

**Pre- and Post-Visit Activities:
Geo Wonders****Overview:**

These activities, which support the Staten Island Museum's lesson "Geo Wonders," introduce students to geology and the geology of Staten Island.

Background Information for Educators:

There are close to 4,000 minerals known and all of them share certain characteristics. To be considered a mineral, a substance must be naturally occurring, inorganic, have a definite chemical composition, and have an orderly inner atomic structure. Minerals are found all over the world, and have been very important in the advancement of human civilization. The crust of the earth is made of rocks, which are composed of minerals. Fairly early in our history, humans learned how to extract minerals from the earth and use them for their benefit. Building materials such as steel, concrete and glass all derived from minerals. Steel comes from hematite or magnetite, concrete from calcite, and glass from quartz. Other useful metals such as gold, silver, copper, lead and zinc are all derived from minerals.

Paleontology is the study of plant and animal fossils and their histories. It is an exciting branch of geology. These fossils tell the details of life in the past. They are the only existing record of life forms that inhabited the earth millions of years ago. They help us reconstruct the ancient environment. Scientists use fossils to help understand why some organisms became extinct.

Vocabulary:

- Convergent—when two tectonic plates are colliding into each other creating mountain ranges, volcanoes, and earthquakes
- Crust- the outermost solid, rocky shell of a planet; earth's crust being composed of igneous, metamorphic, and sedimentary rocks
- Divergent—when two tectonic plates spread away from each other creating rifts and volcanoes
- Fossil - preserved remains of animals or other organic material from the past, often found in sedimentary rock layers
- Geology - The study of the earth's structure, what it is made of, its history, and the processes that act on it
- Glacier - a huge mass of ice slowly flowing over a landmass, formed from accumulated and compacted snow
- Igneous Rock - formed when hot, molten rock material within the Earth is cooled and hardened, e.g., basalt, pumice, diabase and granite
- Index fossil- fossils used to identify the age of different rock layers and determine a geologic time period
- Mineral - a solid, inorganic, naturally-formed substance that has a crystalline structure and specific chemical composition; classified by their properties

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- Magma - hot fluid or semifluid material below or within the Earth's crust from which lava and other igneous rock is formed by cooling.
- Metamorphic - rock that has undergone transformation by heat, pressure, or other natural agencies, e.g., slate, marble, schist, gneiss, serpentinite
- Plate Tectonics - the scientific concept that the surface of the Earth is divided into large slabs of solid rock, called plates, that glide over the earth's mantle
- Rock - an aggregate of two or more minerals; classified by how they are formed
- Serpentinite - a dark, typically greenish metamorphic rock, consisting largely of serpentine or related minerals, formed when mafic igneous rocks react to sea- water.
- Sedimentary - formed from sediments (pebbles, sand, gravel, clay, mud) deposited in layers - nature can cement pieces of these sediments together to form a new rock. Fossils are usually found in this kind of rock, e. g., sandstone, shale, limestone
- Transform- when two plates slide past one another creating earthquakes and faulting

Before Your Visit:

Grades 2-5:

Students will start the KWL chart by listing what they know and what they want to know about Staten Island's geology (below).

Grades 6-8:

Students will read the *Staten Island Advance* article "[An Up-Close Look at Staten Island's Geology](#)" about the geology of Staten Island. After reading the article, students will answer questions in the writing task (below).

After Your Visit:

Grades 2-5:

Students will finish the KWL chart, listing what they learned about geology and Staten Island's geology during their visit to the Staten Island Museum.

Grades 6-8:

Students will complete the following explanatory writing task:

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At the Staten Island Museum, I learned...

Name: _____

Date: _____

What I know	What I want to know	What I learned

Geo Wonders

Name: _____

Date: _____

After reading the *Staten Island Advance's* article "[An Up-Close Look at Staten Island's Geology](#)," answer the following questions in full sentences.

1. Where can you find serpentine rock on Staten Island?

2. What is the Bluebelt and why was it designed? Is the Bluebelt relevant to geology on SI?

3. Where is there evidence that a glacier was present on Staten Island?

4. Name some of the diverse geology that Staten Island has.

Name: _____

Date: _____

After reading the *Staten Island Advance's* article "[An Up-Close Look at Staten Island's Geology](#)," answer the following questions in full sentences.

1. Where can you find serpentine rock on Staten Island?

One can find serpentine rock on Staten Island near the Staten Island Expressway and under Todt Hill.

2. What is the Bluebelt and why was it designed?

The Bluebelt is an area where existing streams play a role in managing storm water; it was designed "to preserve natural drainage corridors including streams, ponds, and other wetlands."

3. Where is there evidence that a glacier was present on Staten Island?

There is evidence that a glacier was present on Staten Island 22,000 years ago in Conference House Park.

4. Name some of the diverse geology that Staten Island has.

Igneous rock, metamorphic rock, sedimentary rock, glacial sediments, wetlands, etc.