IT'S THE GEO BIKE LOOP!

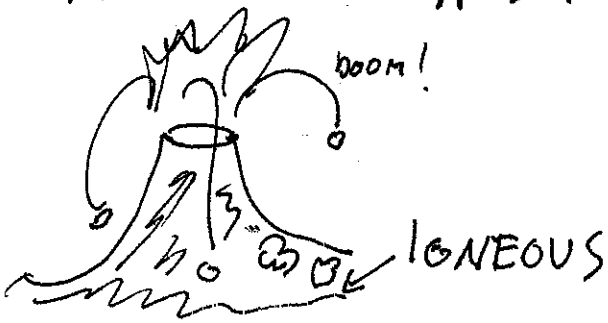
Bicycle

(9-4)

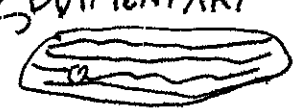
LEADERS -
Justin Chenevert
617-965-6378
MIKE McLellan
617-244-0998

All the cool people are bringing...
2 litres water
Big Lunch
raingear
bug spray/sunscreen
HELMET/BIKE
comfortable shoes

Today we will be looking at several interesting Geological attractions on our bikes. Remember Roxbury Conglomerate from the first day? Well, we're going to be meeting some of it's best friends in the rock world. There are 3 types to rocks.



SEDIMENTARY



METAMOPHIC

ARE YOU READY TO ROCK?

Note: Any puns besides the one above using rock (as in geology) and rock (as in rock an' roll) will not be tolerated. NO exceptions.

In case of Emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.
This program must comply with the regulations of the Massachusetts Dept. of Public Health and must be licensed by the city of Newton Health Department.

Hey look it's the...   617-WOK-NEST

♪ This is a G ♪

Geologic-al Bicycle

Loopicus; dangleaxtonimumenicusia;

Hey look it's your leaders:

Mike Mclellan 617-244-0998

Justin Chenevert 617-965-6378

Hey look it's where to meet:

Brown Middle School 617-DONT-CALL-HERE

Hey look it's what time to meet:

9 am   4 pm

Hey look its what to bring:

Daypack, water, Lunch

BIKE, HELMET, SNEAKERS

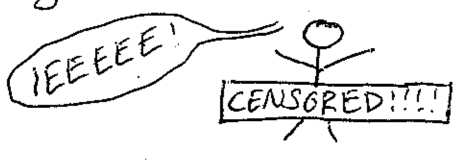
RAINGEAR, first aid, sunscreen

Hey guess what. We're going on a bike loop all about geology. This means we are going in a loop which is like a circle except it goes in all sorts of directions, directions like up, down, left, more left, squiggly, lateral, counterclockwise, and back in time to the 1700s (oh dear). We will learn all about the magically delicious geological features of the garden city which I also like to call the georden city (leprechaun) (oh dear). Be sure to take off your training wheels (take that Jeff) because we'll be big boy/girl biking today

Hey look it's bike hand signals for safety:

RIGHT   LeFt   slow/STOP

Hey! Don't look it's a naked man



I said don't look!! stop looking!!!!!!

The answer to yesterdays snapple fact: 47

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Tripslip #6

Geology Bike Loop

JULY 11, 2005 @ 9-4 @ BROWN MIDDLE SCHOOL@@@@@

equipment · equipment · equipment · equipment · equipment · equipment · equipment · equipment ·

A BIKE, WITH A HELMET, water (lots), lunch, raingear, <u>sneakers</u>, field kit, Helmut Kohl (former prime minister of Germany)

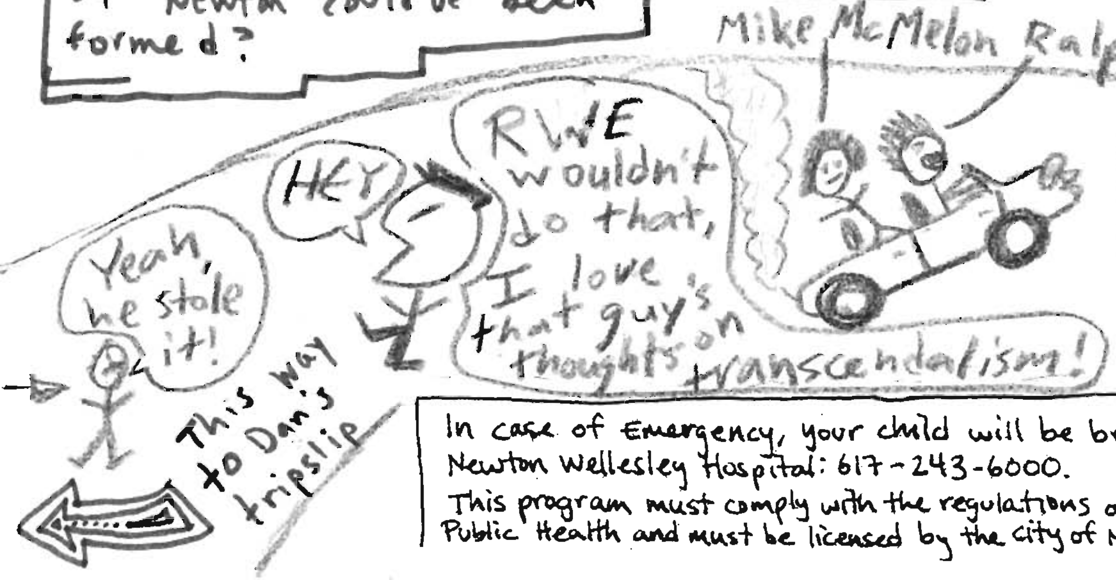
Hold on to your schist because today is... GEOLOGY DAY!!! (awesome jubilant music)

fireworks

And to celebrate this, the historic anniversary of that fateful day when rocks first gained the right to vote, we'll be biking about town (Newton) and checking out all the rockin' (pffpff) geological landmarks around the city. Oh man it's going to be awesome.

RANDOM FACTOID: Did you know that most people spell "transcendentalism" as "transcendalism"?

BIG, OVERARCHING GEOLOGY QUESTION: What are some of the ways the terrain (rocks) of Newton could've been formed?



LEADERS:
Joey "@" Backer 617·969·0288
Garhett Solomon 617·332·1362

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This program must comply with the regulations of the Massachusetts Dept. of Public Health and must be licensed by the City of Newton Health Department.

9-4

July 11, 2005
#5

Geology

Bike Trip

Leaders

Joey B.
617-969-0288
Garhett S.
617-332-1362

bike

pet rock

- hey arnold

So... how bout dem rocks... yep. There are 3 types.

Igneous - volcanic rocks formed when magma comes to the surface and cools.

Sedimentary - small crumbs of other rocks compiling and hardening into 1 rock.

Metamorphic - formed when a rock is put under heat + pressure for a long time.

