Taconite Rocks!

a 6th grade curriculum of the Taconite Industry
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Acknowledgment

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Jim Lassi, Babbitt Elementary School
Sandy Etter, Hibbing Public Schools
Francine Schlander, Hibbing Public Schools
Sandra Ohren, Hibbing Public Schools
# Suggested Activities Timeline

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<th>Day 5</th>
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<td><strong>Day 1</strong></td>
<td>• View 15-minute video, <em>Where Steel Begins</em></td>
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<tr>
<td>• Introduce <em>Taconite Rocks!</em></td>
<td>• Compare video to “Let's Rock!” poster</td>
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<tr>
<td>• Present and discuss sample taconite packet</td>
<td>• Complete “Let's Rock!” Worksheet 2-A or 2-B</td>
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<td>• Distribute student folders</td>
<td>• Complete Part I, Lesson 2 assessment</td>
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<tr>
<th><strong>Lesson 1, History</strong></th>
<th><strong>Day 6</strong></th>
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<tr>
<td>• View 9-minute video, <em>The Birthplace of Minnesota Taconite Industry</em>; discussion questions, Worksheet 1-A</td>
<td>• Introduce and discuss poster “Reclaiming the Land”, Worksheet 2-C</td>
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<td>• Discuss questions, Worksheet 1-B</td>
<td>• Introduce class project</td>
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<td>• Introduce timeline activity, Worksheet 1-C</td>
<td>• Complete Part II, Lesson 2 art and written language assessment</td>
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<td>• Continue timeline activity</td>
<td><strong>Day 7</strong></td>
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<tr>
<td>• Complete map activity, Worksheet 1-D</td>
<td>• Introduce Lesson 3</td>
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<tr>
<td>• Review videos content and previous lessons</td>
<td>• Complete &quot;Whistle While YouWork&quot; interest assessment, Worksheet 3-A</td>
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<th><strong>Day 4</strong></th>
<th><strong>Day 8</strong></th>
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<tr>
<td>• Complete Lesson 1 assessment</td>
<td>• Discuss and complete career grid, Worksheet 3-B</td>
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<tr>
<th><strong>Lesson 2, Process</strong></th>
<th><strong>Day 9</strong></th>
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<tr>
<td>• Introduce Lesson 2</td>
<td>• Invite resource speaker</td>
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| • Introduce “Let's Rock!” (Hard Rock) poster | • Written assessment: paragraph on "If I Worked in the Mines."
| • Discuss questions | |

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<th><strong>Conclusion</strong></th>
<th><strong>Day 10</strong></th>
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<tr>
<td><strong>Day 10</strong></td>
<td>• Complete “Cookie Mining”</td>
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WELCOME

to

Taconite Rocks!

Introduction to Unit

Goal: To introduce the Taconite Rocks! curriculum.

Supportive resources and curriculum materials:
Taconite sample package and student folders

Activities:
1. Pass out the taconite sample packets to students. Allow time to examine and feel the differences.

2. Discuss:
   ✓ what taconite is
   ✓ the process of changing rock to pellet
   ✓ importance of taconite to Iron Range economy
   ✓ family members or friends employed at a plant

3. Present overview of activities for the three units:
   ✓ history
   ✓ process
   ✓ careers
Lesson 1, History

Goal: To know the history and the development of the iron mining and taconite industry.

Student outcomes:
The student will
• complete a time line that includes at least 5 places, 5 people and 5 events to explain the development of the iron mining/taconite industry; or complete a time line of either dates, people or events to explain the development of the iron mining/taconite industry.
• identify Vermilion, Cuyuna and Mesabi ranges with appropriate towns.
• define taconite and iron ore

Supportive resources and curriculum materials:

Videos
The Birthplace of Minnesota Taconite Industry
Description: A 9 1/2-minute video that explains the early development of the industry with a special focus on Babbitt.

Minnesota Mining: A New Beginning
Description: A 23-minute presentation that chronicles the development of the iron mining industry and the taconite industry.

Brochures
“Minnesota’s Iron Mining Industry”
Description: A pamphlet that includes the process, places, events and dates of the development of the taconite industry.

“Founders of the Range” from Mining Matters
Description: A listing of the men who lead in the development of the Ranges and mining.

