

## Final Design Project

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The final design builds on the skills that students developed during the mini designs. Students work in the same groups as for the mini designs, so they are able to develop their teamwork skills. Students receive a rubric in advance to help them prepare their project. Students offer peers feedback on one another's reports, which can help them to prepare for their oral presentations of their final design project.

### Instructions

- **Context:** students have been hired by a mining company to design a ventilation system. In groups, students are given the mine layout, but the vent design is left entirely to their discretion (open-ended design). Students must follow regulations in keeping with the engineering accreditation board of Canada as well as occupational health and safety for vent design, and they must assume some parameters, such as geotechnical, mine planning and costs.
- Students are given 1 of 3 mine locations:
  - 3 groups get a mine situated in Ontario
  - 3 groups get a mine situated in Québec
  - 3 groups get a (coal) mine situated in British Columbia
- The purpose of giving groups different mine locations and types is so that they take into consideration the specific conditions, such as health and safety provincial regulations, in order to optimize their vent design.
- **Bonus points:** encourage students to think sustainably (e.g., renewable energy to replace fossil fuel).
- **Timeline:** 10 days, with time allotted inside and outside of class.
  - Groups research the mine for which they have been employed to build a vent.
  - Using the information, calculations, and design processes from the mini design exercises, groups design a vent system for their given mine.
  - **Day 5 Check-In:** groups meet with the instructor to ensure that they are on track with their work.
  - Groups submit their reports at the end of the final design period.
    - After submission, the report is sent out to another group that is designing for the same mine location/type. That group must evaluate the report and provide peer feedback.
- **Presentation:** the 3 groups working on the same mine location/type present to each other and to the instructor.
  - Presentations are 20 minutes long (3 groups x 20 min = 1hr), followed by a 1 hr discussion period for all three groups.
  - Groups must come up with 5 critical questions (based on written report) to ask the presenting group.