Equipment

field kit
a bicycle
a bicycle helmet
NO Boots!!!
Sneakers

first aid
field kit (yeah it's written twice)
water
lunch
raingear

- line to take up space

In case of Emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.
This program must comply with the regulations of the Massachusetts Dept. of Public Health and must be licensed by the city of Newton Health Department.

Joey

Rocks and Minerals

- Main Rock Types:
  - **Igneous**: The starting point for most rocks. These rocks form from cooled lava or form from mineral solution. See pictures and more at http://www.gpc.edu/~pgore/geology/geo101/igneous.htm
    - **Glassy** rocks like **obsidian** (aka volcanic glass). When lava cools instantaneously it can't form crystals (amorphous), making it appear glassy.
    - **Aphanitic** rocks like **basalt** (aka ocean bedrock). When lava cools quickly, it forms small grains giving a sandpapery feel to broken faces, and an even opaque color.
    - **Phaneritic** rocks like **granite**. When lava cools slightly slower, it forms grains on the order of a quarter inch. Everyone knows what granite looks like.
    - **Vesicular** rocks like **pumice** have air bubbles in them. They are light and can seem like fossilized sponges.
    - **Pyroclastic** or **Fragmental** rocks have lots of debris in them than makes them look odd.
  - **Metamorphic**: These start as any kind of rock, and are morphed. The two factors needed for change are Heat and Pressure. When you have these, the rocks flatten and harden into different rocks.
    - **Schist** can form from Basalt (Igneous), Shale (Sedimentary), or Slate (Metamorphic)
    - **Gneiss** can form from Granite (Igneous) or other rocks. Pressure visibly compresses the rock making it appear grained.
    - **Marble, Quartzite, Magmitite, Slate, and Soapstone** are all examples.
  - **Sedimentary Rocks**: These rocks form when bits of stone in water falls to the floor and collects, and then through compression, harden into a stone.
    - **Clastic** rocks like **Conglomerate** and **Breccia** are mixtures of small rocks and sediment. These are formed in moving waters.
    - Typical **Non-Clastic** rocks like **Chert** (sometimes flint, used for arrowheads), **Limestone** (sometimes chalk), and **Sandstone** all have the sandy appearance usually associated with sedimentary rocks.
    - Another **Non-Clastic** rock, **Halite**, is actually just table salt. It forms when salty or brackish bodies of water dry up. It can be white or brownish (from iron-oxides in the water).
- Misc:
  - **Glass**, often a man made material, is composed of a mineral called quartz. Most sand is quartz, so whenever lightning hits sand, the heat causes the quartz to melt into glass. Quartz is composed of Silicon Dioxide (SiO_2).
  - **Ores**: Rocks that contain significant amounts of metal, and can be mined for that metal. Aluminum ore is called Bauxite
  - **Stalactites** (hanging) and **stalagmites** (floor) are composed of **calcium carbonate**, also known as **Limestone**
- Mohs Hardness Scale
  - Ranging from 1 (Talc) to 10 (Diamond), the Mohs Hardness scale is more like an ordered list of minerals by hardness. Ordering rocks is easy: harder rocks will always scratch

softer rocks, but softer rocks usually won't scratch harder rocks. So with the 10 basic Mohs samples, you can find where any rock goes on the hardness scale.
    - Fingernail: 2.5
    - Copper Penny: 3.5
    - Glass or Knife blade: <5.5
    - Hardened Steel: >6.5
  - See lots of cool pictures and more at: http://mineral.galleries.com/minerals/hardness.htm

Glacial Geology

- Glacier Types
  - **Alpine (Valley) Glaciers** are found in mountain valleys.
  - **Ice Sheets** are the largest glacier type, and can even cover an entire continent.
  - **Ice Shelves** are bodies of floating ice that are still attached to a glacier.
  - **Outlet Glaciers** are confined to valleys but fed by larger glaciers.
  - **Piedmont Glaciers** occupy broad lowlands where alpine glaciers emerge from mountain valleys.
- Glacial Formations
  - **Arêtes** are sharp, jagged ridges left by alpine glaciation.
  - **Cirques** are bowl-shaped valleys left by alpine glaciation.
  - **Drumlins** are streamlined hills left by continental glaciation.
  - **Erratics** are boulders left in odd places by glaciers.
  - **Eskers** are long snake-like hills left in the place of glacial streams.
  - **Fjords** are steep-sided glacial valleys flooded by the ocean.
  - **Horns** are sharp mountain peaks left by alpine glaciation.
  - **Kames** are mounds of debris left by continental glaciers.
  - **Striations** (chicken scratches) form when glaciers drag rocks over bedrock.
  - **Tarns** are shallow lakes or ponds that fill depressions left by glaciers.
    - Know and explain the formation and significance of **Drumlins, Erratics, Eskers, Striations,** and **Tarns.**
- Glacial vs. Stream Erosion
  - **Erosion** is the removal of topsoil, rock, or sand from the surface by wind or water.
  - **Valleys**: Glaciers form U-shaped valleys because they erode over a wide, deep area, while Rivers form V-shaped valleys because they erode only in the canyon bottom.
  - **Deposition** is the laying down of rock-forming material in a natural way. Glaciers are one such way of this happening.

Tectonic Plate Theory

- Earth's Composition (Layers)
  - **Inner Core**: Probably a dense rock 1600 miles in diameter.
  - **Outer Core**: A layer of dense liquid metal and rock about 1400 miles thick.
  - **Mantle**: A layer of less-dense liquid rock about 1800 miles thick.
    - Composed of liquid rock called magma. When magma pours through the crust, it is called lava.

- **Crust**: A layer composed of solid rock about 5-50 miles thick. This is basically what we call the tectonic plates.

- The Plates
  - There are a total of 14 tectonic plates.
  - Each one is 5 - 50 Miles Thick
  - Plate Boundaries: These appear to us as faults and fault lines.
    - **Convergent Boundary**: Where plates move together (ex: Appalacians long ago)
      - Subduction
    - **Divergent Boundary**: Where plates move apart (ex: Atlantic Plate Boundary)
      - Can cause natural hot-water springs (called geysers) like in Iceland.
    - **Transform Boundary**: Where plates move past each other (ex: Baja Peninsula, San Andreas Fault)
      - Often the worst Quakes, and least volcanic activity
    - **Ring of Fire**: The series of fault lines surrounding the pacific plate, at which much volcanic activity can be found.
    - **Hawaii**: A set of volcanic islands formed by a hot spot.
  - Plates often move a few inches at a time during shocks called earthquakes. Earthquakes are measured on the Richter scale with a Seismograph.
  - The modern globe is covered with 75% water and 25% landmass.

