



Student led STEM Initiatives

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WHAT WILL YOU GET OUT OF THIS SESSION?

A model that you can use to:

- maximise student participation with limited resources
- maximise student ownership of programs
- create range of programs to meet different needs
- inspire students to choose STEM subjects



WHAT WILL YOU GET OUT OF THIS SESSION?

A little parcel filled with inspiration.

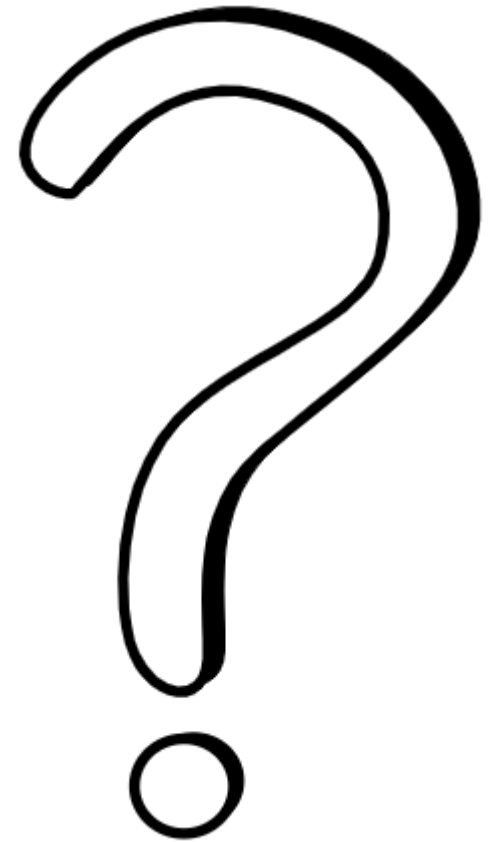
"the people who are crazy enough to think they can change the world are the ones who do."

Steve Jobs



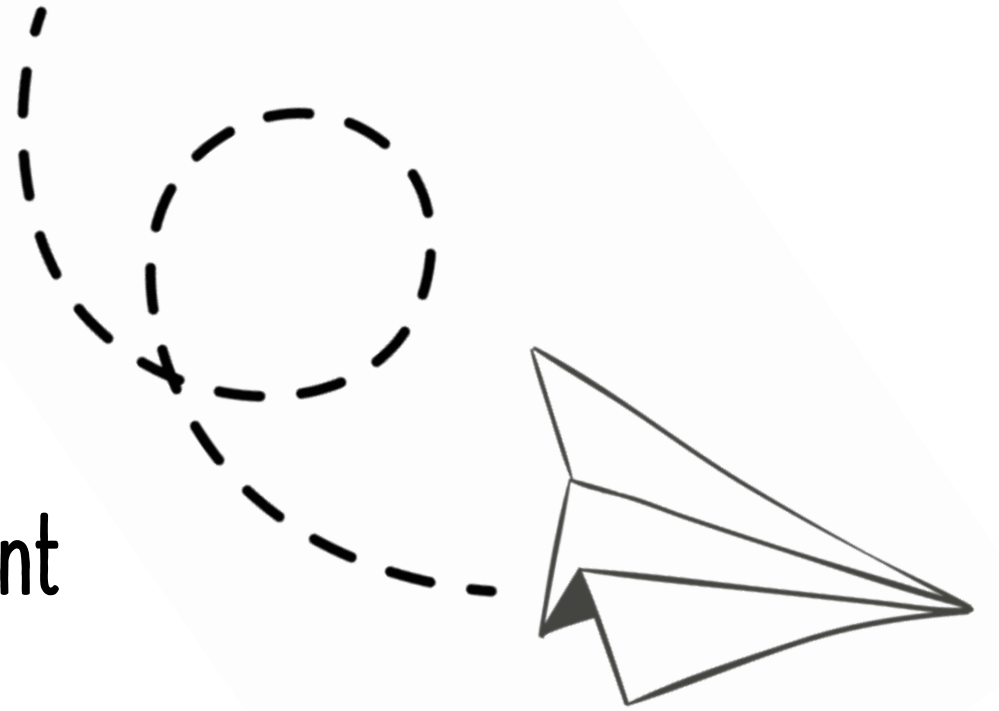
Background...

