a step-by-step list of actions or storyboard to take to make my designed solution.	Planning **Plus:** ▪ I/we can collaborate with others to create a plan of the processes to make a designed solution. ▪ I/we can identify the steps in a mass production process.	Planning **Plus:** ▪ I/we can set milestones for production processes. ▪ I/we can use digital tools to outline the planning and production steps needed to make a designed solution.	Planning **Plus:** ▪ I can interpret drawings to plan resources and production steps needed. ▪ I can use digital tools to create, explain and interpret drawings and plan production timelines.	Create a skill-level appropriate planning, managing and collaborating strategy document of approaches that can be used to plan and manage the process to effectively create a designed solution. Planning and managing strategies: ▪ list of steps ▪ storyboard of steps ▪ production timelines for steps ▪ activities in each step ▪ resources to use in each step including human resources, materials, tools and equipment ▪ Gantt charts ▪ making a flowchart or using a digital planner to record the sequence of tasks and deadlines ▪ using digital tools to keep track of tasks, resources, expenses and deadlines ▪ estimating time allocations on a planning template for the different stages of the design process ▪ identifying techniques to reduce use, cut costs, speed up processes or to form beneficial partnerships with others in production. *Note: designed solutions include products, services, environments or systems at different year levels.*
	Managing ▪ I can record the procedure for making a designed solution.	Managing **Plus:** ▪ I can discuss the importance of managing the time and resources used when producing a designed solution. ▪ I can identify what resources are required and when they would be needed for making a designed solution.	Managing **Plus:** ▪ I can use prior knowledge, research and testing to investigate the time needed for each step of production. ▪ I/we can identify and minimise risks to ensure successful project completion.	Managing **Plus:** ▪ I can organise and manage time, activities and resources to ensure successful project completion. ▪ I can investigate various manufacturing processes to identify strategies to enhance production.	
	Collaborating ▪ I can contribute and work cooperatively in groups. ▪ We can identify roles for each member of a group when we work cooperatively.	Collaborating **Plus:** ▪ I can model responsible behaviour. ▪ I/we can keep track of the things the team have to get done.	Collaborating **Plus:** ▪ I can be an active team member who can contribute ideas to achieve success. ▪ We can negotiate and allocate roles to team members. ▪ We can encourage each other and manage our time/tasks.	Collaborating **Plus:** ▪ We can collaborate to develop production plans for equitable distribution of work. ▪ We can give, receive and use constructive feedback to work effectively as a team to achieve complex tasks.	

PRIMARY DESIGN-PROCESS RUBRIC (AUSTRALIAN CURRICULUM 9.0)

Skill	Essential	Developing	Capable	Proficient	Teacher practices/modelling/graphic organisers
Empathise ▪ Identifying the goal of the task ▪ gathering information and data ▪ identifying assumptions	▪ I can identify the overall goal of the task. ▪ I can identify ways I can gather information.	▪ I can use a strategy to find out information about the task and the possible resources that could be used.	▪ I can use different strategies to gather more information and data about the task and the possible resources that could be used. ▪ I can describe the assumptions I made as I gathered information.	▪ I can compare and contrast the effectiveness of the strategies I used to gather information and data. ▪ I can justify the assumptions I made as I gathered information and data.	Create an empathisestrategy document of approaches. Include: ▪ asking questions ▪ experimenting ▪ iterating ▪ expert knowledge ▪ identifying, gathering and playing with possible resources ▪ investigate and research First Nations designs and resources. *Note: resources include materials, components, tools and equipment.*
Define ▪ Identifying needs and wants ▪ identifying what is important or not ▪ looking at existing products and processes. ▪ exploring resources and techniques.	▪ I can identify the wants and needs that the end product must address.	▪ I can rate the importance of each want and need to the user. ▪ I can list some of the resources and techniques that may be required to create a solution.	▪ I can research already existing designs and associated technologies. ▪ I can explain what is important and what is not.	▪ I can use the aspects in the definestrategy document to compare and contrast the resources and techniques that could be used to make models and the end product.	Create a definestrategy document of approaches. Include: ▪ tools and techniques that could be used to create models and products ▪ considering sustainability ▪ exploring suitability and sustainability of potential materials ▪ considering environmental and social impacts of manufacturing approach. *Note: resources include materials, components, tools and equipment.*
Ideate Generating: strategies for generating design ideas. Developing: strategies to analyse, develop, and improve design ideas. Communicating: strategies to document and communicate the design ideas.	▪ I can brainstorm the features I would like in my designed solution. ▪ I can list what I like and dislike about a design idea ▪ I can draw/sketch 2D drawings or create a model of the design idea(s). I can name and label the design idea(s).	▪ I can list the features of existing designs to generate new ideas. ▪ I can list the pros and cons of a design idea. I can talk about the changes made to a design idea. ▪ I can annotate the drawings to clarify the pros and cons of each design idea. I can describe the results from exploring design ideas.	▪ I can compare and contrast the features of existing designs to provide new ideas. ▪ I can use safety by design principles to generate a range of design ideas. ▪ I can seek feedback on the benefits and drawbacks of my design ideas. ▪ I can develop several alternative versions or models of design ideas based on the feedback. ▪ I can annotate the drawings to explain the features and the resources used using the appropriate technical terms.	▪ I can combine or modify ideas to generate a range of innovative design ideas. ▪ I can identify techniques and resources to use for each design idea. ▪ I can use feedback to improve my design ideas or the resources and processes used. ▪ I can annotate the drawings to explain the techniques that could be used to make it.	Could create a skill level appropriate ideationstrategy document of approaches that can be used to generate, develop and communicate design ideas. Generating includes: ▪ drawing or modelling designs ▪ using prior knowledge, skills and research ▪ critical and creative thinking strategies such as brainstorming, sketching, 3D modelling and experimenting. Developing includes: ▪ feedback from users and others ▪ enhancing and improving the sustainability of the design ideas ▪ properties of materials and processes that could be used ▪ considering the selection of materials and joining techniques to suit the purpose of a product. Communicating includes: ▪ changing perspectives (front vs plan view) ▪ using a range of technologies including digital tools to plan, share and document designs, ideas and processes ▪ including scale, symbols and codes in plans and diagrams; using pictorial maps and aerial views; and using digital mapping applications or infographics to present research and ideas to others. Ensure the students have a design portfolio to track the evolution of their ideas and to learn the process of annotation *Note: resources include materials, components, tools and equipment.*

