

Credits

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Researched by the 2025 Summer@Brown Class:
Thinking Deep: The Geologist Perspective



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deeps.brown.edu



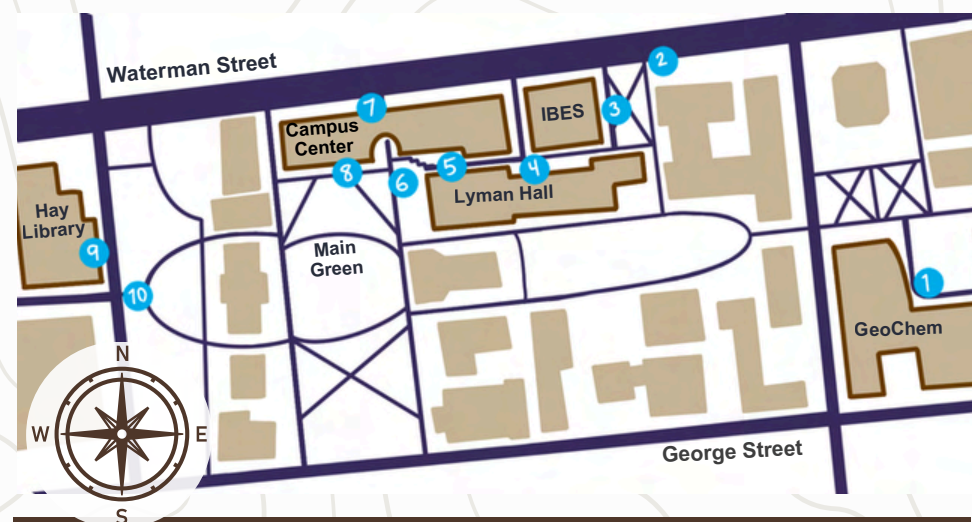
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BROWN

Department of Earth, Environmental
and Planetary Sciences

Campus Geology Field Guide



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|--------------------------------|------------------------------------|
| 1. Jan Tullis Stones (GeoChem) | 6. Bear Statue Bricks (Main Green) |
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Brown's Official Campus Map: facilities.brown.edu/maps

Introduction

Explore Brown's campus from a ground-breaking perspective! With this field guide, you can walk through some of the unique and striking geology to be found around campus, and guide you through identifying the rock types at well-known Brown landmarks.



Students in the 2025 Summer@Brown Class classifying minerals in the Jan Tullis Memorial Stones (Stop #1).

Try identifying and naming campus rocks on your own! We suggest these locations to start:

- Stones on the sides of University Hall
- Flag pole on the Main Green
- Soldier's Arch on Thayer St.

10. Van Wickle Gate Benches

At the cross of Prospect Street and College Street, West of the Quiet Green

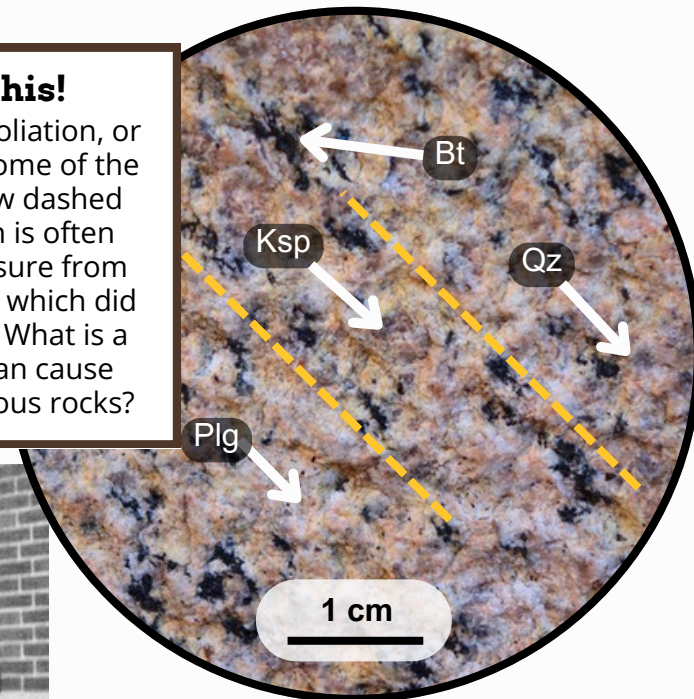


Rock Name: Granite
Rock Type: Intrusive igneous

In one of Brown's most beloved traditions, the center gates remain closed except to welcome first year students onto campus during Opening Convocation and to allow graduating students to process out during the Commencement Procession down College Hill.

