

ROCKS		
	<i>Name</i>	<i>Where Found</i>
Igneous		
A	Massive Basalt	
C	Vesicular Basalt	
C	Amygdaloidal	
A	Ophitic Basalt	
R	Gabbro	
C	Porphyry	
U	Rhyolite	
R	Granite	
Metamorphic		
R	Gneiss	
R	Slate	
Sedimentary		
C	Sandstone	
A	Conglomerate	
R	Shale	
R	Limestone	
MINERALS		
	<i>Name</i>	<i>Where Found</i>
White		
C	Quartz	
C	Chert	
R	Agate	
U	Jasper	
A	Clacite	
Green		
A	Chlorite	
C	Epidote	
R	Prehnite	
Uncommon		
	Copper	
	Datolite	
	Chlorastrolite	
	Thomsonite	

ISLE ROYALE NATIONAL PARK

Checklist of Rocks and Minerals

Name: _____

Date(s): _____

Location on Isle Royale: _____

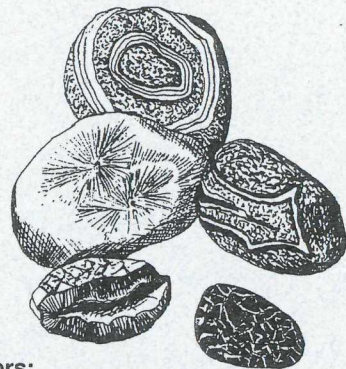
Abundance:

A = abundant

C = common

U = uncommon

R = rare



Note to Park Visitors:

Minerals, like all natural things in the park, cannot be collected and removed. Enjoy them where you find them!

Isle Royale Minerals

The rock layers of Isle Royale are the mirror image of those on the Keweenaw Peninsula, and represent the remnant of the western side of the ancient rift valley, while the Keweenaw Peninsula forms the eastern side. Therefore, you will find the identical rock units and the same rocks and minerals on Isle Royale, but in the opposite order, and tilting in the opposite direction as you find on the Keweenaw Peninsula.

The rocks of Isle Royale are mainly massive, dark colored basalt lavas which are made up primarily of feldspar and pyroxene with lesser amounts of other materials. The feldspar and pyroxene are usually very small and it is difficult or impossible to see the minerals. The dense basalt was partly altered by hot waters to form various minerals which can be detected either by the dark green color (chlorite) or swelling aspect (corrensite).

The sandstone which makes up much of SW Isle Royale and which also occurs between some of the lavas is made up of feldspar, quartz and rock fragments. Glacial activity has carried rocks from Canada, some of them hundreds of miles, and deposited them on Isle Royale. These exotic rocks, granites and gneisses, are only found in the surface gravels or on beaches.

When the lava flows cooled down about one billion years ago, gases separated within the lava flow and gas bubbles rose to the top of the lava flows and were frozen in. After the solidification of the lava these gas bubbles--then empty voids--were filled by hot fluids that circulated throughout the rocks and deposited new minerals. The filled bubbles are now called amygdules. The temperature of the hot fluid determined the mineral assemblage or group of minerals. Zeolites, for example, are deposited at lower temperature than prehnite or pumpellyite. The most beautiful and distinctive minerals of the park specimens come from these amygdules in the basalt since the basalt provides all the necessary elements for the formation of these minerals.

Minerals also occur in veins (mineral-filled cracks) which cut across the sandstone and lava outcrops. These minerals are part of one of the most famous mineral districts of the world, the Lake Superior Copper District, which was the first great metal mining district in North America.

Isle Royale is most prominently known for its *greenstone*, a beautiful nodular compact form of pumpellyite that is the Michigan state gemstone.

Where to look for minerals and how to identify them:

If you want to find minerals at Isle Royale, you should walk the coastlines, especially those that are well wavewashed. The waves expose the minerals, and pebbles of various minerals can be found on adjacent beaches. Using a canoe or small boat, watershoes, and plenty of time, walk the

shore and watch for veins and amygdaloids. Observe the interiors of basalt flows where vesicle cylinders, pegmatites, joints and veins may expose these distinctive minerals. Remember that minerals must be left where you find them, by law.

Individual minerals are sometimes difficult to identify, even for experts, but certain groups of minerals can be distinguished very easily. All you need is your fingernail. The phyllosilicates chlorite, corrensite, and saponite are all of green color and very soft. You can easily scratch them with your fingernail. The other green minerals such as pumpellyite or prehnite are much harder and you will not be able to scratch them with your fingernail. In fact, in pebbles along the shore they stand out, since they are not as easily eroded as the surrounding rock. The unusual pink color of prehnite of Isle Royale often is the result of very tiny inclusions of native copper which makes it similar to the zeolite thomsonite. The zeolite family is in general difficult to identify. But the zeolite laumontite can easily be recognized; it is of white or pink color and if you touch it, it will split up into small fibers.

For More Information:

For information and illustrations of the beach stones of Lake Superior, consult [Is This An Agate?](#) by Susan Robinson. For more information about the geology of Isle Royale, consult [The Geologic Story of Isle Royale National Park](#) by Huber. Both of these publications are available in the park visitor centers.

The largest and most extensive exhibit of minerals of Isle Royale and the Keweenaw can be seen at the AE Seaman Mineral Museum in Houghton. The park visitor center also has a small mineral display.

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Cover illustration by Susan Robinson.*