Skill	Essential	Developing	Capable	Proficient	Teacher practices/modelling/graphic organisers
Prototype/test Making: techniques to create a model or prototype. Safety: strategies to work safely.	▪ I can make a model of the design idea by exploring how available materials could be used or reused in various ways. ▪ I can check that the assembled components work as planned. ▪ I can safely practise a range of making skills using tools and equipment.	**Plus:** ▪ I can explore ways of joining, connecting and assembling components for the design idea. ▪ I can explain the importance of accuracy when designing and making. **Plus:** ▪ I can explain the importance of demonstrating safe, responsible and cooperative work practices.	**Plus:** ▪ I can use the appropriate terminology to describe the making techniques used. ▪ I can use tools and equipment accurately when making. **Plus:** ▪ I can work safely, responsibly, and cooperatively to ensure safe work areas.	**Plus:** ▪ I can practise making techniques to improve my expertise and the quality of the model. ▪ I can describe the environmental impact of the materials, components, tools, equipment and processes I selected and used in the making process. **Plus:** ▪ I can independently develop safe working practices. **Plus:** ▪ I can identify potential risks in the development of a project.	Create a prototype/test strategy document of approaches. Include: ▪ using discarded materials to design, make and model ▪ cutting and joining ▪ sewing ▪ gluing ▪ safe work practices ▪ experimenting ▪ innovative combinations ▪ considering alternatives.
Evaluate Design criteria: developing design criteria to evaluate a designed solution. Evaluating/reflecting: evaluating how well the designed solution meets the design criteria. Refining/revising: refining/revising the designed solution.	▪ I can identify design criteria for a designed solution. ▪ I can record judgements about what I like and dislike about the designed solution. ▪ I can suggest how the designed solution could be improved.	**Plus:** ▪ I can discuss why each design criteria is important. **Plus:** ▪ I can describe how well the designed solution meets the original design criteria. **Plus:** ▪ I can seek feedback from others on how we could improve the designed solution.	**Plus:** ▪ I can negotiate design criteria with others. **Plus:** ▪ I can record experiences of the techniques used and challenges of producing the designed solution. **Plus:** ▪ I can revise the designed solution to more effectively meet the wants and needs.	**Plus:** ▪ I can include design criteria to evaluate the success for processes and planning of a designed solution. **Plus:** ▪ I can evaluate the choices we made at various stages of a design process. **Plus:** ▪ I can modify the production processes used to make a higher quality design solution and improve the costs.	Create an evaluation strategy document of approaches. Include: ▪ personal likes and dislikes ▪ capturing user feedback about what they like and dislike ▪ rating how well the designed solution meets the wants and needs
Planning and collaborating Planning: designing and making a plan. Collaborating: collaborative team behaviour.	▪ I/we can create a step-by-step list of actions or storyboard to take to make the designed solution. ▪ I can contribute and work cooperatively in a group.	**Plus:** ▪ I/we can collaborate with others to create a plan of the processes and resources to make a designed solution. **Plus:** ▪ We can identify roles for each member of a group. ▪ I can model responsible behaviour.	**Plus:** ▪ I/we can set milestones of when things are due. I/we can identify and minimise any risks to ensure success. **Plus:** ▪ We can encourage each other and manage our time/tasks.	**Plus:** ▪ I/we can use digital tools to outline and manage the planning and production steps needed to make a designed solution. **Plus:** ▪ We can give and receive constructive feedback to work effectively as a team.	Create some simple planning templates for the students to use. Develop a conferencing template to use with the students to support them developing their planning, managing and collaboration skills

SELF-REGULATION RUBRIC

Phase	Level A are teacher directed	Level B Engage in class tasks if they are interested in the task	Level C Are beginning to monitor their approach to learning	Level D Are beginning to develop strategies to regulate their learning	Level E Are beginning to intentionally select strategies to regulate their learning	Level F Are becoming systematic in selecting strategies that promote self-regulated learning	Level G Are self-regulated learners
Forethought phase ▪ goal setting ▪ motivation/ belief ▪ planning ▪ selection of strategies ▪ analyse difficulty and effort to complete task.	When given a task by my teacher: ▪ I believe that the task might be too hard. ▪ I want my teacher to tell me I can do it. ▪ I want to have help from my teacher to have a go at the task.	When given a task by my teacher: ▪ I believe that the task might be hard but could be interesting. ▪ I want my friends to think I am clever. ▪ I ask my teacher how I can have a go at the parts of the task I don't know how to do.	When given a task by my teacher: ▪ I believe that I can learn how to do the task. ▪ I want to have a go at the whole task because I want to learn how to always get the answers right. ▪ I can set goals related to the task with help.	When given a task by my teacher: ▪ I believe I have the ability to do well. ▪ I believe that with teacher help I can do well on tasks. ▪ I can set goals related to the task by myself. ▪ I can plan an approach to achieving the goals related to the task. ▪ I aim to finish what the teacher has given me.	**Plus:** When given a task by my teacher: ▪ I will try my best even if the task is not interesting. ▪ I can plan an approach by using strategies I have developed in the past. ▪ If I initially think I cannot do the task properly, I seek strategies to help me do my best.	**Plus:** When given a task by my teacher: ▪ I will find ways to make uninteresting tasks interesting and do my best to learn. ▪ I can set high learning goals for myself. ▪ I know what success looks like and use it to motivate myself. ▪ I can break down larger task goals into smaller goals. ▪ I can analyse the task to plan the most effective approach.	**Plus:** When given a task by my teacher: ▪ I set challenging learning goals to extend myself. ▪ I can manage and grow my suite of learning strategies to consistently achieve my goals. ▪ I can reflect, seek feedback, and refine my plan to ensure the plan will be effective.
Performance phase ▪ focus on task ▪ visualisation ▪ monitoring performance ▪ use of learning strategies ▪ use of task oriented strategies ▪ link to prior learning experiences ▪ ownership of learning process.	As I work on the task: ▪ I follow the steps the teacher tells me to do for the task. ▪ I have a go at those parts I know I can do or I think aren't too hard. ▪ I sometimes hand in unfinished work or work that is not my best effort. ▪ I can become distracted easily. ▪ I rely on other students to model task-focused behaviour for me. ▪ I am motivated to work on the task because I want a good report or I want to please the teacher.	As I work on the task: ▪ I have a go at parts of the task by myself. ▪ I become distracted when I think the task is too difficult. ▪ I can recognise the learning strategies that work for me when doing difficult tasks. ▪ I focus only on the information provided. ▪ I am motivated to work on the task because I want to get it right.	As I work on the task: ▪ I have a go at the whole task with help from my teacher/peers. ▪ I make an effort to ignore distractions when I am getting distracted. ▪ I am more comfortable doing tasks that I have done before because I know I can do them well. ▪ I hand in my best effort when I respond to a task.	As I work on the task: ▪ I have a go at the whole task independently. ▪ I use strategies like repeating teacher instructions, visualising solutions and changing my plan if I am off track. ▪ I am motivated by the teacher giving me positive feedback. ▪ I ask my teacher for feedback as I work on the task. ▪ I aim to finish what the teacher has given me.	**Plus:** As I work on the task: ▪ I can apply past experiences of success to try hard and persist. ▪ I use strategies that have worked in the past when a task becomes difficult. ▪ I can monitor how well my strategies are working as I go. ▪ I use feedback from my teacher or peers to improve as I go.	**Plus:** As I work on the task: ▪ I use self-talk to persist when tasks become difficult. ▪ I can think beyond the requirements of the set task to see the bigger picture. ▪ I use other strategies that have been successful in the past to maximise my learning. ▪ I can use what I have learnt from outside the class to help me with my tasks. ▪ I can change my plan when I need to so I can achieve my goals. ▪ I can persist in order to achieve my goals.	**Plus:** As I work on the task: ▪ I submit completed tasks and I do extra to learn more. ▪ When I encounter difficult tasks I use automated regulation processes so I can be successful. ▪ I find ways to refocus when I become distracted. ▪ I understand my approaches to learning in ways that allow me to take advantage of the learning experience at all times.

