



# Professions and Businesses in Rocks and Minerals

## Rocks & Minerals Unit



### Standards Covered

ELA	Math	Science	Social Studies
SL.8.1, L.8.4, L.8.6, L.7.6, SL.6.1, SL.7.1, L.6.6, SL.8.5, RI.6.7, W.8.9, W.6.2, W.7.2, W.8.2, L.8.6, W.6.6, W.7.4, W.7.6, W.6.7, W.7.7, W.8.6, W.8.7, L.7.6, SL.7.5, L.6.6, RI.6.1, RI.7.1, RI.8.1, RI.6.4, RI.7.4, RI.8.4, W.8.9, W.8.8, L.8.4, L.8.6, W.6.8, W.7.8, W.6.9, W.7.9, L.6.4, L.7.4	6.NS.6, 6.NS.8, 7.EE.3, 7.G.1	6.PS.1, 6.ESS.1, 6.PS.2, 7.PS.2, 6.ESS.5, 6.ESS.4, 7.ESS.1, 8.LS.1	SS.7.13, SS.7.14, SS.7.19, SS.8.16, SS.8.17, SS.7.20, SS.7.21, SS.8.3, SS.8.11, SS.6.4, SS.6.6



### Vocabulary

See unit vocabulary folder



### Text Set

See Rocks and Minerals Text Set from the OCALI Lending Library

Note: this kit will be updated soon – print packing list after updated



### Materials

Materials for these lessons will be linked within the daily outline

[Printable Ohio Maps](#) by county – Open the County Maps tab – select county – save as PDF - print



Teaching All Learners Center



## Instructional Outline

### Week One – Exploring Geology Professions

**Day 1** – Have you ever found a rock on the ground, picked it up and thought, “this is a great rock! I’m going to keep it.”

Let’s begin a new learning adventure by watching the [\*Let’s Talk About Rocks video from PBS\*](#) to learn more about rocks we have within the layers under Ohio and what they are used for today. Are there professions that focus on rocks, minerals, gems and fossils? Yes indeed! Lots of them! Let’s spend a few days learning about many of the professions and businesses that involve geology – specifically, rocks, minerals, fossils, gems and other natural resources the earth provides.

Let’s begin with **Stonemasons**. Stonemasons use rocks to build structures of all types. (e.g. buildings, walls, chimneys, outdoor areas, etc.)

Next, let’s dig into the business of landscaping. **Landscapers** work outdoors and use rocks and other materials to create beautiful and functional outdoor spaces for people to use and enjoy.

**Museum Curators, Collection Managers, Directors and Owners** research, preserve, archive, and display rock and fossil collections for the public to enjoy.

Do any of these professions sound familiar? Have you ever seen people working in these fields? Where can you find these professionals working in our community? Practice your research and resource gathering skills to look-up these businesses in your area and place markers on a [local map](#) to pinpoint their locations.

#### **Day 2** – The Geologist

**Geologists** study earth materials, including rocks, minerals, and fossils to understand Earth's history and locate resources. They investigate how rocks were formed and what has happened to them since their formation.

**Environmental geologists** plan for and test the soil and groundwater in local areas. They also determine the best strategies for remediation if/when contaminants are found.

**Mineralogists** research the structure, chemistry, and properties of minerals.

**Petrologists** are geologists that specialize in the study of rock origin, structure, and composition.



**Hydrogeologists** are geologists that specialize in the study of ground water. One of the most important resources for our Earth. They work to make sure we know how water moves across the earth and how to keep it clean and safe.

**Geomorphologists** focus on understanding how landforms change over time. They perform hydraulic, hydrologic and geomorphic analyses to map resources such as groundwater and petroleum.

**Geochemist/Geophysicist** use chemical and physical methods to analyze rocks and minerals, particularly for identifying deposits that can be sold for a profit to businesses. (e.g. home improvement stores, landscapers, builders, masons, etc.)

Do any of these professions sound familiar? Have you ever seen people working in these fields? Where can you find these professionals working in our community? Practice your research and resource gathering skills to look-up these businesses in your area and place markers on a local map to pinpoint their locations.

### **Day 3 – Into the Community: Geologist for a day**

Plan a visit to observe at a local business in one of the fields we learned about in the previous day(s). (e.g. stonemason, landscaper, museum curator, geologist)

### **Day 4 – The Paleontologist**

Paleontologists specialize in studying fossils, rock formations, and ancient life to determine historical climate and evolutionary changes.

**Geology Professors or Teachers** share their passion and knowledge about geology with young people.

**Volcanologists** study volcanos and volcanic activity below the surface of the earth.

**Earthquake Geologists** study and work in the field of... you guessed it! Earthquakes!

Do any of these professions sound familiar? Have you ever seen people working in these fields? Where can you find these professionals working in our community? Practice your research and resource gathering skills to look-up these businesses in your area and place markers on a local map to pinpoint their locations.

