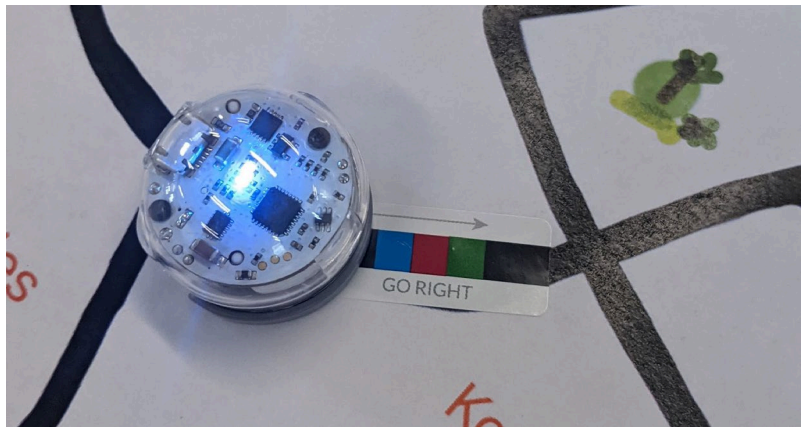


STEM in the Primary Classroom

St Joseph's Bardon

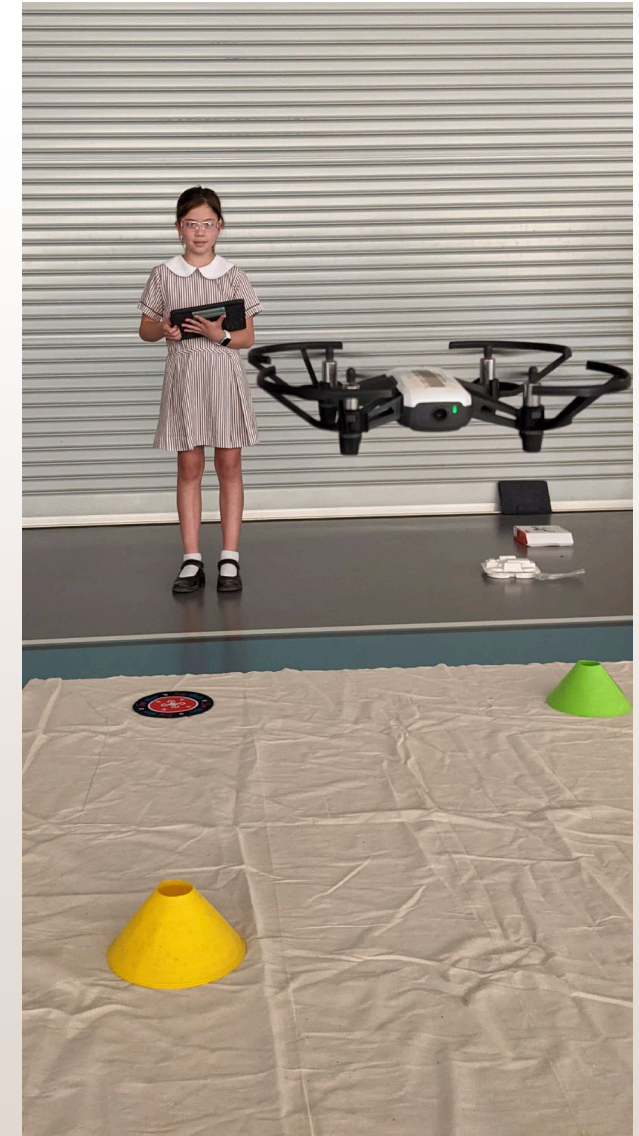
October 2023



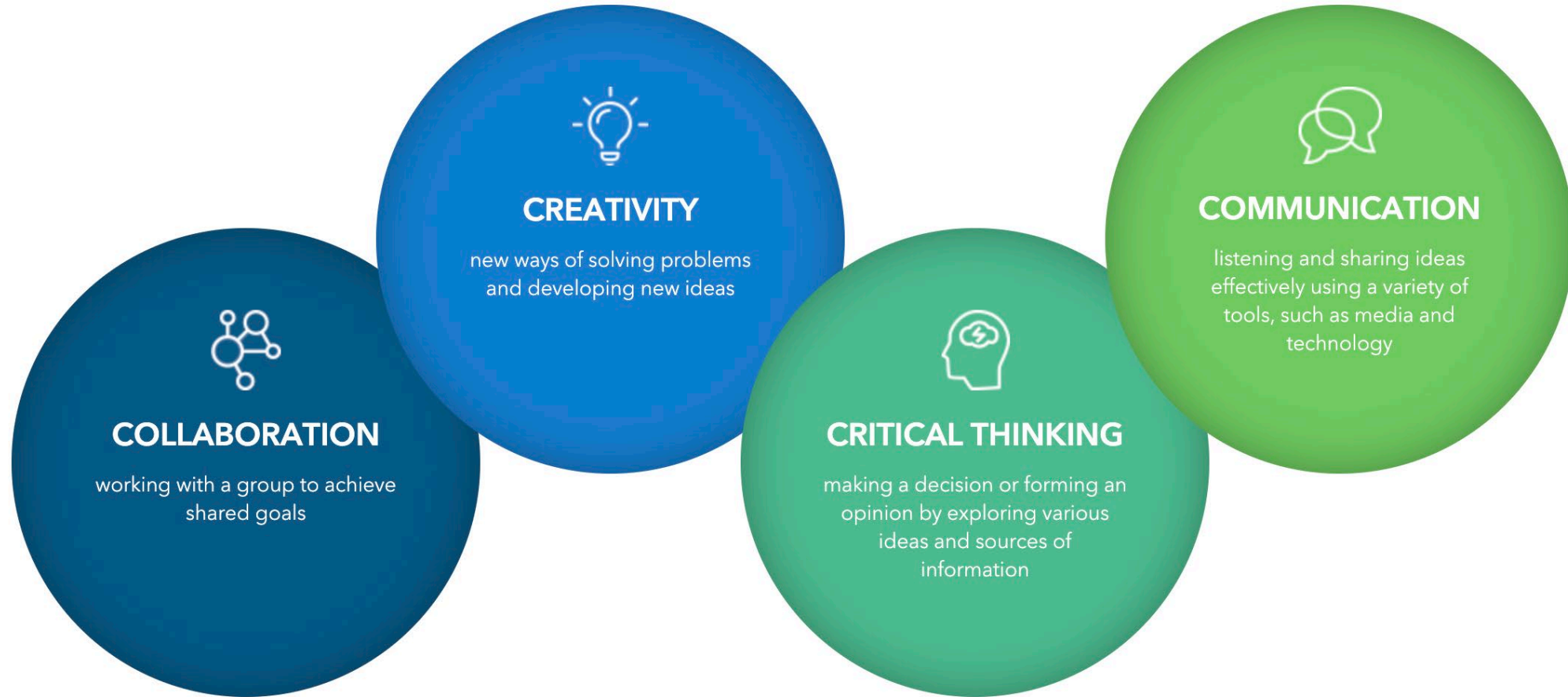


STEM at St Joseph's

At St Joseph's, we pride ourselves in our rigorous approach to STEM Education. In addition to the **in-depth content knowledge required for Science, Technology, Engineering and Mathematics**, we prioritise connected and authentic learning experiences that **develop skills for