Phase	Level A are teacher directed	Level B Engage in class tasks if they are interested in the task	Level C Are beginning to monitor their approach to learning	Level D Are beginning to develop strategies to regulate their learning	Level E Are beginning to intentionally select strategies to regulate their learning	Level F Are becoming systematic in selecting strategies that promote self-regulated learning	Level G Are self-regulated learners
Self-reflection phase: ▪ use of feedback ▪ connecting outcomes to strategies used ▪ reaction to failure ▪ attribution of failure.	After I complete the task: ▪ I forget what I worked on. ▪ I don't ask for feedback. ▪ If I don't do well on a task I think it is because I am not good at it. ▪ I enjoy learning when I find the task easy.	After I complete the task: ▪ I don't reflect or check my work. ▪ I don't use any feedback I have been given. ▪ If I don't do well on a task I don't think I can do much about it. ▪ I enjoy learning when I find the task interesting.	After I complete the task: ▪ I check my work with help from my teacher. ▪ I trust my teacher's advice and rely on them to give me feedback. ▪ If I don't do well on a task I think it is because the teacher didn't help me enough. ▪ I want to improve and will put in more effort next time. ▪ I enjoy learning because I want to do well at school.	After I complete the task: ▪ I reflect or check my work independently. ▪ I use any teacher's advice and feedback to reflect on and improve my work. ▪ I know when I have done well. ▪ If I don't do well on a task I try to work out why and what I can do differently because I want to learn as a result of doing the task. ▪ I enjoy learning new things.	**Plus:** After I complete the task: ▪ I reflect on the strategies I used to learn so I can be more effective. ▪ I use feedback from my teacher and peers to improve my ability to perform. ▪ If I do not do well on a task, I know it is because I used the wrong strategy. ▪ I enjoy learning when I get to investigate something I don't already know. ▪ I think that learning is important.	**Plus:** After I complete the task: ▪ I am able to seek and evaluate internal and external feedback (peers, teachers, experts) to improve my thinking and learning. ▪ If I don't do well on a task I find out why and put in place task based strategies to do better in the future.	**Plus:** After I complete the task: ▪ I have internalised strategies to maximise my learning from each and every task. ▪ I value learning in and of itself. ▪ I know that failing at something is just a stepping stone to learning deeply.

Source: Adapted from Harding et al. (2018)

Notes

A key trait of highly capable learners is that they self-regulate their learning. While there are a number of frameworks describing self-regulated learning, Zimmerman and Moylan's (2009) model is one of the most influential. This cyclical model of self-regulated learning (illustrated in figure 1.5 on page 31of *Igniting STEM Learning*), outlines the three phases and respective processes of self-regulation (Zimmerman & Moylan, 2009):

1. The forethought phase
   Learners analyse the components of a task, set goals and plan strategies prior to commencing learning.
   Key processes comprise:
   - task analysis, where learners deconstruct the task and establish the strategies they will use
   - self-motivation beliefs, addressing the variables that generate and maintain the motivation to perform the task. This includes beliefs about capability, potential for success on the task and the relevance of the task to personal goals.
2. The performance phase
   Learners make use of planning from the forethought phase by implementing and remaining aware of the selected strategies while they are in use. They use self-observation and feedback to monitor their progress and motivation.
   Key processes include:
   - self-observation, where learners assess and regulate their behaviour and learning strategies for the purpose of remaining on track to achieve their goal or, if need be, alter their goal according to changed conditions
   - self-control, which is about maintaining concentration and interest using strategies such as time management, mental imagery, setting up the learning environment, self-praise and self-reward.
3. The self-reflection phase
   Learners evaluate and judge their performance against the standards established in the forethought phase against the selected goals and strategies. This phase requires learners to use observations and feedback to evaluate their results and performance and formulate causal attributions.
   Key processes are:
   - self-judgement, in which learners assess their performance against particular criteria and explain the reasons for success or failure
   - self-reaction, where learners react to self-judgement and identify strategies and approaches to use in future (for example, learning strategies, effort or use of feedback).

To develop students to be highly capable learners, schools need to explicitly teach and embed the rituals, practices and thinking that progressively develop students to be self-regulated. This includes skills in:

- task analysis and goal setting
- reflecting on and addressing their feelings and self-beliefs
- self-monitoring their behaviour and the learning strategies they are using
- using feedback to self-modify their behaviour and the learning strategies they are using
- reflecting on whether they achieved their goal or not and then refining their approach for future use.

These self-regulation skills are, unsurprisingly, not only central to the systems thinking, design thinking and computational thinking frameworks but also at the heart of the general capabilities within the Australian Curriculum.

References:

Harding, S., Nibali, N., English, N., Griffin, P., Graham, L., Alom, B. M., and Zhang, Z. (2018). *Self-Regulated Learning in the Classroom: Realising the Potential for Australia's High Capacity Students*. Assessment Research Centre, Melbourne Graduate School of Education.

Zimmerman, B. J., & Moylan, A. R. (2009). *Self-regulation: Where metacognition and motivation intersect*. In D. J. Hacker, J. Dunlosky, & A. C. Graesser, Handbook of Metacognition in Education (pp. 299–315). Routledge.

TEACHER PROGRESSION OF CLASSROOM PRACTICES RELATED TO SELF-REGULATED LEARNING

Level A **Teachers direct student learning, including goal setting, behaviour, learning strategies and attention.**	**Level B** **Teachers support students to select appropriate behaviours and learning strategies and together they link these to performance and achievement.**	**Level C** **Teachers guide students to differentiate behaviours and motivation that affect learning and to select strategies for improving performance and focus.**	**Level D** **Teachers assist students to evaluate strategies and different approaches to learning to build a repertoire of skills and techniques that can be drawn upon in various learning situations.**	**Level E** **Teachers are explicitly and intentionally teaching students to be self-regulated learners. Students are taught how to draw from their expanding repertoire of skills to independently plan their learning, adapt and create strategies, and use evaluation of performance to improve learning.**
At this level, teachers: ▪ set goals for their students ▪ suggest that students make a general plan when they begin tasks ▪ encourage students to think about learning in terms of the content presented ▪ suggest that there may be more than one way to achieve the desired outcome of a task ▪ guide students to reflect on what they want to achieve. **At this level, students:** ▪ are told to work hard to achieve good grades ▪ are given feedback about what they have done right or wrong ▪ are taught to rely on teachers or parents to inform them of their performance ▪ are told to concentrate when teachers notice they lack focus or are distracted.	**At this level, teachers:** ▪ work with students to set their own goals based on what they know they can do and what will improve their skills ▪ instruct students to use previous achievements to set goals ▪ instruct students, when planning, on how to select strategies that will attain the intended outcome ▪ believe that student self-satisfaction affects their behaviour ▪ support students to picture a quality outcome, use speak-aloud strategies and prior experiences to complete tasks ▪ reiterate the links between effort, persistence and level of achievement when students find tasks difficult. **At this level, students:** ▪ are taught to use feedback to evaluate their performance.	**At this level, teachers:** ▪ assist students to draw on proven strategies to help them focus. **At this level, students:** ▪ are taught to value the connection between setting goals and achievement, including setting goals that develop mastery of specific skills ▪ are taught how to record strategies and use previous learning experiences to improve current learning ▪ are guided to identify strategies and behaviours that improve learning (motivation is increased by harnessing existing interest in a topic) ▪ are encouraged to value and draw satisfaction from the process and outcome of learning. **At this level, teachers and students:** ▪ engage in discussions about the consequences of adaptive and defensive behaviour and how to avoid dissatisfaction.	**At this level, teachers:** ▪ help students understand that the types of goals they set impact their achievement ▪ help students to reflect on the strategies and behaviours that led to their performance on a given task ▪ promote the use of independent self-instruction techniques, such as self-talk, as a method for guiding their learning. **At this level, students:** ▪ are encouraged to become aware of distractions and develop techniques to help them stay on task ▪ are encouraged to try different ways to achieve the desired outcome and to visualise processes for achieving a solution.	**At this level, teachers:** ▪ make explicit the link between independent planning and evaluation of performance with increased self-regulation ▪ provide opportunities for students to independently review their plans according to their progress ▪ encourage students to evaluate different ways of working so they can apply the best process in the future. **At this level, students:** ▪ are taught how to adapt known strategies or create new strategies when they are learning ▪ are taught how to use feedback effectively to improve learning ▪ are taught that they can create their own motivation by believing in themselves and that this improves learning and performance.

Source: Adapted from Harding, S., Nibali, N., English, N., Griffin, P., Graham, L., Alom, B. M., and Zhang, Z. (2018). *Self-Regulated Learning in the Classroom: Realising the Potential for Australia's High Capacity Students*. Assessment Research Centre, Melbourne Graduate School of Education.