Look at this!

This rock has a foliation, or orientation, in some of the minerals (yellow dashed lines). Foliation is often caused by pressure from metamorphism, which did not occur here. What is a process that can cause foliation in igneous rocks?



Fun Fact! The famous Providence author H.P. Lovecraft is photographed sitting on these benches!

9. John Hay Library

20 Prospect Street

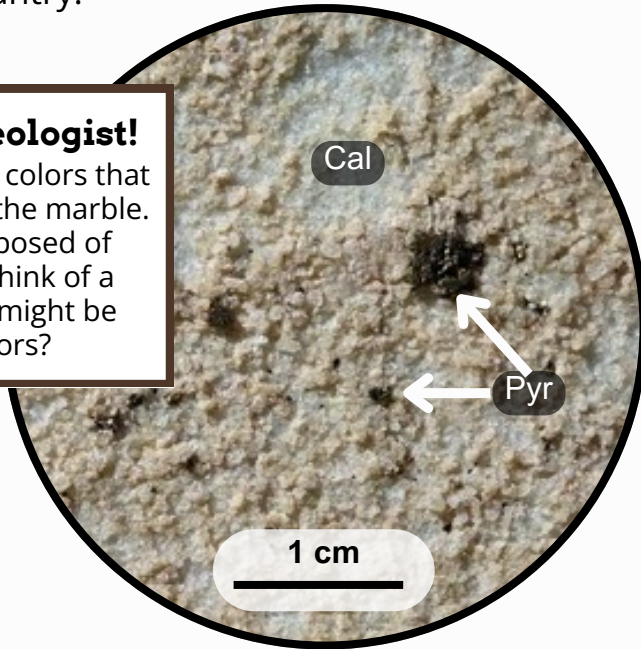


Rock Name: White Marble
Rock Type: Metamorphic

The John Hay Library ("the Hay") is the second oldest library on campus, built in 1910. It houses the University Library's vast collection of rare books and manuscripts, including one of the most notable collections of science history in the country.

Think like a geologist!

Notice the different colors that make up 'bands' in the marble. They are all composed of calcite. Can you think of a reason why they might be different colors?



Fun Fact! Brown acquired this marble from Dorset, Vermont, the largest underground marble quarry in the world.



Definitions and Key Concepts

Texture: Describes the size, shape, and arrangement of minerals in a rock.

Igneous: Rocks formed by cooling from melt.

Metamorphic: Rocks altered (in structure or chemistry) due to heat, pressure, or fluids.

Sedimentary: Organic and inorganic sediments (like bits of broken down rock) compacted together.

Intrusive vs. Extrusive (volcanic vs plutonic): Intrusive rocks cooled slowly with IN the Earth (forming plutons), while extrusive rocks cooled quickly when EXpelled from the Earth (through volcanic eruptions).

Dikes vs. Veins: Dikes are (molten) igneous intrusions which cross-cut existing rock, while veins are formed by minerals precipitating out of fluids which infiltrated fractures in the rock.

Cleavage: Planes of weakness in a mineral.

Enclaves: An aggregate of minerals or rock observed inside a larger rock body.

Mineral Abbreviations and Descriptions

Qz - Quartz; usually glassy and greyish, conchoidal fracture

Plg - Plagioclase; often white or greyish, can be tabular/blocky

Ksp - K (potassium)-feldspar; usually shades of pink/red, can be blocky

Bt - Biotite; darkish black/green, can scratch with your fingernail

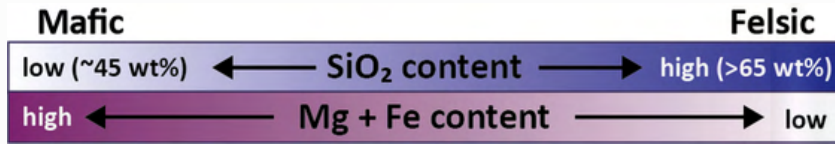
Msc - Muscovite; looks like biotite, but is silvery

