

**BOWMAN GRADE 4 BIG BACK YARD
WHIPPLE HILL GEOLOGY FIELD TRIP OVERVIEW**

Room Parent

The Elementary Science Curriculum Specialist (ESCS), Fran Ludwig, will schedule this walk with the teachers as a grade. Every class in Grade 4 attends on the same day. Full updated walk copies will be provided by the ESCS.

- **Logistics:**
 - **Group:** Groups of 4-6 students.
 - **Time:** Science Curriculum specialist will decide with Grade 4 teachers
 - **Where:** Whipple Hill, Lexington, MA
 - **When:** In late fall or early spring after training with leaves off of trees and with clear weather for good visibility.
 - **Sites:** Parking Lot; Trail Up; Top; Trail down.
- Once a date has been set by Grade 4 teachers and ESCS, schedule parents to lead walk and ensure parents **attend the special Whipple Hill training session beforehand (given by Science Curriculum specialist).**

Teacher

- Liaise with Fran Ludwig, Elementary Science Curriculum Coordinator to schedule trip, done on one day as whole grade.
- Complete before walk work.
- Get Principal's permission for field trip.
- Schedule Bus.
- Back in the classroom: Write the story of a rock you saw today and describe all of the ways it has changed.

PTA Coordinator

- Ensure walk has been scheduled.
- Check that there are enough walk leaders
- Check walk copies are provided by Elementary Science Curriculum Specialist.
- Ensure compasses and magnifying lenses are available.

Questions/Comments?

Logistics questions contact current PTA Coordinator(s)

Nature Walk Overview

Attending a training session is absolutely necessary for this walk.

Logistics:

- **When:** Fall or spring when leaves are off trees if possible and at the end of the Rocks and Minerals unit.
- **Walk Time:** ESCS will decide with teachers
- **Group:** Groups of 4-6 students.
- **Where:** Whipple Hill, Lexington, MA
- **Sites:** Parking Lot; Trail Up; Top; Trail down.

Objectives:

By the end of the walk, each student will have the opportunity to:

1. Describe some rocks and tell how they are different from each other.
2. Identify a few minerals and rocks by comparing them to named samples.
3. Recognize evidence that rocks change over time.
4. Use a map and compass to find the trail and to locate landmarks.
5. Find out how rocks, soil and plants are related to each other.
6. Form a reasonable explanation (not necessarily correct!) about what has happened to a rock in the part based on what it looks like or where it is.
7. Appreciate our role in the care of Whipple Hill's environment.

Materials:

- Egg carton of labeled rocks (one/group)
- Popsicle sticks and a small ruler (one/group)
- Trail map of Whipple Hill (one/group)
- Clipboard, pencil, data sheets (one set/group)
- Magnifiers (one/group)
- Compass (one/group)
- Binoculars (optional)

Activities:

1. Introduction to Whipple Hill/Parking Area Exploration:
 - Examine rocks in the rock wall (color, presence of crystals, rounded/sharp edges)
 - Measure depth of soil near entry sign; observe height of trees.
 - Discuss respect for plants, animals, and non-living environment in Conservation Area.
 - Orient map with compass, locate trail.
2. Walking up trail:
 - Look for signs of weathering and erosion.
 - Describe properties of rocks along train (color, crystal size)

3. Top of Whipple Hill:

- Identify a few rocks and minerals (match to samples); note smoothing of surface of hill.
- Measure soil depth. Observe height of trees.
- Locate highest point, find the direction to landmarks using compass.
- Locate Whipple hill on map; locate peak on Whipple Hill map and find trail down to the east.

4. On the way down:

- Observe the glacial boulders and speculate on how they got there. Describe action of glacier in Lexington.
- (Optional) Locate granite vein and speculate about the age of the vein compared to the dark bed of rock.
- Appreciate the scale of the geologic features from the overlook.
- Observe rocks being broken by tree roots and trees being bent by rocks.
- (Optional) Locate the granite post used as a boundary marker between Lexington and Winchester.

Wrap up: Review all the changes in rock observed or interpreted during the hike: formulation from melted rock, weathering due to air, water, earthquakes and the action of plants and erosion due to water and glaciers.

Return to parking lot.

Before Going Out (Teacher)

1. Compare the earth to an apple. Cut an apple in half and ask how apple parts compare to earth parts. Each has a core at its center. The skin of the apple is like the crust of the earth. Emphasize the thinness of the skin/crust. Can you see the earth's crust? Where it is not buried, you can. Geologists call this **bedrock**. A good example of bedrock is the striped rock outcrop next to Hayden Recreation center. Sometimes loose stones and soil cover the bedrock, as at all Lexington school grounds.
2. Review the **properties** by which minerals can be identified: color, luster, hardness cleavage, etc. Review how rocks are formed. **Igneous** rocks are formed from rock that has melted deep under the surface. This is called **magma**. (Optional enrichment concept: If the magma cools deep underground, medium to large interlocking crystals are formed over long period of time. Medium to large crystals can be seen with the naked eye. If the magma comes to the earth's surface (volcano), the liquid rock cools very quickly and small (or no) crystals form. Some small crystals can be seen with a hand lens, but some are microscopic.) **Metamorphic** rock forms when heat and pressure begin to change a rock but don't completely melt it. Minerals in metamorphic rocks such as gneiss ("nice") often line up in layers resulting in striped appearance.

Have students recall that rocks are made of one or more minerals and that rocks can be compared on the basis of their mineral compositions and whether they are made of crystals or sediments. (The rocks at Whipple Hill are mostly igneous (gabbro with veins of granite), with a few samples of metamorphic (gneiss in glacial boulders).