AUSTRALIAN CURRICULUM 8.4 CRITICAL AND CREATIVE THINKING LEARNING CONTINUUM F–8

		Skill	F	1	2	3	4	5	6	7	8
Critical and Creative Thinking	Inquiring – identifying, exploring and clarifying information and ideas	**Pose questions.**	I can ask 'why' questions.	I can ask questions to find out more information.	I can ask how and why questions.	I can turn 'I wonder' ideas into questions to investigate who, how, what, when and why.	I can ask questions to compare and contrast. I can ask questions to make connections.	I can ask questions that challenge points of view. I can develop questions to clarify and interpret.	I can ask questions to uncover bias and provoke debate. I can ask questions about causes and consequences.	I can ask questions to explain assumptions. I can develop questions to draw conclusions.	I can ask questions to help make inferences and predictions. I can ask questions about complex issues.
		Identify and clarify information and ideas.	I can group things that are similar and things that are different. I can say my opinion.	I can compare to find similarities and differences. I can talk about the difference between fact and opinion.	I can explore information and ideas from sources provided by my teacher. I can tell the difference between fact and opinion.	I can identify main ideas from a text.	I can examine relevant information and opinion from a range of sources. I can put the information related to a topic into my own words.	I can select an appropriate graphic organiser to collect, compare and categorise information and opinions from a range of sources. I can talk about bias.	I can make and explain judgements using evidence on the worth of information and opinions from a range of sources.	I can select an appropriate graphic organiser to collect, compare and categorise information and opinions from a range of sources. I can talk about bias.	I can make and explain judgements using evidence on the worth of information and opinions from a range of sources.
		Organise and process information.	I can use a graphic organiser to identify and clarify information and ideas.	I can select information from a range of sources. I can put the information into my own words. I can talk about bias.	I can select an appropriate graphic organiser to prioritise and clarify information and ideas.	I can make and explain judgements on the worth of information.	I can side with information and justify its worth. I can justify different approaches.	I can debate the validity of information with fact and/or personal opinion. I can clarify complex information.	I can encourage others, negotiate roles and manage time/tasks to improve the way we work and succeed in our goals.	I can support group members to contribute ideas to improve the way we work and how we succeed in our goals.	I can encourage others, negotiate roles and manage time/tasks to improve the way we work and succeed in our goals.
	Generating ideas, possibilities and actions	**Imagine possibilities and connect ideas.**	I can find information from different places.	I can find and sort information from different places.	I can use a range of graphic organisers to organise my information from several sources.	I can use several sources of information to make generalisations.	I can collect, compare and categorise information using a graphic organiser.	I can select an appropriate graphic organiser to collect, compare and categorise information. I can analyse, condense and combine relevant information.	I can analyse, condense and combine relevant information and evidence using criteria (e.g. suitability and reliability).	I can collate succinct, evidence-based information to inform I can validate the accuracy of information.	I can use succinct, evidence-based information to question and connect to new information. I can use criteria to determine the relevance of information.
		Consider alternatives.	I can imagine things in different ways. I can connect things to make new things.	I can use what I know to predict what may happen next. I can add to what I already know.	I can use what I know to come up with a new idea. I can demonstrate what might happen next.	I can use graphic organiser to expand on known ideas I can use my imagination.	I can display and link my ideas to create original/ imaginative ideas.	I can use a range of thinking tools to explore and combine ideas in different ways. I make connections between content in subjects.	I can combine ideas from different sources to create new ideas. I use ideas from one subject in other subjects.	I can achieve goals based on similarities between what I know and new ideas.	I can use trends and commonalities to create new ways of achieving goals.

		Skill	F	1	2	3	4	5	6	7	8
Critical and Creative Thinking	Generating ideas, possibilities and actions (cont.)	**Seek solutions and put ideas into action.**	I can see how to do things in different ways.	I can listen and think about how other ideas are different to mine.	I can value and make judgement about other ideas.	I can ask 'What if' when considering pathways I can judge ideas and make suggestions.	I can ask 'What if?' and consider possible alternatives. I can change my ideas if needed.	I can evaluate and adapt my actions to achieve success.	I can evaluate, adapt and justify my actions to achieve the optimum outcome.	I can innovate and adapt to achieve a successful outcome.	I can negotiate alternatives in conflicting circumstances through innovation.
	Reflecting on thinking and processes	**Think about thinking (metacognition).**	I can say what I was thinking while I was working.	I can suggest a strategy to use to help me.	I can describe different strategies to use to help me.	I can explain the most effective strategies and processes to use.	I reflect on the strategies and thinking I did to see if it was the most effective. I reflect on and check my thinking when something doesn't work out.	I can evaluate and adapt my thinking to achieve successI reflect on assumptions I made and consider constructive feedback.	I can evaluate, adjust, adapt and justify my thinking to achieve greater outcomes.	I can reflect on my thinking to assess assumptions and decisions I make in order to achieve optimum outcomes.	I invite the opinions of others in order to reflect on my own thinking and that of others.
		Reflect on processes.	I can do things step by step.	I can follow the steps to complete a task.	I can say what the steps are to complete a task.	I can identify key words and ideas in information to help complete an investigation. I can check my work against criteria.	I can identify key words and ideas in information and connect these to help complete an investigation. I can help to create criteria to check my work against.	I can reflect on and identify my choices and evaluate their effectiveness.	I can justify the thinking that led to my choices.	I can evaluate and justify the reasons behind choosing a strategy based on the situation.	I can evaluate and justify the reasons behind following a pathway depending on the set of circumstances.
		Transfer knowledge into new contexts.	I can say what I know about a topic.	I can say what I already know to help me learn new things.	I can use what I already know to help me understand new things.	I can transfer information from one setting to make sense of an unfamiliar setting.	I can apply what I know to discover, comprehend and solve the unknown.	I can apply prior knowledge from one subject to another in order to identify new meaning.	I can discuss and apply alternatives (understandings) to use in similar situations (that are unrelated).	I can justify my reasons for decisions when transferring what I know to similar contexts (situations).	I can justify my reasons for decisions when transferring what I know to similar and different contexts (situations).

Critical and Creative Thinking		Skill	F	1	2	3	4	5	6	7	8
	Analysing, synthesising and evaluating reasoning and procedures	**Apply logic and reasoning.**	I can say what choice was made.	I can say why I made a choice.	I can say why a choice was made or an action was taken by others.	I can apply reason logically to reach an outcome.	I can identify and apply the thinking strategies needed to give reasoning.	I can discuss similarities and differences when assessing an outcome in order to justify it with reason. I can assess whether evidence justifies a claim or conclusion.	I can compare and contrast claims and conclusions, (using tools e.g. Venn diagrams) before giving validation I can assess whether reasoning warrants a claim.	I can identify when evidence is illogical when justifying a conclusion or an assumption.	I can identify gaps in reasoning and missing elements in information.
		Draw conclusions and design a course of action.	I can say what happened.	I can say what I could do differently next time.	I can say how the outcome might change depending on how someone acts.	I can use what I know works and doesn't work when planning action to take.	I can use past experience when choosing what action to take or when drawing a conclusion.	I can change or modify the strategies that I utilise to solve problems and take action.	I can use my knowledge and experience to test ideas and concepts and change my action as required.	I can separate and analyse a course of action to identify strengths and weaknesses.	I can appreciate inconsistencies when drawing conclusions.
		Evaluate procedures and outcomes.	I can say if I have done a good job.	I can say why my work is good.	I can say how I have achieved my/our goal.	I can explain the action I took and why my outcome is reasonable (in relation to my objective).	I can justify my ideas and course of action and explain why my outcome is reasonable (considering the goal).	I can use a range of self assessment tools, e.g. a rubric, to assess and reflect on my learning and success in tasks.	I can use criteria to fairly evaluate my own and others work with a view to why outcomes were or were not achieved.	I can self-assess against criteria that I've helped formulate to determine what successes (outcomes) I achieved and what can be expected (or unexpected) next time when hypothesising.	I can formulate criteria (that accounts for expected and unexpected outcomes) to fairly evaluate my own and others work.

