Embedding career education in the Victorian Curriculum F–10

Science, 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:** Science Levels 7 and 8

**Relevant content description:** Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques ([VCSSU095](https://victoriancurriculum.vcaa.vic.edu.au/science/curriculum/f-10#level=7-8))

Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations ([VCSSU090](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU090))

**Existing activity:** Learning about, and using, different separation techniques. Making links between separation techniques in the classroom and practical applications of these techniques.

**Summary of adaptation, change, addition:** Reflecting on the roles of scientists involved in water purification, and the skills utilised in the activity.

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 introduces the students to the techniques used in the laboratory to separate mixtures.  Teacher connects separation techniques to practical solutions in society, exploring why mixtures need to be separated. Examples could include to provide clean water, to produce useful materials (such as salt via evaporation), crude oil distillation or mineral extraction. | Teacher facilitates discussion around how places without access to clean water also don’t have access to equipment they need to purify the water.  Teacher discusses the following questions with the students:   * What scientific job roles would be involved in designing a method to purify water? * What job roles would be involved in getting the equipment to communities that need it? * What challenges do scientists face in designing ways to purify water in these communities?   In groups, students brainstorm everyday items they could use to purify the mixture of water, considering the above questions and answers.  Students work in their groups to separate water using household items. This separation takes the place of the separation in the existing learning activity. |
| Teacher lists different mixtures on the board and asks students to identify which separation technique needs to be used to separate each mixture.  Students are then placed into groups and given a mixture of water and a variety of solutes. Students need to work in their groups to determine which order of separation techniques they will use to separate the water from the mixture.  Students perform their experiment, recording the effectiveness of the techniques used and the component that each technique allowed them to separate. They reflect on how they could improve the effectiveness of separating their mixtures. |
| Students present in their groups their ‘clean’ water and a flowchart of the steps they took to produce it, including annotations of how improvements could be made to each step of the separation process. They comment on the presence of any impurities in the mixture. | They reflect on how the skills they learnt are relevant to different jobs and how those jobs help society. Teacher should highlight the practical, scientific skills developed through the activity, and broader employability skills such as teamwork, written and verbal communication and critical and creative thinking. |

Considerations when adapting the learning activity

* Engineers Without Borders run a [program](https://www.ewb.org.au/programs/school-outreach-book-a-workshop/) in which engineers work with schools to develop a water filtration device, and provide career information. If schools are in the position to do so, this will build on the activity extension.
* Teachers should take some time before the lesson to gather information on the different job roles involved in design equipment for purification of water, such as chemists and engineers. This will assist in facilitating discussion on the various roles that fall under the umbrella of ‘science’.

Benefits for students

Know yourself – self-development:

* Students develop skills in negotiation and teamwork as they design their method for removing the impurities from the water.
* Students will need to work through challenges as they consider the order in which to apply separation techniques and which equipment to use.

Know your world – career exploration:

* Students develop an understanding of how scientists in different job roles use their knowledge of experimental techniques to design a method to fit a purpose, and ensure the method is tested and that results are accurate. They experience this work first-hand, linking their learning to the world of work.
* Students develop an understanding of important contribution science can make to society and the job opportunities that are possible.

Manage your future – be proactive:

* Students are given the opportunity to learn and explore various scientific careers. As they reflect on the skills learnt in the activity and the role of science in helping people, students may consider career options they have not previously been aware of.