The IEEE is an international professional engineering organisation dedicated to advancing technology for the benefit of humanity. The IEEE supports the development of STEM skills in schools through TryEngineering https://tryengineering.org/ and engagements with local engineers.

For more information on STEM support available within NSW to school teachers and students through the NSW Section of IEEE, please see the following pages, and/or contact the IEEE NSW Section Teacher In-Service Program (STEM Outreach) Coordinator;

Emeritus Professor Graham Town
https://site.ieee.org/nsw/
graham.town@mq.edu.au

IEEE Pre-University Educational Resources and Support

v1.3 25/5/2022

The Institute of Electrical and Electronics Engineering (IEEE) freely provides STEM lesson plans and activities for teachers, students, and others interested in STEM education; https://tryengineering.org/

More than 100 activities and lesson plans for use as-is and/or adaption by teachers are available online at;

- **Tryengineering https://tryengineering.org/teachers/lesson-plans/**

The lesson plans may be searched by STEM field, category and age group, as follows;

- Engineering discipline (from aerospace to transportation)
- STEM category (from algebra to weather and climate)
- Age group (from junior primary to senior secondary school)

Alternatively, the complete list and summary of the lesson plans may be found at
https://docs.google.com/spreadsheets/d/19CpGYf4itv0duEVejn3PeleEb3YffJ3dTAbVk5tXryQ/edit#gid=0

A subset of IEEE TryEngineering lesson plans have been aligned to the Australian curriculum;

- **https://ieee-ac.org/TISP/**

Each lesson plan comes complete with teacher notes, an overview video, background material, links to relevant videos and other online resources and references, and a list of student workshop materials. (The materials for student workshops usually cost about $5.00 per team, and often may be reused or recycled).

The student workshops are mostly problem solving and design challenges, designed to be completed by a small team of students within one or two lessons using the engineering design process. The lessons and associated workshops highlight the following aspects of STEM and engineering practice;

- ***Creativity and teamwork in the engineering design process***
- ***Applications of STEM and the social impacts of engineering***

Other similar IEEE lesson plans can also be found at the following IEEE websites;

- TryNano https://trynano.org/education-resources/nanotechnology-lesson-plans/
- Robotics (under development) https://robots.ieee.org/learn/
- History and social impacts of engineering https://reach.ieee.org/inquiry-units/

For further information and/or support (e.g. delivery of teacher training for TryEngineering workshops, convening or mentoring of TryEngineering student workshops by engineers, advice re TryEngineering and other STEM activities, information about engineering careers, etc.) please contact the IEEE NSW Section Teacher In-Service Program (STEM Outreach) Coordinator;

Emeritus Professor Graham Town
https://site.ieee.org/nsw/
graham.town@mq.edu.au

OTHER PRE-UNIVERSITY STEM RESOURCES AND ACTIVITIES

(compiled Dec21/Feb 2022 by IEEE NSW Section STEM Outreach Coordinator, graham.town@mq.edu.au)

1. GOVT/EDUCATION

National STEM Toolkit

- https://www.dese.gov.au/australian-curriculum/national-stem-education-resources-toolkit
- https://www.dese.gov.au/australian-curriculum/national-stem-education-resources-toolkit/i-want-know-about-stem-education/different-kinds-stem-education-initiatives

NSW Dept of Education Early stage STEM units and activities
https://education.nsw.gov.au/teaching-and-learning/curriculum/key-learning-areas/stem/early-stage-1-to-stage-3/stem-units-of-work

Science Teachers Association NSW
https://padlet.com/STANSW/OnlineTools
Classroom Resources https://www.stansw.asn.au/Web/Resources/Classroom-Resources/Web/Resources/Teacher-Resources/Classroom-Resources.aspx

2. IEEE TRYENGINEERING (PRE-UNIVERSITY STEM)

Main portal/site:
https://www.ieee.org/education/preuniversity/index.html
https://tryengineering.org/

TryEngineering Teacher Resources https://tryengineering.org/teachers/
High School Resources https://tryengineering.org/teachers/high-school-resources
Elementary and Primary School Resources https://tryengineering.org/teachers/elementary-school-and-primary-school-resources/