Astronomy

- Astronomical effects on earth:
  - The Earth's tilt causes changes in the angle of sunlight, which means sometimes parts of the earth catch less light from the sun; that is winter.
  - The Earth's proximity to the sun
    - Average 93 million miles
    - 1 Astronomical Unit
    - Has only an insignificant affect on the seasons (contrary to a popular mistake).
  - The Earth's Movements
    - Ratation: The spinning of the earth about its own central axis. (West to East)
    - Orbit: The path the earth follows as it spins around the sun.
  - Earth is the densest planet in the solar system.
  - Eclipses
    - The eclipse is named for the object being hidden or shadowed on.
      - A solar eclipse is when the moon blocks the sun's light from getting to the earth. This can only be seen during the day.
      - A lunar eclipse is when the earth blocks the sun's light from getting to the moon. This can only be seen at night.
    - Due purely to coincidence, the sun and moon are at certain sizes and distances that make them appear exactly the same size from earth.
- **Heliocentric Theory**: The sun-centered theory of astronomy. This theory, by Copernicus, was novel because it removed the earth from the center of the universe. It makes no reference to the sun being the center of the universe, but rather says that the sun is the center of the solar system. This is now accepted as a fact.

Joey

GEOLOGY UNIT

ROCK IDENTIFICATION -p.2

DIRECTIONS:

1.) List rock types for all rocks and correct with key. Follow example in #5 below. Each mistake should be corrected.

2.) Regular and Honors- give rock names - use Physical Geology (pages 19 - 57) to name each. Use key to correct.

3.) Honors- Prepare for verbal quiz. See note at bottom of page.

Rock #	Data- Give route taken on Flow Chart on opposite side. (All students)	Rock type (All students)	Rock name (Do with P.G. book, pages 19-57) (Honors and regular)
5.	Example: 1-2-4-8-	metamorphic	
6.			
7.			
8.			
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15.			
16.			
17.			
18.			
19.			
20.			

Teacher will initial after Verbal Quiz passed on Rock Type recogniton. You may use reverse side during quiz.

Practice on labeled rocks in specimen trays.

GEOLOGY UNIT

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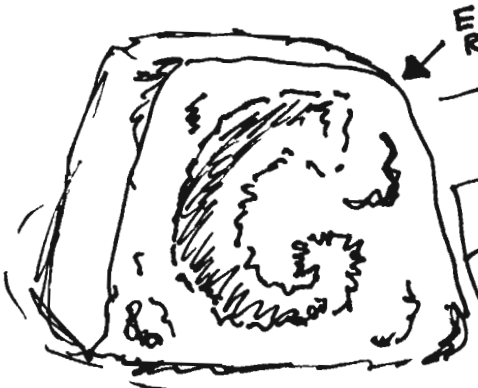


Tripslip #6
July 10

GEOLOGY BIKE LOOP

WA-HOO!

Times: 9am-4pm
Meet at: Brown Middle School
What to bring: YOUR BIKE, helmet, big lunch, much water, SNEAKERS on your feet (not boots), field kit, bike tools if you have 'em, a brazil nut

This is key

Leaders:
Sarina "I rock hard, but rocks rock harder" Yospin
617-969-3966
Jeff "Geology is my bag... ...ology" DeCew
617-964-7845

EL SEÑOR GLACIER

Wow, guys. Wow. You just happen to be going on what is one of my favorite ESP trips. You'll be getting the inside scoop on the really cool geological history of Newton, a.k.a. the stuff of dreams. Our fair city was once being squeezed, poked and shifted around under the massive weight of GLACIERS, and most of the rocky things we see are so cool because of glaciers. This trip rocks! Ho ho ho.

¡Hola!

Today is our Director Gabe's birthday, so you better bring him some food!

EL B-DAY CAKE

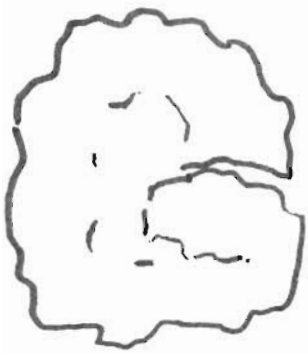
As we bike around to different spots in Newton of geological interest, we'll look for these glacial features. Try and match them with their definitions! (Points for life if you can)

1. Chattermarks
2. Glacial erratic
3. Brighton volcanics
4. Fusilli

a. cool igneous rock found only around here
b. glacial scratches on rocks
c. Sarina's favorite pasta shape
d. totally random boulder that a glacier poops out as it moves

Tripslip #4
July 7, 2004
9am-4pm

Meet at Brown Middle School (same as usual)



GEOLOGY BIKE LOOP!

LEADERS: NATE "IGNEOUS" KAUFMAN
617-796-7762
JEFF "SCHIST" DECEW
617-964-7845

Equipment needed: YOUR BIKE, HELMET, big lunch, lots of water, sneakers (not boots), field kit, bike tools if you have them, a potato-shaped rock

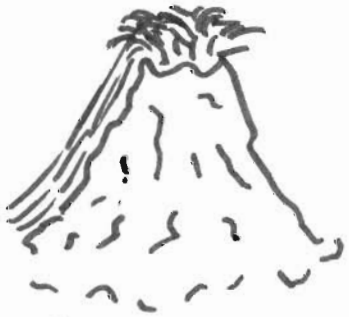
---

I'll bet there's a lot you don't know about the fair city of Newton. For instance, did you know that a few thousand years ago (about 15,000 to be more precise) we were in an ice age, where glaciers ruled? These glaciers have been the cause of the topographical ups and downs of this city. The rock formations we'll see while biking about were made by such glaciers.

But tell me this:
what are the following?

(a.) igneous rocks
(b.) metamorphic rocks
(c.) sedimentary rocks

How do they relate to each other?



VOLCANO

TRIVIA QUESTION OF THE TRIP

In Greek mythology, how did Hades punish Sisyphus?

HINT: GEOLOGY

In case of an emergency, your child will be brought to: Newton-Wellesley 243-6000

Tripslip #6
Leaders:
Jeff (Geofreo) DeCew
617-964-7845
Jonathan Rivnay
617-527-1849

Geology Bike Loop

~ SUPER IMPORTANT TRIPSLIP ~

Required Items:
Bike!!!
Helmet
Sneakers
WATER (2.5 liters)
Huge Lunch
Field Kit
- Raingear
- Bug Spray
- First Aid
- Notebook
- Sun screen

Optional Items:
- Bike Lock

Meeting Place:
Brown Middle School
@ 9:00

THIS TRIP ROCKS!!!!

But on to business, does anyone know the major types of rocks? You might not, and that's okay, because I haven't taught them to you yet. Basically, there are three types of rocks to look out for.