Activities:

1. Introduce and view video. “Today, we will view a video, The Birthplace of Minnesota Taconite Industry. While you are viewing, try to remember:
   ✔ where it started,
   ✔ when it started,
   ✔ if the plant is still operating.”
   Discuss questions, Worksheet 1-A

2. Introduce and view video, Minnesota Mining, a new Beginning.
   Discuss questions, Worksheet 1-B

3. Complete time line activity, Worksheet 1-C

4. Complete map activity, Worksheet 1-D

Iron Range: iron bearing area with distinct characteristics.
There are three iron range districts in Minnesota: Mesabi, Vermilion, and Cuyuna.
Worksheet 1-A  
**Video Discussion Questions**

*B birthplace of Minnesota Taconite Industry*

1. Where is the birthplace of taconite? Why?

2. Why did the early developers research the low grade ore, taconite?

3. How can producing taconite be compared to recycling today?

4. What is the difference between taconite and red ore?

5. When did the first mining plant begin and how many tons were produced?

6. How was math and science used to develop the industry?

7. Why did the Babbitt plant close? What lessons were learned from this early plant?
Worksheet 1-A

Video Discussion Questions

*Birthplace of Minnesota Taconite Industry*

1. Where is the birthplace of taconite? Why?
   
   The birthplace is Babbitt because Peter Mitchell discovered a 1 1/2 miles wide by 12 miles long strip of taconite.

2. Why did the early developers research the low grade ore, taconite?
   
   They saw a valuable resource that was not being used.

3. How can producing taconite be compare to recycling today?
   
   Today’s recycling reuses resources for a healthier planet.

4. What is the difference between taconite and red ore?
   
   Red ore is 50-60% iron and is known as direct shipped ore. Taconite is 20-30% iron and is crushed and processed then shipped as pellets.

5. When did the first mining plant begin and how many tons were produced?
   
   The first plant began in 1920 and produced 200 tons a day.

6. How was math and science used to develop the industry?
   
   The early plans used flow charts and math to solve problems; science experiments discovered the process.

7. Why did the Babbitt plant close? What lessons were learned from this early plant?
   
   The Babbitt plant closed because it could not compete with the other ores being mined. This plant supplied information for other plants to be better built. It was the foundation of today’s taconite industry.
Worksheet 1-B
Video Discussion Questions

Minneapolis Mining: A New Beginning

1. Why did the rich ore run out?

2. In your opinion, which event, person, or place had the most important impact on the taconite industry? Explain.

3. How did the events, people, and places affect the development of the industry?

4. What would the Iron Range be without the taconite industry?

5. What future is predicted for the taconite industry?

Extension activity
Research the contributions of a founder of the Iron Range.

George Stuntz       Captain J.G. Cohoe
Peter Mitchell      Frank Hibbing
Charlemagne Tower   John Monroe Longyear
Merritt Brothers    John McCaskill
Cuyler Adams
Teacher’s Key

Worksheet 1-B

Video Discussion Questions

*Minnesota Mining: A New Beginning*

1. Why did the rich ore run out?
   
   *The heavy demand and World War II caused the ore to run out.*

2. In your opinion, which event, person or place had the most important impact on the taconite industry? Explain.

   *Answers will vary.*

3. How did the events, people, and places affect the development of the industry?

   *Suggested themes: citing any founder’s, events or places contribution(s).*

4. What would the Iron Range be without the taconite industry?

   *Answers should include the expansion of tourism, logging, less population.*

5. What future is predicted for the taconite industry?

   *The future of the taconite industry is competitive and viable with skilled workers using the latest technology.*
Directions: Using the people, places and events from the list, match them to the correct date on the time line.

E.W. Davis discovered taconite process
Cuyuna Range settled
Merritt Brothers discovered Mesabi Range
Soudan Mine opened
Peter Mitchell discovered taconite
Mesabi Range settled
George Stuntz
Vermilion Range settled
Dean Applebee
1st pellet production by Mesabi Iron
Frank Hibbing
high grade ore depleted
8 taconite plants operating
Reserve opened
increased demand because of WWII
### Teacher’s Key

