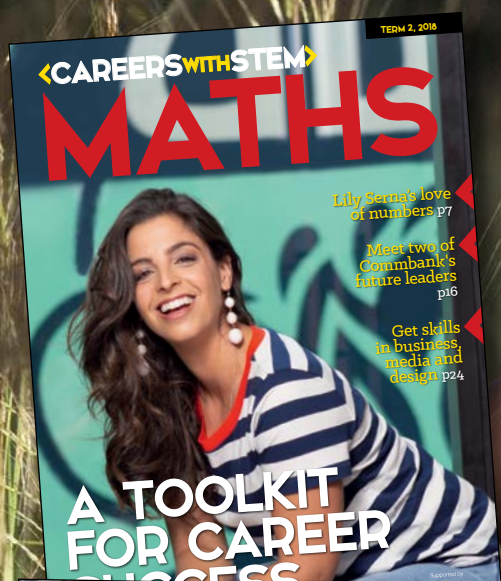


CAREERS WITH STEM

TEACHER NOTES



Years 7-12

The Careers with STEM series includes four quarterly magazines, videos, web articles and posters around careers with science, technology, engineering and maths.

Introduce today's students to the careers of tomorrow
CAREERSWITHSTEM.COM.AU

About Careers with STEM

The Careers with STEM series includes four quarterly magazines, along with website articles, teacher resources and videos across four STEM areas: science, technology, engineering and mathematics. The focus is on independent inquiry and constructivist learning through the application of a range of general capabilities that can “bridge the academic and vocational divide, providing young people with the resources to navigate the future.” *

Each magazine issue provides inspiring stories, statistics and up-to-date information on the careers of the future, and is based on the premise of discovering new areas of innovation through STEM + X – where X is another field of study, a personal passion, or a world-changing goal.

To order additional copies for events, clubs or classrooms, or for annual subscriptions and additional resources, career stories and videos go to: CareerswithSTEM.com.au

*Kate Torii and Megan O’Connell, March 2017. *Preparing young people for the future of work*. Mitchell Report 01/2017.

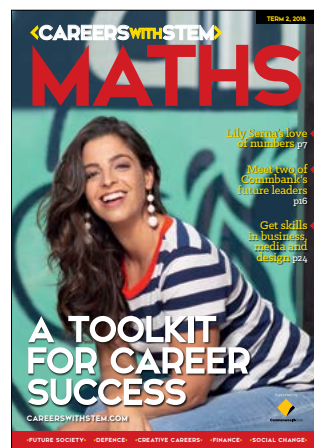
Who are the Notes for?

The Careers with STEM Teacher Notes provide teachers, careers advisors, parents, STEM-based institutions, and mentors with a framework to use the magazines to expose and inspire students towards STEM careers. For teachers, they are ideally suited to years 7–12.

These activities are designed specifically for students to gain insight into a variety of STEM careers across a range of topics and meet specific content-based curriculum outcomes. In the classroom, most of the activities will allow teachers to link to industry and skills-based curriculum outcomes.

Download/Read online

Read or download the magazines for free online. CareerswithSTEM.com.au/read-it-here/



Discover a world of cutting-edge careers and real-life stories.

Jump online and subscribe today to receive every issue of *Careers with STEM*, delivered to your door four times a year. Or order multiple copies for classes, events and clubs from just \$1.95. Sign up at: CareerswithSTEM.com.au/subscribe-and-order/

Subscribe from just \$19.80*

*Australia only, email info@refractionmedia.com.au for international orders.