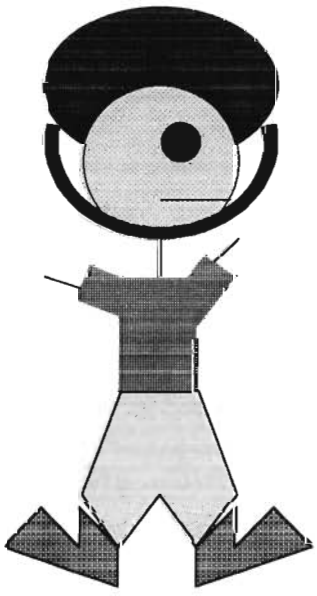
Igneous: The original form of all rocks on earth. Also known as volcanic rocks. These rocks are formed when volcanic magma comes to the surface of the planet and cools and hardens.

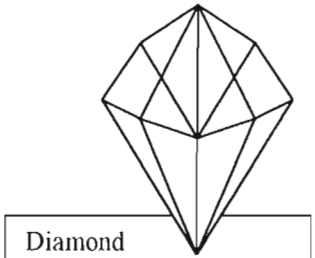
Sedimentary: This form of rock is very varied, but is always formed by the layering and compiling of sediment (or small crumbs of other rocks) and the hardening of them into a single rock. Objects can become trapped on the layers, giving a pudding-effect, (hence, pudding stone is sedimentary).

Metamorphic: The form of a rock which is created after another rock is put under heat and pressure for a long time. These rocks are most easily identifiable by the process of elimination.

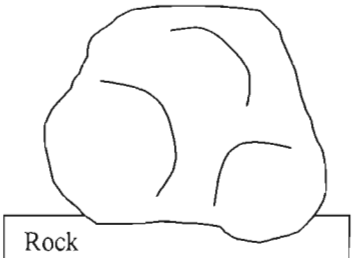
GLACIERS (Not a rock): These mysterious masses of moving magic, are actually only ice. Often there is dirt in them as well, but that is a filthy subject. There are a bunch of greatly gorgeous glossy glacial terms you guys should know. Among them are: Esker, Kettle Pond/Hole, Drumlin, Glacial Pavement, Glacial Striations, Mt. Monadnock, Glacial Erratic.

Plate Tectonics (it rocks, but it's not one): A highly supported theory that the Earth's surface is composed of arc flats called plates which move around on a sea of boiling rock, creating different continents and shapes over the millennia.

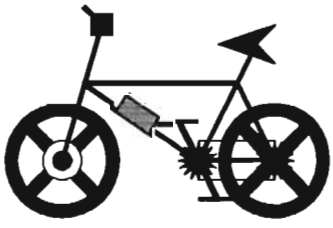




Diamond
(Geological perfection)



Rock
(Geological Imperfection)



Leader: Rachel 332-5932
Times: 8:30—2:00 ★ note the different times!
Wednesday, July 7, 1993

Geology Bike Trip

TripSlip #5

Equipment:
Field Kits
a bicycle
a bicycle Helmet
No boots necessary—sneakers (not sandals) will do nicely.

If you do not have a helmet, CALL ME in advance!

Hmm.... Geology...

There are 3 main types of rocks — SEDIMENTARY, IGNEOUS, and METAMORPHIC. Today we will discuss how they are formed and what they look like. How do these rock types relate to each other? What is the ROCK CYCLE?

The thing about geology which most intrigues me is the formation and evolution of land forms and geographical features. There are many natural forces involved with this process. Some include: GRAVITY, PLATE TECTONICS, WIND, WATER, ICE, and GLACIERS.....

.... glacial geology is a subject in its own rights. We could spend all day talking about the KETTLE PONDS, ESKERS, DRUMLINS, CIRQUES, and GLACIAL PAVEMENT (to name a few) created by the monstrous ice masses which swept over the continent as recently as 14,000 years ago.

(Sorry there are no pictures here, but I just couldn't do the wonders of geology justice with my limited artistic talents.)

FOOD FOR YOUR ~~WORM~~ FISH:

Lichen, which is a life-plant-type thing composed of LICHEN and ALGAE in a SYMBIOTIC (mutually supportive) relationship, helps to break down rock because they have a byproduct of a weak CARBONIC ACID which has a corrosive effect.

There are 3 types of lichen. Do you know what they are?

★ ROCKS ARE GREAT ★ LIKE SHALE + SLATE ★ I CAN'T WAIT! ★

TRIPSLIP #5

8:30 AM to 2PM

Leaders: Rachel: 332-5932
Gordon: 244-9304

Geology Bike Loop

IF YOU DON'T OWN A HELMET, PLEASE CALL US EARLY TONIGHT.

EQUIPMENT:
Sneakers
Bicycle
Helmet

We will be learning the 3 major types of rocks-

METAMORPHIC . . . → A sedimentary or igneous rock which has been changed or "metamorphosed" by heat and/or pressure

SEDIMENTARY . . . → Rock which has been formed from sand, silt, clay, or pebbles which are cemented together.

IGNEOUS . . . → Rock formed when molten volcanic materials cool

do you know the difference?

Around the Boston Basin area (of which we are a part), the most common rocks are Roxbury Conglomerate (sedimentary), Cambridge Argillite (sed./metamorphic) and Brighton Volcanics (igneous)

GLACIERS...

... Swept across our continent as recently as 10,000 years ago, levelling ground, creating lakes and ponds, dropping sediment, and generally changing the face ☺ of North America.

A GLACIER is formed when snow accumulates into a HUGE PILE which puts pressure on the bottom snow, metamorphosing it into ICE.

Flakes for Your Bowl:

Check out these glacial geology terms:

ESKER
KETTLE POND
DRUMLIN
GLACIAL PAVEMENT
GLACIAL STRIATIONS
MONADNOCK
GLACIAL ERRATIC

Many of you have probably heard of PLATE TECTONICS, and the theory derived by Alfred Wegener that the land masses of Earth were once joined in one SUPER CONTINENT called Pangaea. Today we will explore the process of continental drift and discuss plate tectonic theory!!

TRIP SLIP #5

8:30 AM to 2 PM

Leaders Rachel: 332-5932
Gordon: 244-9304

Geology Bike Loop

IF YOU DON'T OWN A HELMET, PLEASE CALL US EARLY TONIGHT.

EQUIPMENT:
Sneakers
Bicycle
Helmet

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METAMORPHIC . . . → a sedimentary or igneous rock which has been changed or "metamorphosed" by heat and/or pressure
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IGNEOUS . . . → Rock formed when molten volcanic materials cool.
do you know the difference?

