

How can Stage 2 improve our local marine environment?

Stage 2 students from Toormina Public School were given the opportunity to engage collaboratively to investigate the concept, “How can Stage 2 improve our local marine environment?” After participating in an initial excursion along the Coffs Creek Boardwalk through to the Jetty Foreshore students had to identify what they saw, what issues they could identify and whether these were man-made or naturally occurring events. Students then collaborated in groups to identify how the local marine environment could be improved and who had the power to oversee these changes. Students researched solutions, designed alternative practices and wrote letters to relevant authorities. Our STEM Project culminated with a STEM Expo which allowed our students to share their work with their peers and the wider Toormina Community.

Science and technology outcomes	ST2-1VA ST2-2VA	ST2-4WS ST2-11LW	
Mathematics outcomes	MA2-1WM MA2-2WM	MA2-3WM MA2-18SP	MA2-19SP
English Syllabus	EN2-1A EN2-2A	EN2-4A EN2-9B	EN2-10C EN2-11D EN2-12E

Statement of impact

Students have successfully shared their findings with all other students at Toormina Public School as well as parents and special guests, including the Mayor of Coffs Harbour, Mrs Denise Knight. Students were invited to pass on their thoughts and ideas to council for these to be raised in a formal setting. As a result of the project students have a greater appreciation of their local marine environment and are taking conscious steps to ensure that they are taking ownership of their actions and that these do not have a negative affect on our fragile coastal environment. Students and teachers have also identified how STEM can be used as a highly effective teaching pedagogy which enable 21st century learning whilst maximising learning outcomes.

For more information

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THE UNIVERSITY OF
SYDNEY

Toormina Public School – STEM Project – Stage 2



SUMMARY

Stage 2 students from Toormina Public School were given the opportunity to engage collaboratively to investigate the concept, *“How can Stage 2 improve our local marine environment?”* After participating in an initial excursion along the Coffs Creek Boardwalk through to the Jetty Foreshore students had to identify what they saw, what issues they could identify and whether these were man-made or naturally occurring events. Students then collaborated in groups to identify how the local marine environment could be improved and who had the power to oversee these changes. Students researched solutions, designed alternative practices and wrote letters to relevant authorities. Our STEM Project culminated with a STEM Expo which allowed our students to share their work with their peers and the wider Toormina Community.

PURPOSE/ CONTEXT

Toormina Public School formed an alliance with the STEM Teacher Enrichment Academy – Primary Program with the aim of upskilling our teachers with the knowledge, skills, resources and support to make real change in their classroom teaching. In line with the STEM Teacher Enrichment Academy ethos we aimed to:

- Introduce and support exciting and effective approaches to learning, enhance teachers’ knowledge of content and approaches to teaching integrated science, mathematics, and technology in Years 3-6 of the Australian Curriculum for NSW.

- Develop teachers' awareness of relevant STEM-related applications to society and career pathways and to build the students characteristics as 21st Century Learners.

Big idea/s and why does this learning matter?

Our school community is concerned about the negative environmental impact on our local marine environments. The school already has done some research on pollution effects on our beaches through a targeted Kids Teaching Kids program (K-6).

Driving Question

How can Stage 2 improve our local marine environment?

Syllabus Outcomes

Science

ST2-1VA Shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities.

ST2-2VA Demonstrates a willingness to engage responsibly with local, national and global issues relevant to their lives, and to shaping sustainable futures.

ST2-4WS Investigates their questions and predictions by analysing collected data, suggesting explanations for their findings, and communicating and reflecting on the processes undertaken.

ST2-11LW Describes ways that science knowledge helps people understand the effect of their actions on the environment and on the survival of living things.