**Student Worksheet 1-C**  
**Listening & Reading**

**Directions:** Using the people, places and events from the list, match them to the correct date on the timeline.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event/Person</th>
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</thead>
<tbody>
<tr>
<td>1860</td>
<td>E.W. Davis discovered taconite process</td>
</tr>
<tr>
<td>1865</td>
<td>George Stuntz</td>
</tr>
<tr>
<td>1870</td>
<td>Cuyuna Range settled</td>
</tr>
<tr>
<td>1880</td>
<td>Merritt Brothers discovered Mesabi Range</td>
</tr>
<tr>
<td>1882</td>
<td>Soudan Mine opened</td>
</tr>
<tr>
<td>1890</td>
<td>Peter Mitchell discovered taconite</td>
</tr>
<tr>
<td>1890’s</td>
<td>Merritt Bros. discovered Mesabi Range</td>
</tr>
<tr>
<td>1892</td>
<td>Mesabi Range settled</td>
</tr>
<tr>
<td>1900</td>
<td>Peter Mitchell discovered taconite</td>
</tr>
<tr>
<td>1904</td>
<td>Vermilion Range settled</td>
</tr>
<tr>
<td>1910</td>
<td>Dean Applebee</td>
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<tr>
<td>1910</td>
<td>Vermilion Range settled</td>
</tr>
<tr>
<td>1912</td>
<td>Mesabi Range settled</td>
</tr>
<tr>
<td>1913</td>
<td>Mesabi Range settled</td>
</tr>
<tr>
<td>1920</td>
<td>Frank Hibbing</td>
</tr>
<tr>
<td>1930</td>
<td>Vermilion Range settled</td>
</tr>
<tr>
<td>1940</td>
<td>Vermilion Range settled</td>
</tr>
<tr>
<td>1944</td>
<td>increased demand because of war</td>
</tr>
<tr>
<td>1950</td>
<td>increased demand because of war</td>
</tr>
<tr>
<td>1950-52</td>
<td>high grade ore depleted</td>
</tr>
<tr>
<td>1954</td>
<td>Reserve opened</td>
</tr>
<tr>
<td>1955</td>
<td>1st pellet production by Mesabi Iron</td>
</tr>
<tr>
<td>1960</td>
<td>8 taconite plants operating</td>
</tr>
<tr>
<td>1970</td>
<td>8 taconite plants operating</td>
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<tr>
<td>1970’s</td>
<td>8 taconite plants operating</td>
</tr>
<tr>
<td>1980</td>
<td>1st pellet production by Mesabi Iron</td>
</tr>
<tr>
<td>1990</td>
<td>8 taconite plants operating</td>
</tr>
</tbody>
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Taconite Rocks!  
Lesson 1
Worksheet 1 - D

Map

Place the names of the towns in the Mesabi, Vermilion or Cuyuna Range on the map provided. Using a color pencil, shade the Mesabi Range area blue, Vermilion Range red and the Cuyuna Range green.

The towns to be placed are:

- your town
- Aitkin
- Aurora/Hoyt Lakes
- Babbitt
- Biwabik
- Brainerd
- Chisholm
- Crosby
- Ely
- Eveleth
- Grand Rapids
- Hibbing
- Nashwauk
- Soudan
- Tower
- Virginia

Taconite Rocks!  Lesson 1
Teacher’s Key

Worksheet 1 - D
Map

Place the names of the towns in the Mesabi, Vermilion or Cuyuna Range on the map provided. Using a color pencil, shade the Mesabi Range area blue, Vermilion Range red and the Cuyuna Range green.

The towns to be placed are:

- your town
- Aitkin
- Aurora/Hoyt Lakes
- Babbitt
- Biwabik
- Brainerd
- Chisholm
- Crosby
- Ely
- Eveleth
- Grand Rapids
- Hibbing
- Nashwauk
- Soudan
- Tower
- Virginia

Taconite Rocks! Lesson 1
1. When and where did the taconite industry begin?

2. What is taconite?

3. Who discovered taconite?

4. Who is the “Father of Taconite” and why?

5. Describe the difference between red ore and taconite.

6. Name the three ranges of the Iron Range.

7. Name two important people who helped develop mining and tell what they did.
1. When and where did the taconite industry begin?
   The industry began in Babbitt in 1922.

2. What is taconite?
   Taconite is a hard rock that contains about 20-30% iron.

3. Who discovered taconite?
   Peter Mitchell discovered taconite.

4. Who is the “Father of Taconite” and why?
   E.W. Davis is the “Father of Taconite” because he developed the taconite mining process.

5. Describe the difference between red ore and taconite.
   Red ore is 50-60% iron and taconite is 20-30% iron. Red ore is shipped directly and taconite is processed and formed into pellets and then is shipped.

6. Name the three ranges.
   The three ranges are: Mesabi, Cuyuna and Vermilion.

7. Name two important people who helped develop iron mining industry.
   Any of two: George Stuntz, Peter Mitchell, Charlemagne Tower, Merritt Brothers, John McCaskill, Captain Cohoe, Frank Hibbing, The Longyears
Lesson 2, Process

Goal: To know the process of taconite production.

Student outcomes:
The student will
• describe the taconite process.
• describe land reclamation.

Supportive resources and curriculum materials:
Videos
Where Steel Begins
Description: A 15-minute video that describes the process of mining taconite. Mining occupations are shown in the video.