- Talented and hardworking science teachers
- Well attended annual family science event



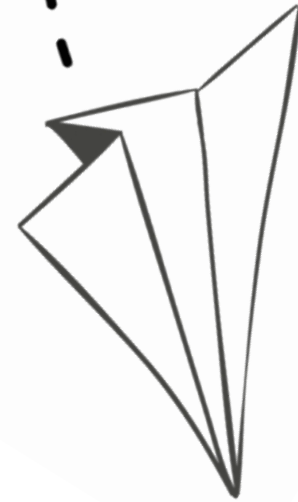
Challenges

- Decreasing numbers in VCE Science
- Students wanted greater involvement
- High teacher workloads



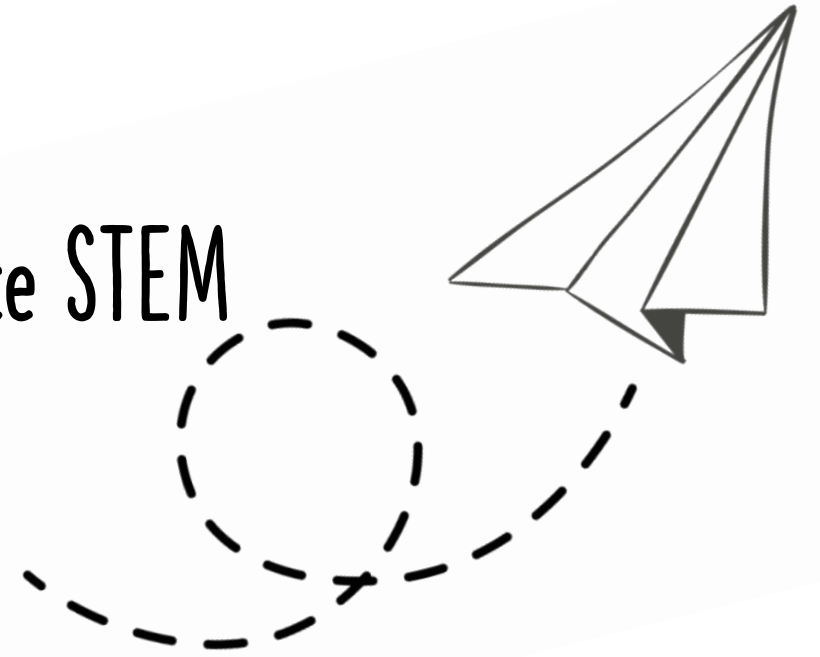
Trialled

- Teacher run lunch time demonstrations
- Teacher run primary school events
- Teacher run lunch time practical sessions



Opportunity knocks

- Joint project with Metro Trains to promote STEM careers to girls
- Outcome: EngGirls
- A program designed by girls in Year 9 to promote the value of STEM to younger children.



EngGirls highlights

- Led by students for students
- Short 6 week lunch time program
- Low cost in dollars and teacher time
- Collaborative
- Work towards goal
 - STEM workshop for primary students



6 years later

- More teachers joined the team
- Has grown to include other year levels
- Won an award - [Innovating to help girls to thrive in STEM](#)
- Well known brand within school community
- Alumni come back to share their experiences at University

What do the Year 9 EngGirls say?

"Students in Year 9 should join the EngGirls program because it gives you a lot of opportunities to learn more about team work and it's fun."

"100% do it. It's lots of fun, a great experience, kind of challenging and looks good on your resume."

"Do it, the hard work will pay off when you teach the younger kids and the excursion is a lot of fun."



What do past EngGirls say?