Cal - Calcite; usually white, but can be other colors

Amp - Amphibole; dark black/green, can have 'splintery' edges

Pyr - Pyrite; metallic bronze/gold color, often has a cubic shape

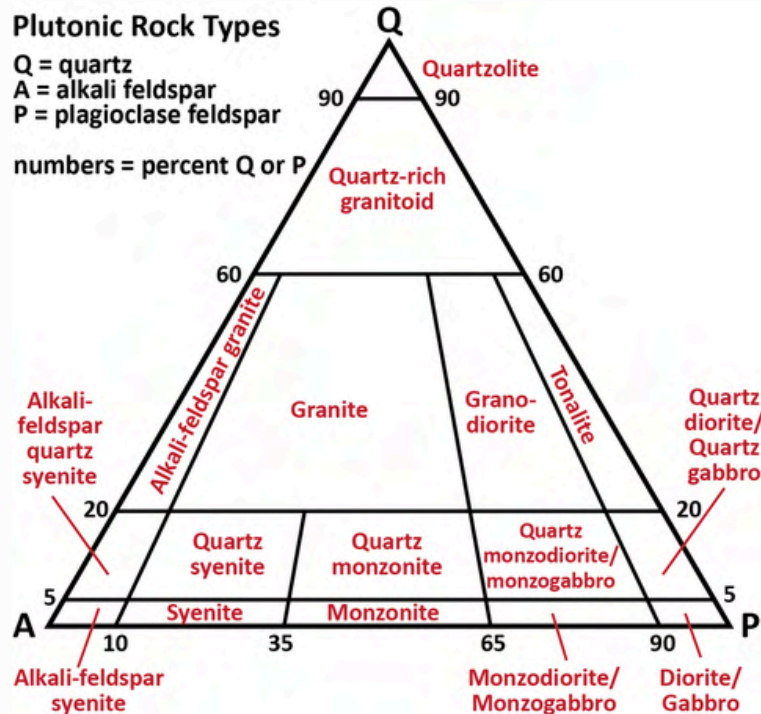
Mafic vs. Felsic: Igneous rocks can have compositions which are rich in feldspars and silica (felsic) or rich in iron and magnesium (mafic).



Naming Intrusive Felsic Rocks

Geologists use **ternary diagrams** like the one below to name intrusive (plutonic) felsic rocks. Each corner of the ternary represents 100% of one component (quartz, K-feldspar, and plagioclase), with the amount of that phase decreasing as you move away from that corner toward an edge.

When geologists see intrusive felsic rocks in the field, they typically would call them “granite”, but technically granite is defined by a very specific composition!



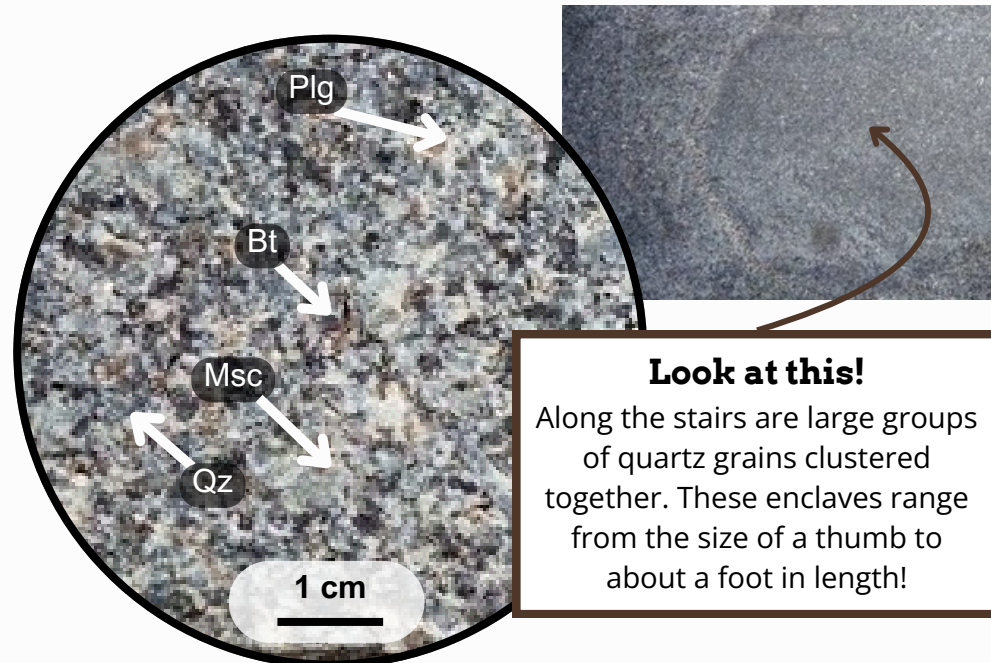
8. Campus Center Stairs

75 Waterman Street
Facing the Main Green

Rock name: Tonalite

Rock Type: Intrusive igneous

The Stephen Robert '62 Campus Center is a major cornerstone of student activity, including the Admissions Welcome Desk, the BOLT (Brown Outdoor Leadership Training) Office, student lounges and study spaces, and the Blue Room coffee shop. On sunny days, the steps on the south side of the building are a popular hang-out spot overlooking the Main Green.



