

Lesson Plan

Description

Students will learn about the mining life cycle and that the mining industry is full of diverse career opportunities through playing the Mine Evolution digital game.

Learning Outcomes

- Associate diverse careers with the mining industry
- Mining is safe, innovative, socially responsible, and environmentally conscious

Introduction

The **mining life cycle** consists of 4 phases with diverse roles:

Exploration: This is where a property is explored extensively, using various techniques, to see if there is mineable material present and estimate how much there is.

Development: This is where the mine is designed and constructed.

Production: This is where the ore is removed and processed to extract metals and minerals for the market.

Mine Closure and Reclamation: This is where the mine is closed and remaining equipment or buildings may be recycled, donated, or sold. After mine closure, the environment is reclaimed through a process of re-greening.

Throughout the mining life cycle, the community and the environment must be considered. Every company needs to earn the **approval of the community** before exploration and mining can begin. Throughout the mining life cycle, companies need to be sure that local community groups are accepting of their activities and practices. Companies will often accomplish this with open and honest conversation, community engagement, donations/volunteering, job creation, and participation in community events.

A new business entity in the Sudbury, Ontario area (on the traditional lands of the Robinson Huron Treaty Territory) is a great example of **equal partnership with Indigenous communities**. Aki-eh Dibinwewziwin is a mine contracting business created in partnership with Atikameksheng Anishnawbek, Sagamok Anishnawbek, and Wahnapiitae First Nation and Technica Mining (a Sudbury-based mining company). Aki-eh Dibinwewziwin means “to be owned by the earth”. The company name was generated by Anishinaabe Language holders. The new business entity will now provide world-class mine contracting services for their partners and allow the First Nations to meaningfully participate in the economic benefits in their territorial lands.

Environmental health is an important consideration throughout the entire mining life cycle. A reclamation plan must be in place before mine construction, and environmental indicators (such as water quality) are consistently monitored. See the “Greening Mining” lesson plan for more information.

Innovation and technology are being used within the mining industry to make mining more safe and environmentally responsible. Mining equipment is moving from diesel to electrical. Fuel usage is tracked and monitored, so companies can be sure they are reducing consumption. Automation and remote operations are already occurring in modern mines throughout Canada. Robotics are also being utilized in the mining industry. Rovers, drones, and robots are used for monitoring ground movements, checking for bad air quality underground, and performing search and rescue missions. Robots can go into places that aren't safe for humans to go. The future of mining will see even more advancements in robotics and will also include artificial intelligence. Cleaner sources of power, like hydroelectric, solar, and wind, are currently in use at many sites to help offset costs and carbon footprints. Hydrogen power is also being considered for current and future use, as well as miniature nuclear reactors. There will likely be newer power innovations coming to market in the next several years. All of these innovative technologies are making mining more effective, efficient, and most importantly safe for people and the environment.

Mining is essential for modern life and for a greener future, thus it is imperative we keep innovating in this sector. That’s why the people in the industry are so important. As you can start to see, it takes many different fields and specialists to come together to mine. From community relations to environmental specialists, programmers, construction and heavy machinery, the mining industry has it all!

Mine Evolution is free digital game where players can build the ultimate modern mine to unlock our green future. Your mission is to build Canada’s green future through modern mining. Play in an open map, collect Earth’s treasures across Canada to unlock new technology, and build the ultimate modern mine!

As a part of this project, five other Pan-Canadian curriculum linked lesson plans were created with short “mini-games” to play in the classroom, along with a hands-on activity.

Action

Students will play the Mine Evolution digital game for 30 minutes. The game can be downloaded at: www.mineevolution.ca. Students can begin a “New Game” and follow the tutorial to learn to how to play.

As they are playing, have them record each new career they encounter in the game using the handout. By the end of the 30 minutes, they should have discovered various careers within the mining industry. Have students research and record a short description for each career.

Consolidation/Extension

Students can choose one career they are interested in and create a career profile. What are their primary responsibilities? What education do they need?

Accommodations/Modifications

Length of gameplay can be adjusted based on needs. Level of depth for career profile can be adjusted based on grade level.

Assessment

The handout can be collected and used as an *Assessment of Learning* if you wish to evaluate your students in a summative manner.

Additional Resources

- [British Columbia Mine Information \(gov.bc.ca\)](http://gov.bc.ca)
- [Importance Of Mining - Minerals Education Coalition](#)
- [Atikameksheng Anishnawbek, Sagamok Anishnawbek and Wahnapiatae First Nation partner in historic, collaborative agreement with successful Canadian mining contractor \(anishinabeknews.ca\)](#)
- [Spot® - The Agile Mobile Robot | Boston Dynamics](#)