



Challenging stereotypes, creating change

Improving girls' participation in STEM



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STEM in 2018

In Australia:

- Less than a third of STEM degree graduates are women.
- Women make up only 16% of STEM employees
- We have the lowest number of girls and women studying STEM at university in the Asia-Pacific region, compared to their male counterparts.
- BUT more than half (52%) of girls aged 12-14 want to pursue a career in STEM



Why does this matter?

“Tech is the new frontier of job and wealth creation — the more women we have in STEM fields the lower the risk of economic and social inequality between men and women.”

– co-founder of Code like a Girl, Vanessa Doake

If women were employed equally in STEM it could boost women’s earnings by \$299 billion over the next ten years.



'A Story of Attrition'



Australian Government
Office of the Chief Scientist

DATASHEET 2: NOVEMBER 2016

WOMEN IN STEM

A story of attrition

PRIMARY SCHOOL

SECONDARY SCHOOL

POST-SECONDARY EDUCATION

WORKFORCE



Australia loses female talent at every stage of the STEM pipeline despite no innate cognitive gender differences

Achievement and retention of women in STEM is related to:

- » Engagement
- » Confidence
- » Bias

PRIMARY SCHOOL

1 Gender bias and stereotyping begins at an early age

Two thirds of children aged nine to eleven draw a man when asked to draw a scientist.



2 Girls in Grade 4 are less confident in their maths abilities

SECONDARY SCHOOL

4 Attitudes to STEM subjects affect performance

% of 15 year olds who DO NOT think maths will help them:



With later study

20% 33%

Get a job

16% 24%

5 Fifteen year old girls are less confident in applying

7 Participation in key Year 12 STEM subjects shows a clear gender imbalance

PHYSICS	3:1	
ADVANCED MATHS	1.9:1	



Why?

- A lack of female friends
- Teenage girls don't feel welcome in STEM classrooms
- Lack of connection between classroom learning and real life applications
- Lack of role models
- Perceptions of male dominance
- Lack of encouragement from society
- Low belief in self-efficacy



