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# Generation STEM

STEM Community Partnerships Program

Teacher Professional Learning Day | 10 March 2021

SUPPORTED BY





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# This place has a long history of learning and inquiry

CSIRO acknowledges the traditional custodians of land on which we meet, the Cabrogal of the Darug Nation, who have cared for this country for tens of thousands of years, and pay our respects to their elders; past, present and emerging.

We recognise the role of past elders in maintaining the integrity of this land and as Indigenous scientists they managed the land sustainably.

# Housekeeping



## Schedule:

9am	Introduction and overview Project inquiry & question formulation process
10:30 am	Morning tea
10:45 am	Practice using the project inquiry sheet
12:30 pm	Lunch
1:15 pm	The program and planning for your class
3:00pm	Finish

# Where are you?

**How confident do you feel about delivering inquiry learning?**

1. I find it daunting
2. I am unsure
3. I am on the fence
4. I am quite confident
5. I am super confident



**How often do you currently use inquiry in your classroom?**

1. Never
2. Yearly
3. Each term
4. Each unit
5. Most lessons





# Project inquiry

## **Confirmation inquiry**

*Learners are given a question, as well as a method, to which the end result is already known. The goal is to confirm the results. This enables learners to reinforce already established ideas, and to practice their investigative skills.*

## **Structured inquiry**

*Learners are given the question and the method of achieving the result, but the goal is to provide an explanation that is already supported by the evidence gathered during and through the investigative process.*

## **Guided inquiry**

*Learners are only given a question. The main goal is to design the method of investigation and then test the question itself. This type of inquiry is not typically as structured as the previously mentioned forms.*

## **Open inquiry**

*Learners must form their own questions, design investigative methods, and then carry out the inquiry itself. They must present their results at the end of the process.*

# Icebreaker



# Program Overview

The NSW Government committed a \$25 million endowment to drive investment in science, technology, engineering and mathematics (STEM) skills across the state.

These technical and nontechnical skills match those Forbes has listed as essential for the future.