AUSTRALIAN CURRICULUM 8.4 ETHICAL UNDERSTANDING LEARNING CONTINUUM F–6

Ethical Understanding	Skill	F	1	2	3	4	5	6
	Recognise ethical concepts.	I can tell you what a good and a bad behaviour is.	I can say when things are fair or unfair, right or wrong.	I can recognise what is right and wrong and show tolerance.	I can explore what it means to treat people equally.	I can treat people equally.	I can explore the difference between an honest mistake and an intentional action.	I can explain ethical concepts such as truth and justice.
	Explore ethical concepts in context.	I can tell you if someone is being kind and caring.	I can see when others are being fair or unfair.	I can discuss how people or characters are behaving.	I can explore what I need to do if I witness bullying.	I can take responsibility if I am a witness to bullying.	I can identify cause and effect in my own and others' actions.	I can identify cause and effect in my own and others' actions and that all actions have consequences.
	Reason and make ethical decisions.	I can talk about the choices characters in stories make and why.	I can see that people make different choices.	I can understand why people make different choices.	I can explore ways to reach fair and respectful decisions.	I can explain and discuss ways to reach fair and respectful decisions.	I can explore a variety of reasons people view and respond differently to issues in our community.	I can empathise with viewpoints the differ from my own on social issues.
	Consider consequences.	I can explain how someone might feel if they are being treated unkindly.	I can see how people's feelings influence the way they behave.	I can understand how people's feelings influence the way they behave.	I can explore ways that cause people to feel let down.	I can explain and discuss ways that cause people to feel let down.	I can identify the consequences of actions in familiar and imaginary situations.	I can evaluate and explain if a consequence is fair or unfair.
	Reflect on ethical action.	I can tell you the difference between things I want and things I need.	I can think about how someone is feeling and act on it.	I can act appropriately depending on the situation.	I can tell what I would do to behave correctly in various situations.	I can tell what I should do to behave correctly in various situations.	I can identify ethical responses to situations (e.g. animal testing).	I can explain why a decision is ethical (e.g. animal testing).
	Examine values.	I can care after myself and others.	I can talk about some school values.	I can talk about school and community values.	I can tell you what honesty, respect and equality means when working with others.	I can tell you why it is important to show honesty, respect and equality when working with others.	I can explore the values of equality, fairness, dignity and non-discrimination in our communities.	I can examine the values of equality, fairness, dignity and non-discrimination in various communities.
	Explore rights and responsibilities.	I can explain the reasons for our school and classroom rules.	I can be responsible for myself and my actions.	I can be responsible for myself and others.	I can discuss my rights and responsibilities that are expected of me at school.	I can investigate and describe my rights and responsibilities that are expected of me in the community.	I can monitor consistency between rights and responsibilities when interacting face-to-face.	I can monitor consistency between rights and responsibilities in media and social.
	Consider points of view.	I can explain my ideas and listen to others' ideas.	I can see that people may value different things.	I can consider different points of view.	I can give possible reasons for deciding whether my point of view is unbiased.	I can describe my reasons for deciding whether my point of view is unbiased.	I understand that bias exists in decision making.	I can explain why bias exists in decision making and media.

AUSTRALIAN CURRICULUM 8.4 PERSONAL AND SOCIAL CAPABILITY LEARNING CONTINUUM F–6

Personal and Social Capability	Skill	F	1	2	3	4	5	6
	Recognise emotions.	I can tell you how I am feeling.	I can say how I feel and how others feel.	I can say how a person or character is feeling and why.	I can talk about my feelings about celebrations, such as birthdays, personal achievements.	I can talk about my feelings and how others may feel about celebrations, such as birthdays, achievements of myself and others.	I can identify an appropriate and inappropriate emotional responses to situations.	I can identify an appropriate and inappropriate emotional responses to situations and their consequences.
	Recognise personal qualities and achievements.	I can talk about my likes and dislikes.	I can say what I am good at and what I need to work on.	I can say what I am good at and how this can help at home and at school.	I can list some of my strengths using different examples from home and school.	I can list a range of strengths and weaknesses using different examples from home, school and community.	I can identify how my personal qualities contribute to my success as a learner.	I can describe how and why my personal qualities contribute to my success as a learner.
	Understand themselves as learners.	I can have a go at new challenges.	I can do things myself to improve my work.	I can say what I need to do to improve my work.	I can set my own learning improvement goals and know what to do to achieve them with teacher support.	I can set my own learning improvement goals and know what to do to achieve them.	I can identify my preferred learning style and work habits.	I can utilise my preferred learning style and work habits to perform at my best.
	Develop reflective practice.	I can show that I know how to work well and finish my work.	I can explain something that I learned today.	I can understand how people's feelings influence the way they behave.	I can explore ways that cause people to feel let down.	I can explain and discuss ways that cause people to feel let down.	I can identify the consequences of actions in familiar and imaginary situations.	I can evaluate and explain if a consequence is fair or unfair.
	I can say when I have done a good job.	I can use feedback to improve my work I can set short term goals with teacher help.	I can improve a piece of work after hearing or reading comments on it.	I can explain how I have used a suggestion from someone else to improve my work.	I can identify my strengths and limitations, and with guidance can set challenges to develop new skills.	I can identify my strengths and limitations, and can independently set personal challenges to develop new skills.	I can identify ethical responses to situations (e.g. animal testing).	I can explain why a decision is ethical (e.g. animal testing).
	Express emotions appropriately.	I can identify how I feel.	I can say what happened and how I felt.	I can behave in a way that is mindful of others.	I can self-manage anger, frustration and excitement with teacher support.	I can self-manage anger, frustration and excitement.	I can identify situations when emotions impact on my learning.	I can identify and control situations when emotions impact on my learning.
	Develop self-discipline and set goals.	I can join in with others during class activities.	I can follow routines and finish my work.	I can finish my work on time and do my best.	I can focus on set tasks and finish activities on time.	I can focus on set tasks, prioritise the important bits and finish work on time.	I can identify goals and make plans to achieve success.	I can use SMART goals to improve my learning.
	Work independently and show initiative.	I can have a go with help from my teachers.	I can have a go by myself and ask for help when I need it.	I can work independently and use strategies when I get stuck.	I can try to find a solution to a problem by myself.	I can challenge myself to find a solution to a problem independently.	I can identify situations where it is beneficial to work independently.	I can explain the benefits of working independently and effective work habits when doing so.
	Become confident, resilient and adaptable.	I can identify members of my family, friends and people in my community who I feel safe with.	I can recognise when I feel safe and unsafe.	I can persist when I feel challenged.	I can try new strategies to solve a problem.	I can find a solution to a problem independently.	I can discuss coping strategies for managing setbacks.	I can apply appropriate coping strategies to managing personal setbacks.