"I learnt skills that I couldn't learn in class. How to talk with people, how to encourage people to join in."

"I got to know the science teachers more. We had sport, music and theatre outside of class times and I could now do science activities."

"I wouldn't have chosen so many science subjects without EngGirls and STEM ambassadors. It gave me the confidence to choose subjects like Chemistry which other students said was really hard."

What are the take home messages?

Students value connections to teachers beyond the classroom

Gives students
confidence to
choose VCE STEM
subjects

Students value extracurricular activities

Provides opportunity to learn work skills

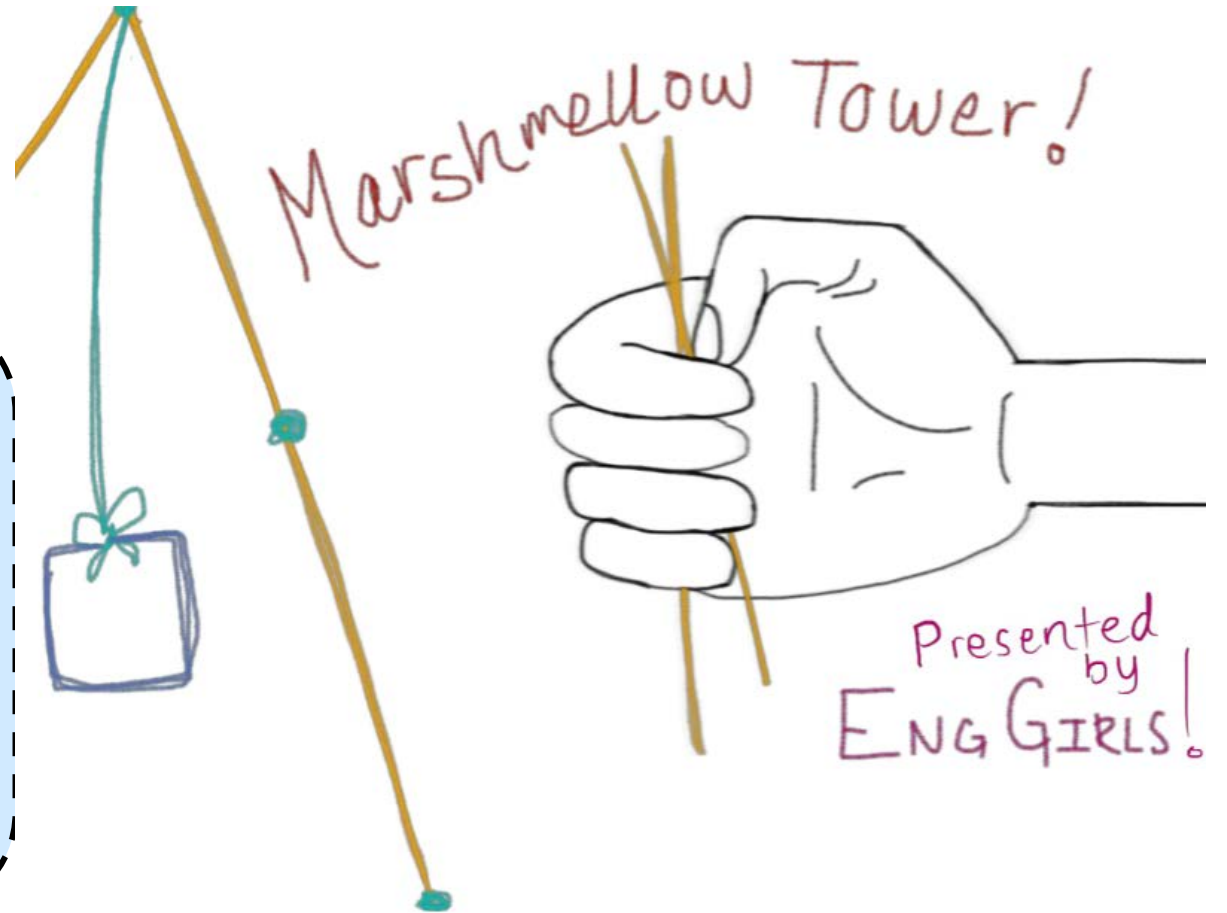
Shows students that STEM is fun

At what cost?

