

Create It Comp – Lesson and Activity Ideas

Below are a selection of curriculum-linked lesson ideas and accompanying activity sheets, written for primary students, on the topic of engineering and idea creation.

*Adult supervision is recommended for all activities.

Broad learning outcomes

- Students will learn about engineering as a field.
- Students will discover the contribution that engineers make to our community.
- Students will learn about the idea creation process.

Technologies (Design and Technologies, Digital Technologies)

- Students to write a list of appliances that can be connected to the internet (the 'Internet of Things' – IoT). Compare lists and see what you can come up with.
- Think about mobile phones/another e-technology item. What do they need to work? Write a list. (e.g. access to wi-fi, access to make phone calls, software to make all the apps, etc.)

Mathematics

- Students to list as many 3D shapes as they can. Compare lists and see what the most well-known shapes are.
- Students to complete the **3D drawing practice worksheets 1-3** (lower primary, primary) – these worksheets aim to introduce students to drawing 3D shapes and encourage them to think about drawing items using simple 3D shapes as the building blocks. There are three versions so you can choose which versions work best for your year levels.
- Students to complete the **Finish the 3D shapes worksheet** (primary, middle years) – this worksheet encourage students get more comfortable drawing 3D shapes and how to build on the shapes to draw their own ideas. (Answers for the four shapes are cube, cylinder, cone, and sphere.)
- Students to survey friends, classmates, and family about what they know about engineering – how many types of engineering can they list? Draw a graph to illustrate the results.

Science

- Students to explore the different types of engineering. What types of engineering did you discover that you didn't know about?
- Students to work in groups and build a bridge out of just newspaper and sticky tape, then test how weight-bearing it is. How strong can you make it? What design elements do you need to add to your bridge for strength?
- Think about your school and what it needs. List the types of engineering that you'd need to use to build it.
- Make a list of challenges that someone could face when navigating a city. How could engineering help? Can you design something to solve one of these problems?
- Investigate the ways that engineering works with other types of sciences (e.g. Dr Milan Brandt worked with surgeons to help their patient).

English

- Students to complete the **Technology Stack worksheet** (primary, middle years, secondary) – the worksheet encourages students to consider the technologies that are required to design a 'smart product' or app. All these questions have to be answered by an engineer for them to create a product that will be complete and useful.
- Students to watch one/some of the Centenary Heroes videos and discuss some of the ways they think engineers have helped their lives
- Students to formulate some interview questions for an engineer of their choice, and research some of the answers. Examples of engineers include:
 - o John Bradfield – Sydney Harbour Bridge
 - o Dr Marlene Kanga – the President of the World Federation of Engineering Organizations (WFEO), and previous President of Engineers Australia
 - o Alan Finkel – Australia's Chief Scientist
 - o Florence McKenzie – Australia's first female electrical engineer
- Students to select an invention and describe it in 100 words – how does it work? What does it do? Does it help people? Does it make life easier?

Humanities and Social Sciences (History, Geography, Economics and Business, Civics and Citizenship)

- Students to select a famous Australian invention and research the engineer/s behind the invention. Inventions could include:
 - o Black Box Flight Recorder
 - o Wi-Fi
 - o The Pacemaker
- Discuss what students think engineers have worked on in their daily lives – what has engineering made possible?

The Arts (Dance, Drama, Media Arts, Music, Visual Arts)

- Students to complete the **Mash-ups worksheet 1** (primary, middle years) – this worksheet gets students thinking about how engineers have combined different products to create new ones. The answer to the last ‘mash-up’ is a mobile phone. Students are then encouraged to think about other products that can be combined, and example of how technology can be removed from something to make a new product.
- Students to complete the **Mash-ups worksheet 2** (primary, middle years) – this worksheet builds on Mash-ups worksheet 1 and asks students to create three items by ‘mashing-up’ two items (or three if they want) from the border of the sheet.
- Students to practice drawing in 3D (either free-style or by drawing an object)

Health and Physical Education

- Think about the Tokyo Olympics and Paralympics. Students to invent products to help Paralympians compete in Olympic events that don’t have a Paralympic version at Tokyo 2020. Are there options already available at local competitions? Examples include baseball and softball, fencing, golf, hockey, sailing, climbing, and gymnastics.

You can find more information about the sports at the Tokyo Olympics and Paralympics on the website:

<https://tokyo2020.org/en/games/sport/>

OTHER USEFUL RESOURCES

STARportal

Find STEM resources, activities, and providers on STARportal. Find nationally available and free resources, or local activities and workshops for your school.

<https://starportal.edu.au/>

STARportal: Women in STEM and Entrepreneurship

Access a series of 19 video profiles featuring women working in STEM. Find out more about different STEM careers.

<https://starportal.edu.au/activity/women-in-stem-and-entrepreneurship>

STARportal: STEMP Pack 4 – Bringing Engineering to Life

Students can learn broadly about engineering and the different types, and consider the important role of engineering in the past, the present, and the future.

<https://starportal.edu.au/activity/stem-pack-4-bringing-engineering-to-life>

For Teachers For Students: Innovation – creative and critical thinking

Creative and critical thinking themed education resources, including tips about being a critical thinker and problem solver, STEM-based challenge cards and activities, and lesson ideas to extend the activities.

<https://www.forteachersforstudents.com.au/site/themed-curriculum/innovation/>