Personal and Social Capability	Skill	F	1	2	3	4	5	6
	Appreciate diverse perspectives.	I can listen to and encourage others in my group. I can identify the range of likes and dislikes in the class.	I can listen to other people's ideas.	I can listen to others' ideas and think how they are the same or different to mine.	I can recognise difference in opinion and make suggestions for improvement.	I can discuss my thoughts and opinions with my classmates, seeing their perspective.	I can recognise that social and cultural factors can help and hinder people's understandings in social settings.	I can explain how and why communication can help or hinder peoples' understandings in social settings.
	Contribute to civil society.	I can tell you how I help at home and at school. can tell you my role in the classroom and my family.	I can say how I help others and how others help me.	I can say how I help others and they help me in my community.	I can give examples of how I help my classmates and others in my community.	I can identify various people in my community and how they make a difference.	I can identify needs or problems in the local community.	I can identify and address needs and problems in the local community.
	Understand relationships.	I can work together with others in my grade.	I can get along with all people.	I can explain how what I say or do affects others.	I can identify ways to care for my classmates.	I can explain how my actions affect others and the importance of including others.	I can identify the difference between positive and negative relationships.	I can identify behaviours that are displayed in a positive relationship.
	Communicate effectively.	I can encourage others in my group. I can listen to others in my group. I can wait my turn to talk.	I can make my body and voice match my words.	I can listen and share my ideas effectively.	I can explain how my ideas have grown.	I can explain how my ideas have grown and how they have changed.	I can identify different ways of communicating in a variety of situations.	I can explain my reasons for choosing a communication style in a given situation.
	Work collaboratively.	I can share my classroom equipment with the grade. I can follow the class routine.	I can participate well in group activities.	I can contribute and work cooperatively in groups.	I can explain how I helped my group and if my group achieved its goals.	I can keep track of the things the team have to get done.	I can be an active team member who can contribute ideas to achieve success.	I can encourage others, negotiate roles and manage time/tasks.
	Make decisions.	I can make choices in my learning.	I can make good and fair choices.	I can work with others to make good and fair choices.	I can allocate roles to team members if I am the team leader.	I can volunteer for roles in my team.	I can identify factors that influence decision making.	I can discuss factors that influence decision making and consider their usefulness.
	Negotiate and resolve conflict.	I can listen to others' ideas. I can talk about how others might be feeling.	I can take simple steps to solve conflicts with help.	I can take simple steps to solve conflicts myself.	I can name a variety of strategies to solve a conflict.	I can identify strategies to negotiate positive outcomes to problems.	I can discuss a range of strategies that can be used to diffuse/resolve conflicts.	I can apply a range of skills and strategies to independently resolve conflicts.
	Develop leadership skills.	I can help in the classroom by putting things away and keeping my space tidy.	I can accept responsibility for my actions.	I can model responsible behaviour.	I can allocate roles to team members if I am the team leader.	I can volunteer for roles in my team and keep track of when I have to do to get the job done.	I can help to run a group activity that works towards a set goal.	I can plan and run group activities that work towards a set goal.

AUSTRALIAN CURRICULUM 9.0 CRITICAL AND CREATIVE THINKING CAPABILITY LEARNING CONTINUUM F–6

Skill	F	1	2	3	4	5	6
INQUIRING							
Develop questions.	I can ask 'why' questions about something I am familiar with.	I can ask questions to find out more information about something I am familiar with.	I can ask 'how' and 'why' questions that are on topic about something I am familiar with.	I can turn 'I wonder' ideas into questions to investigate who, how, what, when and why about something I am unfamiliar with.	I can develop questions to compare and contrast to support me understanding a topic. I can develop questions to make connections.	I can develop questions that challenge points of view. I can develop questions to clarify processes or procedures.	I can develop questions to uncover bias and provoke debate. I can develop questions to interpret processes or procedures.
Identify, process and evaluate information.	I can say my opinion about information provided by my teacher. I can group things that are most relevant to a topic.	I can talk about the difference between fact and opinion in information provided by my teacher. I can identify the similarities and differences in information provided by my teacher.	I can identify and explore information from a range of sources provided by my teacher. I can explain the similarities and differences in information provided by my teacher.	I can identify the relevant information and opinions in a range of sources. I can use a graphic organiser to summarise information related to a topic.	I can examine relevant information and opinion from a range of sources. I can put the information related to a topic into my own words.	I can select an appropriate graphic organiser to collect, compare and categorise information and opinions from a range of sources. I can talk about bias.	I can make and explain judgements using evidence on the worth of information and opinions from a range of sources.
GENERATING							
Create possibilities.	I can explore and connect ideas to imagine new possibilities.	I can use what I know to predict what may happen next. I can connect and expand ideas to create new possibilities.	I can use what I know to come up with a new idea. I can creatively expand ideas to create new possibilities.	I can use a graphic organiser to connect and expand on new and known ideas.	I can use a variety of thinking tools to connect and expand on new and known ideas.	I can use a variety of thinking tools to change and combine new and known ideas in different ways.	I can use a variety of creative ways to combine and elaborate on new and known ideas.
Consider alternatives.	I can suggest how to approach a given task or problem in a different way.	I can listen and think about how other ideas are different to mine.	I can consider and explore different or creative ways to approach a task or problem.	I can ask 'What if' when comparing alternative ways to approach a task, issue or problem.	I can compare and judge alternative ways to approach a task, issue or problem and recommend a preferred option. I can change my ideas if needed.	I can evaluate and adjust my current approaches and recommend a preferred pathway to success.	I can evaluate, creatively adjust and justify my approaches to achieve the best outcome.
Put ideas into action.	I can learn from trial-and-error as I put my ideas into action.	I can experiment with options as I put my ideas into action.	I can predict possible results before I put my ideas into action.	I can predict an outcome, and trial some options and assess their effectiveness as I put my ideas into action.	I can trial a range of options and assess their effectiveness as I put my ideas into action in order to get the most effective outcome.	I can test a range of options to see which option best suits the situation I can assess and refine options when a prediction doesn't eventuate.	I can systematically test a range of options and re-evaluate my ideas for more effective outcomes.

Skill	F	1	2	3	4	5	6
ANALYSING							
Interpret concepts and problems.	I can identify some of the main parts of a concept or problem.	I can identify the main parts of a concept or problem.	I can describe how the main parts of a concept or problem relate to each other.	I can identify the significant elements and relationships within a concept or problem.	I can prioritise the significant elements and relationships within a concept or problem.	I can identify the relevant and significant aspects of a concept or problem.	I can explain how approaches may change depending on the subject or learning area.
Draw conclusions and provide reasons.	I can draw conclusions and make choices when completing tasks.	I can identify the reasons for choices I made when completing tasks and drawing conclusions.	I can explain the reasons for my choices when completing tasks and drawing a conclusion.	I can use observation and prior knowledge to provide the reasons for my choices when completing tasks and drawing conclusions.	I can construct arguments for my choices when completing tasks and drawing conclusions.	I can use discipline knowledge to provide the reasons for my choices when completing tasks and drawing conclusions.	I can evaluate arguments for choices made when completing tasks and drawing conclusions.
Evaluate actions and outcomes.	I can say if I have done a good job.	I can say why my work is good.	I can use a given set of criteria to support why I believe why my work is good.	I can explain the ideas, conclusions and actions I took and why my outcome is reasonable (in relation to my objective).	I can use a given set of criteria to support the ideas, conclusions and actions I took and explain how they achieved the desired outcome.	I can use a range of self-assessment tools, e.g. a rubric, to evaluate the effectiveness of a course of action or the outcome of a task.	I can use given or co-developed criteria to fairly evaluate my own and others work with a view to why outcomes were or were not achieved.
REFLECTING							
Think about thinking (metacognition).	I can say what I was thinking while I was working and drawing conclusions.	I can identify the thinking and learning strategies I used while I was working and drawing conclusions.	I can describe the different thinking and learning strategies I used.	I can select and describe the most effective thinking and learning strategies and processes to use when I work and draw conclusions.	I can reflect on the thinking and learning strategies and processes I used to see if they were the most effective I reflect on and check my thinking when something doesn't work out.	I can evaluate and adapt my thinking to achieve success I reflect on assumptions I made and invite alternative perspectives or constructive feedback.	I can evaluate, adjust, adapt and justify my thinking to improve future outcomes.
Transfer knowledge.	I can say what I know about a topic.	I can say what I already know from a previous experience to help me learn new things.	I can use what I already know from a previous experience to help me understand new things.	I can use aspects of knowledge and skills gained from one setting to make sense of an unfamiliar setting or context.	I can identify prior knowledge and skills gained from one setting that can be used in a new setting or context.	I can discuss and apply aspects of prior knowledge and skills gained in one context to a new or unrelated context.	I can apply prior knowledge and skills to use in a new or unrelated context to achieve a specific purpose.