innovation, collaboration, and creative and critical thinking**. We encourage our students to be lifelong learners and responsible global citizens.



STEM: More than just the Learning Areas



(Voogt & Roblin, 2012; Scott, 2015 and Chalkadaki, 2018)

Expert Teaching Team

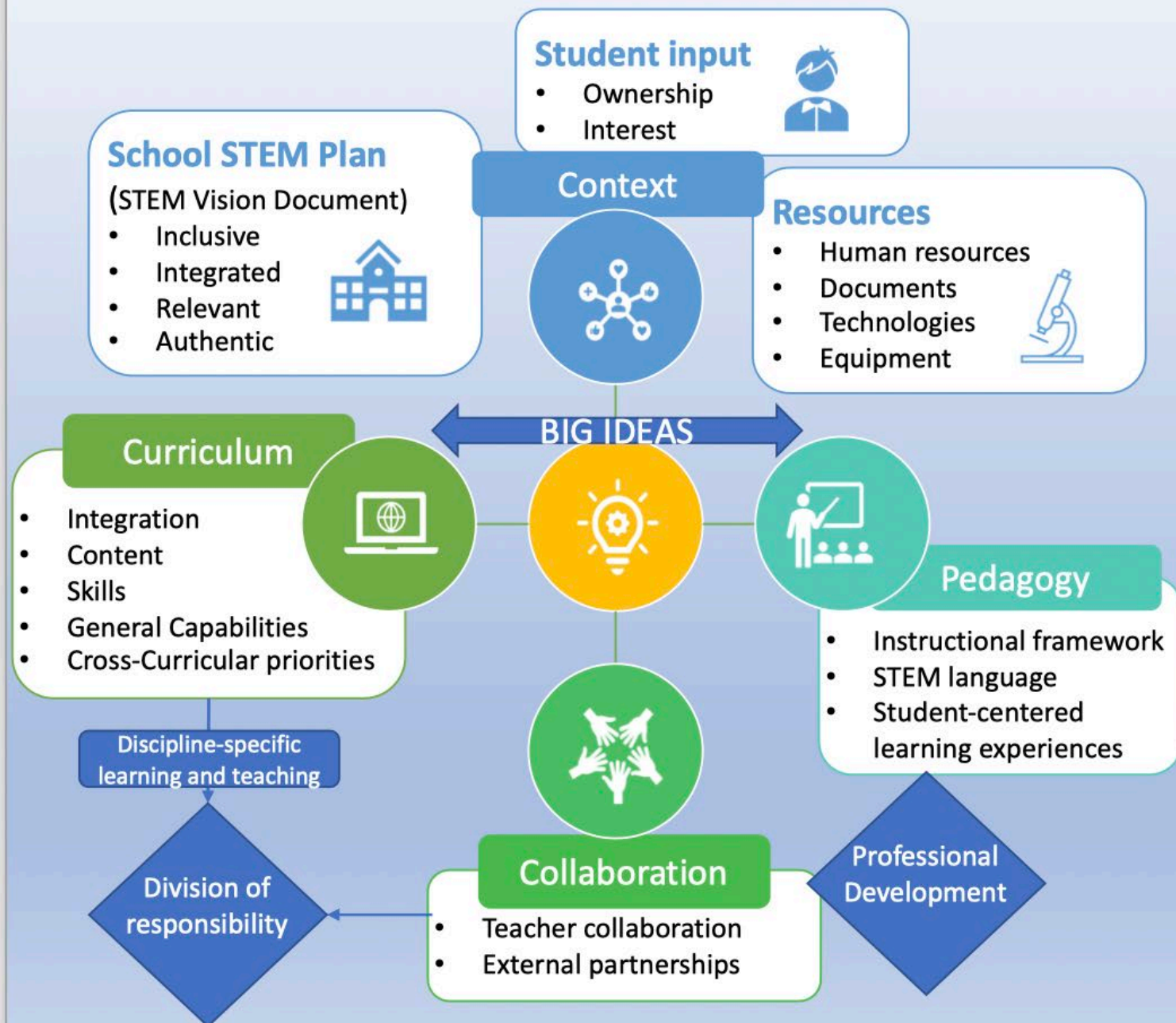
St Joseph's has a STEM specialist teacher who works with students and classroom teachers to integrate STEM opportunities into learning and teaching across curriculum areas.

