



LEARNING ACTIVITY:

# Safe as a Mine

GRADES 6–12

## MATERIALS

- Paper and pencil or device on which to take notes
- Internet access



**Figure 1: Quarry.**  
Credit: Society for Mining, Metallurgy & Exploration (SME)

**S**afety is always the top priority in modern mining. It is important to every person working in the industry — most importantly to ensure everyone’s health, but also to prevent lost productivity and costly equipment damage. Safety in the mining industry is crucial to our society since minerals obtained from mining are required for everything we use such as buildings and roads, computers, and phones, and everything we do, from farming to medicine to green energy generation. In this exercise, students will learn about the Personal Protection Equipment (PPE) used in mining as well as innovations to make a safe industry even safer.

## PROCEDURE

- 1 List some potential hazards of working in surface mines or quarries (Figure 1). Include the hazards of being outside, in addition to those of mining operations and activities.
- 2 List potential hazards in an underground mine (Figure 2). Think about the underground environment as well as the challenges of using equipment underground. Be sure to think about modern mining practices, conducted with modern communication, construction, lighting, sensors, and machines that dig and haul underground.
- 3 Visit <https://mineralseducationcoalition.org/esw/> to view a diagram showing Mining PPE. In addition to what is shown, Mining PPE also includes hearing and fall protection. Research the different types of mining PPE and some of the features that are important in each type of safety equipment. For example, boots may need a steel toe, protective material, non-slip tread, etc.
- 4 PPE is an important part of reducing risk, but technology is also important. Watch the “Mining 2.0 Progress and Innovation in the Industry” video [20:51] or, optionally, the “micro-learning” version [3:31], both found at <https://media.smenet.org/jobs-of-tomorrow-series>, looking for technological innovations that improve safety.



**Figure 2: Underground miners in PPE.**  
Credit: S. Chundra, Creative Commons 4.0  
Source: [https://commons.wikimedia.org/wiki/File:Underground\\_Mining\\_team.jpg](https://commons.wikimedia.org/wiki/File:Underground_Mining_team.jpg)

## ANALYSIS

- 1 Think about modern technology that you have used or would like to use. How could it be used to make mining safer?
- 2 How can the operation of vehicles from a distance (remote control) increase the safety of a mining operation?
- 3 What kind of safety hazards in mining can you detect with a drone?
- 4 What hazards would be associated with mining in space, Earth’s oceans or in landfills? What PPE would be required for these types of mining operations?

## ADDITIONAL RESOURCES

Go to [MineralsEducationCoalition.org/esw](https://MineralsEducationCoalition.org/esw) for more “Jobs of Tomorrow”-related activities, video links, and information about mining-related careers and safety.

## NGSS CONNECTIONS

- SEP:** Asking Questions and Defining Problems  
**DCI:** ESS2.A: Earth’s Materials; ESS3.B: Natural Resources  
**CCC:** Influence of Science, Engineering, and Technology on Society and the Natural World

## SDG CONNECTIONS

- 8:** Decent Work and Economic Growth  
**9:** Industry, Innovation, and Infrastructure

