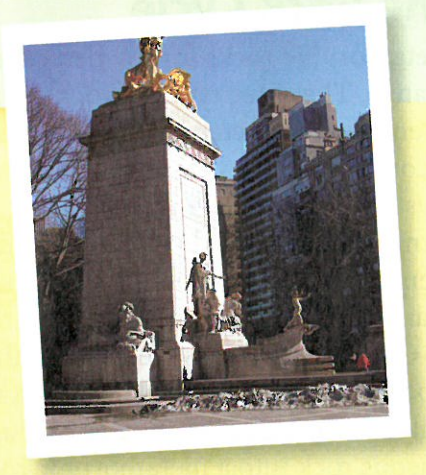
ON SITE: GEOLOGY IN CENTRAL PARK

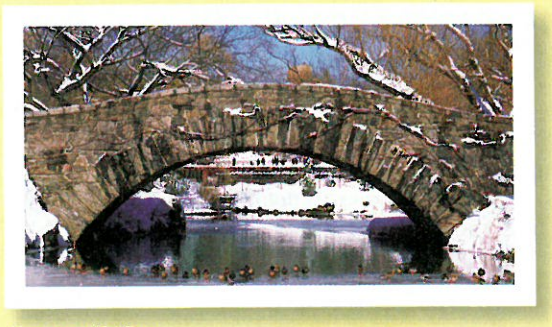
Some people travel to remote locations of the world to see different types of rock. However, examples of rocks often can easily be found in urban areas. Central Park in New York City is an excellent place to find examples of igneous, sedimentary, and metamorphic rock, both naturally occurring and used for sculptures, monuments, and bridges.



Maine Monument

The Maine Monument Located at the main entrance to Central Park, the Maine Monument is an immense structure made of marble, limestone, and bronze. The massive bow of a ship that makes up the base of the monument was sculpted out of marble, a type of metamorphic rock. A bronze statue sits atop a 15-m limestone pylon.

Schist and gneiss These two types of metamorphic rock occur naturally in Central Park. Outcroppings of these rocks, formed from sedimentary or igneous rock under intense heat and pressure, can be found throughout the park. The Gapstow Bridge was constructed using the local bedrock.



Gapstow Bridge

The Obelisk Weighing 221 tons and standing 21 m high, Cleopatra's Needle is the oldest human-made object in Central Park. The granite was quarried in Egypt more than 3000 years ago in 1475 B.C. The sculpture remained in Egypt until 1879, when it was moved to the United States. Granite is more resistant to weathering than other types of rock, and engravings made in granite can be read for hundreds of years, making it an excellent rock for the construction of monuments.

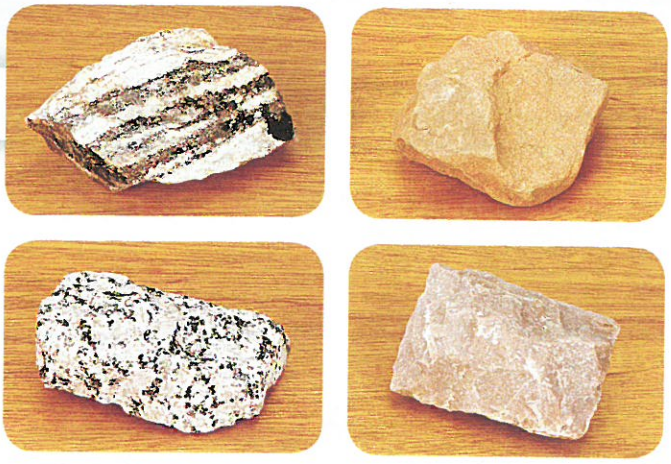
Cleopatra's Needle

WRITING in Earth Science

Promotional Brochure Research more information about the type of rock used to build structures and that occur naturally in your area. Create a promotional brochure that describes a tour focused on local geology. To learn more about the different types of rock, visit glencoe.com.

GEOLAB

INTERPRET CHANGES IN ROCKS



Background: As the rock cycle continues and rocks change from one type to another, more changes occur than meet the eye. Color, grain size, texture, and mineral composition are easily observed and described visually. Yet, with mineral changes come changes in crystal structure and density. How can these be accounted for and described? Studying pairs of rocks can show you how.

Question: *How do the characteristics of sedimentary or igneous rocks compare to metamorphic rocks?*

Materials

samples of sandstone, shale, limestone, granite, quartzite, slate, marble, and gneiss
magnifying lens
paper
beam balance
100-mL graduated cylinder or beaker that is large enough to hold the rock samples
water

Safety Precautions

Procedure

1. Read and complete the lab safety form.
2. Prepare a data table similar to the one at the right. Adjust the width of the columns as needed.
3. Observe each rock sample. Record your observations in the data table.
4. Recall that density = mass/volume. Make a plan that will allow you to measure the mass and volume of a rock sample.
5. Determine the density of each rock sample, and record this information in the data table.

Sample Data Table

Sample Number	1	2	3	4
Rock type				
Specific characteristics				
Mass				
Volume				
Density				

Analyze and Conclude

1. **Compare and contrast** sandstone and quartzite.
2. **Describe** how the grain size of sandstone changes during metamorphism.
3. **Describe** the textural differences you observe between shale and slate.
4. **Infer** Compare your calculated densities to those calculated by other students. Infer why yours might differ.
5. **Explain** why the color of a sedimentary rock may change during metamorphism.
6. **Evaluate** the changes in density between shale and slate, sandstone and quartzite, limestone and marble, and granite and gneiss. Does density always change? Explain your results.

SHARE YOUR DATA

Peer Review Discuss your results with other groups in your class. Speculate on the reasons for variations in mass, volume, and density.