### **Day 5 – Into the Community: Paleontologist for a day**

Plan a visit to observe at a local business in one of the fields we learned about in the previous day(s). (e.g. paleontologist, archeologist, fossil collector, fossil exhibit)



## Week Two – The Business of Rocks and Minerals

### Day 1 – The Minor

**Mining/Quarry Workers or Engineers** oversee the extraction of minerals, rocks, and metals from the earth.

**Geotechnical Engineers** study rock and soil movement, make-up and other factors to ensure the stability of construction projects.

**Mud Loggers or Wellsite Geologists** analyzes rock samples at oil and gas drilling sites to interpret subsurface geology.

**Hydrographic surveyors** use instrumentation to map out the shape, contours and depth of streams, lakes, inlets and ocean bottoms. They often work for government agencies or private companies doing surveys for the government and nonprofits and often work to restore the earth's ecology.

Do any of these professions sound familiar? Have you ever seen people working in these fields? Where can you find these professionals working in our community? Practice your research and resource gathering skills to look-up these businesses in your area and place markers on a local map to pinpoint their locations.

### Day 2 – Into the Community: Mining for a day

Plan a visit to observe at a local business in one of the fields we learned about in the previous day(s). (e.g. mining, surveyor, etc.)

### Day 3 – The Gemologist

**Gemologists** identify, grade, and determine the value of gemstones.

A **Lapidary** cuts, polishes, and engraves stones and gems.

**Bench Jewelers** design, make, repair, and set gemstones and metals to make jewelry.

**Gem/Mineral Dealers** specialize in the sale and trade of mineral specimens and gems to museums, businesses and independent buyers.

### Day 4 – Into the Community: Gemologist for a day

Plan a visit to observe at a local business in one of the fields we learned about in the previous day(s). (e.g. jewelry store, mineral exhibit, gem minor, lapidary)

### Day 5 – Geology “In the News” Writing and Presentation Project

Choice #1: Students use notes, photographs, and artifacts from each of their community business visits to develop a Geology Portfolio or digital book.



Choice #2: Interview a geologist and gather personalized information to answer your burning questions about geology and their career – gather notes and capture the Q&A of the interview on video or audio recording.

Choice #3: As a class create a “job fair” that will be open for a day for peers, school staff and families to visit to learn more about the field of geology. Students select one of the professions they learned about to create posters, displays, digital presentation or lab table display to demonstrate their learning and experiences from the unit. \*\*Students can present using assistive technologies, alternate modes of communication and adapted materials as needed to create their presentations and present.

## Week Three – Visiting Rock and Mineral Businesses

**Day 1** – You too can work or find leisure in rocks and minerals

Rockhounds or Fossickers are amateur collectors who look for rocks and minerals as a hobby, while the fields we have explored in previous days would be considered careers or professions.

Which area of geology sounds most interesting? Let’s review and explore A Day in the Life of 10 Geoscientists

What do I need to learn and do to work in the field of geology? Watch Best Geology Jobs for People Who Love Science

**Day 2** – A Career in Geology... ME?

What to learn more about colleges that offer geology classes?

Visit local college or university to explore a ThinkCollege affiliated programs in geology in your local area. Visit the college. Visit a geology class. Visit on off-site research location or practice site.

1. Look online to see which colleges and universities in Ohio offer ThinkCollege programs.  
[https://thinkcollege.net/college-search?fulltext=&state\[OH\]=OH](https://thinkcollege.net/college-search?fulltext=&state[OH]=OH)
2. Use a mapping tool (e.g. Google Maps) to determine which program is closest to your local area.
3. Look up the university and look through their list of majors and classes. Do they offer any programs in geology fields?
4. Call to make an appointment and schedule a visit.



### Day 3 – A Vision and a Plan for Post-School Work in Geology

1. Look online to see which career tech (CTE) schools are in your local area.  
<https://highered.ohio.gov/about/ohios-campuses/career-technical-education/ohio-career-technical-school-by-district>
2. Use a mapping tool (e.g. Google maps) to determine which program is closest to your local area.
3. Look up the CTE program(s) that is closest and explore their list of programs and classes. Do they offer any programs or work related to the field of geology? (remember the many we have explored)
4. Call to make an appointment and schedule a visit.

### Day 4 – Day trip

Visit local post-secondary geology CTC program or university.

Or

Explore the [Backward Planning Tool from Employment First](#) to create a backward planning map from the profession/work/volunteer job you would like to aim for and then build/identify steps from middle school classes, experiences, etc. to high school, to post school goal.

Note: Students can use pictures, visual/auditory choices, and assistive technologies to participate in the choice making and backward planning process.