The role and responsibility of the STEM specialist teacher includes:

- Facilitating professional development for staff in STEM education*
- Leading STEM education initiatives for students both in the classroom and during extra-curricular activities*
- Partnering with community, government, and industry STEM professionals*
- Collaborating with classroom teachers using a co-teaching cycle to co-plan, co-teach, co-debrief and co-reflect (Sharratt & Fullan, 2012) to build capacity and confidence in embedding STEM across the curriculum, as outlined in the table below.*

	1 st year - 2020	2 nd year - 2021	3 rd year - 2022	4 th year - 2023	5 th year - 2024
STEM Learning Experience 1	Co-teaching cycle completed	Supported delivery	Independent delivery*		
STEM Learning Experience 2		Co-teaching cycle completed	Supported delivery	Independent delivery*	
STEM Learning Experience 3			Co-teaching cycle completed	Supported delivery	Independent delivery*
STEM Learning Experience 4				Co-teaching cycle completed	Supported delivery
STEM Learning Experience 5					Co-teaching cycle completed

DESIGNING FOR CONNECTED STEM



Set targets

- Identify learning outcomes
- Plan assessment

Consider differentiation

- Individualised
- Low floors & High ceilings

Plan the teaching sequence

- Outline the structure and detail of each session (including resources)

Include a celebration of learning

- Wide walls
- Community connection

Report and Reflect

- Student report cards
- Data-based reflection

Example of planning for Prep



Learning Intentions

We are learning to follow and create sequence (put things in order).
We are learning to use ordinal numbers.
We are learning to give instructions.
We are learning to write algorithms for technology (write code).

Success Criteria

I can list the steps in order from 1st to 5th.
I can follow steps to put things in order.
I can give clear instructions to my partner and to a robot.
I can listen to instructions and follow instruction.