Around the Boston Basin area (of which we are a part), the most common rocks are Roxbury Conglomerate (sedimentary) Cambridge Argillite (sed./metamorphic) and Brighton Volcanics (igneous)

GLACIERS...
... Swept across our CONTINENT as recently as 10,000 years ago, levelling ground, creating lakes and ponds, dropping sediment, and generally changing the face ☺ of North America. A GLACIER is formed when snow accumulates into a HUGE ~~PILE~~ which puts pressure on the bottom snow, metamorphosing it into ICE,

Flakes for Your Bowl:

Check out these glacial geology terms:

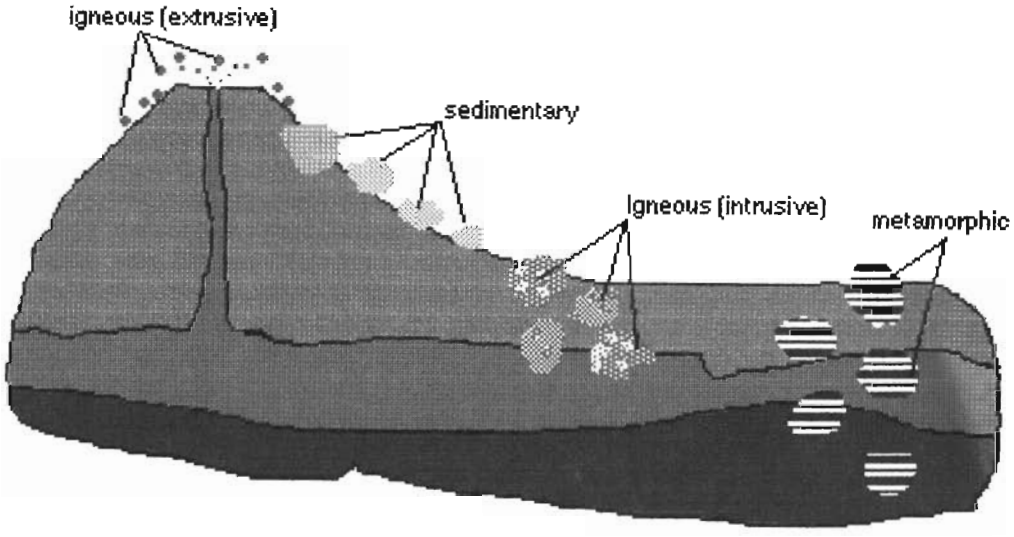
ESKER
KETTLE POND
DRUMLIN
GLACIAL PAVEMENT
GLACIAL STRIATIONS
MONADNOCK
GLACIAL ERRATIC

Many of you have probably heard of PLATE TECTONICS, and the theory derived by Alfred Wegener that the land masses of Earth were once joined in one SUPER CONTINENT called Pangaea. Today we will explore the process of continental drift and discuss plate tectonic theory!!

Geology Bike Loop

Trip#: #6, Geo Bike Loop
Leaders: Dan Thomases (527-2763)
Peter Montague (969-4196)
Date: Wednesday, 10 July 1996
Time: 9:00am-2:00pm
Equipment: Lunch, Water, Raingear, Bike, Helmet, any useful bike tools, and Field Kit (back-pack, first-aid kit, including spare change and moleskin, extraboot laces, ~~boots~~ Sneakers, sharpened, or usable, pencils, note book compass and map).

Today we will be biking all over Newton to check out some various types of geology. Geology means the study of geos or, most simply, rocks and minerals. The three different types of rocks are sedimentary, igneous and metamorphic. Sedimentary rocks are formed by any kind of weathering effect. How many different kinds of weathering can you think of? Igneous rocks are divided into two categories: Intrusive and extrusive, but both are formed from transformation with heat. What do you suppose the words intrusive and extrusive describe in this scenario? Metamorphic rock is created by a combination of heat and pressure it is like a hot sandwiched smushed together. What do you think it would look like?



As we bike from place to place tomorrow try to think about what we are looking at and how it looks differently from other rocks we look at. And don't forget to use your hand signals, especially stop!

Geology Bike 2002

TripSlip #1
7/6/99

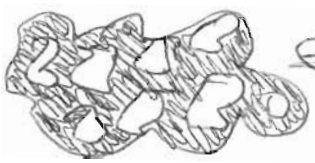
Leaders: Julie (964-7248)
GABE (969-3966)

MEET @ BROWN (8:30-9:00)

Equipment: Bicycle, Helmet, Sneakers, feild kit, day pack, lunch, WAter, your Brain!

Okay, The first Bike Trip I'm leading, yah!! We are going to look at different geological sites in newton. We will be seeing 3 types of Rocks: igneous, sedimentary, and metamorphic we will talk about how all these rocks are formed. what type of rock can fossils be found in? How Do fossils get into these rocks? Some of the geological formations we will see are Roxbury Conglomerate, glacial erratics, glacial pavement, drumlins, eskers, kettle ponds, Brighton volcanic, hairpin folds and glacial scratches. I'm not so sure of what these all are either,

This being a bike trip do Not FORGET YOUR BIKE!! wear sneakers, because it will be much more comfortable then riding in boots. It is also really important that you listen to leaders during a bike trip for obvious reasons. Well, I'M pretty psyched, I hope you are too. See ya then,



← a really bad drawing of a roxbury Conglomerate.

GEOLOGY BIKE LOOP

SUPER LEADERS:
JULIE - 617-964-7248
ANGELA - 617-527-7993

LOCATION: BROWN
@ 8:30 to 4:00

EQUIPMENT: BIG OL' LUNCH, LOTS O' WATER, FIELD KIT, SNEAKERS, BIKE + HELMET

SO ON THIS TRIP WE GET TO BIKE AROUND AND EXPLORE THE SUPER COOL GEOLOGY OF NEWTON. --- WHAT IS GEOLOGY YOU ASK? -- WELL I'M GLAD YOU DID. GEOLOGY IS THE STUDY OF THE ORIGEN, HISTORY + STRUCTURE OF THE EARTH. SO TODAY WE ARE GOING TO LOOK AT ROCKS OF WHICH THERE ARE THREE MAIN TYPES OF ROCKS: IGNEOUS, SEDIMENTARY AND METAMORPHIC -- WE'LL TALK ABOUT THEIR CHARACTERISTICS TOMORROW

PS. THE WORD OF THE DAY IS TUBULAR

Geology Bike loop

Leaders
Peter
Molly

8:30 - 2
↑
So we can check your Bikes

Equipment

- Bike
- Helmet
- lots of water
- feild kit
- day pack
- NO boots

Thear are 3 main types of rocks. thear are igneous, Sedimentary, and metamorphic. on this trip you will learn about Glacial geology and whate rocks go through as they travel thro the 3 different stages.

You can get dehydrated very fast when biking in the sun so remember to bring lots of water.

Things to think about

whate is an esker? Think about the different rocks you learn now can you figure out how they got that way and whate rock type they are.

whate is a Drumlin?