AUSTRALIAN CURRICULUM 9.0 ETHICAL UNDERSTANDING LEARNING CONTINUUM F–6

Skill	F	1	2	3	4	5	6
UNDERSTANDING ETHICAL CONCEPTS AND PERSPECTIVES							
Explore ethical concepts.	I can tell you what is right and wrong or good and bad.	I can say when things are fair or unfair, honest or dishonest.	I can describe actions and behaviours associated with being honest and fair.	I can identify what it means to show respect and tolerance.	I can describe how a situation or context affects actions and behaviour.	I can identify and describe ethical concepts such as truth and justice.	I can explain how perspectives may vary according to the situation or context.
Examine values, rights and responsibilities, and ethical norms.	I can identify some of the school values. I can identify the school and classroom rules.	I can talk about the school and classroom values and expectations. I can be responsible for myself and my actions.	I can explain why we have school and classroom rules and why they are important. I can discuss my rights and responsibilities and the expectations at school.	I can describe how values, rights and responsibilities, and shared expectations influence people's responses.	I can describe how values, rights and responsibilities, and shared expectations influence the decisions people make.	I can describe how the relationships between values, rights and responsibilities, and ethical norms influence people's responses to ethical issues.	I can describe how the relationships between values, rights and responsibilities, and ethical norms influence the decisions people make to ethical issues.
Recognise influences on ethical behaviour and perspectives.	I can share how someone might feel if they are being treated unkindly.	I can share how people's feelings influence the way they behave.	I can share examples of when people's feelings and behaviour match and when they do not.	I can explain how emotions can affect behaviour in different situations.	I can explain how emotions can affect decision-making in different situations.	I can explain how habits and behaviour shape people's character.	I can examine how habits and behaviour inform people's ethical perspectives.
RESPONDING TO ETHICAL ISSUES							
Explore ethical perspectives and frameworks.	I can share examples of different consequences.	I can share how different consequences might affect the way people behave or act.	I can identify the similarities and differences between values such as caring, compassion and empathy.	I can describe the differences and connections between rights and responsibilities, and care and respect.	I can describe how the differences and connections between rights and responsibilities, and care and respect affect decision-making.	I can discuss how an ethical framework can be built on consequences, virtues and duties.	I can describe how an ethical framework can guide ethical decision-making.
Explore ethical issues.	I can talk about the choices characters in stories make and why.	I can identify that people make difference choices based on their perspective or approach.	I can identify people's different perspectives or approaches and how they influenced a person's choice.	I can identify examples that show people may have different values and perspectives.	I can use the examples to describe how those values and perspectives influenced the choices they made.	I can identify how people's perspectives or approaches to ethical issues may vary in different situations.	I can describe how people's perspectives or approaches to ethical issues may vary in different situations.
Making and reflecting on ethical decisions.	I can tell you the difference between things I want and things I need.	I can share how people's wants and needs influence their choices and actions.	I can identify examples of how perspectives and values influence people's decision-making.	I can describe the process by which I make decisions.	I can use ethical perspectives and values to describe the process by I make decisions.	I can identify alternative ethical responses to an issue when making and reflecting on ethical decisions.	I can consider alternative ethical responses to an issue when making and reflecting on ethical decisions.

AUSTRALIAN CURRICULUM 9.0 PERSONAL AND SOCIAL CAPABILITY LEARNING CONTINUUM F–6

Skill	F	1	2	3	4	5	6
SELF-AWARENESS							
Personal awareness	I can talk about my likes, dislikes, strengths, abilities and interests I can describe how what I am good at and what I am not influences the choices I make.	I can list my personal qualities and share examples from home and school.	I can describe how my personal qualities contribute to my growth.	I can explain how my personal qualities contribute to my success as a learner.	I can explain the influences on my personal qualities and how they contribute to my success as a learner.	I can analyse the influence that choices have on developing my ability to be a successful learner.	I can identify areas where I can grow and improve as a learner.
Emotional awareness	I can say how I feel and why I feel the way I do.	I can describe how I feel and how others may feel.	I can describe what could be the reasons that others feel that way.	I can identify appropriate and inappropriate emotional responses to situations.	I can explain how my own behaviour and emotional response affected others.	I can identify different factors and situations that could influence my emotional responses.	I can analyse the influence of different factors and situations on my emotional responses.
Reflective practice	I can discuss how my choices either helped or hindered me learning or completing my work.	I can improve how I learn and work after hearing or reading comments on it.	I can explain how I have used a suggestion from someone else to improve how I learn and work.	I can identify my abilities and limitations, and with guidance can set challenges to develop new skills.	I can identify my abilities and limitations, and can independently set personal challenges to develop new skills.	I can seek feedback from others to improve my skills.	I can use the feedback I have been given to analyse and develop strategies to improve my skills.
SELF-MANAGEMENT							
Goal setting	I can use one or more strategies to join in with others during class activities.	I can co-create goals with my teacher to help my learning when working by myself or with others.	I can work with others to develop goals to improve my learning.	I can set improvement goals in my learning I can make plans to achieve the goals.	I can set SMART goals to improve my learning I can make plans to achieve the goals successfully.	I can select and use strategies to monitor my learning.	I can refine my learning goals and plan for further improvement.
Emotional regulation	I can recognise how my emotions affect how I feel and act.	I can say what happened and how I felt.	I can behave in a way that is mindful of others.	I can identify ways to moderate my emotions.	I can describe ways to moderate my emotions and why it is important.	I can use a strategy to regulate my emotions.	I can use a range of strategies to regulate and co-regulate with others.
Perseverance and adaptability	I can have a go at familiar tasks with help from my teachers.	I can have a go at familiar tasks by myself and ask for help when I need it.	I can persist when faced with unfamiliar tasks I can work independently and use strategies when I get stuck.	I can persist when I feel challenged I can discuss possible new strategies to solve challenging or unfamiliar tasks.	I can learn from successes, setbacks and failures I can apply new strategies to solve challenging or unfamiliar tasks.	I can discuss coping strategies for managing setbacks when faced with challenging or unfamiliar tasks.	I can apply appropriate coping strategies to managing personal setbacks when faced with challenging or unfamiliar tasks.