Teaching and Learning Activities

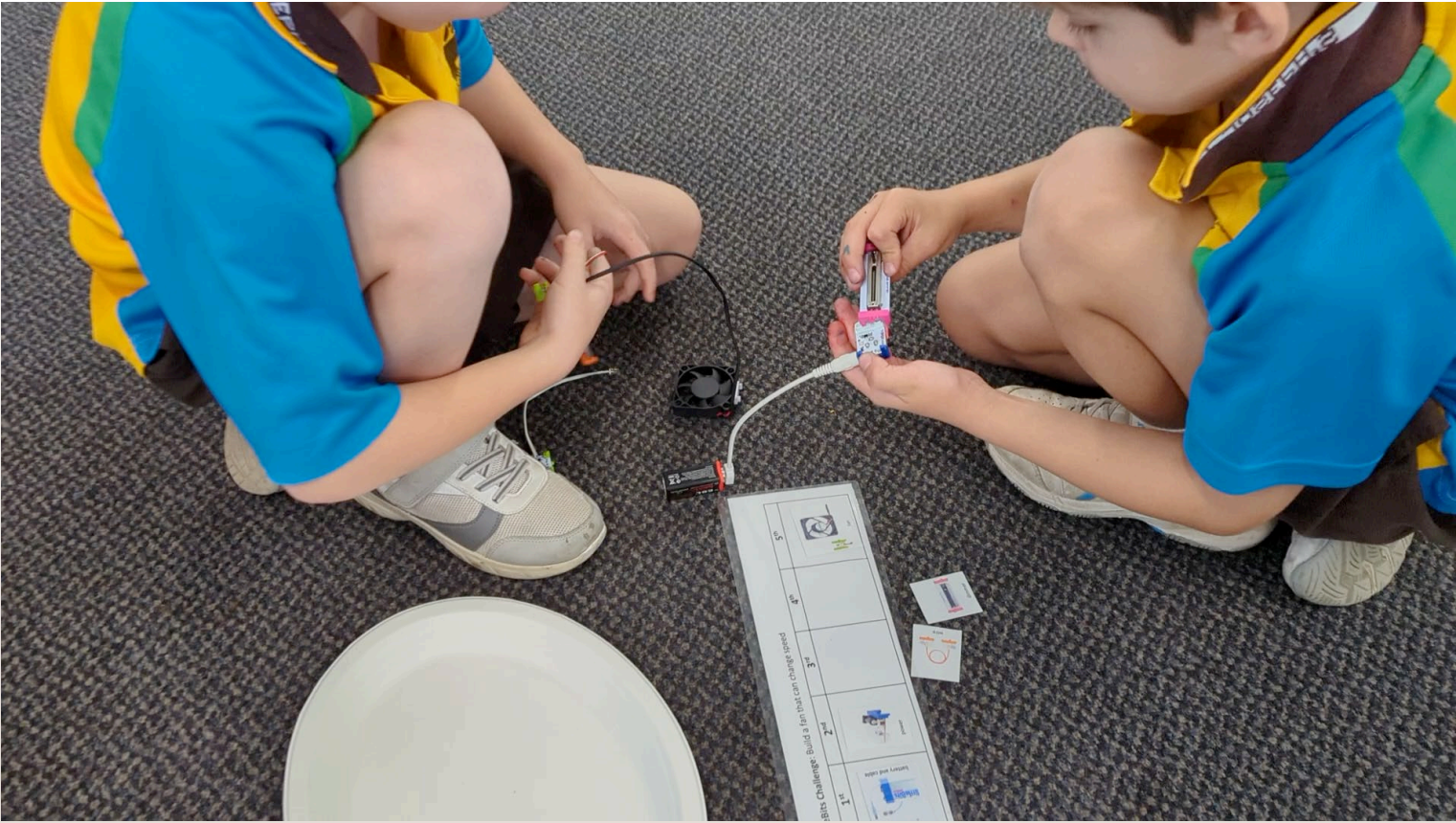
Resources

Lesson 1 – LittleBit sequencing

- Introduce the term 'STEM' and describe how each part relates to the LittleBits sequencing activity (an example of how the disciplines work together)
- Discuss what students know about energy and electricity
- Discuss how to be a good group member
- Arrange students into pairs or groups of three to follow the instructional cards
- Tier 1: Complete sequencing card (side 1)
Complete sequencing card (side 2) with teacher support
- Tier 2: Independently complete both sides of the cards
- Tier 3: As above plus challenge to have light turned on and a justable power to the fan

- LittleBits sets (battery, cable, power, slide dimmer, long LED, wire & fan) x8
- Laminated sequence cards and parts cards x 8
- Plates and cups to hold materials





Name: Audrey Date: Oct 2023

STEM – LittleBits Circuits

Draw a diagram of the LittleBits circuit:

1st 2nd 3rd 4th 5th

Success Criteria: I can follow steps to put things in order
I can list the steps in order from 1st to 5th
I can draw a picture of my LittleBits circuit (extension - and label the input and output)

Name: Loise PG Date: Oct 2023

STEM – LittleBits Circuits

Draw a diagram of the LittleBits circuit:

battery 1st 2nd 3rd 4th 5th

Success Criteria: I can follow steps to put things in order
I can list the steps in order from 1st to 5th
I can draw a picture of my LittleBits circuit (extension - and label the input and output)

Name: syd PG Date: Oct 2023

STEM – LittleBits Circuits

Draw a diagram of the LittleBits circuit:

1 2 3 4 5

Success Criteria: I can follow steps to put things in order
I can list the steps in order from 1st to 5th
I can draw a picture of my LittleBits circuit (extension - and label the input and output)

External Partnerships 2023



External Partnerships 2023

Organisation	Program	Status	Contact
BBC	Bush Neighbours	confirmed	Mike Stevens mike.stevens@brisbane.qld.gov.au
SOWN	Native planting & frog habitats	pending	info@saveourwaterwaysnow.com.au
Dr Karl	Zoom session	confirmed	<i>Dr Karl Office: 02 9351 2963</i>
CSIRO	STEM Professionals in Schools	Confirmed partnership with Dr James Smith	Meg Spandler Megan.Spandler@csiro.au
CSIRO	I2S2	Not yet applied	I2S2@csiro.au
UQ	Brain Raider partnership	confirmed	Sarah Matthews s.matthews@ug.edu.au
Young ICT Explorers	Competition	confirmed	Travis Joy 02-9935 4451 info@youngictexplorers.net.au
SheMaps	Map my School (Term 2)	For 2024	Paul Mead +61 432 469 500 paul@shemaps.com
SheMaps	Tournament of Drones (Term 4)	2024	Paul Mead +61 432 469 500 paul@shemaps.com
API	A Day in the Life of a 7 Year Old	confirmed	Stephanie Somerville stephanie.somerville@API.edu.au
USQ	Particle theory	confirmed (Term 3 & 4)	Dr Carole Haeusler carole.haeusler@usq.edu.au
Griffith University & Newcastle University	Science & Engineering Challenge Discovery Day	Term 2 confirmed	Sally McPhee s.mcphee@griffith.edu.au
Atomic School	Photosynthesis through atoms	Term 4 Confirmed	Mr Ian Stuart
BCE	STEM MAD	confirmed	Rochelle Smith romasmith@bne.catholic.edu.au
CSIRO	Bebras Challenge	confirmed	CSIRO – Digital Careers digitalcareers@csiro.au

Bush Neighbours – Brisbane City Council





Bush Neighbours and CoSpaces



Year 4 Example Assessment: Bush Neighbours



 YEAR 4 STEM Term 1, 2023	
Name:	Date:
How can we be good 'bush neighbours'? Use CoSpaces to share your ideas for how we can create positive change to the natural environments in our school and local community.	
HASS <u>I am learning to</u> identify the significance of the environment and its role in supporting the lives of people and other living things Success Criteria: <ul style="list-style-type: none"> I can suggest ideas to care for the environment I can explain the impact of my ideas 	Science <u>I am learning to</u> explain how living things depend on each other and the environment to survive. Success Criteria: <ul style="list-style-type: none"> I can identify the role and interactions of various living things in an ecosystem Living things have lifecycles I can explain how living things depend on each other and their environment to survive.
Digital Technologies <u>I am learning to</u> use CoSpaces to virtually present and explain my ideas Success Criteria: <ul style="list-style-type: none"> I can change the material of an object I can add animation to an object I can program objects with CoBlocks I can make appropriate design choices I can add 360-degree photo files 	



Idea 1:	Plant trees and shrubs in Rosewood Reserve
Who or what does this help?	Native animals such as possums, squirrel gliders, and insects especially the Skipper butterfly species.
How does it help? *Include information about how plants and animals support each other in habitat.	<p>By planting trees and shrubs, we can make more clean air for animals to breathe. Plants take in carbon dioxide and produce more oxygen.</p> <p>Plants can make energy from the sun through photosynthesis and give animals such as butterflies food to eat.</p> <p>If they grow for 100 years, some trees can provide hollows for animals to shelter in.</p> <p>Two of the plants we have selected for our school are Lomandra and Dianella. These plants are both host plants for a number of Skipper butterfly species.</p>
What steps do you have to follow to make this change happen?	<p>Find a site to plant the trees</p> <p>Prepare the site with compost and soil</p> <p>Plant the trees and shrubs</p> <p>Ensure the trees are watered regularly</p> <ul style="list-style-type: none"> Speak for Mrs Burke to check if the plant will be watered by the gardener Make a roster for students to water