#7 7/12/94

Geology Bike Coop

Gordon Pable
244-9304
Dan T.
527-2763
Newton South
8:30 - 2:00

Equipment: Very Important

Bike

Helmet (call if you need one)

2 water bottles

if you have bike repair tools and can carry them please do.

and Sneakers (no boots)

lunch and field kit

and much enthusiasm

Does anybody know what Krakatoa is? it's what happens when you stub your toe on a rock! (many guffaw) Actually Krakatoa is a huge volcano, that, when it erupted many years ago it covered the earth in a smoky haze. But did you know volcanos are a very important part of the rock cycle many rocks begin their existance when they are forced from the earth through the cone of the volcano. Can you name some of these rocks. They all fall under a special name called IGNEOUS!

There are three types of rock, meaning all rocks fall in one of these catagories.

Igneous - Liquid to solid - explained above.

Sedimentary - rocks that are formed by layers of sand and sediments

Metamorphic - rocks that are formed from a pre-exist rock by heat and pressure.

Since another one of my multitudinal specialities of this year is plate techtonics, the study of the huge plates that make up the earth's crust and how they move, you can get some funky info on it. The earth is composed of 12 plates. These plates have been steadily moving since they were once all connected in a huge mass called Pangaea. N.A. was once part of Africa!! These plates move on a bed of molten lava on currents called convection currents. It is the moving of these plates that cause the volcanos and the earthquakes, do you know how? (Hint: think about friction). But even with these catastrophies, it would be even worse if the plates stopped, but we'll talk about that later.

Other fun geological features we'll see and talk about today.

Escars, Drumlins, glacial pavement, Kettle ponds, Peneplains, Glacial erratic and Moooooooorrrrrrrreeeee!!!

Leaders: Sarina Yospin (969-3966) ← pin
Jesse Sayles (965-2719) ← sail

Time: 8:30-2:00 Meet at: BMS

Equipment: Fully functional BIKE and one big fat protective HELMET, bike tools if you've got 'em, LUNCH, H_2O, field kit, map, compass, one onion (diced and lightly browned), this trip slip

ROCKS ROCK!

No need to wear hiking boots cuz it's a bike trip!

You guys are pretty lucky, because you have the original geo-dude and geo-dudette on this trip with you! (I say "original" because, once when I was watching the TV show "Pokémon," I noticed that one of them is called geodude, and he's made of rocks. Pretty lame.)

It just happens that my specialty is... GEOLOGY! Today, we'll be biking around Newton, looking for evidence of glaciers and the like. We'll discuss things like chattermarks and glacial grooves. Do you know what these things are? We'll learn all about it! Hey, and what do you think is the most abundant rock at Newton's surface?

Tripslip: 4

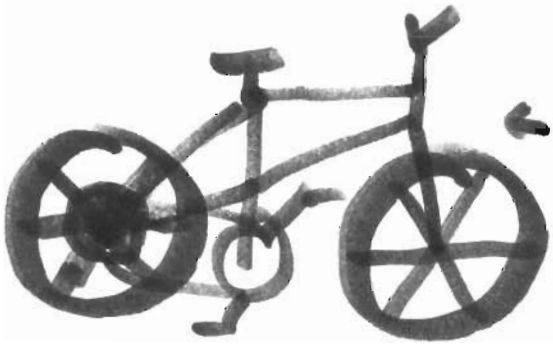
Geology Bike Loop

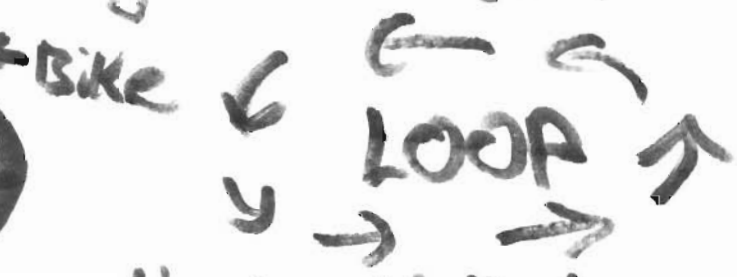
Leaders:
Jeff DeCew
617-964-7845
Nate Kaufman
617-796-7762

Where: Brown Middle School
When: 9:00 AM - 4:00 PM

Equipment:
YOUR BIKE
H_2O (2 qt)
Field kit
First Aid
Raingear
SHOES
Sunblock
LUNCH

HEY! You are going on the very first bike trip of ESP '04! We will be learning about mostly glacial geology and glaciology.





In case of an emergency, your child will be brought to: Newton Wellesley: 617-243-6000

This program must comply with the regulations of the Massachusetts Department of Public Health and must be licensed by the City of Newton Health Department.

BIKE TRIP

You Need A Bike on 7/10/03

GEO BIKE LOOP

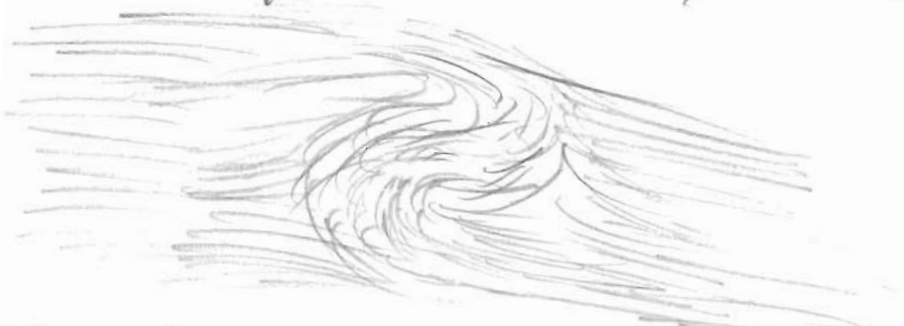
Jeff DeCew
964-7845
Sarina Yospin
969-3966

Meet at Brown at 9:00 AM with your Bike, in good/decent condition, and a helmet which fits you, preferably comfortably, but you wear it anyways OK, so what is the geology bike loop? It's one of those trips where we don't have a destination, so much as a wonderful journey to look forward to. We will be making several stops in various unique places of geological interest in newton.

equipment:

Day pack, field kit, Raingear, 2 liters of H2O, your Lunch, A BIKE, A HELMET, marmot or two gallons of caged engine sugar mixed with breach and pineapple juice. or a bar of chocolate.

what does this look like to you? if you can



guess, you will

Geology Bike Loop

Leaders: Dan Thomases 527-2763
Gordon Roble 244-9304

tripslip #7
7/12/94

time: 8:30 – 2:00 – to check bikes

Equipment: Bike
Helmet (call if ya don't have one!)
2 Canteens, one with water, one with something sugary, Field Kit and LUNCH
SNEAKERS (not Boots)

On this trip we will be exploring all kinds of Geology throughout Newton. We will discuss big words like Drumlins, Glacial Pavement, Drumlins and Monadnock

Matching: A) Igneous B) Metamorphic C) Sedimentary

1. – Roxbury Conglomerate
2. – Combridge Argilite
3. – Bryton Volcanic
4. – Shist
5. – Quartz
6. – Slate

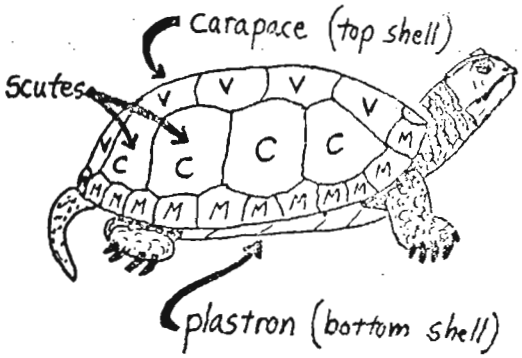
Do You Know what these ↑ words mean? Don't worry, we'll go over them.