Fun Fact! When the west end of the Faunce House was built in 1904, it was named “Rockefeller Hall” in honor of its donor, Mr. John D. Rockefeller, Jr, of the class of 1897.

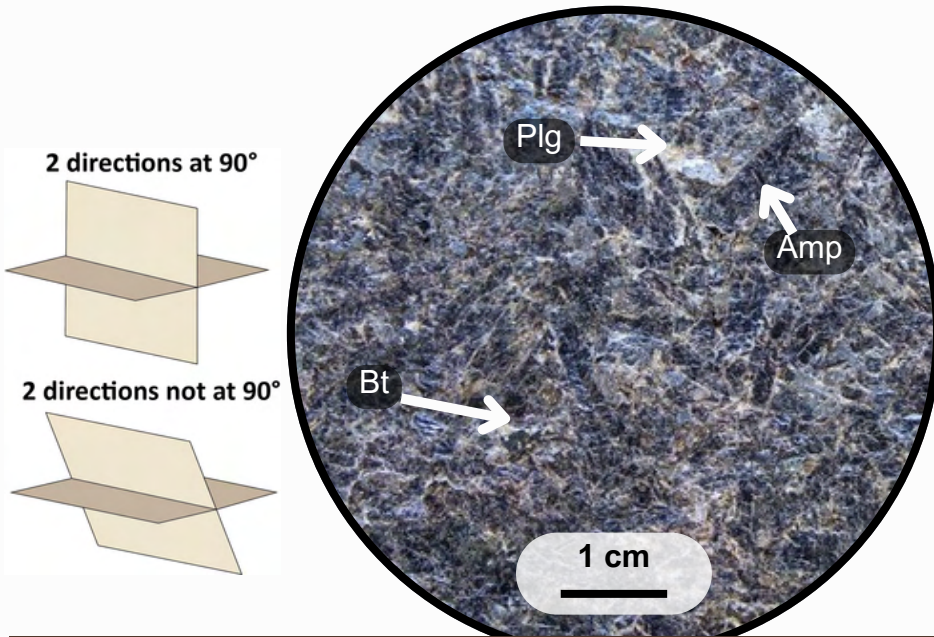
7. Faunce Arch Benches

75 Waterman Street
in front of the Faunce Arch
leading to the Main Green



Rock name: Amphibolite
Rock Type: Metamorphic

Four stone benches welcome guests to the Campus Center from the Waterman Street entrance. The benches commemorate Leon L. Haley Jr '86, a heroic doctor and celebrated alumni who provided lifesaving vaccines and care during the COVID-19 pandemic.