> SCIENCE > MATHS > ENGINEERING > CODE

Using the Careers with STEM magazines in class

CAPABILITIES	ACTIVITY IDEAS
<p>RESILIENCE + PERSONAL AND SOCIAL CAPABILITY</p>	<p>READ: <i>Make a Difference</i>, <i>Careers with Maths</i> p3.</p> <p>THINK/DO: (1) List the soft skills mentioned in this opening article that maths can help you develop. Are you surprised to hear a maths expert list so many important life skills that doing maths has brought him? What skills has maths brought you? Which skills do you think you already have? Which would you find useful developing?</p> <p>(2) Have a flick through the rest of the <i>Careers with Maths</i> magazine and find any other soft skills people mention. Make a group or class list on the board of all the soft skills you can find. Which skills are identified regularly?</p> <p>FOLLOW WITH: At the bottom of page 3 there is a quote from 2018 Australian of the Year Eddie Woo. Head to 'Woo Tube' now and search one of Eddie's videos on a topic you are currently studying in maths. Other than being good at maths, what other skills does Eddie use when he is teaching that makes him a good communicator?</p>
<p>PROBLEM SOLVING + CRITICAL AND CREATIVE THINKING</p>	<p>READ: <i>Maths Wizard</i>, <i>Careers with Maths</i> p24 and also the puzzles on p5 of these notes.</p> <p>THINK/DO: Adam Spencer likes writing his own maths puzzles and number games. Try creating something of your own using maths. You could make a maths puzzle or game, map out a pattern or make a piece of art using maths at the basis.</p> <p>FOLLOW WITH: Got to bit.ly/MathsTNvideo and watch the slow-mo music video. How do you think maths was used to create this video?</p> <p>NOW WATCH THE VIDEO Q&A:</p> <ol style="list-style-type: none"> 1. The One Moment at bit.ly/MathsTNvideoQA. This introduces the science and maths used in the video. 2. The One Moment of Math at bit.ly/MathsTNvideoQA2. This video focuses on the maths that was needed to make the video. List the different types of calculations used in the video. Try calculating the maths for your own slow-mo action video timed to real-time music.
<p>LITERACY + PERSONAL CAPABILITY</p>	<p>READ: <i>Smart Move</i>, <i>Careers with Maths</i> p15.</p> <p>THINK/DO: Go to: bit.ly/MathsTN10skills and look at the skills listed for 2015 and for the 4th Industrial age, in 2020.</p> <p>Create a graphic to compare the two lists. In your graphic, include (1) a Venn diagram to show which skills are common and unique to each set of skills and (2) an interesting way to show the rank or importance of the skill in relation to others on the list.</p> <p>Will you be ready for the 4th Industrial age? Which skills do you feel you already have, and which do you need to work on?</p> <p>FOLLOW WITH: In pairs, choose a career profile from the CareerwithSTEM.com.au website that interests you and try to identify how that career would need and/or benefit from the skills needed for the 4th industrial age. Match the skills with aspects of the job that would require those skills.</p>
<p>PERSONAL AND SOCIAL CAPABILITY + INTERCULTURAL UNDERSTANDING</p>	<p>READ: <i>Find Your Career Path</i>, <i>Careers with Maths</i> p8–9.</p> <p>THINK/DO: Take the quiz to find out which career might suit you. Turn to the relevant section of the magazine and read about that job. Make a note of the hot jobs listed at the bottom of the breakout box and research the activities people do in those jobs. Comment on which jobs you think might be easy to travel overseas with, and which might change because of different cultural situations.</p> <p>FOLLOW WITH: Pick your dream STEM job from either the <i>Careers with Maths</i> magazine or any that you have come across while researching STEM careers. Write a possible study and career path for this job by using the Degree Finder on the Careers with STEM website found at: CareerswithSTEM.com.au/degree-finder/</p>

Deep Dive Activity: How is maths applied to security and data?

Digital Technologies Curriculum Links:

- ACTDIK034 – Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems
- ACTDIP036 – Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements
- ACTDIP043 – Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities

Capabilities:

Literacy + Personal and Social Capability + Ethics + Critical and Creative Thinking

Read:

Strategy: Advanced Career, *Careers with Maths* p22

Think/Do:

Maths and security work together on many levels. For example, think about how your personal data is kept secure and the range of ways your own data is protected across a variety of situations. Choose one of the situations below and describe a data security challenge and a solution to the challenge. Share your ideas with others who have considered some of the other situations listed below.

SITUATION	CHALLENGE(S) – HOW MIGHT PERSONAL DATA BE BREACHED?	SOLUTION(S) – HOW IS THE DATA KEPT SECURE?
Withdrawing cash from an ATM		
Transferring money to a friend's bank account online		
Aboriginal or Torres Strait Islander who doesn't want a photo of their deceased relative posted on Facebook		
Using Pay ID to collect a salary		
A doctor emails you the results of personal medical tests		

Maths Wizard

Adam Spencer is on a mission to make maths magical for everyone. Try out the puzzles below and try making up your own!

Puzzle One

PUZZLE TIME!

Three boxes are labelled below.
Of the 3 statements, at most one is true.
Which box is unlocked?

This box is unlocked LEFT	This box is locked MIDDLE	The <i>left</i> box is locked RIGHT
---	---	---



Puzzle Two

Amy, Ben, Cassius and Delia need to cross a rickety old wooden bridge between two mountain tops late at night. Don't ask why, that's not important.

They only have one very weak torch which means only two of them can cross at at any time. In addition, when two people cross together, they have to travel at the slowest person's pace so they can both see. And to top things off, in exactly 18 minutes the bridge will collapse (again, see 'don't ask why, that's not important'). Amy can get across the bridge in 1 minute, Ben 2 minutes, Cassius takes 5 minutes and Delia 10.

If Amy and Delia go across, that takes 10 minutes and Amy returns with the torch taking 1 minute.

If Amy and Cassius then cross and Amy returns, it takes 5 minutes plus 1 minute. Amy and Ben then cross together in 2 minutes.

In total, that takes $10 + 1 + 5 + 1 + 2 = 19$ minutes and just about anyone you ask comes up with that as the quickest possible crossing time.

But in fact they can get across quicker. Not in 19 minutes ... not in 18 minutes, but under 18 minutes.

Find a combination of crossing that gets Amy, Ben, Cassius and Delia safely across the river in less than 18 minutes.

Reflection

What I have learnt about careers in STEM...	What I found interesting/inspiring about careers in STEM...	What I still want to know about careers in STEM – and where I could go to find out...

S

T

E

M



FLUID MECHANICS + MATHS
MATHS P13

Which areas of science benefit from a background in maths?

Sophie Calabretto



DATA ANALYSIS + MATHS
MATHS P7

How does maths fit into a career at Australia's biggest tech start-up, Atlassian?

Lily Serna



DEFENCE + OPTIMISATION
MATHS P22

How do defence strategists and navy acquisitions teams use maths?

Mingmei Teo



ECONOMICS + MATHS
ECONOMICS FLIP P5

How can economics help us better understand the impact of Sydney's controversial pub lockout laws?

Steve Yeong

For more career profiles, information and quizzes go to CareerswithSTEM.com.au