Monetary Cost: \$300*

Teacher time:
Each program requires
≈ 6 hours per staff member

* Not including EngGirls excursions



Model for Student led Programs

Led by 2 -3 students

Pop Up Program -
3 - 6 weeks

Students work
in teams with
allocated roles

Give students choice

Invest in leaders

Know your
program has
value

Program has purpose

Each week has
set goals

Pop up lunchtime program

3 – 6 weeks, 35 min sessions

Week 1

- Introduce leaders
- Leaders run session: outline task and goals
- Students select teams and roles
- Allocate tasks for week

Each week has set goals



Student led program

Led by 2 -3 students

Invest in leaders

Ask for expressions of interest from previous year's program, interview and select 2 -3 students.
Organise weekly pre-meeting to write running sheet, set session goals and allocate tasks.

Student led program

Example Running Sheet

Week 2 Running Sheet

Team Leaders Gemma, Sarah, Sarah M

Things to do before meeting:

ADH – Insert bulletin notice reminding students of meeting. Wed 13th March. Remind students that they need to bring their iPads.

GEM – Make MyAitken pages for each group to upload posters and their introductions

ADH	Introduce the leaders
GEM	- Take attendance; Ask students to tick off names
SG	- Introduce the tasks for today's sessions ○ Promotions manager needs to make poster ○ Communication manager needs to write introduction for the team and allocate speaking tasks to team members ○ Production team/leader needs to build prototype
GEM	- Help production team with the building of the prototype. Direct them to the supplies. Give them clues where needed.
SM	Thank students for attending and let them know that week they will be putting together the packs for the students

Students work in teams with allocated roles

For example: EngGirls, Teams of 5 students

Communications manager Writes the workshop introduction for the team and allocates speaking tasks to team members.

Team leader Manages timeline, organises communication between team members

Production team organises materials for the team and tests designs (2 team members)

Promotions manager Writes media releases and designs a poster

Give students choice

For example: STEM ambassadors - Family Science Night

School community is invited to celebrate all things Science.

Students work in groups with a Science teacher as a mentor to design an interactive activity for the night.

Students are given choice on the design of their project. This promotes ownership and encourages students to invest in their project.

Give students choice

For example: STEM ambassadors - Family Science Night

2019: Destination Moon

Agriculture Team had a display where children could meet the chickens and learn about what it would be like for chickens in space.



Program has purpose

Students work towards
a common goal

National Science Week

STEM week

Titration Competition Day

Shearing Day

Family Science Night

National Tree Day

School workshops

Agriculture Day

Environment Week

COVID-19 Mask
Challenge

Royal Melbourne Show

Know your program has value

Don't apologise for student's investing their time and effort. The benefits far outweigh costs

Time management

Supporting others

Communication- talking/writing

Cooperation

Professionalism

Decision making

Problem solving

Teamwork

Leadership skills

Conflict resolution

Active listening

Respecting others

Where do I start?

Start with what you are passionate about

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graph TD; A[Start with what you are passionate about] --- B[Girls STEM group]; A --- C[Minecraft Madness]; A --- D[Survival Skill Sessions]; A --- E[Space Program]; A --- F[Python Pop-Ups]; A --- G[Audino];
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Girls STEM group