Real world  
problem  
solving &  
skills

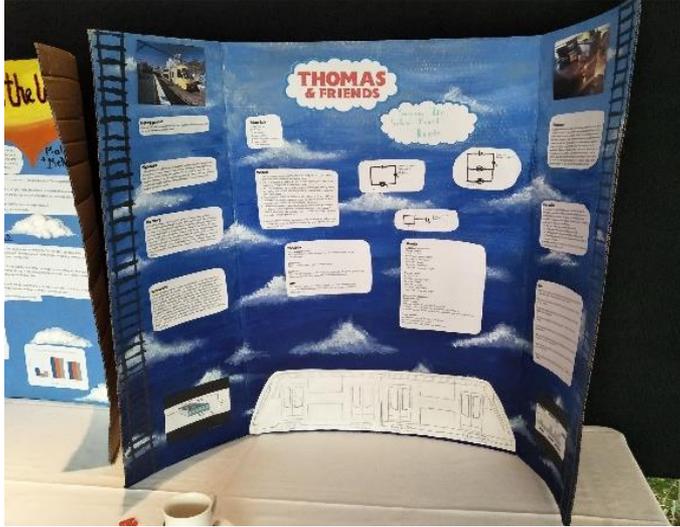
Exposure to  
real  
STEM work

Awareness of  
different  
career  
opportunities

# Site visits and Mentors



# Showcase event



Questioning



# Questioning

- Select questions for inquiry

Work  
individually

As many  
questions  
as you can

Don't stop to  
judge, discuss,  
edit or answer  
Q's

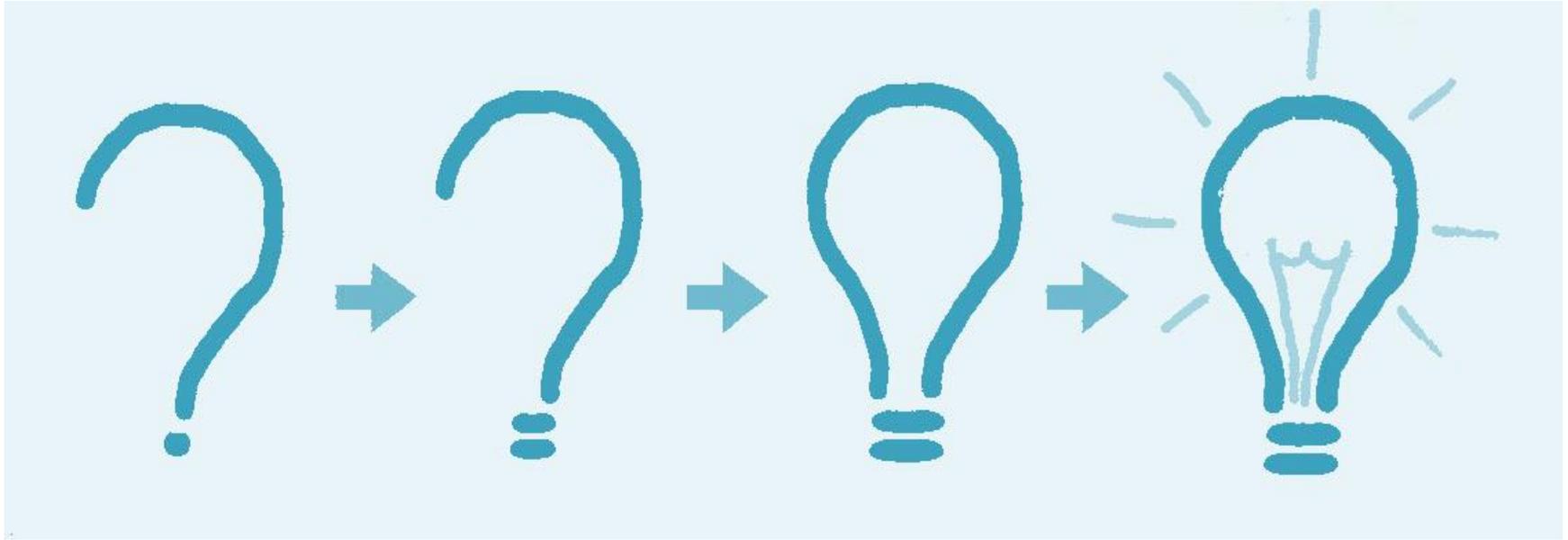
One  
question  
per post-it

Change any  
statements  
into questions

# Morning tea



# Improve questions



## **Step 1**

Work in pairs

## **Step 2**

Take a look at  
the questions

## **Step 3**

Categorise  
the questions

## **Step 4**

Select  
questions  
for designing

# Prioritise questions

- Consider the questions' purpose – developing an inquiry on this topic
- Select the best question, using a strengths and weaknesses analysis to help

Strengths	Weaknesses
<p>Is it topical?</p> <p>Is it relevant?</p> <p>Is it possible to find out?</p> <p>Is it specific?</p> <p>Are you going to enjoy this inquiry?</p> <p>Does it address a worthwhile problem?</p> <p>Does it answer a specific question?</p> <p>Does it open up new areas of interest?</p>	<p>Is it too general?</p> <p>Is it poorly defined?</p> <p>Is it based on inaccurate ideas?</p> <p>Is the outcome already known?</p> <p>Does it involve too much time?</p> <p>Does it require too many resources?</p> <p>Is it too complicated to find out?</p> <p>Is the answer already available?</p>

# Next steps



## Inquiry Planner

Use this planner to help design your investigation. Remember that your investigation should be:

- Safe
- Solution focussed
- Specifically communicated

**Question**

What is your inquiry question or problem you will investigate?

What solution do you expect? What makes you think that?