Year 4 Example Assessment: Bush Neighbours



YEAR 4 COSPACES PROJECT

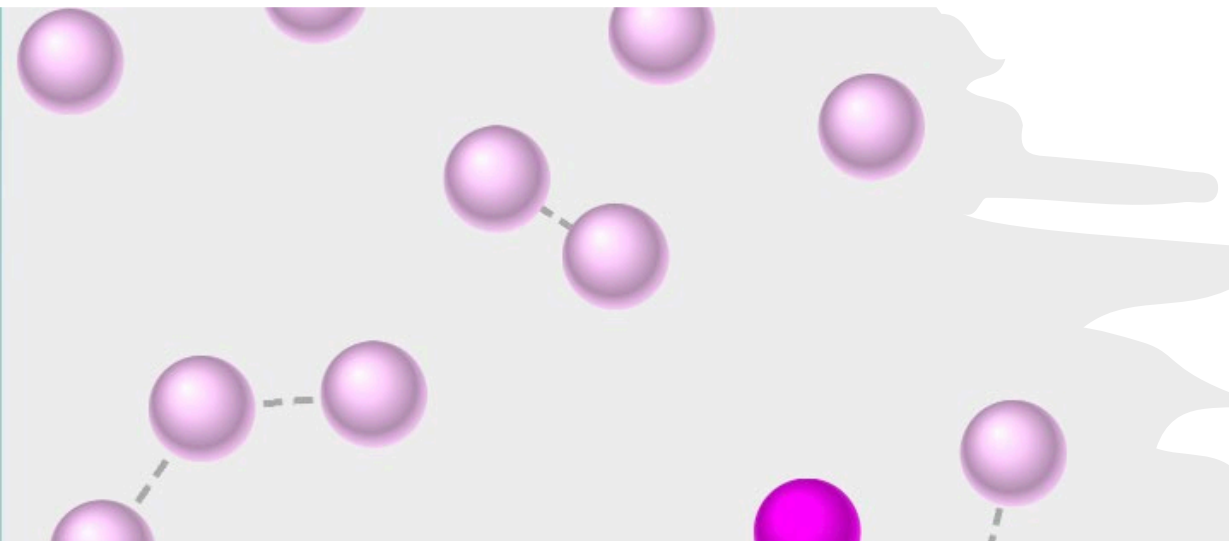
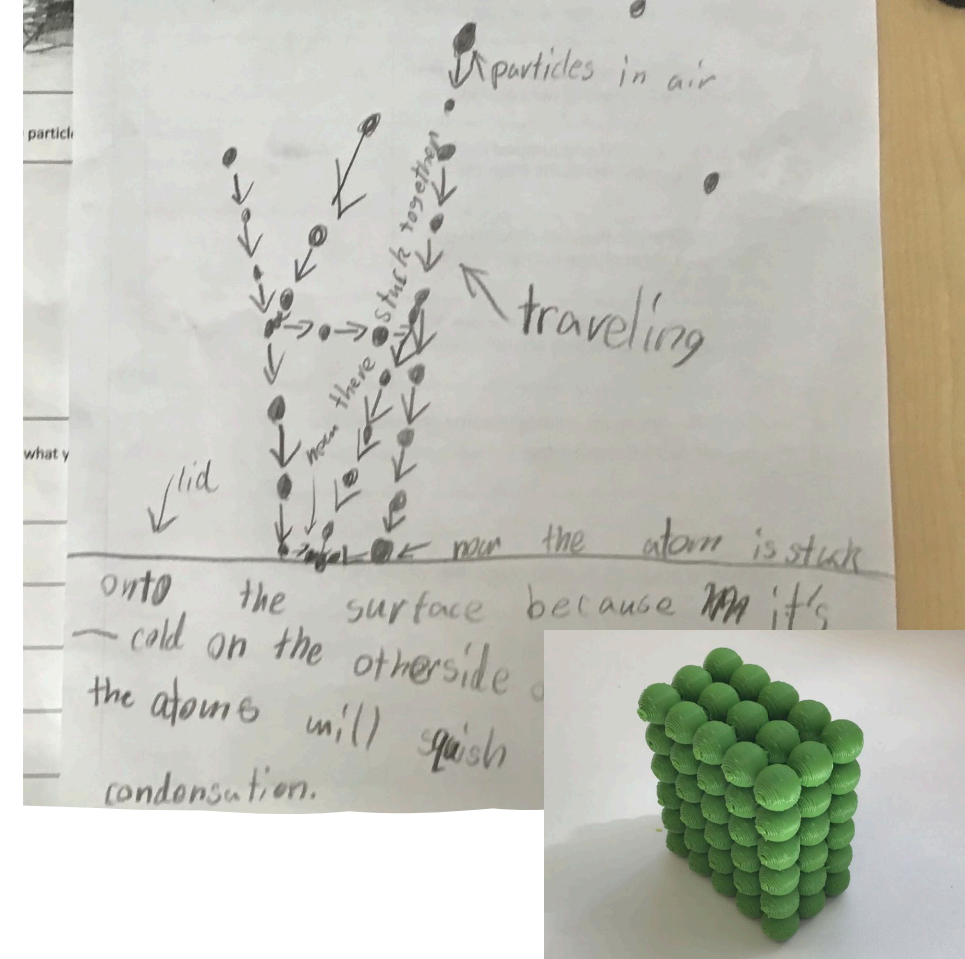
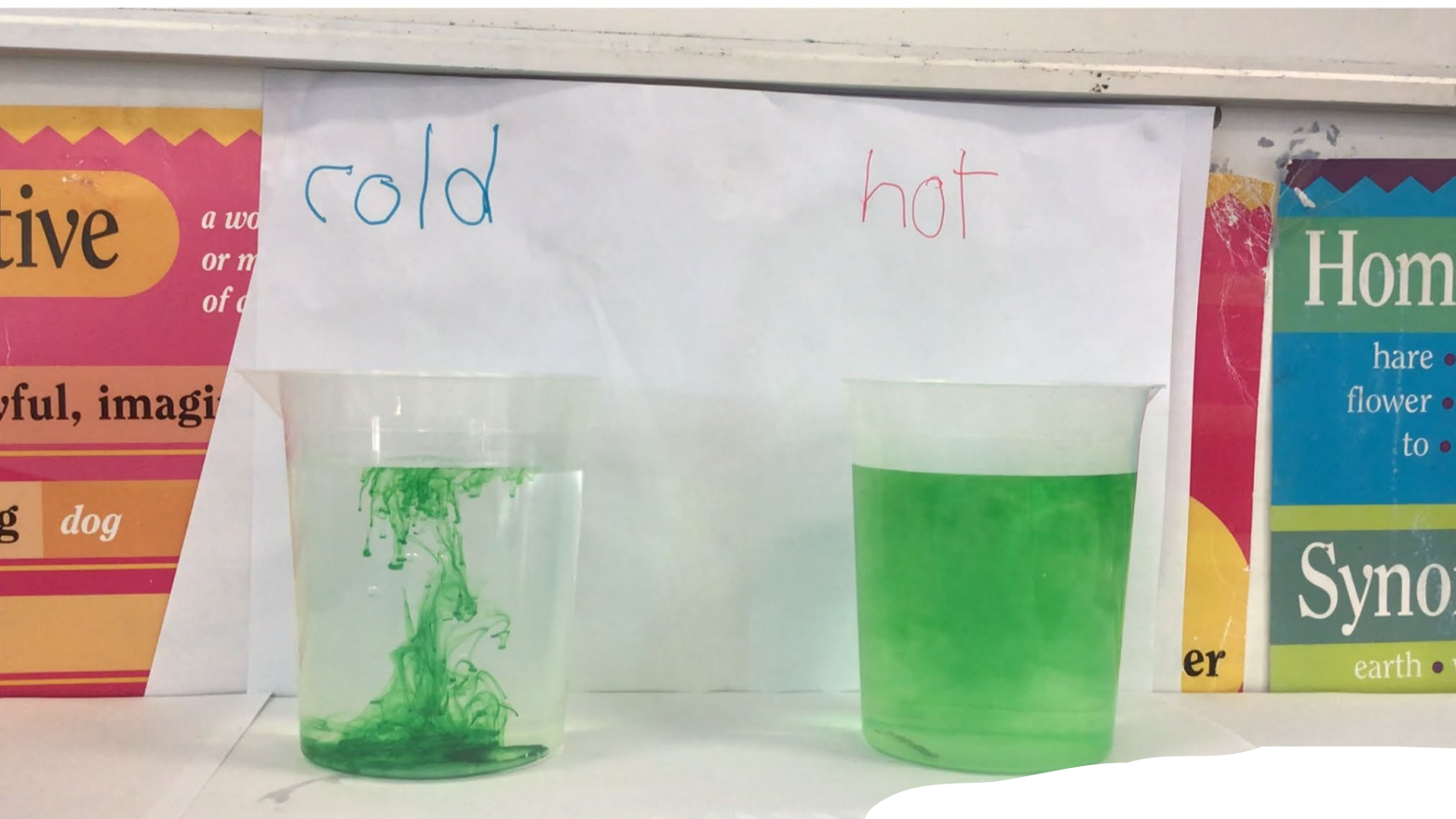
Criteria for Success:

Name:

	★	★★	★★★
Propose ideas for positive change (HASS)	Student proposes some ideas but they are not appropriate to the situation.	Student proposes three ideas for positive change that are appropriate to the situation.	Student proposes three or more ideas that demonstrate innovative thinking.
3 points	1/3	2/3	3/3
Use Science knowledge to explain how to support habitat (Science)	Student cannot make clear connections between their ideas and how it will support habitat.	Student can connect their ideas to Science knowledge about how to support habitat.	Student gave an in-depth explanation of how their ideas will positively impact habitat.
6 points	0/6	4/6	6/6
Describe the relationship between living things in a habitat (Science & HASS)	Student is not sure how different living things are connected in habitats.	Student can describe some connections between various plant and animals in the local habitat.	Student can give a detailed description of the interaction of plants and animals in the local habitat.
6 points	0/6	4/6	6/6
Research (HASS)	Student is not sure how or where to find information.	Student uses different sources (people, books, tv) to find information and make some connections between human impact and animal habitats.	Student uses a diverse range of sources to find information, make connections and draw logical conclusions about the roles humans can play in protection of habitats.
4 points	0/4	2/4	4/4
CoSpaces Skills (Digital Technology)	Student does not know how to use CoSpaces to create a virtual environment.	Student can use CoSpaces to upload 360 degree photos, add object from the library, resize them and place them accurately into the environment.	← plus ← plus Student can animate objects and change their materials to enhance the presentation and place them accurately into the virtual environment.
4 points	0/4	2/4	3/4
Creating algorithms with CoBlocks (Digital Technology)	Student does not know how to code objects in CoSpaces.	Student can create simple algorithms with CoBlocks (e.g. move or speech bubble).	Student can create more complex algorithms with CoBlocks such as using loops and multiple steps.
4 points	0/4	2/4	4/4