Posters
“Let's Rock!”
“Reclaiming the Land”

Materials for Assessment
Some art materials may need to be supplied to the students (see page 2 - 7)

Part I Activities using Where Steel Begins video and “Let's Rock!” poster
1. View video, Where Steel Begins.
2. List and discuss the taconite process. Use the sample taconite packet and the “Let’s Rock!” poster.
3. Use the “Let's Rock!” poster and Worksheets 2-A or 2-B
   2-A: have students complete the identified tasks.
   2-B: have students design tasks under each heading.

Part II Activities using “Reclaiming the Land” poster
1. Introduce poster
2. Assign partners or let students choose a “Study Buddy.”
3. Worksheet 2-C, discussion questions
4. Discuss and define the terms on the back of the poster.
Worksheet 2-A

Let’s Rock!

Activity Guide
for the IMA “Let’s Rock!” Poster

**Math**

1. change words into numbers
2. convert tonage into pounds
3. compare numbers: mini van = weight
4. change large numbers to expanded notation

**Vocabulary/Spelling**

1. taconite

**Creative Writing**

2. Pretend you are the rock being crushed. Describe the feeling.

**Research**

1. List other steel products.
2. Describe the route of ore boats.
3. Measure the distance of a route.
Worksheet 2-B

Let’s Rock!

Activity Guide
for the IMA “Let’s Rock!” Poster

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Worksheet 2-C
Discussion Questions

“Reclaiming the Land” poster

1. In what way has mining changed the environment?

2. Name the ways of reclamation.

3. Name ways of preventing erosion.

4. List ways in which the mining company has put nature back on track. Why is this important?

5. Can you think of special projects that the mining company has done to restore our community environment?

6. Compare and contrast public land use to mining land use.

7. Without reclamation, what would the land be like?

8. List the cause and effect of water and air pollution and the removal of top soil.
Assessment Lesson 2, Part I

Steps in Processing Taconite Rock

Directions: Label the signpost at each stop during your walk through the steps in processing taconite rock into pellets, ready to be shipped to the nation’s steelmakers.
Assessment Lesson 2, Part I  
Steps in Processing Taconite Rock

Directions: Label the signpost at each stop during your walk through the steps in processing taconite rock into pellets, ready to be shipped to the nation’s steelmakers.
Assessment Lesson 2, Part II

Reclamation

Creative Writing/Art Project

1. Draw a picture or poster or create a 3-dimensional model. Label your reclamation project.

2. Describe your project by writing a paragraph to tell how you reclaimed a pit or a parcel of land to make it more usable. Be sure to include the materials used, people needed and the time it would take for the reclamation project.
Lesson 3, Careers

Goal: To explore careers and interest in the mining industry.

Student outcomes:
The student will
• explore careers and required training related to mining.
• assess his/her interests related to mining careers or occupations.

Supportive resources and curriculum materials:
Reference the previous materials used i.e., videos, posters
“Careers in Mining” transparency master
“Careers in Mining” job descriptions

Activities
1. Recalling information from posters, videos and print, brainstorm a list of careers.

2. Administer Common Ground’s “Whistle While You Work” career assessment (Worksheet 3-A) .

3. Discuss what training or education would be necessary for the careers.

4. Assign the students the “Careers in Mining” career grid (Worksheet 3-B) to identify related subjects and training for careers or jobs. Enter into groups to share information.

Assessment Lesson 3: “If I Worked in the Mines”
Written Language: Have the students write a paragraph about a career or job that is of interest. Explain their reason. The students should include information about the subjects they should study in high school as well as their plans for schooling after graduation.

Extension activities:
1. Expert Interview (Grad Rule Standard)
2. Contact resource speaker, i.e., parent, relative, friend or a person listed on the resource sheet.
Careers in Mining: Whistle While You Work

You might not know what career you want, but you know what you like to do. In mining there are many different careers, just as there are in other industries. You have many choices for your future career, so try to find something to do that you enjoy. Then you'll really feel like whistling while you work!

Rank the following activities from 1 to 10, with 1 being what you enjoy most.

- Collecting and identifying rocks
- Making maps and drawings
- Solving puzzles and problems
- Organizing group activities
- Woods, plants and animals
- Writing, talking on the phone
- Computer games
- Big trucks and machinery
- Working with tools
- Selling things

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Careers in Mining

If you ranked collecting and identifying rocks highly, you might like being a geologist.

If you like making maps and drawings, you could become an industrial designer.

Solving puzzles and problems is an ability needed by a mining engineer.

If you're good at organizing group activities, you could become a good plant manager.

Woods, plants and animals are managed by environmental engineers and wildlife managers.