TryEngineering Lesson Plans
https://tryengineering.org/teachers/lesson-plans/
https://tryengineering.org/teacher/
https://trynano.org/education-resources/nanotechnology-lesson-plans/

TryEngineering lesson plans for Australian Curriculum

- **https://ieee-ac.org/TISP/**
- https://site.ieee.org/queensland/chapters/tisp/

TryEngineering Student Resources https://tryengineering.org/students/

TryEngineering Volunteer Resources
https://stemportal-tryengineering.ieee.org/
Lesson plan toolkits https://tryengineering.org/engineering-lesson-plan-toolkit/

Try Engineering Tuesday (Topical engineering blog and webinar with pre-university student activities)
https://tryengineering.org/teachers/tryengineering-tuesday/
https://tryengineering.org/news/tryengineering-tuesday-smart-grid/

Try Engineering live webinar series https://tryengineering.org/news/tryengineering-live-webinar-series/

TryEngineering Teacher Workshops
Volunteer STEM portal - Teacher workshops https://stemportal-tryengineering.ieee.org/category/9abdffe7-89e0-4c12-a7cd-c5158b24201d
Canada pre-service teacher training https://stemportal-tryengineering.ieee.org/programs/detail/ef881bd6-e82d-409f-b1f3-6582cd0dab52

3. OTHER IEEE

TryNano: Nanotechnology portal https://trynano.org/
Reach: History of technology portal https://reach.ieee.org/
Robots: https://robots.ieee.org/
IEEE Learning Network (online CPD courses) https://iln.ieee.org/public/TrainingCatalog.aspx

4. ENGINEERS AUSTRALIA

School Presentation Kits - about engineering
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators/School-Toolkits

Resources for Schools

For teachers/educators
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators#All

All teachers
https://www.engineersaustralia.org.au/interesting-and-fun-resources
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators

School presentation kits
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators/School-Toolkits

Engineering in the Australian Curriculum (Shireane McKinnie)
https://www.engineersaustralia.org.au/sites/default/files/resource-files/2021-03/Engineering-in-the-Australian-curriculum.pdf

Secondary teachers
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators#High%20School

Engineering Games (Canberra)
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators/Engineering-Games

Engineering Studies Teacher Program (Newcastle Yr 11&12)
https://www.engineersaustralia.org.au/For-Students-And-Educators/NESA

Primary teachers
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators#Primary

EngQuest packages (primary)
https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators/EngQuest

For parents/carers https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Parents

Primary

EA Junior Club https://eajuniorclub.com.au/

For teachers https://eajuniorclub.com.au/teachers

For parents https://eajuniorclub.com.au/parents

Secondary

Future of Engineering https://www.engineersaustralia.org.au/For-Students-And-Educators/Engineering-Careers/Future-Of-Engineering

Becoming and Engineer https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Secondary-Students/Become-An-Engineer

For students and educators https://www.engineersaustralia.org.au/For-Students-And-Educators

Primary https://www.engineersaustralia.org.au/For-Students-And-Educators/Primary-School

Secondary https://www.engineersaustralia.org.au/For-Students-And-Educators/High-School

Tertiary https://www.engineersaustralia.org.au/For-Students-And-Educators/Tertiary

Events and Curated Activities

Experience IT (Yr 7-10 girls) https://www.engineersaustralia.org.au/node/43381
Discover Engineering (yr 7-10) https://www.engineersaustralia.org.au/node/43356

Cochlear Summer School (Yr 11-12) https://www.engineersaustralia.org.au/node/43391
Engineering Summer School (Yr 12) 5-10/12/2021 https://www.engineersaustralia.org.au/node/43386

Dream big: engineering our world https://www.engineersaustralia.org.au/news/2021/05/stepping-stem-0
One of Engineers Australia Queensland's flagship STEM programs is the Dream big: engineering our world events. Organised by Engineers Australia, this event is run in collaboration with universities across the state. School students, from the ages of 8-13, spend an afternoon watching the 'Engineering Our World' film before exploring hands on engineering activities and asking professional engineers questions about their work.