Student name:

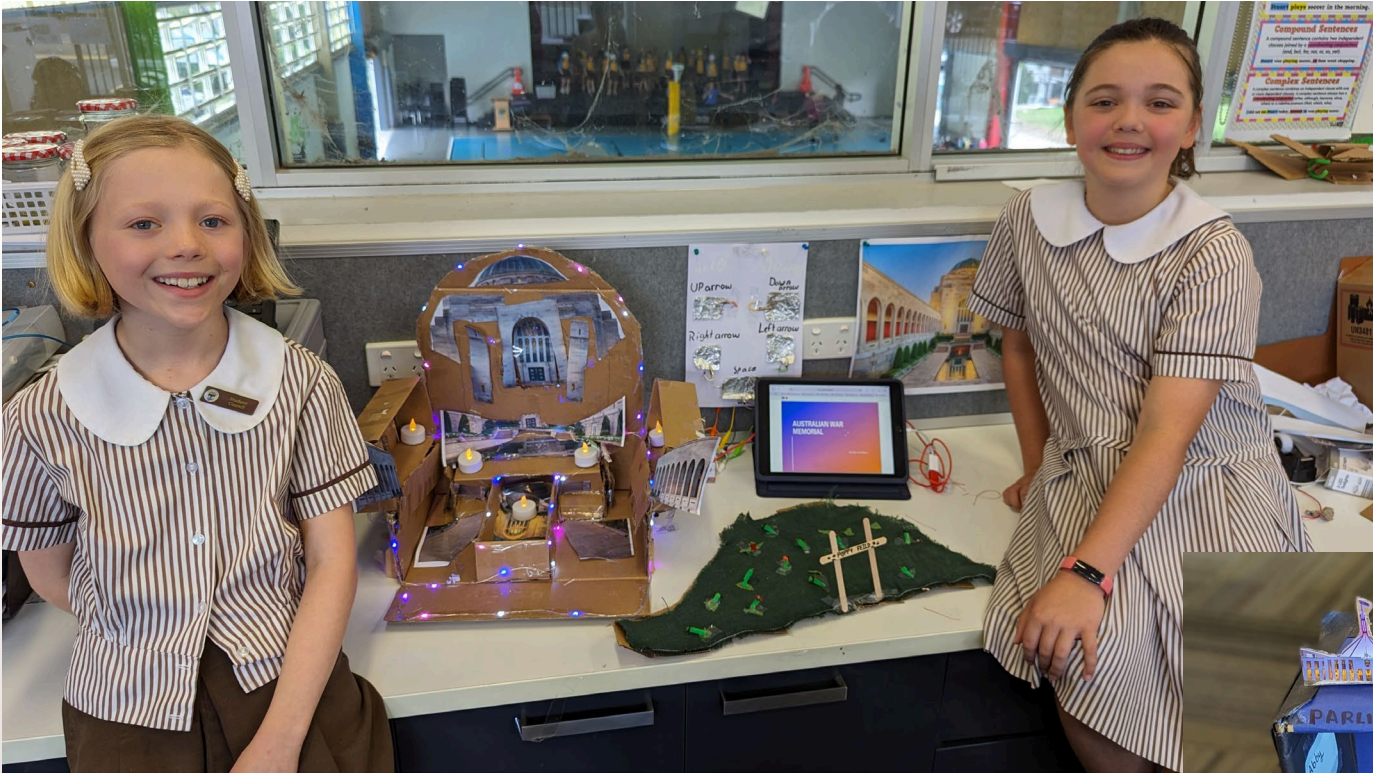
HASS		HASS	
Propose ideas for positive change	/3	Well Above	12 - 13
Describe the relationship between living things in a habitat	/6	Above	10 - 11
Research	/4	Expected	7 - 9
TOTAL:	/13	Below	3 - 6
		Well below	0 - 3
SCIENCE		SCIENCE	
Use Science knowledge to explain how to support habitat	/6	Well Above	12
Describe the relationship between living things in a habitat	/6	Above	10 - 11
TOTAL:	/12	Expected	7 - 9
		Below	4 - 6
		Well below	0 - 3
DIGITAL TECHNOLOGIES		DIGITAL TECHNOLOGIES	
CoSpaces Skills	/6	Well Above	8
Creating algorithms with CoBlocks	/6	Above	6 - 7
TOTAL:	/12	Expected	4 - 5
		Below	2 - 3
		Well below	0 - 1



Heat and Atomic Theory
 Dr Carole Haeusler
 University of Southern Queensland (USQ)

PARTICLE MODELS AND INFORMATION OF A SOLID

Year 6 HASS project



STEAM Challenge



ST JOSEPH'S STEAM CHALLENGE 2022

In celebration of National Science Week, CBCA Book Week, and the wonderfully creative students at St Joey's, we are holding an intraschool competition with prizes for every year level.

"My dream for a better world"

Choose one idea to make the world a better place. You might find some inspiration from the UN Global Goals or something closer to home. Ask your family and friends!

Your project could be designed to inform others about this issue or an actual product/solution that makes a difference.