Writing and talking on the phone are among the daily activities of public relations and marketing professionals.

Students that are good at computer games might enjoy careers in data processing.

Big trucks and machinery are operated by miners.

Plants need people who are good at working with tools to be plant workers.

If you have a knack for selling things, you might enjoy being a sales representative.

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<table>
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<tr>
<th><strong>Careers in Mining</strong></th>
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<tr>
<td><strong>Accountant</strong></td>
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<tr>
<td><strong>Agglomerator Operator</strong></td>
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<tr>
<td><strong>Automotive Mechanic</strong></td>
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<tr>
<td><strong>Blaster</strong></td>
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<tr>
<td><strong>Carpenter</strong></td>
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<tr>
<td><strong>Communications Coordinator</strong></td>
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<tr>
<td><strong>Concentrator Operator</strong></td>
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<tr>
<td><strong>Crane Operator</strong></td>
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<td><strong>Crusher Operator</strong></td>
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<td><strong>Data Processor</strong></td>
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<tr>
<td><strong>Electrical Repairman</strong></td>
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<td><strong>Electrician (Field Expanded)</strong></td>
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<td><strong>Electrician (Shop)</strong></td>
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<td><strong>Engineering Technician II</strong></td>
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<td><strong>Environmental Technician</strong></td>
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<td><strong>Expediter</strong></td>
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<td><strong>Laborer</strong></td>
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Ironworker  Lay out, fabricate, assemble, erect, or make repairs for all types of structural and plate work; perform all kinds of welding.

Locomotive Mechanic  Make repairs to diesel, diesel electric, electric and steam locomotives.

Machinist  Set up and operate machine tools, perform any dismantling, fitting or assembly required for plant maintenance or construction.

Manpower Scheduler  Prepare a variety of weekly work schedules for production and maintenance employees.

Mason  Lay brick and perform other masonry work.

Millwright  Inspect, repair, replace, install, adjust, and maintain all mechanical equipment in a major producing unit or assigned area.

Mine Draftsman  Draw new stadia charts and trace maps of pits, dumps, and other properties.

Mine Engineering Analyst  Collect, compile and analyze data related to crude ore and waste production with respect to quantity and quality control.

Mine Equipment Operator  Perform a variety of tasks associated with the mine equipment operation: operate a crawler, tractors with front-end loaders or forks to load, semi-tractor, various types of powered mobile equipment, service trucks, crawler crane, powered graders, mobile (rubber-tired) and boom truck type cranes, rubber-tired backhoe; operates and attends pumps, services equipment.

Painter  Perform interior and exterior hand and spray painting.

Physical Tester  Collect and prepare samples for analysis and perform physical tests.

Rotary Drill Operator  Move, set up, and operate mobile, crawler mounted, rotary blast hole drill.

Supercraft  More than one trade.

Surveyor  Direct crew and operate geological and surveying equipment; analyze field and office data.

Systems Repairman  Install, repair, construct, adjust, modify and service all types of electronic equipment.

Technical Draftsman  Prepare design layouts and design drawings of equipment and structures, or equipment alteration; photograph, develop and print pictures for use of Engineering and other departments.

Train Operator  Operate train for haulage, switching and servicing work in and about mine, plant and shops by remote portable radio control.

Truck Driver (Production)  Operate production trucks of all types for hauling ore or stripped materials.

Utilities Operator  Operate boilers, water and waste water treatment plants, pump stations and air compressors to provide utilities for the entire plant.

Warehouseman (Salvage)  Receive, check, store and issue warehouse supplies and equipment.
**Summary Statement of Content Standard**

Answer questions using information gathered through direct observations, experiment and other sources.

---

### Description of Student Performances

<table>
<thead>
<tr>
<th></th>
<th>Performance Record</th>
<th>Achievement Grades/Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develops mind map for investigating an identified topic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Plans, conducts, and documents an expert interview.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Writes a field note after the interview.</td>
<td></td>
<td></td>
</tr>
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</table>

Circle Final Achievement Grade/Rating: 4 3 2 1

### Test Management Skills

<table>
<thead>
<tr>
<th></th>
<th>Performance Record</th>
<th>TMS Grades/Ratings</th>
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</thead>
<tbody>
<tr>
<td>Manages time well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keeps trying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses resources appropriately</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Circle Final Task Management Skills Grade/Rating: 4 3 2 1

---

Key: 4 = Exceeds expectations, approximately "A" work  
3 = Meets expectations, approximately "B" work  
2 = Work has deficiencies or process lacks independence  
1 = Unacceptable or incomplete

---

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Appendix
STUDENT PERFORMANCE TASK 1
Expert Interview

<table>
<thead>
<tr>
<th>Standard Code</th>
<th>Level</th>
<th>Topic</th>
<th>Amount of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inquiry G5.1</td>
<td>✔ Developmental MN Standard</td>
<td>Interviewing</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

Specific Statement(s) from the Standard

What students should do:

3. Gather information through direct observation and interviews:
   a. identify a topic or area for investigation
   b. write a rich and detailed description of the observation
   c. conduct an interview with follow-up questions or design and conduct a survey
   d. record and organize information
   e. evaluate the findings to identify areas for further investigation.

