

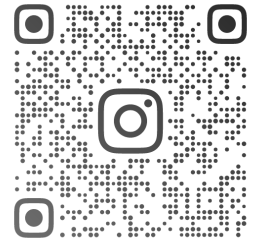


**Electrifying the Future - Harquail School of Earth Sciences,
Laurentian University
Lesson Plan 2: Minecraft Exploration**

Lesson Description:

This lesson focuses on the identification and material properties of minerals relevant to daily life of many people across the world. Two options are available, a geologist's search for minerals and a quiz show game that can be modified for various age groups. This lesson specifically fits into Ontario's grade 4, 5, and 12 science curriculum, but there may be alternative outcomes in the curriculum that may be fitting for this lesson.

For an additional description of the activity, Cate Larsen at the Harquail School of Earth Sciences at Laurentian University has provided a description on Instagram. The video can be viewed on instagram through the QR code or by visiting the website <https://www.instagram.com/reel/Co-1WxADeS3/?igshid=ZWI2YzEzYmMxYg==>.



REEL SHARED ON FEB 22, 2023
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Lesson objective(s):

- Students will learn and utilise terminology related to minerals and geological processes.
- Students will learn how to identify minerals.
- Students will learn the attributes of different minerals and their utility in daily life.

Lesson Considerations

- Some of the components are small and may be challenging to assemble. In situations where dexterity and fine motor control is limited, extra time and support may be required for students' success.

Site/Space Considerations

- Assembly requires table space for a class that is separated into groups of 3-4 students.
- Competition requires a space that is approximately 15m lengthwise. A hallway may work with flashlights, but an atrium with lots of natural light or an outdoor space with a flat surface may allow for the competition to better represent the learning environment intended for the activity.

Required Materials:

Minecraft Kit from Laurentian University, computer, projector.

Curricular Outcomes:

See end of document for Grade 4,5, & 12 outcomes that may apply to this lesson.

Author's Note:

Please note that this first edition of the lesson may require some modification to better fit curricular objectives. There is a capacity for this lesson to be modified in a way to better suit students' capacity and fit a style of exploratory learning, but was not included in this lesson for logistical reasons.

Please modify this lesson where needed.

Activities

Minecraft Mineral ID - Becoming a geologist

Time: 20-30 minutes

Group Size: 2-3 students

Target: Grades 4-5

Materials: 1 x 4 gallon bucket, 1 x Minecraft Mineral Identification Kit, 6-9 kg. play sand *per group*. Projector and computer for presentation.

Preparation: Place $\frac{1}{3}$ to $\frac{1}{2}$ of an 18kg bag of play sand into a 4 gallon plastic bucket and place all of the minerals included in the Minecraft Mineral Kit into different places into the sand. Place all of the included information cards with the mineral face up.

Instructions:

Introduce the field of a geologist - show them the different geologist tools (hard hat, vest, magnets, notepad, etc.)

They get to practise the skills of a geologist by using the tools provided to uncover minerals from the sand and identify the minerals using the Minecraft Mineral ID cards.

Campers get to dig through the bucket, find one sample each until everyone has found at least one sample. Campers will refer to Minecraft ID cards to identify the mineral and keep score of how many they have found. Try to identify all 12 minerals as a team. Once all minerals have been discovered, each team has their own minerals on top of their respective ID cards.

Further discussion on the properties and utility of each mineral contained in the kit can be presented at the teacher's discretion. Extending the activity to "classify different rocks and minerals according to their composition and physical properties, using various tests and criteria" (Grade 4 Outcome E2.4 from the Ontario Curriculum) or other curricular elements can be helpful.

Minecraft Mineral ID - Quiz Show

Group Size: 3-4 students

Target: Grades 4, 5, and 12

Materials: 1 x Minecraft Mineral Identification Kit *per group*.

Projector and computer for game show.

Prizes (if suiting for the classroom)

Preparation: Collect the required number of Minecraft Mineral Identification Kits for the class and remove all of the cards from each kit (make sure to keep them organised so that you can replace them afterwards). Set up a Jeopardy! style gameshow in the appropriate software (such as factile) with the questions from the cards included in the kit. If there are relevant questions that complement the curricular outcomes you are covering, they may be a helpful addition to the competition.

Instructions:

1. Have students look through all of the minerals as a group. Have students write down all of the names of each mineral they know and have them guess at the utility they may have for us.
2. Have a discussion about each of the minerals and the utility of each. Each has special properties or characteristics that are relevant for daily life.
3. Have a competition with a Jeopardy! style software (such as www.playfactile.com) with each of the teams competing for points. If prizes are suitable for your classroom, they may be helpful.

Ontario Curricular Outcomes

The outlined activity does not fit with any specific curricular outcomes, but is meant to complement the learning experience of other lessons. This list may not include all relevant outcomes.

Grades 1-8

- A1.1** use a scientific research process and associated skills to conduct investigations
- A1.2** use a scientific experimentation process and associated skills to conduct investigations
- A1.3** use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems
- A1.4** follow established health and safety procedures during science and technology investigations, including wearing appropriate protective equipment and clothing and safely using tools, instruments, and materials
- A1.5** communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes

Grade 4

- E1.1** analyse ways in which geological processes impact society and the environment
- E1.2** assess social and environmental impacts of extracting and refining rocks and minerals and of manufacturing, recycling, and disposing of products derived from rocks and minerals, while taking various perspectives into account
- E2.1** explain geological processes that result in the formation of igneous, sedimentary, and metamorphic rocks, using the rock cycle
- E2.2** describe the physical properties of igneous, sedimentary, and metamorphic rocks
- E2.3** classify different rocks and minerals according to their composition and physical properties, using various tests and criteria
- E2.4** describe everyday uses of rocks and minerals
- E2.5** describe how fossils are formed and what information they can provide about Earth's history

Grade 5

- C1.1** assess the impacts on society and the environment of various processes used in the manufacture of common products

- C1.2** assess how the use of specific materials in the manufacture of consumer products affects the environment, and identify actions that society and individuals can take to mitigate negative impacts
- C2.7** explain why specific physical properties of various solids, liquids, and gases make them useful for particular applications
- E1.1** analyse long-term impacts of human uses of energy and natural resources, on society and the environment, including climate change, and suggest ways to mitigate these impacts
- E1.2** evaluate effects of various technologies on energy consumption, and describe ways in which individuals can use technology to reduce energy consumption
- E1.3** analyse how First Nations, Métis, and Inuit communities use their knowledges and ways of knowing to conserve energy and resources

Grade 12 (SES4U) - Earth and Space Science

- E1** analyse technologies used to explore for and extract Earth materials, and assess the economic and environmental impact of the exploitation of such materials;
- E2** investigate the properties of minerals and characteristics of rocks, including those in their local area;
- E3** demonstrate an understanding of the properties of minerals and the formation and characteristics of rocks.