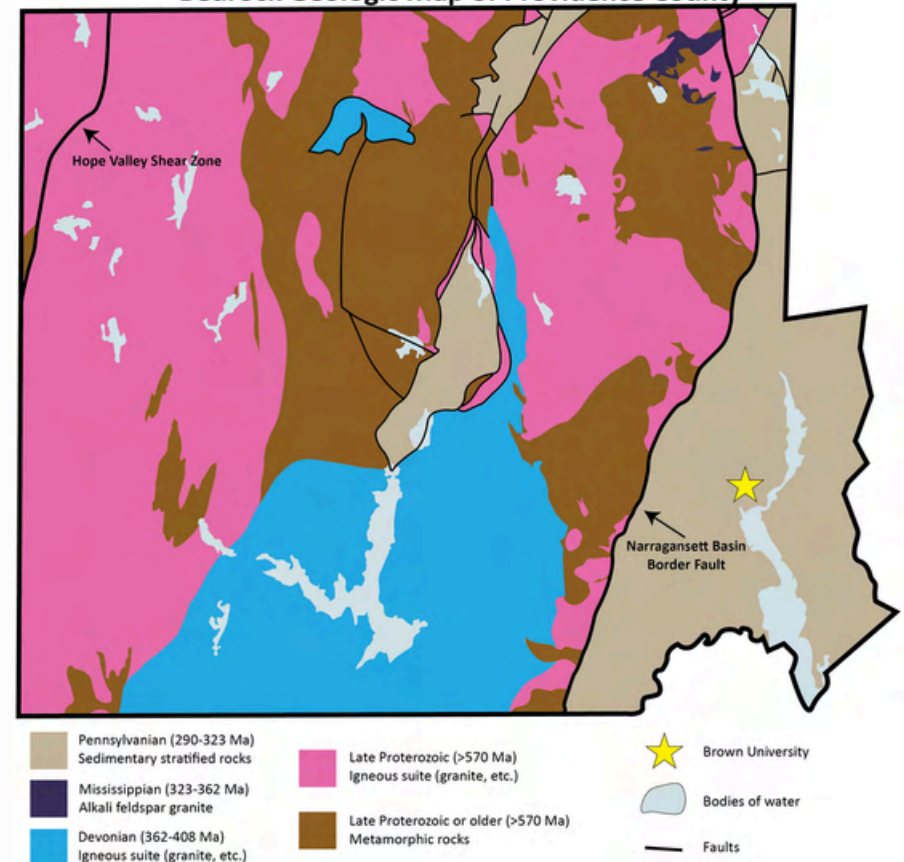
Challenge! Get up close and personal with the benches.

The minerals amphibole and pyroxene look very similar in the field. The best distinguishing feature is their cleavage planes; pyroxenes have 2 planes that are at 90° angles to each other, and amphiboles have 2 at 120° . Can you see the cleavage planes?

The geology of Providence's Campus Hill is primarily composed of the Rhode Island Formation, which is mostly sedimentary (conglomerates, sandstones, shales) and metasedimentary rocks left behind by ancient glaciers, and from other erosion events. These rocks were deposited on top of the older igneous bedrock.

A major structure called the Narragansett Basin Border Fault runs through this area. This fault places rocks of very different ages and compositions right next to each other. The fault dips inwards towards the Narragansett Basin (to the right of the map). The Basin formed during the Carboniferous Period, around 320 million years ago, due to tectonic activity that included rifting and strike-slip movements.