English

EN2-1A Communicates in a range of informal and formal contexts by adopting a range of roles in group, classroom, school and community contexts

EN2-2A Plans, composes and reviews a range of texts that are more demanding in terms of topic, audience and language

EN2-4A Uses an increasing range of skills, strategies and knowledge to fluently read, view and comprehend a range of texts on increasingly challenging topics in different media and technologies

EN2-9B Uses effective and accurate sentence structure, grammatical features, punctuation conventions and vocabulary relevant to the type of text when responding to and composing texts

EN2-10C thinks imaginatively, creatively and interpretively about information, ideas and texts when responding to and composing texts

EN2-11D Responds to and composes a range of texts that express viewpoints of the world similar to and different from their own

EN2-12E Recognises and uses an increasing range of strategies to reflect on their own and others' learning

Mathematics

MA2-1WM Uses appropriate terminology to describe, and symbols to represent, mathematical ideas

MA2-2WM Selects and uses appropriate mental or written strategies, or technology, to solve problems

MA2-3WM Checks the accuracy of a statement and explains the reasoning used

MA2-18SP Selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs

MA2-19SP Describes and compares chance events in social and experimental contexts

Possible Experts

1. Marine Science Centre - Expert visit
2. Toormina H.S. marine studies program
3. Landcare
4. Coffs Harbour City Council
5. Kerry Cameron - Marine field scientist

6. Dolphin Marine Magic - Turtle rescue
7. Jetty Dive Centre
8. Sea shepherd
9. Fishing Tackle Australia
10. Waste management- (Coffs tip)
11. National Parks and Wildlife - Andrew Turbill

Audience

Stage 1 and Stage 3 students from Toormina Public School as well as the wider school community.

Culminating Event

School staff, Stage 1 and 3 students, parents and community members will be invited to attend a special presentation event in the form of a STEM Expo to be held in the hall on Friday 2nd November. This will allow students from all Stage 2 classes to present their findings to the audience as a celebration of their work.

Syllabus Outcomes	Teaching, learning and assessment	Resources
<p>ST2-1VA Shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities.</p> <p>ST2-2VA Demonstrates a willingness to engage responsibly with local, national and global issues relevant to their lives, and to shaping sustainable futures.</p> <p>EN2-1A Communicates in a range of informal and formal contexts by adopting a range of roles in group, classroom, school and community contexts</p> <p>EN2-11D Responds to and composes a range of texts that express viewpoints of the world similar to and different from their own</p>	<p>Revisit Growth Mindset & Learning Pit</p> <p>Brainstorm - How can Stage 2 improve our local coastal environment?</p> <p>What do we think the major issues that we could address might be?</p>	<p>Growth mindset posters</p> <p>White boards</p> <p>White board markers</p>
<p>ST2-1VA Shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities.</p> <p>ST2-2VA Demonstrates a willingness to engage responsibly with local, national and global issues relevant to their lives, and to shaping sustainable futures.</p> <p>ST2-4WS Investigates their questions and predictions by analysing collected data, suggesting explanations for their findings, and communicating and reflecting on the processes undertaken.</p>	<p>Excursion:</p> <p>Bus to Promenade Coffs Creek walk Morning tea and break</p> <p>Walk along creek walk</p> <p>Walk to Park Beach - Lunch and break (play in park)</p> <p>Walk on Park Beach</p> <p>Walk to Jetty</p> <p>Walk along the foreshores</p> <p>break and play at foreshores</p> <p>Return to school - brainstorm - what are the major issues that we saw?</p> <p>How can they be addressed?</p>	<p>Clip boards</p> <p>Worksheets</p> <p>iPad minis</p>

