

# Do the Science

**Instructional materials:** *FOSS Earth Materials: Inv. 2, Part 2*

**Grade level 4-5**

**Lesson:** Testing for Hardness

<p><b>Big Idea:</b> Scientific investigations involve asking and answering questions and comparing the answers with evidence from the real world. <i>This inquiry standard will be taught through the context of Earth science: 4-5 ES2A</i></p>		
<p><b>Lesson Learning Target:</b> 4-5 INQ A &amp; D</p> <ul style="list-style-type: none"> <li>Systematically collect and record relevant <i>observations</i> and data.</li> <li>Support conclusions with evidence/data.</li> </ul>	<p><b>Vocabulary:</b> observations, questions, evidence, investigations, properties, physical properties, chemical properties, quartz, hardness, scratch test, gypsum, calcite, fluorite, mineral</p>	
<p><b>Success criteria:</b></p> <ul style="list-style-type: none"> <li>I can record observations from my investigation on a table.</li> <li>I can interpret the information I record.</li> <li>I can use my observations as evidence to answer questions.</li> </ul>	<p><b>Common Misconceptions about Content:</b></p> <ul style="list-style-type: none"> <li>Rocks and minerals are not associated</li> <li>Rocks and minerals are the same thing</li> <li>Rocks and minerals are volcanic</li> </ul>	<p><b>Common Misconceptions about Scientific Inquiry:</b></p> <ul style="list-style-type: none"> <li>Scientists always use one “scientific method” that has a prescribed set of steps.</li> </ul>
<p><b>Elicitation Activity*:</b> Present <b>Step 1</b> “Gather Materials” and <b>Step 2</b> “Discuss Mineral Identification” as written in the FOSS materials.</p>	<p><b>Talk Structures/Discourse Strategies:</b> <b>Steps 1 and 2:</b> Small group discussions</p>	
<p><b>Target introduction/lesson Activities:</b> Present <b>Steps 3 through 5</b> as written in the FOSS materials.</p> <p><b>Introduce the learning target with Step 6.</b> <b>Modify Step 6</b> by having the students first discuss the questions in their groups; then randomly select a reporter in each group report their group’s answer providing evidence to support their reasoning.</p> <p>Present <b>Step 7</b> through <b>16</b> as written in the FOSS materials.</p>	<p><b>Steps 3 and 4:</b> Teacher to students <b>Step 5:</b> Small group discussions</p> <p><b>Step 6:</b> Small group discussions to answer question with supporting evidence.</p> <p><b>Step 7:</b> Teacher to students <b>Step 8:</b> Small group discussions <b>Steps 9 through 11:</b> Small group discussions lead to answering questions with supporting evidence <b>Steps 12 through 15:</b> Small groups communicate graphically and verbally to answer questions with supporting evidence.</p>	

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<p>Embedded Formative Assessment:</p> <p><b>Formative assessment: Steps 12 through 15</b></p> <ul style="list-style-type: none"> <li>Recorded observational evidence from the investigation on a chart: Earth Materials Notebook p. 9, "Scratch Test."</li> <li>Evidence used to support answers: Student Sheet #15, "Response Sheet; Scratch Test."</li> </ul>	
<p>Adjustment Trigger <i>What level of student performance will necessitate an instructional adjustment?</i></p>	<p><b>100% correct responses</b></p> <ul style="list-style-type: none"> <li>Accurately records observations on the scratch test table.</li> <li>Interprets the information in order to list the minerals in order of hardness.</li> <li>Cites the information as evidence when answering questions.</li> </ul>
<p><b>Instructional Adjustment (if needed):</b></p> <p>Have the group discuss their results with another group and come to consensus.</p>	
<p><b>Reflection:*</b></p> <p><b>Step 17</b> Student Sheet #15, "Response Sheet"</p> <p><b>Step 18</b> Word Bank</p> <p><b>Step 19</b> Content/Inquiry Entries</p>	

\* Opportunity for formative assessment