Product

1. Mind map for investigating a topic
2. Interview documentation
3. Field note

Central Learning

Gather information by framing initial questions, listening to responses, and immediately developing further questions to probe for relevant information.

Description of Task

1. When the students begin the research process, it is helpful to explore how an expert in the topic area might organize an inquiry. For this task, provide the students with a list of potential topics.

2. They will prepare a mind map for an investigative topic by brainstorming all of the resources:
   • people that might provide information for their study
   • experts
   • places

   If their knowledge is limited on the topic, it would be helpful to access at least one general source of information. For example, on the topic of immigration, they might read Do People Grow on Family Trees: Genealogy for Kids and Other Beginners, The Official Ellis Island Handbook by Ira Wolfman (New York: Workman Publishing, 1991) and develop a mind map for investigating the topic that might include the following:

   Mind Map for Immigration
   
<table>
<thead>
<tr>
<th>People</th>
<th>Experts</th>
<th>Places</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacob Lattimer</td>
<td>History Professor</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>Elizabeth Walker</td>
<td>Genealogist</td>
<td>The Research Center at the MN History Museum</td>
</tr>
<tr>
<td>James Swanson</td>
<td>Local Historian</td>
<td>MN Historical Society</td>
</tr>
<tr>
<td>Susan Petrocelli</td>
<td>Historical Interpreter</td>
<td>Statue of Liberty Ellis Island Foundation</td>
</tr>
</tbody>
</table>

3. Using the available technology (telecommunications, phone, letter), the students will contact one of the sources of information on their list and ask for permission to interview.
STUDENT PERFORMANCE TASK 1
Expert Interview

Description of Task, continued

4. They should design an interview guide with four questions. The purpose of the interview is to find out HOW to do a study on a topic, not to find out detailed information ON a topic. The interview questions should help them understand the kinds of research questions experts ask about a topic, issues related to the main topic, important sources of information on the topic, and organizations they could contact for additional information.

5. The student will now conduct the interview with their expert source. If the interview is written (questionnaire handed out in person or via e-mail), the student will have a written copy of the interview response. If the interview is oral (over the phone or in person), they will need to tape the interview. Inform them that they can only tape an interview after obtaining permission from the expert.

6. They are required to write a field note for their interview that identifies their source, date of interview, and the background of their source. They need to include a copy of their interview guide, a summary of answers to the interview questions given by their source, and what they have learned about how to conduct a study on their topic (in this last section, they should include a revised mind map for their investigation).

7. They will submit their original mind map, documentation of their interview (in written or taped

Task Management Skills

- Manages time well
- Keeps trying
- Uses resources appropriately

Special Notes

The materials and topics used in this task can be adapted based upon the curriculum used by individual school districts.

This assessment task should be linked with units of instruction and the parameters for topic choice should be determined by the curriculum. Good resources on interviews skills include: Reaching Out: School-Based Community Service Programs (from the National Crime Prevention Council, 733 15th Street, NW, Suite 540, Washington DC 10005) Families Writing by Peter Stillman (Cincinnati, OH: Writer's Digest Books, 1989), and Oral History in the Classroom (from Social Studies School Service, 10000 Culver Blvd., Culver City, CA 90230).

The task in this package will also allow students to demonstrate competencies in any content area. However, the performance criteria listed here reflect the requirements for meeting the inquiry standard at the developmental level. Additional criteria would need to be generated if the ask in this package is used to assess other standard areas.

This assessment package is based upon material that may appear in the following publication: Monson, M.P and Monson, R.J. (in press). Integrated Learning Assessment: Building Stronger Bridges Between Learning, Curriculum and Assessment. Tucson, AZ: Zephyr Press. Task designer Michele Pahl Monson can be reached through e-mail at 0197supt@informns.k12.mn.us,
STUDENT PERFORMANCE TASK 1
Expert Interview

Performance Criteria

<table>
<thead>
<tr>
<th>CHECKLIST FOR TASK 1 (For teacher information)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E</strong>=Excellent</td>
</tr>
<tr>
<td><strong>S</strong>=Satisfactory</td>
</tr>
<tr>
<td><strong>N</strong>=Needs Improvement</td>
</tr>
</tbody>
</table>

Demonstrates preliminary research work in developing mind map for the investigation.