KEY TO THE ADULT FROGS, TOADS AND TREEFROGS OF NEW ENGLAND

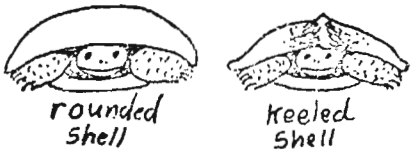
START

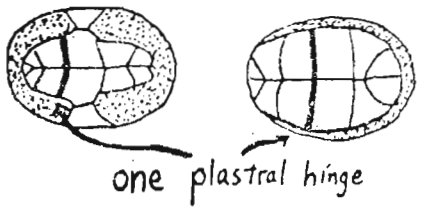
- No large toe discs
  - Eye pupil round or horizontal
    - Skin smooth and damp
      - Small spots or no spots on the back.
        - No black mask between nose and eye.
          - No dorsalateral folds. → BULLFROG
          - Dorsalateral folds. → Strong 'musk-like' odor. Web reaches tip of fifth toe. → MINK FROG
          - Dorsalateral folds. → No strong odor. Web fails to reach tip of fifth toe. → GREEN FROG
        - Black mask between nose and eye. → WOOD FROG
      - Large dark spots on the back.
        - Yellow beneath the hind legs. → PICKEREL FROG
        - White beneath the hind legs. → LEOPARD FROG
    - Skin 'dry' and rough
      - Chest spotted. 1 or 2 warts per large spot on back. → AMERICAN TOAD
      - Chest unspotted. 3 or more warts per large spot on back → FOWLERS TOAD
  - Eye pupil vertical → SPADEFOOT TOAD
- Large toe discs
  - Light spot beneath the eye. Orange beneath the hind legs. → GRAY TREEFROG
  - No light spot beneath the eye. Black 'X' on the back → SPRING PEEPER

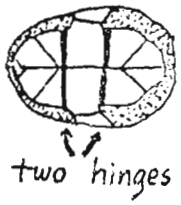
Identification Key to Adult New England Turtles



V = Vertebral Shields
C = Costal Shields
M = Marginal Shields







START

carapace has no scutes or scales	carapace has scutes or scales

carapace has no scutes or scales

long tube-like snout. flexible shell. N.W. Vermont → Eastern Softshell T.

carapace has scutes or scales

tail smooth	tail saw-toothed

tail saw-toothed → Snapping T.

tail smooth

plastron with no hinges.	plastron has one or two hinges.

plastron with no hinges.

Shell quite smooth.	Shell rough and textured.

Shell rough and textured.

black spots on neck and legs. scutes gray and black.	Orange on neck and legs. scutes pyramidal.

black spots on neck and legs. scutes gray and black. → Diamond-Backed Terrapin

Orange on neck and legs. scutes pyramidal. → Wood T.

Shell quite smooth.

Carapace without yellow spots.	Carapace with bright yellow spots. plastron black and orange. → Spotted T.

Carapace without yellow spots.

head without large orange marks.	head with one or two large orange marks. → Bog T. (Muhlenberg's)

head without large orange marks.

Olive carapace with markings. dorsal keel. N.W. Vermont. → Map T.	No olive carapace. No keel.

No olive carapace. No keel.

Costal and vertebral shields black with faint red markings. → Red-Bellied T.	Costal and vertebral shields black with no colored markings. → Painted T.

plastron has one or two hinges.

without light spots on carapace.	profuse light spots on carapace. bright yellow chin. 1 plastral hinge. → Blanding's T.

without light spots on carapace.

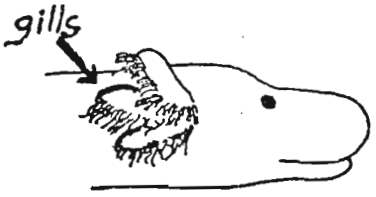
without colored markings on carapace.	irregular yellow, orange or olive markings on carapace. high dome shell 1 plastral hinge. → Eastern Box T.

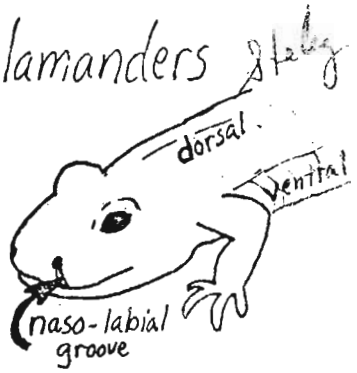
without colored markings on carapace.

head without light stripes.	head with light stripes.
large plastron. two plastral hinges → Mud T.	Small plastron. 1 plastral hinge → Musk T. ("stinkpot")

head without light stripes.

Identification Key to Adult New England Salamanders





START

4 toes on each hind foot	5 toes on each hind foot

4 toes on each hind foot

retains maroon gills throughout life. dark stripe through eye. pale belly.	No gills as an adult. White belly with black spots. base of tail is constricted.
→ Mudpuppy	→ Four-toed sal.

5 toes on each hind foot

Without conspicuous white or blue markings on dorsal surface	Conspicuous white or blue flecks, spots or bands on dorsal surface

Without conspicuous white or blue markings on dorsal surface

base color of sides other than pink, salmon or red.	base color of sides pink or salmon to deep red.

base color of sides other than pink, salmon or red.

indistinct or no yellow spots.	large yellow spots on black base. Gray belly. no nasal grooves.
	→ Yellow Spotted sal.

large yellow spots on black base. Gray belly. no nasal grooves.

no red spots.	red spots ringed with black. base color yellow or green.
	→ Red-Spotted Newt. (water stage)

no red spots.

no yellow belly	yellow belly. very slender. nasal groove.
	→ Northern Two-lined sal.

no yellow belly

back is red or gray. belly "salt + pepper". slender. nasal groove.	base color gray to brown. 5-8 pairs of light spots on dorsal surface. Chunky. nasal groove.
→ Red-Backed sal.	→ Northern Dusky sal.

base color of sides pink or salmon to deep red.

red spots ringed with black along dorsal surface. no nasal grooves	light and dark line running from eye to nostril. nasal grooves.
→ Red-Spotted Newt "Red eft". (land stage)	→ Spring sal.

