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:** Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales ([VCSSU102](https://victoriancurriculum.vcaa.vic.edu.au/science/curriculum/f-10#level=7-8))

Analyse patterns and trends in data, including describing relationships between variables, identifying inconsistencies in data and sources of uncertainty, and drawing conclusions that are consistent with evidence ([VCSIS138](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSIS138))

**Existing activity:** Looking at the rocks present in a local area, identifying them and constructing a map.

**Summary of adaptation, change, addition:** Extending understanding of the local geology by unpacking the implications for the construction industry.

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 a rock sample from the local area to explain how a geologist would look for different characteristics to identify the rock type. | Teacher introduces the role of geology in the construction industry as an example of the application of the students’ learning in a real-world environment. Students brainstorm the types of roles that use science (especially geology) in construction (i.e. civil engineer, geo-engineers, geologists, surveyors). They consider/research what these roles entail.  Students investigate why rock classification, and application of geology skills, are important in the construction industry, using the following questions as prompts.   * What assessments need to be made regarding the geology of an area before construction can commence? * What are the risks of constructing when geological assessments have not been made? * Are there laws about constructing in certain areas based on the geological significance? * Why do civil engineers need to understand the geology of the area where they are working? |
| Students practise identifying rocks in the classroom using rock samples from the chosen area and a classification key. |
| In groups, students go out into the field and identify the rocks they find, keeping a log of the characteristics of the rock. They take photographs of the rocks for later use. They note the lustre, hardness and other properties of the rocks on site. |
| Following their work in the field, students return to school and work in their groups to generate a map of the rocks in the area using the images and data they collected.  They then suggest different purposes for different types of rocks and suggest what each rock type would/would not be good for. The type of rock, its properties and its uses could be linked to the way that each rock type was formed. |
| Students research the different rock types further, with a focus on the geological history of the area. They present all their findings, including the results of their practical investigations related to the properties of different rock types, as a written report. | As an extension of the existing activity, students can add the information collected to their final written report in a new section titled ‘Implications of the research’. They explain how the rock types present would impact construction in the area, as though they are a scientist communicating their findings. |

Considerations when adapting the learning activity

* Teachers should consider showing or discussing the different technologies used to identify rocks, from simple tests such as Moh’s hardness scale, to atomic absorption spectroscopy. This will help students to develop an understanding of the different ways geologists can generate data, identify rocks and also the importance of certain properties of rocks.
* Permission will be needed to remove samples from the field for further investigation in the classroom.
* Interviewing a geologist and/or civil engineer in person or via video could strengthen students’ understanding of the impact of geology on local industries.

Additional resources to help when adapting the learning activity

* Geoscience Australia, [Australian and region surface geology](http://maps.ga.gov.au/interactive-maps/#/theme/minerals/map/geology) (interactive map of all the geology in Australia)
* Pelagia Research Library, ‘[Importance of geology in construction and prevent the hazards](https://www.imedpub.com/articles/importance-of-geology-in-construction-and-prevent-the-hazards.pdf)’

Benefits for students

Know yourself – self-development:

* Students build communication skills as they work with their group to ensure they are prepared to present the information collected. They need to negotiate with each other and decide who is completing each task so that everyone is contributing equally to the group.
* Students develop an understanding for how people’s opinions often differ, and why, when analysing whether a site is fit for construction. They develop an understanding of the importance of considering all opinions, and how to analyse information to make decisions.

Know your world – career exploration:

* Students develop skills in analysing risk and complying with laws as they examine the impact of geology on the construction industry. These are skills that engineers require to conduct their everyday work.
* Students will have the opportunity to use tools such as spatial technologies when they are in the field. Through their analysis they will be able to unpack how individuals in different careers use these tools differently, and enhance their ability to use information and technology effectively. Students will develop an understanding of the different roles required in the construction industry and learn the importance of collaboration between parties in the successful construction of a building.

Manage your future – be proactive:

* Through learning how scientists work in the construction industry, students may identify skills or knowledge they might like to gain for the future. For example, when observing a geological site, they may be interested in fault lines, how they arise and what further information this gives us about the geological history of the area and the impact of this on construction. As such, students utilise an opportunity to learn and explore new career options.