Be creative – present your idea in one of the following ways:

- piece of writing (poem, persuasive text, narrative)
- poster, drawing, photo, diorama, painting
- video or stop motion (3 minute limit)
- website
- Computer game (using Scratch or Makecode arcade)
- An engineered object or prototype (with description)

Submit projects to the ALC or Mrs Byrne
by the **31st August 2022**



For more information please contact Mrs Byrne: claire.byrne@bne.catholic.edu.au



ST JOSEPH'S STEAM CHALLENGE 2023 INSPIRING INNOVATIONS

IN CELEBRATION OF **NATIONAL SCIENCE WEEK** AND **CBCA BOOK WEEK**, WE ARE ONCE AGAIN HOSTING AN INTRASCHOOL STEAM COMPETITION WITH PRIZES FOR LOWER, MIDDLE AND UPPER PRIMARY STUDENTS. THIS YEAR'S THEME IS "INSPIRING INNOVATIONS".

TO ENTER THIS COMPETITION, STUDENTS SHOULD SHARE AN EXCITING INNOVATION FROM THE PAST, SOMETHING CURRENTLY IN THE PIPELINES, OR EVEN THEIR VERY OWN INSPIRING IDEA. THE SKY IS THE LIMIT!

BE CREATIVE - YOU CAN PRESENT YOUR PROJECT IN ANY OF THE FOLLOWING FORMATS:

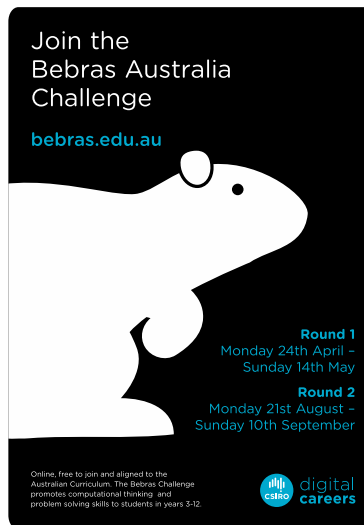
- PIECE OF WRITING (POEM, PERSUASIVE TEXT, NARRATIVE)
- POSTER, DRAWING, PHOTO, DIORAMA
- VIDEO OR ANIMATION (3 MINUTE LIMIT)
- WEBSITE
- COMPUTER GAME (USING SCRATCH OR MAKECODE ARCADE)
- AN ENGINEERED OBJECT, MODEL OR PROTOTYPE (WITH DESCRIPTION)

• **PROJECTS DUE:
31ST AUGUST 2023**



ANY QUESTIONS - PLEASE CONTACT
MRS CLAIRE BYRNE
CLAIRE.BYRNE@BNE.CATHOLIC.EDU.AU

PROJECTS CAN BE DELIVERED TO THE ALC OR STEM LAB.
PLEASE SEE MRS BYRNE FOR SUBMISSION OF DIGITAL PROJECTS.



Bebras Challenge

Under 8s Day





BrainRaiders 2023



Data Collection

The SRS data of current Year 3 to 6 students at St Joseph's Bardon show that in 2020, 33% of students were achieving an 'Above' or 'Well Above' achievement in curriculum learning area, Technologies. In the most recent reporting period (Semester 2, 2022), this proportion increased to 60% which indicates a growth of almost 80% in a two-year period.

Student achievements

2021

- Young ICT Explorers (YICTE) First place SEQ division (Year 5/6 division)
- Young ICT Explorers (YICTE) Third place SEQ division (Year 3/4 division)
- Young ICT Explorers (YICTE) First place National Championships (Year 5/6 division)
- Science and Engineering Discovery Days, South Brisbane – First place
- BCE STEM MAD Competition – 2nd place (STEM in the Future division)

2022

- Young ICT Explorers (YICTE) First place SEQ division (Year 3/4 division)
- Young ICT Explorers (YICTE) Second place SEQ division (Year 3/4 division)
- Young ICT Explorers (YICTE) Third place National Championships (Year 3/4 division)
- BCE STEM MAD Competition – 2nd place (STEM in the Future division)

2023

- BCE STEM MAD Competition – 2nd place (STEM in the Future division)
- Bebras Challenge – 8 teams awarded High Distinction in 2023



Digital Technology & Extension opportunities



10:33 am Wed 14 Sep

AA scratch.mit.edu

Giant's Causeway - Kid... www.google.com.au/se... First fleet on Scratch Calculator.net: Free Onl... calc - Google Search

ScrATCH File Edit Tutorials First fleet Share See Project Page maxyeets

Code Costumes Sounds

Motion

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- go to random position
- go to x: -92 y: 60
- glide 1 secs to random position
- glide 1 secs to x: -92 y: 60
- point in direction 90
- point towards mouse-pointer
- change x by 10
- set x to -92

Looks

Sound

Events

Control

Sensing

Operators

Variables

My Blocks

Pen

when clicked

set Day to 0

go to x: -90 y: 60

erase all

pen down

set pen size to 5

set pen color to red

point in direction -105

repeat 20

- move 0.59 steps
- wait 0.1 seconds

repeat 30

- move 1.65 steps
- turn 3.55 degrees

Day 2

World map showing continents: North America, South America, Africa, Europe, Asia, Australia, and the oceans: Atlantic Ocean, Indian Ocean, Southern Ocean, and Pacific Ocean.

Sprite Sprite1 x -92 y 60

Size 25 Direction -105

Stage

Backdrops 1

Sprite1 Sprite2 Sprite3 Sprite4 Sprite5

Backpack



Charlotte

Lily D

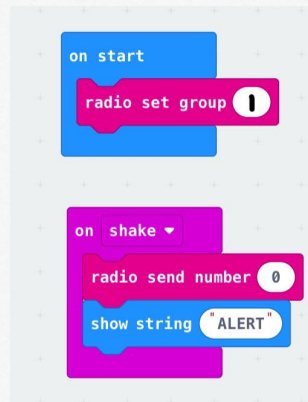
Australian

Avocados

el

Sier

code 1



code 2