Demonstrates ability to contact sources (within the limits of available technology and the accessibility of sources).

Designs an expert interview guide that addresses four areas (research questions, issues, sources of information, and organizations).

Conducts interview effectively (within the limits of available technology and the accessibility of sources).

Documents the interview in written or taped formats.

Prepares a field note that gives the background of the interview:
- includes a copy of interview guide
- summarizes answers given by source
- summarizes what was learned about conducting research on the topic
- revises the mind map for the investigation

**OVERALL EVALUATION**

Teacher Evaluation
CHECKLIST FOR TASK 1 (To use with students)

E=Excellent
S=Satisfactory
N=Needs Improvement

Student Evaluation | Teacher Evaluation
--- | ---
__________ | __________
**Makes a list (mind map) of people to question about how to research a topic.**

__________ | __________
**Finds fitting ways to contact sources.**

__________ | __________
**Makes an interview guide that is complete and easy to read:**
- asks questions that can be researched
- brainstorms ideas about the main topic
- suggests people to ask about topic
- suggests places to find facts about the topic

The Interview

__________ | __________
**Asks questions that are related to the topic.**

__________ | __________
**Asks questions that are clear.**

__________ | __________
**Writes down or tapes the answers.**

__________ | __________
**Writes field notes that are detailed and easy to understand:**
- includes a copy of the interview guide
- summarizes answers from the source
- states what was learned from the research
- completes and revises the mind map.

OVERALL EVALUATION __________

Notes following Performance

ATTACH ALL DOCUMENTS THAT ARE APPROPRIATE TO THIS ASSESSMENT
Great **Internet** Ideas

1. Correspond with email pen pals around the world.

2. Mentoring—have an expert in a field answer your questions.

3. Contact important figures—send email to company CEOs or government officials.

4. Find mailing lists and newsgroups on appropriate subjects.
WORDSEARCH

Find career possibilities in the mineral industry.

ACCOUNTANT
BLASTER
CHEMIST
CLERK
COMPUTER
CRUSHER OPERATOR
DIESEL MECHANIC
DRILLER
EN ENGINEER
EQUIPMENT OPERATOR
FOREMAN
GEOLOGIST
LABORER
MANAGER
MECHANIC
METALLURGIST
OILER
PERSONNEL
PLANT OPERATOR
PURCHASE AGENT
REFINER
SAFETY
TECHNICIAN
TRUCK DRIVER

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WORDSEARCH

Find career possibilities in the mineral industry.

ACCOUNTANT  BLASTER  CHEMIST  CLERK  COMPUTER  CRUSHER OPERATOR  DIESEL MECHANIC  DRILLER  ENGINEER  EQUIPMENT OPERATOR  FOREMAN  GEOLOGIST  LABORER  MANAGER  MECHANIC  METALLURGIST  OILER  PERSONNEL  PLANT OPERATOR  PURCHASE AGENT  REFINER  SAFETY  TECHNICIAN  TRUCK DRIVER

Taconite Rocks!

Appendix
Mining Terms

SCRAMBLE

Use the Word Library below to unscramble the words.

1. HSCUR
2. YORVERC
3. LRIDL
4. MEORITALCN
5. AUHL
6. LPTELE
7. DLOA
8. ATTOCNEI
9. SYASA
10. EROPDOSTIE
11. TALBS
12. PORXETOLINA

Word Library

ASSAY LOAD
BLAST ORE DEPOSIT
CRUSH PELLET
DRILL RECLAMATION
EXPLORATION RECOVERY
HAUL TACONITE

Taconite Rocks!  Appendix
Mining Terms

SCRAMBLE

Use the Word Library below to unscramble the words.

1. HSCUR CRUSH
2. YORVEERC RECOVERY
3. LRIDL DRILL
4. MEORITALCN RECLAMATION
5. AUHL HAUL
6. LPTELE PELLET
7. DLOA LOAD
8. ATTOCNEI TACONITE
9. SYASA ASSAY
10. ERO PDOSTIE ORE DEPOSIT
11. TALBS BLAST
12. PORXETOLINA EXPLORATION

Word Library

ASSAY    LOAD
BLAST    ORE DEPOSIT
CRUSH    PELLET
DRILL    RECLAMATION
EXPLORATION RECOVERY
HAUL TACONITE
Materials needed:

- 3 types of chocolate chip cookies—Mothers, or another low-priced store brand (fewer chips). Chips Ahoy (more chips), and Chips Deluxe (most chips)
- Flat toothpicks
- Round toothpicks
- Paper clips
- Cookie Mining Sheet
- Cookie Mining Grid
- Cookie Mining Money

Procedure:

1. Explain the object of cookie mining: to make a profit. Each student buys property (a cookie), equipment (toothpicks or paper clips), pays for the mining operation and reclamation. In return, the students receive money for the ore mined (chocolate chips).