Generation STEM Community Partnerships Program - CSIRO Education and Outreach

- Use the planner to develop your questions into an inquiry plan

# Lunch



# Library Tour



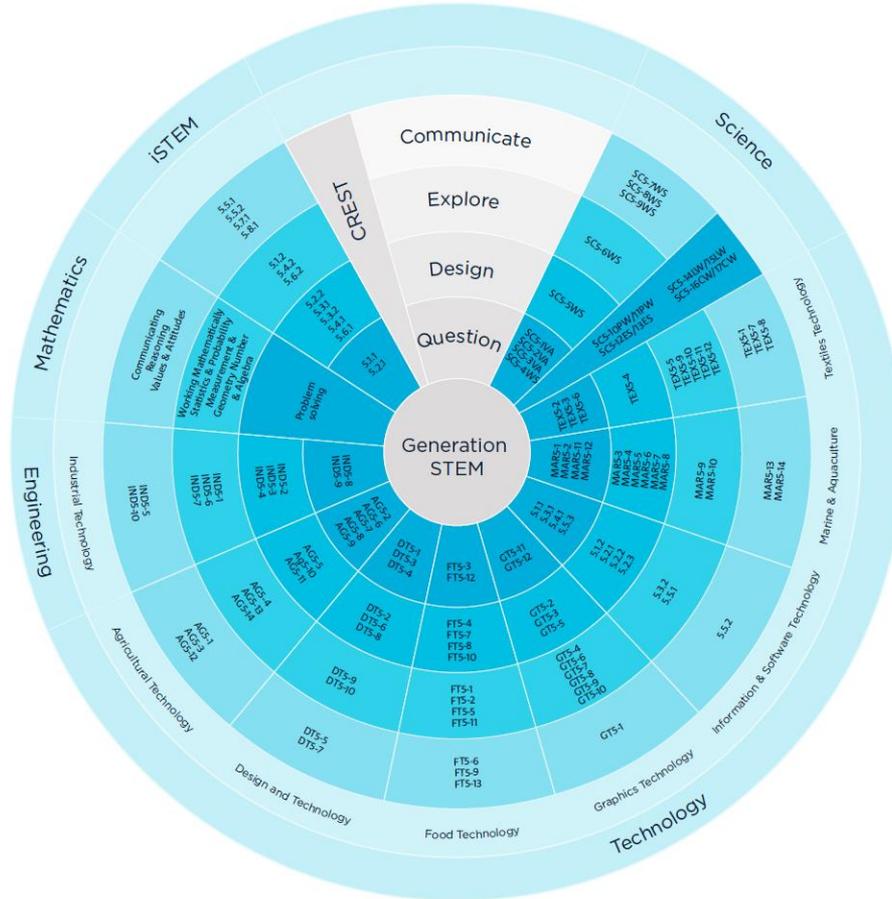
# Planning



# STEM CPP Program Model



# Curriculum mapping





# CREST

Creativity in Research, Engineering,  
Science, and Technology

- ✓ Non-competitive
- ✓ Focused on the demonstrated level of competency
- ✓ Resources for planning and scaffolding student inquiries
- ✓ Six award levels for recognising successful completion of student inquiries
- ✓ Teacher professional learning



# STEM Professionals in Schools

- STEM Professionals in Schools is a national volunteer program that facilitates partnerships between schools and industry.
- Generation STEM is using this program to connect the local industry and business partners to your schools.



<https://www.csiro.au/en/Education/Programs/STEM-Professionals-in-Schools>

**Interested? Apply now>**

**Teachers>**

Apply now

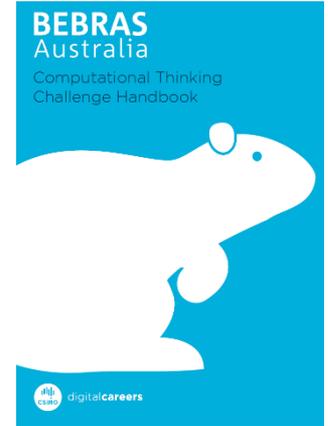
# Digital Careers

<https://digitalcareers.csiro.au/en/Resources>

Videos, worksheets, lesson plans and activities that are prepared and linked to the curriculum.

Bebras is run in March and September. A free, online challenge which engages students in collaborative, creative, and critical thinking.

CyberTaipan is a team challenge (2-5 students) who play a series of online qualifying rounds, which will challenge them to learn about networking, cyber defence and cyber security.



# Young Indigenous Girls' STEM Academy

This [program](#) gives young Indigenous women the tools and support they need to succeed in an exciting STEM career.

The holistic, streamlined approach to support will promote access to STEM careers for high achieving Year 9 and Year 11 students.

This support will start before students choose critical high school subjects that enable relevant study and career progression into STEM fields.

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# Monitoring and evaluation



**Monitoring** – the regular collection of information about a program, eg, number of participants and demographic information



**Evaluation** – the one-off assessment about the extent to which a program is achieving its goals, eg, did the program increase interest in STEM among students



M&E helps to continuously improve Generation STEM and to understand whether the program is working and achieving what it's meant to

Individualised data report

Chance to win an iPad

Help to improve the program

Time to plan for your class



# Where are you now?

**How confident do you feel about delivering inquiry learning?**

1. I find it daunting
2. I am unsure
3. I am on the fence
4. I am quite confident
5. I am super confident



**How often will you use inquiry in your classroom?**

1. Never
2. Yearly
3. Each term
4. Each unit
5. Most lessons





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*Generation STEM is managed by CSIRO and made possible by an endowment from the NSW Government to the Science and Industry Endowment Fund (SIEF).*

# Thank you

**Education and Outreach**

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[csiro.au/en/Education](http://csiro.au/en/Education)

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# Have a look ...

- <https://www.teachermagazine.com.au/articles/careers-education-unlocking-meaningful-stem-opportunities>
- <https://www.teachermagazine.com.au/articles/teacher-podcast-dylan-wiliam-on-effective-questioning-in-the-classroom>
- <https://eprints.qut.edu.au/122150/7/122150.pdf>
- <https://www.irishtimes.com/news/education/why-we-need-more-t-shaped-graduates-1.2584765>
- <https://medium.com/@BryanMMathers/the-t-shaped-student-ba9c01cc3b8c>
- <https://www.forbes.com/sites/bernardmarr/2019/04/29/the-10-vital-skills-you-will-need-for-the-future-of-work/#349f2b533f5b>