A Sustainable STEM Solution

Designing and Building a Frog Bog in your school

St Raphael's Primary School West Preston, Victoria

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"Problem Based Learning is a process of teaching and learning that focuses on problem based, project centered activities that produce a product for a client. PBL will be based on re-engineering processes that bring people from multiple disciplines together."

Problem Based Learning PBL Lab Stanford University https://pbl.stanford.edu



Problem Based Learning: The Driving Question

How do WE take responsibility and care for endangered species in OVR Common Home?



	Victorian Curriculum: Science Understanding	Victorian Curriculum: Science Inquiry Skills	Victorian Curriculum: Capabilities	Victorian Curriculum Cross- curricular Priorities	Religious Education Lens
	Level 5/6 Biological Sciences: Living things have structural features and adaptations	Questioning and predicting. Planning and conducting. Recording and	Critical and creative thinking. Ethical Personal and	Sustainability Aboriginal and Torres Strait Islander histories and cultures.	A STEM Design and Technology program to consider the costs and benefits of frogs, eco-
Problem Based Learning	that help them to survive in their environment.	processing. Analysing and evaluating. Communicating.	social.	'Tiddalick dreamtime story'.	systems and, Our Common Home with scientific, religious and Social Justice lenses (Laudato Si).



1 EMPATHISE

Debate the definition of living livings. Consider living things that are precious in our community.

² DEFINE

Engage with Caritas Australia, Melbourne Water & Darebin Creek Management Centre. Design Thinking Process

5 TEST

Decide on the one of the designs and construct the Frog Bog. Overtime, monitor frog numbers.

The Design Thinking Process

³ IDEATE

Generate ideas in teams: how to build the Frog Bog, location, resources, issues, costs etc. PROTOTYPE

Choose one or two ideas and create small prototypes of the Frog Bog. Spend time making changes and trying new ways to create your ideas.

Move to the signed area Humans Every living of the room, if you agree could survive or disagree with the organism is following statements. without Be prepared to explain special! nature! your position! Frogs are an Ecosystems Our Pope Francis important are made up calls us to care indicator of the for Our Common ofliving health of our Home! things! environment! Using **Empathy** A Frog Bog @ Habitat Animals and St Raphael's will destruction is the Stage to plants only benefit the local survive in healthy greatest threat to engage environments! frog populations! community!



Engaging STEM Experts

- Student: Pet Frogs
- Sustainability Teacher & 5/6 HR Teachers
- School Maintenance staff
- 🖋 Caritas Australia
- Melbourne Water
- La Trobe Indigenous Plant Nursery
- STEPS to Sustainability Conference
- Education Officers
- Darebin Creek Management Centre
- Merri Creek Management Centre



Additional opportunities:

- Neighbouring Primary Schools
- Family STEM presentation evening/day
- Local Council
- Student led Professional Learning: It takes a Spark STEM Conference
- Local newspaper and Television
- School Podcasts and Newsletters

Live FM Radio Broadcast

CEM STEM MAD

Finding an Audience





Problem Based Learning

Design and construct your own frog friendly habitat



Design and construct your own frog friendly habitat





SWOT
Analysis

S	W	Ο	Τ
Strengths	Weaknesses	Opportunities	Threats
tudent engagement.	Space limitations.	Awareness raising: World Wetland Day.	Safety concerns: Pre, during and post
Cross-curricula opportunities.	Time limitations: Planning &	International Frog Day.	build.
Authentic hands-on	Building.	Water Bug Investigation.	A crowded curriculum.
STEM learning.	Lack of teacher	Increase biodiversity in	A forgotten project.
Empower students.	Expense (\$1000.00)	the school (Resource	Equal opportunities for
Encourage STEM.		Smart Schoolsj.	students.
Beyond Biological sciences.	Need to be well resourced: gardening supplies.	Teacher & student collaboration	
		Girls in STEM	

Our Frog Bog Journey



Winners STEM MAD Showcase 2019 Best Engineered Product, Primary and Secondary Category Swinburne University, School of Engineering

Prize: Full day STEM immersion with Felicity Furey, Swinburne University, Hawthorn VICTORIA



St Raphael's Primary Schoo

Amongst our wonderful school Indigenous Garden, the Year 5/6 students accepted

the challenge to design and build a Frog Bog. As a sustainable school with a great love for the environment and all living things, we wanted to provide a frog friendly habitat for these fascinating creatures. Of the 35 frog species that live in Victoria, 16

of these live in Melbourne and unfortunately frog numbers around the world are declining, partly due to habitat

loss. Frogs are important biotic factors in ecosystems and can act as indicators of water health, as frogs are sensitive to

changes in their environment.

Frog Bog

Our Frog Bog is thriving!

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St Raphael's PS Frog Bog Late 2019 St Raphael's PS Frog Bog Early 2021