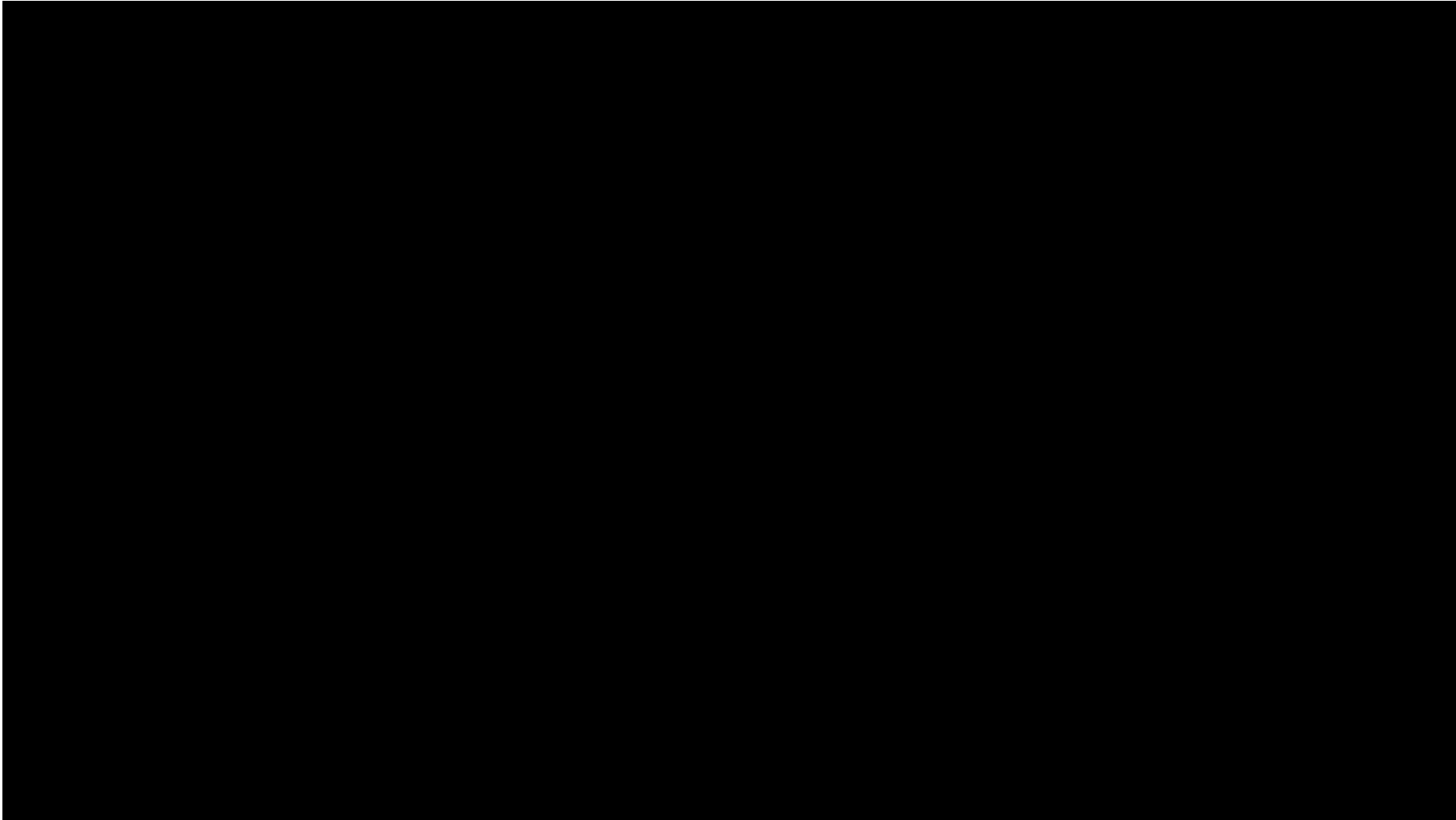
Myth Busting

- “But boys are better at maths”
- “But girls just don’t like STEM as much.”
- “The pay gap doesn’t exist/doesn’t effect career choices.”
- “STEM workplaces are already inclusive.”

At a glance

- There is no gender difference in mathematics ability.
- Women’s participation in engineering careers increases in inclusive cultural environments.
- Women in STEM earn less than their male colleagues.
- While STEM employers have made improvements, sexism is still a challenge.





What can we do about it?

KEY STEPS TOWARDS GENDER EQUALITY IN STEM



ELIMINATE
stereotypes
and bias



EMPHASISE
real-life STEM
applications
in teaching



REWARD
hard work and
build confidence –
it's okay if you
don't understand
it straight away



ENCOURAGE
organisations to
create supportive
and inclusive
workplaces, and
monitor progress
towards equality



https://www.chiefscientist.gov.au/wp-content/uploads/OCS_Women_in_STEM_datasheet.pdf



Eliminate Stereotypes

- Making role models available
 - Non-stereotypical role models
- Inclusive language in the classroom
- Information about STEM workplaces
- Build community





Emphasis Application

- Multidisciplinary
- Range of tasks
- Real life application
- Incorporate STEM into other subject areas
- Grow confidence young



Reward Hard-Work

- Having a go > perfect
- Growth mindset
- Use mixed ability, collaborative, investigative tasks rather than competitive ones



Encourage Supportive Environments

- Search for the Next Tech Girl
Superhero/RoboGals/Curious Minds
- Variety of tasks/applications
- Build on interests
- Ask open-ended questions (and vary who answers!)
- Provide 'girl only' clubs and competitions
- Run a mentor program
- In early years provide opportunities for problem solving and experimenting



What does an inclusive school look like?

- Integrate subjects where possible
- Review STEM tasks and assignments
- Provide female role models
- Girl-friendly or girl-only STEM spaces
- Growth mindset/self-efficacy
- Show clear pathways



Girls in STEM: Next Generation

“Don't let anyone rob you of your imagination, your creativity, or your curiosity. It's your place in the world; it's your life. Go on and do all you can with it, and make it the life you want to live.”

- Mae Jemison



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