### Day 5 – Unit Post Assessment

See *Pre Post Assessment* slides in folder and Standards-based Learning Progressions for this unit





## Pre and Post Assessment

Included in the unit plans:

- ☐ Work sample with checklist, rubric, or notes
- ☐ Learning progressions (task analysis) rubric
- ☐ Diagnostic data – specific skill set:
- ☐ Project with rubric

Could be added to the unit plans:

- ☐ Captioned photos
- ☐ Test or quiz in accessible format
- ☐ Audio or video recording with data sheet
- ☐ Benchmark assessment formatted like alternate assessment
- ☐ Other






## Providing All Students Access

When planning tools and supports, consider adapting and expanding teaching materials, student materials, technology, and curricular resources.

Student specific supports and services across the tier aligned to this lesson should be pulled from the IEP, RIMP, gifted, 504 plan, behavior plan, EL plan, diversity profile, etc. Consider assistive technology, instructional strategies, and environmental adaptations.

### Designing to the Edges (Tip to Tip)

Universal Tools and Supports	Activity Specific Multiple Means & Differentiated Tools	 Student Specific Supports & AT (*add student initials or code to note individual student supports or SDI)
<b>Examples include:</b> <ul style="list-style-type: none"><li>• Learning Progression rubric to track own skill development</li><li>• Test format like AA</li><li>• Manipulatives</li><li>• chunking of tasks/items</li><li>• access to sensory breaks</li><li>• cues to refocus attention to task</li><li>• instructions and/or text read aloud</li></ul>	<b>Examples include:</b> <ul style="list-style-type: none"><li>• social stories</li><li>• verbal and/or visual models with appropriate social and transition skills (ex. hands to self, sit in seat, wait in line)</li><li>• preferential/flexible seating in the classroom to minimize distraction while working on academic tasks</li><li>• verbal and/or picture prompting to task</li></ul>	<b>Examples include:</b> L- <ul style="list-style-type: none"><li>• flexible seating choice</li><li>• deep pressure touch i.e. weighted blanket and/or weighted vest as needed, heavy work activities</li><li>• sensory chew toys</li></ul> T- <ul style="list-style-type: none"><li>• customized seating</li></ul>





<ul style="list-style-type: none"> <li>• goods and services T chart with sorting cards with pictures and words on each card</li> </ul>	<ul style="list-style-type: none"> <li>• instructions and/or texts read aloud</li> <li>• Pictures, visual cues for reading</li> <li>• Boardmaker picture cues</li> </ul>	<ul style="list-style-type: none"> <li>• presentation of communication symbols on the left in a vertical array</li> <li>• choice making with voice output single message switches</li> </ul>
<ul style="list-style-type: none"> <li>• videos with CC</li> <li>• music</li> <li>• map of Ohio</li> <li>• transition supports music, movement, objects/materials</li> </ul>	<ul style="list-style-type: none"> <li>• multiple choice selection from an array of word or word+picture choices</li> <li>• manipulatives</li> <li>• flexible seating options</li> <li>• tactile/object choices</li> <li>• sensory supports</li> <li>• reteaching as needed</li> <li>• redirection as needed</li> </ul>	
<ul style="list-style-type: none"> <li>• repetition of instruction</li> <li>• verbal and/or visual cues</li> <li>• visual/auditory timer</li> <li>• Manipulatives</li> <li>• Modeling</li> <li>• information broken down, segmented</li> <li>• chunking of tasks</li> <li>• access to sensory breaks</li> <li>• cues to refocus attention to task</li> <li>• instructions and/or text read aloud</li> </ul>	<ul style="list-style-type: none"> <li>• social stories</li> <li>• verbal and/or visual models with appropriate social and transition skills (ex. hands to self, sit in seat, wait in line)</li> <li>• preferential seating in the classroom to minimize distraction while working on academic tasks</li> <li>• verbal and/or picture prompting</li> <li>• instructions and/or texts read aloud</li> <li>• Pictures, visual cues for reading</li> <li>• Boardmaker picture cues</li> </ul>	<p>C-</p> <ul style="list-style-type: none"> <li>• flexible seating choice</li> <li>• deep pressure touch i.e. weighted blanket and/or weighted vest as needed, heavy work activities</li> </ul> <p>D-</p> <ul style="list-style-type: none"> <li>• Wiggle cushion</li> </ul> <p>R-</p> <ul style="list-style-type: none"> <li>• reinforcers</li> </ul> <p>J-</p>



<ul style="list-style-type: none"> <li>● adult support to increase independence in the school environment and during classroom tasks</li> <li>● Paraprofessional to model appropriate behavior, facilitate academic tasks, implement de-escalation strategies</li> </ul>		<ul style="list-style-type: none"> <li>● adult/peer modeling of appropriate behavior/ appropriate social communication</li> <li>● adult/peer modeling/facilitation for calming strategies</li> <li>● Personal communication device</li> <li>● LAMP- Words for Life program for communication</li> </ul> <p>T-</p> <ul style="list-style-type: none"> <li>● visual models for correct way to form letters and numbers</li> <li>● picture cues to aide in comprehension</li> </ul> <p>W-</p> <ul style="list-style-type: none"> <li>● visual model for writing</li> </ul>
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