# 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.

**Three components:**

1. Background: Information about the geology of Staten Island to prepare yourself and your students for your trip to the Staten Island Museum.
2. Pre-Visit Activity: Before your visit, students will create a KWL chart about geology (grades 3-5) OR read an article about the geology of Staten Island and answer related questions (grades 6-8). These will provide context for the visit and also help students to complete the post-visit task.
3. Post-Visit Activity: Back in the classroom, students will draw on the first two components of the activity to complete an explanatory writing task about the geology of Staten Island.

**Materials:**

1. Background information for teachers.
2. Article link, "An Up-Close Look at Staten Island's Geology."
3. Student writing task.
4. Graphic organizers.

**Background Information:**

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.

One interesting property of some minerals is that of fluorescence. When exposed to certain types of high energy light, such as ultraviolet light, some minerals will glow, or fluoresce, because their electrons can absorb this energy. The glow comes when the electron releases the stored energy. The German poet Goethe (1749-1832) is credited with being the first scientist to note that ultraviolet light can cause fluorescence in minerals. The term fluorescence was coined by the English scientist George Stokes (1820–1903), who had observed this property in the mineral fluorite. You can see this and other rocks "shine" in the Fluorescent Mineral Room at the Staten Island Museum located at 75 Stuyvesant Place.

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:**

- Fluorescence - the visible or invisible radiation emitted by certain substances as a result of incident radiation of a shorter wavelength such as X-rays or ultraviolet light.
- Fossil - the remains or impression of a prehistoric organism preserved in petrified form or as a mold or cast in rock.
- Geology – the science that deals with the earth's physical structure and substance, its history, and the processes that act on it.
- Glacier – a huge mass of ice slowly flowing over a landmass, formed from compacted snow in an area where snow accumulation has exceeded melting and sublimation.
- Igneous Rock – formed when hot, molten rock material within the Earth is cooled and hardened.
- Mineral – natural nonliving material; substance of definite chemical composition.
- 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 - denoting rock that has undergone transformation by heat, pressure, or other natural agencies,
- Plate Tectonics – the scientific concept that the surface of the Earth is a mosaic of rigid, shifting plates.
- Rock - the solid mineral material forming part of the surface of the Earth and other similar planets, exposed on the surface or underlying the soil or oceans.
- Serpentinite - a dark, typically greenish metamorphic rock, consisting largely of serpentine or related minerals, formed when mafic igneous rocks are altered by water.
- Sedimentary – formed from sediments (pebbles, sand, gravel, clay, mud) deposited in water – nature can cement pieces of these sediments together to form a new rock. Fossils are usually found in this kind of rock, e. g., slate, marble, schist, gneiss, serpentinite.

**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:

At the Staten Island Museum, I learned…

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name: _____

Date: _____

| What I know | What I want to know | What I learned |
| --- | --- | --- |
| | | |

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.