Embedding career education in the Victorian Curriculum F–10

Mathematics, Level 7

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 level:** Mathematics, Level 7

**Relevant content description:** Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving [(VCMMG258)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMMG258)

**Existing activity:** Using area formulas for rectangles and triangles to solve problems involving areas of surfaces.

**Summary of adaptation, change, addition:** Researching occupations that use area calculations.

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 |
| Teacher uses diagrams and working on the whiteboard or digital smartboard to demonstrate the calculation of areas of rectangles $Area=base ×height $, and proofs for the area calculation for triangles $Area= \frac{1}{2}×base×height$Students discuss and ask questions regarding area calculation methods during class discussion. | Teacher introduces a range of occupations that use area calculations, for example, farming, architecture and design, interior decorating, environmental planning, or engineering. Teacher then demonstrates the calculation of areas of rectangles $Area=base ×height $and proofs for the area calculation for triangles$ Area= \frac{1}{2}×base×height$ – as per existing activity. |
| Teacher provides students with paper and scissors and shows using concrete materials that the area of any triangle is $$Area= \frac{1}{2}×base×height$$where the height is measured from a line perpendicular to the triangle base and intersecting the triangle’s apex. Teacher scaffolds and assists students to show this is the case for any triangle: isosceles, scalene, equilateral and right-angled triangles.Students use concrete materials (paper/cardboard and scissors, ruler and pencils) to prove this is true for all triangles. | Students break into ‘expert groups’ so that each group has at least the same number of students in it as there are categories selected by students from those on the board. Each expert group selects *one* occupational group (so that no two groups have the same selection).Expert groups use the internet to research their selected occupational area and speculate how their occupation might use area calculations for rectangles, triangles and composite shapes in their roles. For example, interior designers might use area calculations to design floor covering areas. |
| Teacher provides written (text-based) exercises involving calculation of the areas of rectangles and triangles.Students work through written exercises and diagrams in workbook. | Expert groups design one occupationally contextual problem based on calculation of area of triangles, rectangles or composite plane shapes. They may refer to a textbook for inspiration based on existing example questions.Expert group problems should be mathematically robust and must relate directly to a problem that might exist in that occupation. Each member of the expert group will need to take notes and record the question or problem. |
| Teacher and students review responses in class with students doing a preliminary self-assessment, which the teacher then checks and confirms or refines. Teacher provides individual feedback as appropriate. | Expert groups divide up and form new groups, so that there is at least one member of each expert group in each of the new groups. These are called ‘jigsaw groups’.Jigsaw groups are (a) provided with a brief overview of what each of the selected occupations do by their relevant expert group member, and (b) are set the expert group activity or exercise to work through together. Jigsaw groups record their working out for each expert group problem on separate A3 or butcher’s paper.Original expert groups are re-formed to review and discuss each jigsaw group response to their problem. Teacher leads a class discussion regarding each example, demonstrating correct responses. Teacher emphasises the importance of accurate area calculations in a range of professions. |

Considerations when adapting the learning activity

* The expert group phase will need to be closely monitored by teachers to ensure that the example questions are realistically contextualised to occupation and mathematically accessible to their peers.

Additional resources to help when adapting the learning activity

* Maths Is Fun, [Areas of plane shapes](https://www.mathsisfun.com/area.html)
* MathsPathway, [Classroom activity: Area of a triangle](https://www.youtube.com/watch?v=pbI-eZ2q2hQ)

Benefits for students

Know yourself – self-development:

* By working in different groups of peers to research and report back on the links between mathematics and an occupation-specific role, students use communication skills to work with others.
* By engaging in an activity which requires them to change both team members and activity focus, students learn skills in being adaptable.

Know your world – career exploration:

* When researching an occupation and using this to propose a problem requiring a solution involving mathematics, students use technology effectively to organise and integrate career information.
* By speculating the ways in which area calculations might be required within specific types of work, students learn to better understand work.

Manage your future – be proactive:

* When posing and then solving problems involving mathematics within a specific work-related context, students earn to make informed decisions by generating alternative pathways and solutions.