Bedrock Geologic Map of Providence County



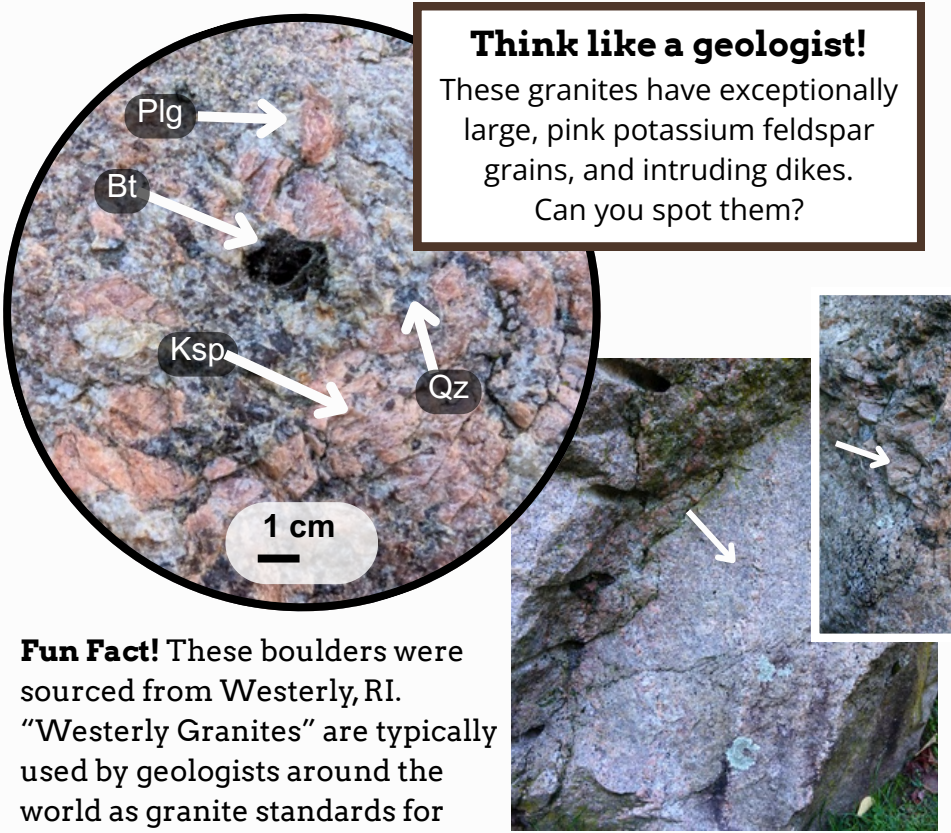
1. Jan Tullis Memorial Stones

On the MacMillan Green, on the north side of the GeoChemistry Building



Rock Name: Granite
Rock Type: Intrusive Igneous

These large granitic boulders were brought to Brown by Jan Tullis, a beloved faculty member and titan in the field of geology. They are an important landmark for the DEEPS community, and act as popular spot for picnics, office hours, and (in the case of our pre-college class) outdoor classes.



Think like a geologist!
 These granites have exceptionally large, pink potassium feldspar grains, and intruding dikes. Can you spot them?

Fun Fact! These boulders were sourced from Westerly, RI. "Westerly Granites" are typically used by geologists around the world as granite standards for rock deformation experiments.

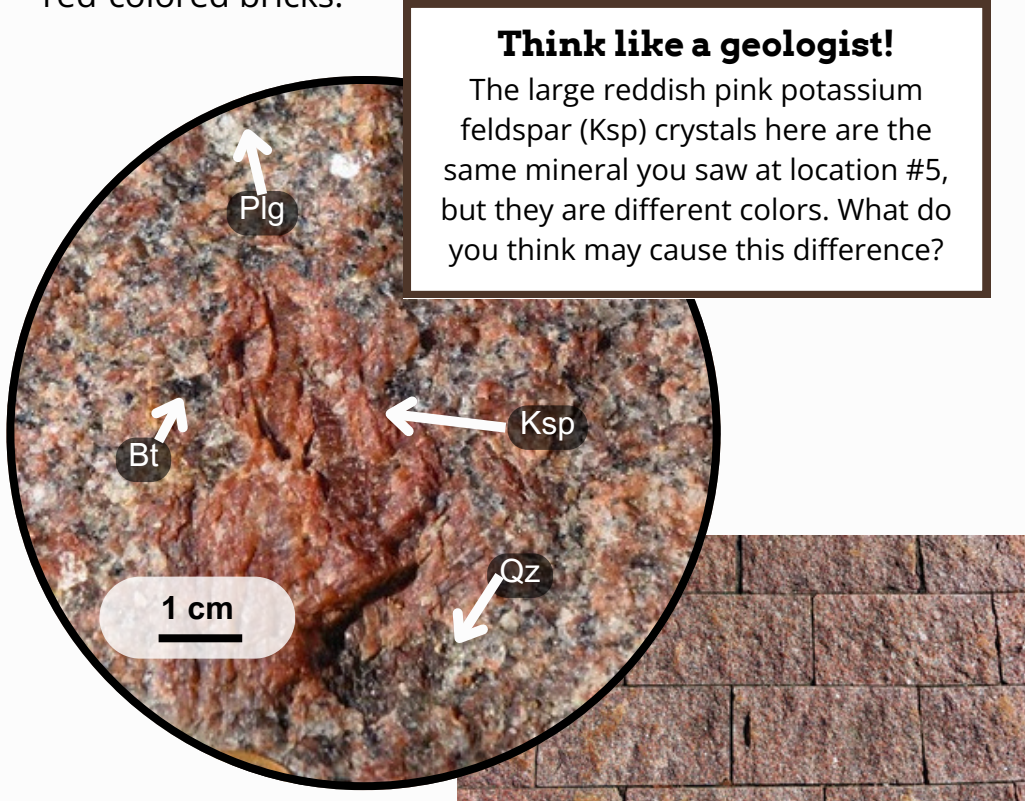
6. Bear Statue Bricks

South of the Faunce Arch, overlooking the Main Green



Rock Name: Syenite
Rock Type: Intrusive igneous

The 7 foot tall "Bronze Bruno" statue, now with a green patina, was installed in 1927. It stands above a courtyard of interesting red-colored bricks.



Think like a geologist!
 The large reddish pink potassium feldspar (Ksp) crystals here are the same mineral you saw at location #5, but they are different colors. What do you think may cause this difference?

Fun Fact! On the back of the pedestal, there's a piece of slate (sedimentary rock) that was stepped on by Roger Williams when he came to Rhode Island in 1636.