Skill	F	1	2	3	4	5	6
SOCIAL AWARENESS							
Empathy	I can listen to and encourage others in my group I can identify other's needs, emotions, cultures and backgrounds.	I can list the similarities and differences between the needs, emotions, cultures and backgrounds of myself and others.	I can describe how the needs, emotions, cultures and backgrounds are the same or different to mine.	I can discuss the importance of valuing each other's needs, emotions, cultures and backgrounds.	I can demonstrate how I value the needs, emotions, cultures and backgrounds of others.	I can explain how the ability to appreciate others' needs, emotions, cultures and backgrounds is important.	I can explain how appreciating other's assists in the development of social awareness.
Relational awareness	I can take care of others as we play and work together in my class.	I can describe ways to care for my classmates I can share how others may feel.	I can discuss how my and other's actions can affect others and the importance of including others.	I can identify how I can contribute to healthy relationships with others.	I can discuss strategies of how we can sort out disagreements with others.	I can identify and describe a variety of relationships.	I can identify and describe the roles and responsibilities of people within a variety of relationships
Community awareness	I can tell you about the different groups in the classroom and my family.	I can say how I help others and how others help me.	I can say how I help others and they help me in my community.	I can give examples of how I help my classmates and others in my community.	I can identify and describe various people in my community and how they make a difference.	I can describe and explain the needs or problems in various communities.	I can explain how we can do something to address the needs or problems in various communities.
SOCIAL MANAGEMENT							
Communication	I can encourage others in my group I can listen to others in my group I can wait my turn to talk.	I can make my body and voice match my words.	I can listen and use a range of ways to share my ideas effectively.	I can identify different verbals and non-verbal strategies to more effectively respond to others.	I can apply different verbals and non-verbal strategies to more effectively respond to others.	I can identify different strategies when communicating in a variety of situations.	I can use a range of strategies when communicating in a variety of situations.
Collaboration	I can share my classroom equipment with the class I can follow the class routine.	I can participate well in group play, tasks and activities.	I can contribute and work cooperatively in group tasks and activities.	I can carry out my role in a group I can explain how I helped my group.	I can keep track of the things the group have to get done I can explain how each person in the group contributed to achieving our goals.	I can support group members to contribute ideas to improve the way we work and how we succeed in our goals.	I can encourage others, negotiate roles and manage time/tasks to improve the way we work and succeed in our goals.
Leadership	I can practice leadership by helping in the classroom and being responsible for myself.	I can accept responsibility for my actions.	I can describe when it is important to show leadership I can model responsible behaviour.	I can allocate roles to team members if I am the team leader.	I can volunteer for roles in my team and keep track of when I have to do to get the job done.	I can use different leadership approaches when we work in a group to achieve our goals.	I can work with others to discuss and use the best approaches to plan and achieve group goals.
Decision-making	I can identify choices in my learning that are good for me and others.	I can make good and fair choices.	I can work with others to make good and fair choices.	I can describe the factors that influence mine and others' decisions.	I can predict the outcomes of individual and group decisions.	I can discuss the factors that influence individual and group decision making.	I can consider usefulness of the influential factors when making decisions.
Conflict resolution	I can listen to others' ideas that I don't agree with I can talk about how we could calm situations down.	I can take simple steps to solve conflicts with help I can share possible ways we could prevent and solve conflicts.	I can take simple steps to solve conflicts myself.	I can describe a range of conflict resolution strategies which can result in a positive outcome.	I can apply a range of conflict resolution strategies to negotiate positive outcomes to problems.	I can assess the causes and effects of conflict.	I can practise a range of different strategies to prevent, defuse or resolve conflict.

PRIMARY DESIGN PROCESS RUBRIC (AUSTRALIAN CURRICULUM 8.4)

Skill	Essential	Developing	Capable	Proficient	Teacher practices/modelling/graphic organisers
Empathise ▪ Identifying the goal of the task ▪ gathering information and data.	▪ I can identify the overall goal of the task. ▪ I can identify ways I can gather information.	**Plus:** ▪ I can use a strategy to find out information about the task.	**Plus:** ▪ I can use different strategies to gather more information and data about the task.	**Plus:** ▪ I can compare and contrast the effectiveness of the strategies I used to gather information.	Create an empathisestrategy document of approaches. Include: ▪ asking questions ▪ iterating ▪ expert knowledge.
Define ▪ Identifying needs and wants ▪ identifying what is important or not ▪ looking at existing products and processes.	▪ I can identify the wants and needs that the end product must address.	**Plus:** ▪ I can rate the importance of each want and need to the user. ▪ I can list some of the resources and techniques that may be required to create a solution.	**Plus:** ▪ I can research already existing designs and associated technologies. ▪ I can explain what is important and what is not.	**Plus:** ▪ I can compare and contrast the techniques that could be used to make the end product.	Create a definestrategy document of approaches. Include: ▪ tools and techniques that could be used ▪ considering existing products and processes.
Ideate Generating: strategies for generating design ideas. Developing: strategies to analyse, develop, and improve design ideas. Communicating: strategies to document and communicate the design ideas.	▪ I can brainstorm the features I would like in my designed solution.	**Plus:** ▪ I can list the features of existing designs to generate new ideas.	**Plus:** ▪ I can compare and contrast the features of existing designs to provide new ideas. ▪ I can use safety by design principles to generate a range of design ideas.	**Plus:** ▪ I can combine or modify ideas to generate a range of innovative design ideas.	Could create a skill-level appropriate ideationstrategy document of approaches that can be used to generate, develop, test and communicate design ideas.
	▪ I can list what I like and dislike about a design idea.	**Plus:** ▪ I can list the pros and cons of a design idea.	**Plus:** ▪ I can seek feedback on the benefits and drawbacks of my design ideas. ▪ I can develop several alternative versions or models of design ideas based on the feedback.	**Plus:** ▪ I can identify techniques and resources to use for each design idea. ▪ I can use feedback to improve my design ideas or the resources and processes used.	
	▪ I can draw/sketch 2D drawings or create a model of the design idea(s). ▪ I can name and label the design idea(s).	**Plus:** ▪ I can annotate the drawings to clarify the pros and cons of each design idea.	**Plus:** ▪ I can annotate the drawings to explain features.	**Plus:** ▪ I can annotate the drawings to explain the techniques that could be used to make it.	
Prototype/test Making: techniques to create a model or prototype. Safety: strategies to work safely.	▪ I can make a model of the design idea by exploring how available materials.	**Plus:** ▪ I can explore ways of joining, connecting and assembling components for the design idea.	**Plus:** ▪ I can use the appropriate terminology to describe the making techniques used.	**Plus:** ▪ I can practise making techniques to improve my expertise and the quality of the model.	Create a prototype/teststrategy document of approaches. Include: ▪ using discarded materials to design, make and model ▪ cutting and joining ▪ sewing ▪ gluing ▪ safe work practices.
	▪ I can safely practise a range of making skills using tools and equipment.	**Plus:** ▪ I can explain the importance of demonstrating safe and responsible work practices.	**Plus:** ▪ I can work safely and responsibly to ensure safe work areas.	**Plus:** ▪ I can independently develop safe working practices.	

Skill	Essential	Developing	Capable	Proficient	Teacher practices/modelling/graphic organisers
Evaluate Evaluating/reflecting: evaluating how well the designed solution meets the design criteria. Refining/revising: refining/ revising the designed solution.	▪ I can record judgements about what I like and dislike about the designed solution.	**Plus:** ▪ I can describe how well the designed solution meets the original wants and needs.	**Plus:** ▪ I can record experiences of the techniques used and challenges of producing the designed solution.	**Plus:** ▪ I can evaluate the choices we made at various stages of a design process.	Create an evaluationstrategy document of approaches. Include: ▪ personal likes and dislikes ▪ capturing user feedback about what they like and dislike ▪ rating how well the designed solution meets the wants and needs.
	▪ I can suggest how the designed solution could be improved.	**Plus:** ▪ I can seek feedback from others on how we could improve the designed solution.	**Plus:** ▪ I can revise the designed solution to more effectively meet the wants and needs.	**Plus:** ▪ I can modify the techniques used to make a higher quality designed solution.	
Planning and collaborating Planning: designing and making a plan. Collaborating: collaborative team behaviour.	▪ I/we can create a step-by-step list of actions or storyboard to take to make the designed solution.	**Plus:** ▪ We can identify who will be responsible for each action.	**Plus:** ▪ We can set milestones of when things are due.	**Plus:** ▪ We can reflect on planned steps to see if improvements can be made.	Create some simple planning templates for the students to use.
	▪ I can contribute and work cooperatively in a group.	**Plus:** ▪ We can identify roles for each member of a group. ▪ I can model responsible behaviour.	**Plus:** ▪ We can encourage each other and manage our time/tasks.	**Plus:** ▪ We can give and receive constructive feedback to work effectively as a team.	