EngQuest https://www.engineersaustralia.org.au/For-Students-And-Educators/For-Educators/EngQuest
EngQuest is a free program for primary schools that provides students with a fun way to explore Science, Technology, Engineering and Maths (STEM). EngQuest was created by Engineers Australia as a hands-on experience that children can relate to and has reached over 100,000 students per year since 2014.

Other resources

https://www.engineersaustralia.org.au/About-Us/Divisions/Newcastle/Virtual-STEM-Resource

- What is Engineering?
- Secondary Students and STEM
- Discover Engineering: What do Engineers, Associates and Technologists do?

Find out more information from the National Committee for Engineering Associates and Technologists about the roles of engineers, associates and technologists.

For Volunteers going into schools
https://www.engineersaustralia.org.au/For-Students-And-Educators/Volunteers
https://engineersaustralia.org.au/news/2021/11/member-opportunity-be-involved-state-stem-programs

5. IET EDUCATION WEBSITE

https://education.theiet.org/about-iet-education/
https://education.theiet.org/support/education-a-z/
https://education.theiet.org/key-stage-1-2-3-and-4-free-stem-resources/

IET magazine https://eandt.theiet.org/
STEM Challenges https://eandt.theiet.org/tags/stem-challenges
Engineers' stories https://education.theiet.org/campaigns/look-at-me-now/our-stories/
FIRST Lego League https://education.theiet.org/first-lego-league-programmes/
Santa loves STEM https://education.theiet.org/campaigns/santa-loves-stem-2020/

6. OTHERS

- **Australian Chief Scientist – STAR portal** https://starportal.edu.au/
- **NSW Chief Scientist & Engineer** https://www.chiefscientist.nsw.gov.au/funding/science-education/science-and-engineering-student-competition-sponsorship-program
- **ATSE** (**STELR,** SAGE, IMNIS) https://stelr.org.au/
- **CSIRO** https://education.csiro.au/
  - https://www.csiro.au/en/education/Resources/Educational-datasets
  - **https://www.csiro.au/en/education/programs/stem-professionals-in-schools**
- **Science and Engineering Challenge** https://www.newcastle.edu.au/faculty/engineering-and-built-environment/science-and-engineering-challenge
- **Engineers Without Borders** https://ewb.org.au/project/school-outreach/
- **Reengineering Australia** https://rea.org.au/
- **F1 In schools** https://www.f1inschools.com/
- **Optus Cybersecurity** https://dayofstem.com.au/optus.html
- **The Engineering Link Group**
  - http://www.telg.com.au/programs/elp/
  - https://www.telg.com.au/Australia
  - https://www.telg.com.au/stem-outreach/
- **DiscoverE sites: https://discovere.org/teach/**
- **Important messages re engineering https://discovere.org/training/talking-to-kids-about-engineering/**
- **The Engineering design process https://discovere.org/resources/integrating-the-edp-into-stem-activities/**
- **Makerspace** https://www.makerspaces.com/
  - **http://makerspacesaustralia.weebly.com/makerspaces-in-schools.html**
  - **http://makerspacesaustralia.weebly.com/projects.html**
  - https://www.makerspace.org.au/
  - https://makezine.com/
- **NASA** https://www.nasa.gov/stem
- **UK STEM** https://www.stem.org.uk/
- **Day of STEM (**Started in 2015, but no longer active) https://dayofstem.com.au/
  Education Resource Guide https://dayofstem.com.au/education.html
  Help guide https://dayofstem.com.au/assets/pdf/COL/instructor_getting_started.pdf

- **Women in STEM Australia** https://womeninscienceaust.org/
  For female students in STEM….
    - Australia's Women in STEMM – a diverse series of career profiles
    - Australia's Science Channel – Women in STEM
    - Berkeley Extension – resources for girls and women interested in data science and AI
    - Choose Maths
    - Code Like A Girl
    - Coderdojo
    - Engaging Girls in Early STEM Learning
    - Fizzics Education
    - Girl Geek Academy
    - Girls Who Code
    - Growing Tall Poppies
    - In2Science
    - Kode With Klossy
    - National Youth Science Forum
    - Power of Engineering
    - Robogals
    - Sisters in Science
    - STELR
    - STEM Professionals in Schools (CSIRO)
    - Tech Girls are Superheroes
    - TechTrails
    - Women in STEMM Australia