<p>EN2-1A Communicates in a range of informal and formal contexts by adopting a range of roles in group, classroom, school and community contexts</p> <p>EN2-2A Plans, composes and reviews a range of texts that are more demanding in terms of topic, audience and language</p> <p>EN2-10C thinks imaginatively, creatively and interpretively about information, ideas and texts when responding to and composing texts</p>		
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<p>range of texts that are more demanding in terms of topic, audience and language</p> <p>EN2-4A Uses an increasing range of skills, strategies and knowledge to fluently read, view and comprehend a range of texts on increasingly challenging topics in different media and technologies</p> <p>EN2-9B Uses effective and accurate sentence structure, grammatical features, punctuation conventions and vocabulary relevant to the type of text when responding to and composing texts</p> <p>EN2-10C thinks imaginatively, creatively and interpretively about information, ideas and texts when responding to and composing texts</p> <p>EN2-11D Responds to and composes a range of texts that express viewpoints of the world similar to and different from their own</p> <p>EN2-12E Recognises and uses an increasing range of strategies to reflect on their own and others' learning</p> <p>MA2-1WM Uses appropriate terminology to describe, and symbols to represent, mathematical ideas</p> <p>MA2-2WM Selects and uses appropriate mental or written strategies, or technology, to solve problems</p> <p>MA2-3WM Checks the accuracy of a statement and explains the reasoning used</p> <p>MA2-18SP Selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column</p>		
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<p>graphs</p> <p>MA2-19SP Describes and compares chance events in social and experimental contexts</p>		
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<p>texts</p> <p>EN2-11D Responds to and composes a range of texts that express viewpoints of the world similar to and different from their own</p> <p>MA2-18SP Selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs</p> <p>MA2-19SP Describes and compares chance events in social and experimental contexts</p>		
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Assessment

Students' projects will be assessment against the following assessment criteria:

- 1) Students participated in our excursion and clearly identified possible focus areas within our STEM project.
- 2) Students determined future direction as a part of a group and this was outlined clearly.
- 3) Students were engaged in the processes of investigating, designing and making and using technology.
- 4) The STEM Expo display was well presented and descriptions of work clearly articulated.
- 5) Students were able to clearly discuss their project's principles, methodology and outcomes.

Toormina Public School STEM Marking Sheet

Student: _____

Group Members:

Part	Criteria	Points
1	Students participated in our excursion and clearly identified possible focus areas within our STEM project.	20
2	Students determined future direction as a part of a group and this was outlined clearly.	20
3	Students were engaged in the processes of investigating, designing and making and using technology.	20
4	The STEM Expo display was well presented and descriptions of work clearly articulated.	20
5	Students were able to clearly discuss their project's principles, methodology and outcomes.	20
Total		

Additional Comments:

Evaluation

- How did students demonstrate deep understanding of content covered?
- Did the project demonstrate evidence of the criteria?
- Were all students engaged?
- Toormina Public School would like to acknowledge Sarah Wiggins evaluation rubric.

Self Evaluation

	Unsatisfactory Effort (0 Points)	Effort Needs Improvement (1 point)	Satisfactory Effort (2 points)	Outstanding Effort (3 points)
I contributed to the team.				
I exhibited scientific thinking.				
I maintained a positive attitude.				
I completed the STEM Expo task.				
I reflected on my work.				

Team Evaluation

	Unsatisfactory Effort (0 Points)	Effort Needs Improvement (1 point)	Satisfactory Effort (2 points)	Outstanding Effort (3 points)
My team worked well together.				
My team displayed problem-solving skills.				
My team had a positive attitude.				
My team completed STEM Expo task.				
My team discussed and reflected on our work.				

Teacher Evaluation

	Unsatisfactory Effort (0 Points)	Effort Needs Improvement (1 point)	Satisfactory Effort (2 points)	Outstanding Effort (3 points)
Student Co-operated with the team.				
Student exhibited scientific thinking.				
Student maintained a positive attitude.				
Team completed the STEM Expo task.				
Student reflected on their work.				

Project Proposal

Driving Question: How can Stage 2 improve our local coastal environment?

Group:

Location of problem/issue:

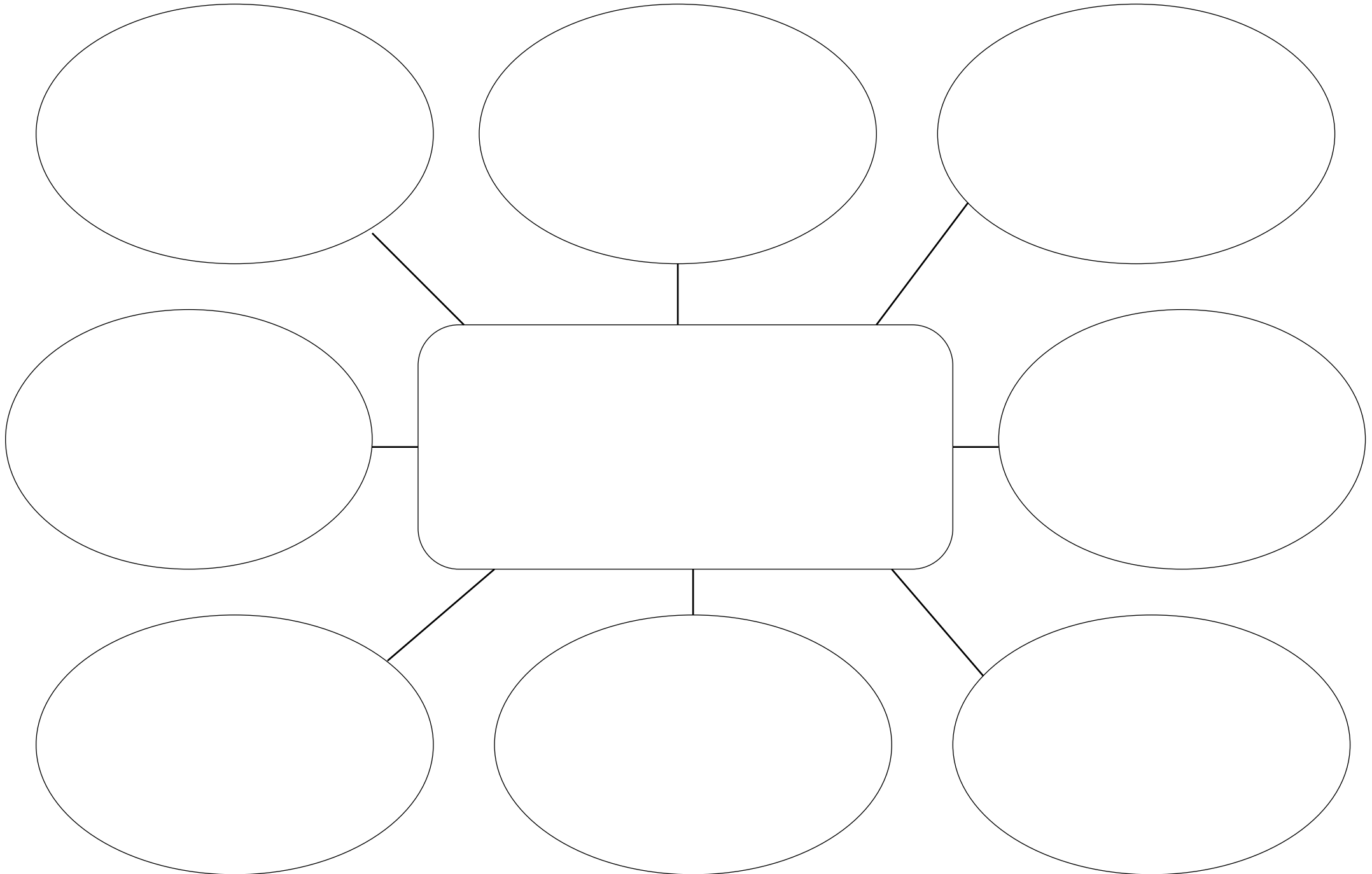
What is the problem/issue?

Who/ what does it impact on? How?

Who is our project audience?

What do we want our audience to know, feel or do?

Brainstorm: What are our solution ideas?



Areas of Improvement

Note: Location, what you saw and why it is a problem. Who or what does it impact on? How?

Environment

Community

Ideas for Improvement

Areas of Improvement	
Note: Location, what you saw and why it is a problem. Who or what does it impact on? How?	
Environment	Community
Ideas for Improvement	



You are **Invited!**

STEM Expo

Dear Parents and Special Guests,

The students in 3/4J, 3/4I, 3/4P and 4/5O have been working on a project in conjunction with the STEM Teacher Enrichment Academy at the University of Sydney exploring the concept of, "How can we improve our local coastal environment?"

You are invited to a STEM Expo in the School Hall where the students will share with you the work that they have completed.

We look forward to seeing you there!

Friday 2nd November

9:15am-9:45am

Toormina Hall