Embedding career education in the Victorian Curriculum F–10

Design and Technologies – Engineering principles and systems, Levels 7 and 8

An existing learning activity linked to a particular learning area or capability in the Victorian Curriculum F–10 can be easily adapted to incorporate career education, enriching students’ career-related learning and skill development.

1. Identify an existing learning activity

**Curriculum area and levels:** Design and Technologies – Engineering principles and systems, Levels 7 and 8

**Relevant content description:** Analyse how motion, force and energy are used to manipulate and control electromechanical systems when creating simple, engineered solutions ([VCDSTC045](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC045))

**Existing activity:** Investigating the inputs, processes and outputs of a household or office system of choice, such as a bladeless fan.

**Summary of adaptation, change, addition:** Exploring professionals involved in designing an engineered solution.

2. Adapt the learning activity to include a career education focus

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| Existing learning activity | Adaptations, changes or extensions that can be made |
| Students investigate the inputs, processes and outputs of various household and office systems, such as a bladeless fan.  Teacher brings in or projects an image or video of a bladeless fan (see ‘Additional resources’) and leads a discussion on inputs, processes and outputs by asking the following questions:   * What is the input? * What is the process occurring? * What is the output?   Students discuss the input, process and output of a bladeless fan to analyse how motion, force and energy are used to manipulate and control an electro-mechanical system to create an engineered solution.  Students answer the same questions for a bladed fan and compare the responses. | Students extend their thinking to consider the job involved in the design and production of the system, such as the bladeless fan. They identify roles such as designer, engineer and tester, and list what each role contributes to the evolution of a product’s design. They consider the skills and knowledge needed to contribute to the process. |
| Students consider the ‘what’ and ‘why’ of designing systems of household appliances. They research the product development process, including what is involved and why (i.e. why design a new type of fan when the existing ones work? Energy efficiency, innovation, aesthetics, etc). They identify where fans are used, how the design has evolved over time, etc., to inform their thinking. | Students expand their thinking to include the other roles that are necessary for a product such as a bladeless fan to exist, using the following questions as prompts.   * Why did engineers come up with bladeless fans? Who generated the need, given that the old types of fan were working? * How did engineers find out about the need for bladeless fans? * Who might have been involved in collecting data from customers about who would purchase a bladeless fan? * How might have they tested the systems? Are the same engineers who are involved in designing the bladeless fans also involved in testing or are they different professionals? * What type of businesses in Australia are involved in selling bladeless fans? * What job roles are involved in the manufacture, marketing and sale of bladeless fans? |
| Students identify additional improvements that could be made to a system such as a fan – what comes next? They research reviews of current fans to aid their thinking, looking at what consumers have to say about current system designs. | Students comment on who they might have to collaborate with to make a new modified design, for example, CEOs, test engineers, marketing executives, sales executives and market researchers. They identify which of the roles in the design, production and sales process matches their skills and interests. |

Considerations when adapting the learning activity

* Teacher will need to be prepared to scaffold students’ exploration of the roles involved, including introducing the roles, skills and knowledge.

Additional resources to help when adapting the learning activity

* [How bladeless fans work](https://www.youtube.com/watch?v=gcx2mAu4NjY)

Benefits for students

Know yourself – self-development:

* Students recognise how being adaptable and changing thinking based on new information can lead to new opportunities for success and growth.
* Students learn about the value of working well with others to create a product and take it to market.

Know your world – career exploration:

* Students develop their ability to efficiently use technology to gather information.
* Students explore the labour market by identifying the roles involved in the design and manufacture process.

Manage your future – be proactive:

* Students identify a multitude of roles involved in the design, production and sales process, and consider how these relate to their own skills and interests.