

**Lesson 6: Ranking the Rocks**

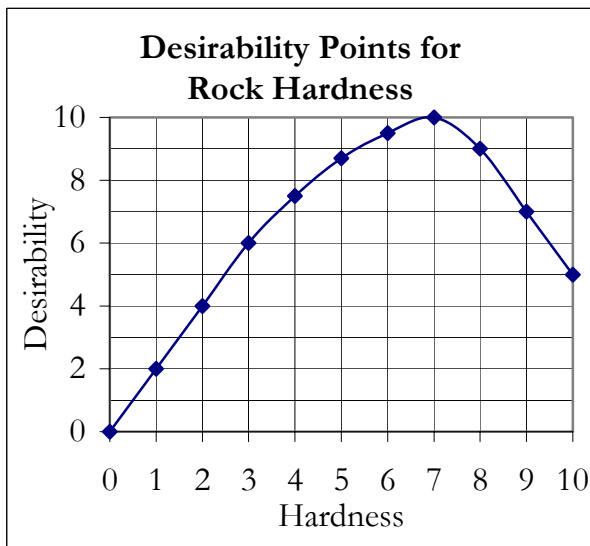
This activity has been designed to help you rank the rock types based upon the rock test data that you collected in the previous lesson. Engineers often have guidelines to help rank potential solutions. Remember there is more than one right answer; however, some right answers are better than others! For example, location A and location B may both be suitable cavern locations – but location A might cost less to construct and be closer to a major highway.

To rank the rocks, you will use “desirability points” based upon **the strength** of the different rock characteristics. You need to know which rocks have the best **strength** characteristics. Here’s what you have learned about the importance of the different rock characteristics for building caverns:

- Hardness:** very important for strength. Caverns built in soft rock might collapse. However, a really hard rock might be difficult to build in.
- Color:** not important for strength but may be important for other reasons.
- Granular:** important – granular rocks are not as strong as solid rocks.
- Porosity:** important – holes or pores in rocks weaken the rock.
- Luster:** not important for strength but may be important for other reasons.

The graph and table below provide the desirability points for each of the five characteristics. Using the graph the table and ID rock chart, fill in the desirability points table on the next page for each of the rocks that you tested.

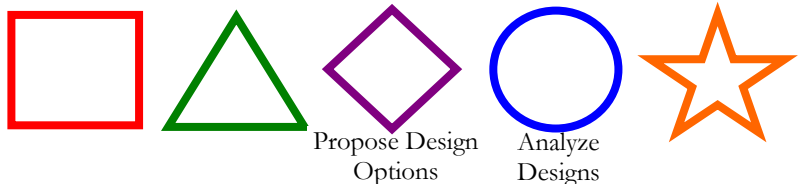
**DESIRABILITY CHART**



Look at your Rock ID Chart to identify the rock’s hardness. Look at Desirability Chart and find its hardness. Use the chart to assign desirability points by the line curve.

Rock Characteristic	Strength Desirability Points
Hardness	See graph
Color	0
Granular	3 pts if solid; 0 if granular
Porosity	3 points if solid; 0 if rock has holes
Luster	0

Note that a column has been left blank to allow you to add another parameter if you choose to. For example, the table on the previous page do not consider water seeping into the caverns. You might want to consider this!



**Desirability Points and Rock Ranking Table**

<u>Rock Type</u>	<u>Hardness</u>	<u>Color</u>	<u>Granular</u>	<u>Porosity</u>	<u>Luster</u>		<u>Total Points</u>	<u>Ranking</u>
Limestone								
Basalt								
Obsidian								
Pumice								
Sandstone								
Slate								
Granite								
Gneiss								

1. Based on desirability points, what is the most important and least important rock property for designing and building caverns, tunnels and underground structures?

Most important rock property? \_\_\_\_\_

Least important rock property? \_\_\_\_\_

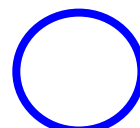
2. Take a look again at the top three sites you listed during Lesson 4. Do your top three sites rank in the top three rock types? Use the table below.

<b>Location from Lesson 3</b>	<b>Rock Ranking?</b>	<b>Good Choice?</b>

3. Is there a highly ranked rock that did not make your top three potential locations?

Revise, if necessary, your top three potential locations and list them in the table below. Please provide an explanation for each location.

<b>Location</b>	<b>Provide explanation why</b>



Propose Design Options

Analyze Designs

