Embedding career education in the Victorian Curriculum F–10

Mathematics, Level 4

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 4

**Relevant content description:** Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems [(VCMNA153)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA153)

**Existing activity:** Partitioning, regrouping and then adding or subtracting large multi-digit numbers, recognising and demonstrating that the place-value pattern is built on the operations of multiplication or division of tens.

**Summary of adaptation, change, addition:** Investigating occupational examples of the use of place value for counting and calculating volumes of goods and services.

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 concrete materials, such as place-value diagrams with coloured counters (for example, ones = yellow, tens = red, 100s = blue) or tally marks, and shows the partitioning of numbers up to tens of thousands. They reinforce the decimal place value system using place-value diagrams, hundreds charts and/or number lines. | Teacher connects large numbers to real-world context and practical situations. The decimal place-value system is related to large quantities of real things, making them easier to quantify and calculate.Teacher explains that in many occupations people need to count, package and transport large numbers of items. Farmers might pack their produce into boxes of ten, crates of ten boxes (making 100s) and containers of ten crates (making 1000s). Teacher then explains that each truck might carry ten containers (10 000 items). They can use hundreds charts to reinforce this. Teacher explains that having such a system makes it easier to work out ‘how much?’ and then how to add and subtract large quantities of goods. |
| Teacher sets written exercises for students to work through, working on calculations by partitioning and regrouping.Given 4- or 5-digit numbers, students partition or regroup in order to add or subtract these numbers and find a solution. | Students choose the real-world context of the activity, for example, supermarket food items, retail consumer goods. Students solve practical quantity problems by ‘boxing’, ‘crating’, ‘containing’ and ‘trucking’ a large collection of selected ‘produce’ by generating a 5-digit number and using materials (for example, MAB blocks) bundled together in groups of 10, 100, 1000 and so on. Students work out how many ‘trucks’ might be needed to transport their ‘produce’. |
| Teacher assesses solutions by checking on a calculator and marking set exercises.Students review by comparing responses and working. | Students check peers’ work by pretending they are a customer checking that quantities/volumes are correct. Students may use calculators.Students and teacher review by discussing other occupations in which people would have to count, value, package and transport large amounts of things.  |

Considerations when adapting the learning activity

* Teachers will need to explicitly remind students of the ‘bundling’ of ones into ten, tens into 100s and 100s into 1000s, using hundreds charts, number lines and/or MAB blocks.
* Place-value charts and place-value counters can also be used to reinforce basic place-value concepts.
* Creating a diagram or graphic showing bundling of ones (units) into tens (‘boxes’), tens into 100s (‘crates’), 100s into 1000s (‘containers’) and 1000s into 10 000s (‘trucks’) may assist students to visualise this activity.
* As an extension, students can reflect on the use of mathematics as a tool for making informed decisions by discussing what often happens when we ‘guess’ or ‘just think’ something is the case, compared to when we carefully measure and calculate. The ABC Catalyst episode listed below will also help make this point with students, as will the optional extra of inviting a farmer, truck driver or even logistician in to talk to the class about quantifying, estimating and using maths to manage large quantities.

Additional resources to help when adapting the learning activity

* AMSI Schools, ‘[Place value houses](https://calculate.org.au/2014/03/13/place-value-houses/)’ and ‘[Place value counters chart](https://calculate.org.au/2014/03/13/place-value-counters-chart/)’
* ABC Catalyst, ‘[The Secret to Making Better Decisions](https://www.abc.net.au/catalyst/the-secret-to-making-better-decisions/11017274)’

Benefits for students

Know yourself – self-development:

* Solving problems in a real-world context assists students to connect mathematically abstract concepts such as place value with practical applications and utility. This will assist with the understanding that mathematics is a tool with which we explore the world and thus avoid anxiety about maths as a subject.
* Utilising peer checking within the simulated context of ‘supplier/customer’ will assist students to work with others by developing communication skills and interacting cooperatively.

Know your world – career exploration:

* Students investigate some aspects of industries, careers and occupations associated with farming, transport and packaging, contributing to their capacity to understand work.
* Inviting a farmer, truck driver or logistician in to talk to the class about what they do and how mathematics supports their work will encourage students to be lifelong learners and expose them to learning and career opportunities.
* Solving mathematical problems by simulating a ‘real world’ work situations will provide students with insight into the world of work and provide an early opportunity to experience work.

Manage your future – be proactive:

* Students can reflect on the use of mathematics as a tool to make informed decisions in businesses or organisations, based on accurate quantification and calculation, and by using systematic problem-solving skills.