

Mineral: A mineral is a naturally occurring chemical compound, usually of crystalline form.

Hardness: Resistance of a material to deformation, indentation, or penetration.

Fracture: The cracking or breaking of a hard object or material.

Cleavage: The tendency of crystals, certain minerals, rocks, etc., to break in preferred directions so as to yield more or less smooth surfaces.

Streak: The line of powder obtained by scratching a mineral or rubbing it upon a hard, rough surface.

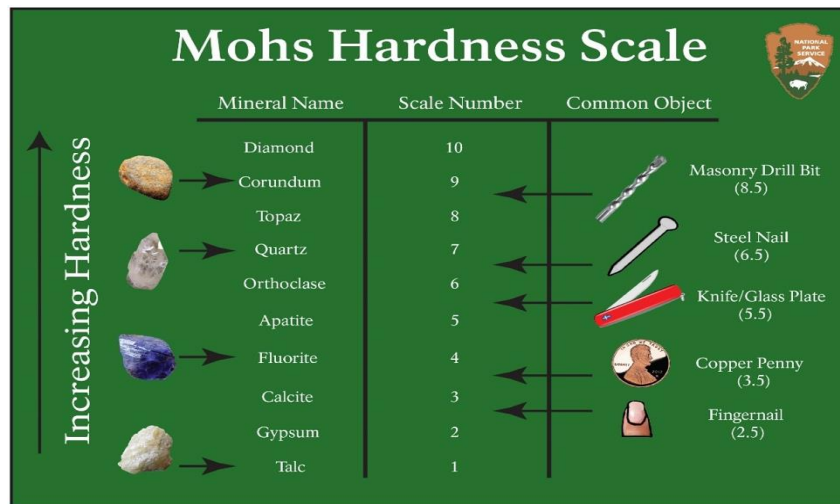
Organic: Relating to, or derived from living organisms.

Materials and Resources

Tools: Mason's drill bit, nail, knife, penny, fingernail

Materials: Slate, sandstone, marble, granite, wood and shell.

Worksheet and instructions



	Mineral Name	Scale Number	Common Object
↑ Increasing Hardness	Diamond	10	
	Corundum	9	Masonry Drill Bit (8.5)
	Topaz	8	
	Quartz	7	Steel Nail (6.5)
	Orthoclase	6	
	Apatite	5	Knife/Glass Plate (5.5)
	Fluorite	4	
	Calcite	3	Copper Penny (3.5)
	Gypsum	2	
	Talc	1	Fingernail (2.5)

Image retrieved: https://www.nature.nps.gov/geology/education/images/Mohs_Scale2.jpg

Lesson Body

1. Begin with a brief introduction to mineral traits and characteristics.
2. Give a brief explanation of Mohs hardness scale.
3. Students are divided into groups and given tools and materials.
4. Students will estimate the hardness of each material on Mohs harness scale.
5. Arrange provided minerals from softest to hardest.
6. Discuss the characteristics of each sample and how they might be used.
7. Discuss what characteristics are important when applied to organic materials such as shell, wood or bone.

Procedure

Beginning with the knife, try to scratch the first *mineral* sample. If the knife scratches the sample, you know the mineral is softer than the knife. (<5.5) If the knife leaves a metallic *streak*

on the sample, the material is harder than the knife. (>5.5) Continue testing the minerals until the **hardness** of each has been estimated.

Students will be divided into small groups and given 6-7 minutes to place their rocks in order from softest to hardest. Students will be asked to provide reasoning for their ordering as they work. Students will have the opportunity to walk around the room to investigate how each group of minerals were ordered by other students.

Assessment

Students will demonstrate knowledge of different material characteristics and how they may be used by the people of Cascadia to create various tools. They will be provided with samples or photos of assorted tools and asked what they may be used for and how they were made.

Examine the photo below and answer the following questions:

1. Which tools are made from wood?
2. Which tools are made from stone?
3. What do you think is the hardest tool pictured?
4. What do you think is the softest tool pictured?
5. Can you tell which materials are organic?

Matching Game:

Match the picture of the tool to the name of the tool.



	Slate
	Maul
	Halibut hook
	Fish knife
	Antler wedge
	Beaver tooth knife
	Elbow adze
	Sandstone slab
	Drill
	D Adze