Embedding career education in the Victorian Curriculum F–10

Science, Levels 9 and 10

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 9 and 10

**Relevant content description:** The transmission of heritable characteristics from one generation to the next involves DNA and genes. ([VCSSU119](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU119))

Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries. ([VCSSU115](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU115))

Communicate scientific ideas and information for a particular purpose, including evidence-based arguments and using appropriate scientific language, conventions and representations. ([VCSIS140](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSIS140))

**Existing activity:** Exploring how a genetic disorder is inherited and explaining this and the risk of having a child with a genetic disease to the public.

**Summary of adaptation, change, addition:** Extending the exploration to investigate jobs/roles and skills that are involved in providing genetic screening services to individuals.

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 explains the difference between inheritable diseases and non-heritable diseases, and the role DNA and genes play in these. They outline how some diseases, such as cancer, have a genetic cause but how most cancers are not inherited. They discuss how some genetic variations may link to a higher chance of developing a particular disease and whether there is also a risk to offspring and/or other family members. | To extend, teacher highlights the jobs/roles involved in providing genetic screening services to individuals, such as administrating and processing results from the different technologies available, and genetic counselling. Teacher should emphasise the connection between science skills and a wide range of occupations students may not have considered. For example, the area of genetic counselling requires people with legal skills, accounting skills and interpersonal skills, in addition to science knowledge and skills. Teacher highlights the importance of interpersonal skills for genetic counsellors, who have to deliver news to patients and the impact this news can have on individuals and families.  In groups, students choose a job/role and discuss:   * What skills does this job/role need? * Why are these skills important? * How does this job/role draw on the skills of other professionals around them? * What other professions would use similar skills?   Students reflect on their own skills and the skills and knowledge they feel they developed through this activity, and identify how they might use these skills in other aspects of their life or careers that are not science-focussed. |
| Students investigate the technology, such as genetic screening and non-invasive prenatal testing, that have assisted in the understanding of inherited conditions and the potential risks to the individual, offspring and/or other family members. Their research can include pre-existing technology, advances in technology, how the technology works, what it shows and who uses it. Has this technology affected the prevalence of genetic diseases? What impact has this had on jobs in this field? |
| Students choose and investigate an inherited condition and how it is passed from one generation to the next. They research the technology available to assist with determining whether an individual carries a genetic variation and the likelihood it could cause a genetic condition in their offspring.  Students present their findings to their peers as a brochure or oral presentation using appropriate scientific language. |

Considerations when adapting the learning activity

* At these levels, students will be considering future work and study options, and may need help visualising the possibilities available in a single industry that connect to their own interests and skills.
* Teacher can support students to understand how they can combine an interest in science with skills from other disciplines. This may require some additional preparation; the school’s careers practitioner will be a useful resource.
* Teacher should be sensitive of any genetic disorders of students in their class.
* Asking a bioinformatician or doctor to talk about how they work in collaboration with genetic counsellors will help students to recognise the complexity of the role and the importance of collaboration in assisting those with genetic disorders.

Additional resources to help when adapting the learning activity

* Genomics Education Programme, [Genomics specialist careers: Meet the genetic counsellors](https://www.youtube.com/watch?v=hH7pHJVMHeA)
* [JobOutlook](https://www.joboutlook.gov.au/) – Students can search the term ‘genetic’ for information about careers related to genetics.

Benefits for students

Know yourself – self-development:

* Students develop, and understand the importance of, empathy and effective communication.
* Students develop skills as active listeners and learn to be respectful of sensitive information and other people’s opinions.

Know your world – career exploration:

* Students understand the benefits of the work genetic counsellors do for individuals, families and society and how changes in prevalence of genetic diseases can alter the work of genetic counsellors.
* Students identify their skills and strengths and understand how these align with the work of genetic counsellors as well as transfer to other fields.

Manage your future – be proactive:

* Through analysis of the broad range of jobs genetic counsellors perform and the diversity of people they deal with every day, students understand that the world of work is constantly changing.
* Students understand the real-world application of the skills they are learning by reflecting on the skills used by genetic counsellors.