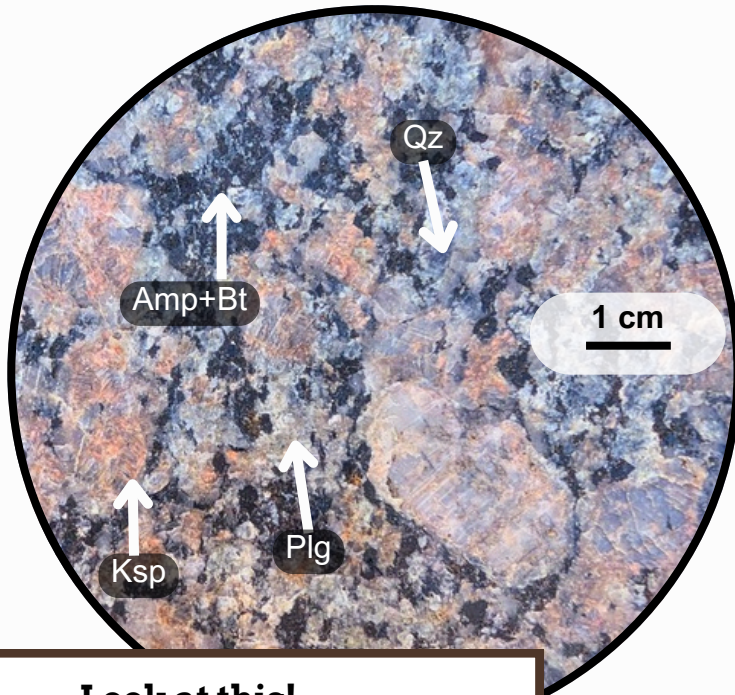
5. Campus Center Fountain

Between the Solomon Center and Stephen Robert Campus Center

Rock Name: Quartz syenite
Rock Type: Intrusive igneous



The sculptural fountain honors the memory of Brown student Casey Shearer, class of 2000. The 9-foot tall fountain is made of bronze and glass.



Look at this!

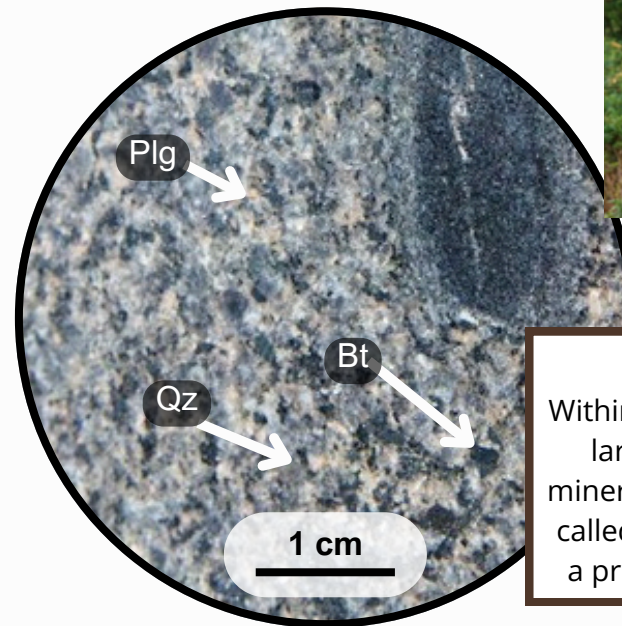
This rock has a "porphyritic texture", meaning that there are very large grains (red feldspars) embedded in a finer-grained groundmass. These larger grains had more time to cool from the melt, and so they had a longer time to grow.

2. Waterman Street Posts

Between 91 and 85 Waterman Street

Rock Name: Granodiorite
Rock Type: Intrusive Igneous

These stone posts line the sidewalk along Waterman Street, near the IBES building. They have polished sides, but if you look at the top you can see some cool cleavage of the crystals!



Look at this!

Within these granodiorites are large aggregates of dark minerals like biotite. These are called "mafic enclaves" within a predominantly felsic rock.

Fun Fact! Plymouth Rock and the Rosetta Stone are also made of granodiorite!