2. Each player starts with $19 worth of Cookie Mining Money, a Cookie Mining Sheet, and a sheet of the grid paper.

3. Each student must buy his/her own “mining property” or cookie. Write the cookie prices on the board:
   
   Store brand chocolate chip - $3.00  
   Chips Ahoy - $5.00  
   Chips Deluxe - $7.00

4. After the cookies are bought, have the students give their “mine” a name, and record it, along with the price of their cookie on the sheet.

5. Have them place their cookie on the grid paper and trace the outline of the cookie. They should then count each square that falls inside the circle, counting partial squares as a full square, and record that number on the sheet.

6. Students must now buy mining equipment. They can purchase more than one piece or type of equipment. If a mining tool breaks, it is no longer usable, and a new tool must be purchased. Write the prices on the board:

   Flat toothpick - $2.00 each  
   Round toothpick - $4.00 each  
   Paper clip - $6.00 each

   Have them record the price of mining equipment on their sheets.

7. Now they can mine the chips out of the cookies. No student can use his fingers to hold a cookie. The only things that can touch the cookie are the mining tools and the paper the cookie is sitting on. The maximum mining time is 5 minutes, at a cost of $1.00 per minute. Students can finish mining before the 5 minutes are up, and record the time spent mining on the sheet.

8. Students receive $2.00 for each chocolate chip mined. Broken chips can be combined to form one whole chip.

9. After the cookie has been mined, students should use the tools to “reclaim” the property, placing it back into the circled area. No fingers or hands allowed. Draw another circle around the reclaimed cookies, and assess students $1.00 for each square over the original count.

10. The player with the most money at the end of the game wins, and everyone gets to eat the remainder of their cookie!

Discussion Points:

- Did it matter which cookie you bought? Which cookies were harder or easier to mine, and why? Which cookies were more expensive?
  
  - What about the mining equipment? Which tools, or combination of tools were most effective? Did certain tools break?
  
  - When you tried to reclaim your cookie, what happened? Was it difficult to return this cookie back to the same exact size that it was before mining the chips?
Mining Economics: 
Cookie Mining

1. Name of cookie mine

2. Price of cookie
(Mothers $3.00, Chips Ahoy $3.00, Chips Deluxe $7.00)

3. Size of cookie
____ squares covered

4. Equipment:
- Flat toothpick
  ____ x $2.00 =
- Round toothpick
  ____ x $4.00 =
- Paper clip
  ____ x $6.00 =

Total Equipment Cost

5. Mining:
____ minutes x $1.00
Cost of removing chips

6. Total Cost of Mining

7. Chip removal:
- Number of chips
  ____ x $2.00
- Value of Chips

How much did I make?

Value of chips

Total cost of mining

Profit/Loss

8. Reclamation:
____ squares x $1.00
Mining Economics: 
Cookie Mining

1. Name of cookie mine: BIG CHIP

2. Price of cookie: 7.00 (Mothers $3.00, Chips Alloy $5.00, Chips Deluxe $7.00)

3. Size of cookie: 59 squares covered

4. Equipment:
   - Flat toothpick: \( \frac{2}{2} \times $2.00 = 4.00 \)
   - Round toothpick: 
   - Paper clip: 

   Total Equipment Cost: 4.00

5. Mining: 4 minutes \( \times \) $1.00 Cost of removing chips: 4.00

6. Total Cost of Mining: 15.00

7. Chip removal:
   - Number of chips: \( \frac{10}{2} \times $2.00 = 20.00 \)

   Value of Chips: 20.00

8. Reclamation: 50 squares \( \times \) $1.00 50.00

How much did I make?
Value of chips: 20.00
Total cost of mining: 15.00
Profit/Loss: +5.00
Cookie Mining
Cut this grid paper in four parts
<table>
<thead>
<tr>
<th>Cookie Mining Money</th>
<th>Cookie Mining Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ One Dollar $</td>
<td>$ One Dollar $</td>
</tr>
<tr>
<td>$1</td>
<td>$1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cookie Mining Money</th>
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Taconite Rocks! Appendix