Minecraft Madness

Survival Skill Sessions

Audino

Space Program

Python Pop-Ups

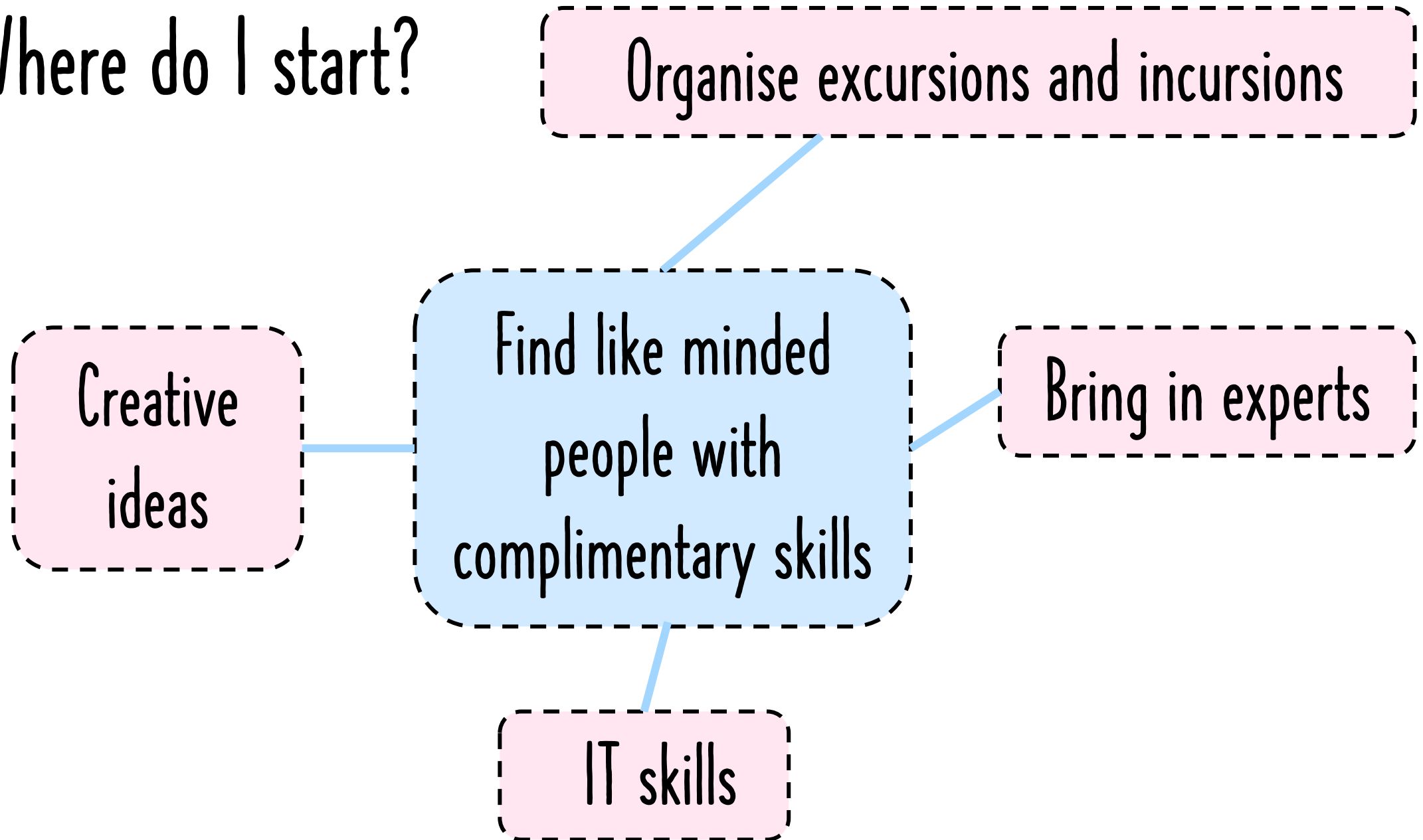
Where do I start?

Ask students what
type of group they
would be interested
in leading

Start small

Minecraft Madness

Where do I start?



So what about those Science VCE class sizes?

8 classes → 16 classes

Also, reflective of changes to 7-10 program to include The 7 principles outlined in The GiST

Significant increase of girls in Physics and Chemistry



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