

STEMPOWERED

TEACHING RESOURCES

Outline of Education Program

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TECH
SCHOOLS



Education
and Training

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INTRODUCTION

The primary goal of the education program is to inspire and enable more girls to take up pathways in STEM by exposing them to the diversity of careers available to them, showcasing female role models working in STEM, analysing barriers to girls' involvement in STEM and working with teachers, students and their community to overcome these issues through systemic and local initiatives.

Addressing the under-representation of women and girls in STEM requires a multi-faceted approach involving an examination of gender construction, stereotyping and unconscious bias. The problem remains deeply entrenched in Australia, which has one of the most sex-segregated workforces in the developed world. The issue is one of culture at many levels, and the role of boys and men in enabling girls and women's engagement needs to be included alongside initiatives to interest and inspire girls. The role of teachers, parents/carers and the school community is also key to success.

The education program will be comprised of 3 parts:

1. Teacher Professional Development
2. Student Lesson Plans
3. Community Engagement and Public Program suggestions

The Her Place Education Team has shaped the education program using current data, academic research and best practice pedagogy.

The most effective program will allow for 90 minutes of Teacher PD (inclusive of 30 minutes exploring the exhibition at the start of the PD), to precede the student STEM lesson plans. This timing allows teachers to be introduced to the Inquiry-based task that students will be working on in the lesson plans.

1. Teacher Professional Development

Pre-Professional Development Reading Materials:

- Girls and STEM Fact Sheet
- What is the role of Gender Stereotypes?
- Subjects and careers under STEM umbrella
- What Sorts of Strategies could we use in our school?

During the Professional Development Session:

Total Time: 90 minute session

Location: Tech School

Part I: Teachers will spend 30 minutes in the Exhibition. Each of the women in the Exhibition will have responded to the following questions:

- What was it that made you choose a career in STEM? What was it that made you choose STEM subjects?
- What was the role of teachers in this choice? Were they important? Influential? Supportive? Discouraging?
- What advice would you give to girls if they were thinking about continuing/not continuing STEM subjects?

- What advice would you give teachers to enable them to encourage and support girls choosing STEM?

Part II: Viewing of the exhibition will then be followed by a 60 minute interactive PD session with Her Place educators.

Issues explored during the PD will include:

- Data on girls involvement in STEM subjects at different school levels (including evidence about the age at which girls begin to move away from STEM).
- Data on the levels of women's involvement in STEM careers in Australia.
- Examination of reasons why women need to be involved in STEM. For example, preparation for future jobs, increased pay rates, job satisfaction, flexible work hours for example.
- Examination of barriers to girls'/women's involvement. E.g Negative attitudes towards girls and STEM, lack of role models, male-dominated curriculum content, lack of opportunities for experience, childhood toys reinforcing gendered stereotypes, lack of mentors, unconscious bias, boys' attitudes and behaviour, male culture of the STEM workplace.
- Exploration of skills needed for STEM work. E.g. "core" skills that have been seen as traditionally "feminine" such as problem solving, empathy and inquiry.
- Examination of successful approaches to increase girls/women involvement - Australian and International
- Introduction of Student Lesson Plans

Student Lesson Plans

- Teachers need to use the 3 Lesson Plans (see Student Lesson Plans).
- Fact Sheets and other resources are included for student and teacher use.
- Extension activities are provided for use as required.
- Teachers will need to pay attention to the gender dynamics in classes to ensure that girls are equally involved and represented

The Lesson Plans are divided the following way:

Lesson 1: Pre-visit Class

- Students investigate STEM involvement within their own classroom.
- Students are introduced to the 10 women in the *STEMpowered* Exhibition
- Students formulate Inquiry Questions to be answered when visiting the exhibition

Lesson 2: Exhibition Visit

- Students spend time at the exhibition at the Tech School answering their Inquiry Questions.
- Students investigate issues affecting women in STEM.
- Students discuss options for use at their school to increase girls' engagement with STEM.

Lesson 3: Post-exhibition Lesson

- Students translate their learning about the lack of women in STEM into action in their own school context.
- Students gather data from their school about STEM involvement across all year levels.

- Students make recommendations to teachers and the school community for local action to create a more engaging culture for girls in STEM at the school.

2. Community Engagement and Public Programs

- Her Place has also been asked to suggest options for Community Engagement and Public Programs.
- We are aware that teachers and schools are already under pressure to deliver a wide range of programs but experience shows that successful cultural change requires a “whole of school” approach, inclusive of parents and community.
- We therefore make the following range of suggestions:
 - Students to present results of their STEM* Inquiry projects to the community at a forum attended by all schools participating in the program.
 - Parents/carers are invited in recognition of their key role in STEM choices of students.
 - Local businesses invited to present to and liaise with students at the forum about their STEM-based industry.
 - These results should also be presented/communicated to DET and the Steering Committee.
 - There is the potential for schools/DET to offer awards to most successful Inquiry projects.
 - Schools could invite local women working in STEM to come and talk with students (and parents?)
 - Students could showcase their STEM projects to their parents/carers.
 - Events could dovetail in with key school events that already exist. For Example: Assemblies before subject selection and students presenting to other students.

*This also includes STEAM which incorporates the Arts into STEM.