3. IBES Fountain

On the East side of the IBES Building,
85 Waterman Street



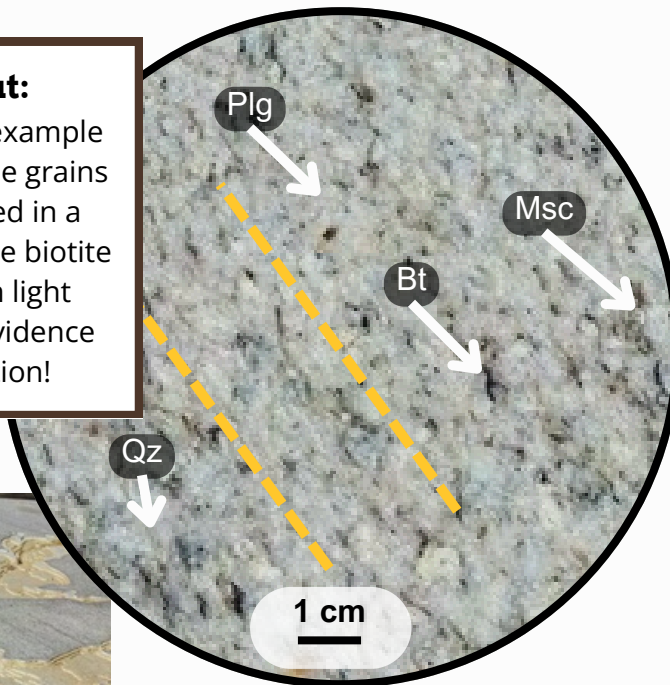
Rock Name: Quartz Monzodiorite

Rock Type: Intrusive igneous

Outside the Institute at Brown for Environment and Society (IBES), you can find *Under the Laurentide*, 2014, a water table by artist Maya Lin. It features the topography of Narraganset Bay carved from a single oval slab, with a fountain demonstrating the flow of local rivers.

Check this out:

This rock has a great example of a foliation, where the grains in the rock are aligned in a particular direction. The biotite and muscovite form light banding, indicating evidence for some deformation!



Fun Fact! This stone is from a nearby quarry in Chelmsford, Massachusetts.

4. Leeds Pillar

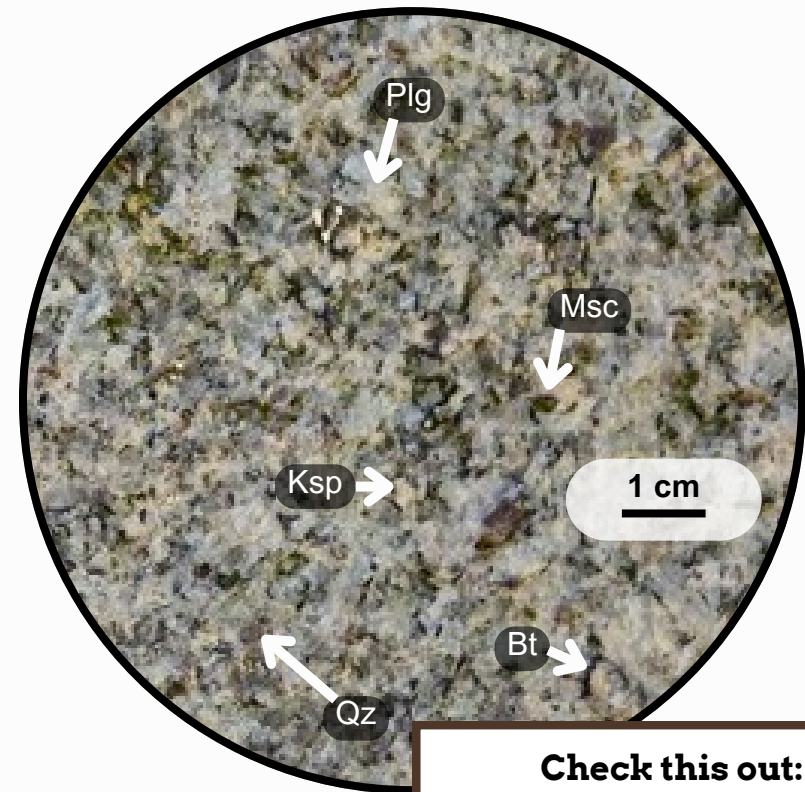
In front of Layman Hall,
83 Waterman Street



Rock Name: Granodiorite

Rock Type: Intrusive Igneous

The Leeds Theater is one of the two main-stage theaters in Layman Hall, home to Brown's Theatre Arts & Performance Studies program.



Check this out:

You can tell this rock has been weathered by the rust-like color on some of the muscovite grains.