Conspicuous white or blue flecks, spots or bands on dorsal surface

Small spots or flecks on dorsal surface.	large white spots or bands running across dorsal surface. no nasal groove
	→ Marbled sal.

Small spots or flecks on dorsal surface.

dark base color. blue spots or flecks. no nasal grooves	very dark base color. silver flecks. very sticky. extreme Southwestern New England. nasal grooves.
	→ Slimy sal.

dark base color. blue spots or flecks. no nasal grooves

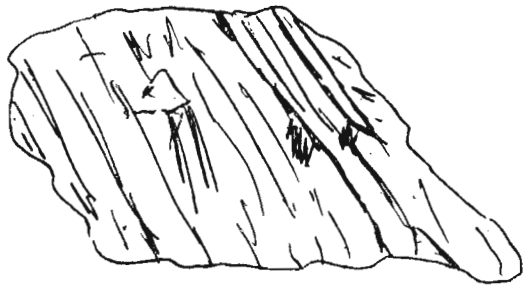
blue flecks. slender. long toes. long snout.	usually has spots instead of flecks. short toes. chunky.
→ Jefferson sal.	→ Blue Spotted sal.

→ Hybrid

Note: The construction of a Salamander key for general use is difficult because salamanders are rugged individualists in terms of size, shape and especially color. Nasal-labial grooves, most helpful to the expert, are often very difficult to see and have not been used on this key as a means for basic categorization.

Dan DeWolf 1974

TRIP: # GEOLOGY BIKE LOOP



LEADERS: Delio Tramontozzi
244-3377
&
RACHEL kuller

Date: July 15, 1991

MORE Biking!

Equipment:

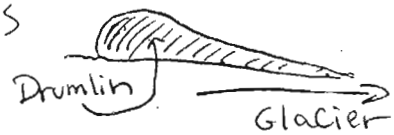
BIKE - preferably a 10 speed

HELMET

TIME: 8:30 A.M so we can check Bikes
2:00 p.m.

Possibly if you have one - Tire and bike tools + repair kit.
2 Canteens - One w water - H_2O and the other - something sugary! mmmm.
Field kit

I'm ready for more biking how about you guys! we will be biking and learning a lot about ROCKS - They're so interesting - HA! Our Rock person - Rachel - will be having lots of fun telling you about such things as, GLACIAL PAVEMENT, or Roxbury Conglomerant, Sedementary Rock, Metamorphosed Rock, Escars, Drumlins and lots O' neat Land formations. Do you know a really neat way to find out which way a glacier retreated to after leaving a Drumlin? You follow the axis of the Drumilin like this



BIKE - BIKE - BIKE

Leader: Rachel 332-5952
Times: 8:30—2:00 ☆ note the different times!
Wednesday, July 7, 1993

Geology Bike Trip

TripSlip #5

Equipment:
Field Kits
a bicycle
a bicycle helmet
No boots necessary—sneakers (not sandals) will do nicely.

If you do not have a helmet, CALL ME in advan

Hmm.... Geology...

There are 3 main types of rocks — SEDIMENTARY, IGNEOUS, and METAMORPHIC. Today we will discuss how they are formed and what they look like. How do these rock types relate to each other? What is the ROCK CYCLE?

The thing about geology which most intrigues me is the formation and evolution of land forms and geographical features. There are many natural forces involved with this process. Some include: GRAVITY, PLATE TECTONICS, WIND, WATER, ICE, and GLACIERS.... ....glacial geology is a subject in its own rights. We could spend all day talking about the KETTLE PONDS, ESKERS, DRUMLINS, CIRQUES, and GLACIAL PAVEMENT (to name a few) created by the monstrous ice masses which swept over the continent as recently as 14,000 years ago.

(Sorry there are no pictures here, but I just couldn't do the wonders of geology justice with my limited artistic talents.)

FOOD FOR YOUR ~~WOE~~ FISH:

Lichen, which is a life-plant-type-thing composed of LICHEN and ALGAE in a SYMBIOTIC (mutually supportive) relationship, helps to break down rock because they have a byproduct of a weak CARBONIC ACID which has a corrosive effect.

There are 3 types of lichen. Do you know what they are?

★ ROCKS ARE GREAT ★ LIKE SHALE + SLATE ★ I CAN'T WAIT!

RIPSLIP # 10
15 July 1991
Rachel 332-5932
and Delio 354-3377

GEOLOGY BIKE LOOP

830 to 2

EQUIPMENT: Field Kit
NO BOOTS
Bicycle
HELMET (Call if you don't have one!!!)
Extra Water
Sunblock
Bug Repellent
Enthusiasm
a PERMISSION SLIP

We will hand out water bot kits!

(1)

The BOSTON BASIN (where we stand) used to be part of AFRICA!!!

It moved to its present location through a process called CONTINENTAL DRIFT!!
(Yes, it's true, you're feeling the EARTH MOVE UNDER YOUR FEET!!)

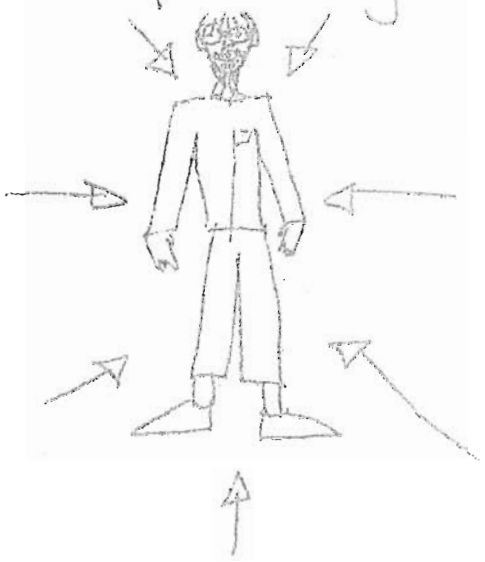
We'll talk about something called plate tectonics, which describes how the continents are CONSTANTLY MOVING.

Newton was formed over 600 million years ago when the earth looked cont.

(2)

a lot different. In fact, all the separate continents we know today were once ONE LAND MASS called Pangaea.

(discovered by a dude called Alfred Wegener!!)



(3)

The Ice Age

The youngest deposits were laid down in the Quarternary period, 2 million years to the present. They were laid down by the glaciers during the ice age. The glaciers plucked up and carried the rocks as it moved forward and deposited them as it retreated.

The glacier left different rock forms which are easily identifiable.

Some types to know:

cont.

(4)

GLACIAL TILL
GLACIAL ERRATIC
DRUMLIN
KETTLE POND
GLACIAL PAVEMENT
GLACIAL STRIATIONS
ESKERS
MONADNOCK
GLACIAL MORRAINE

PENEPLAIN

(5)

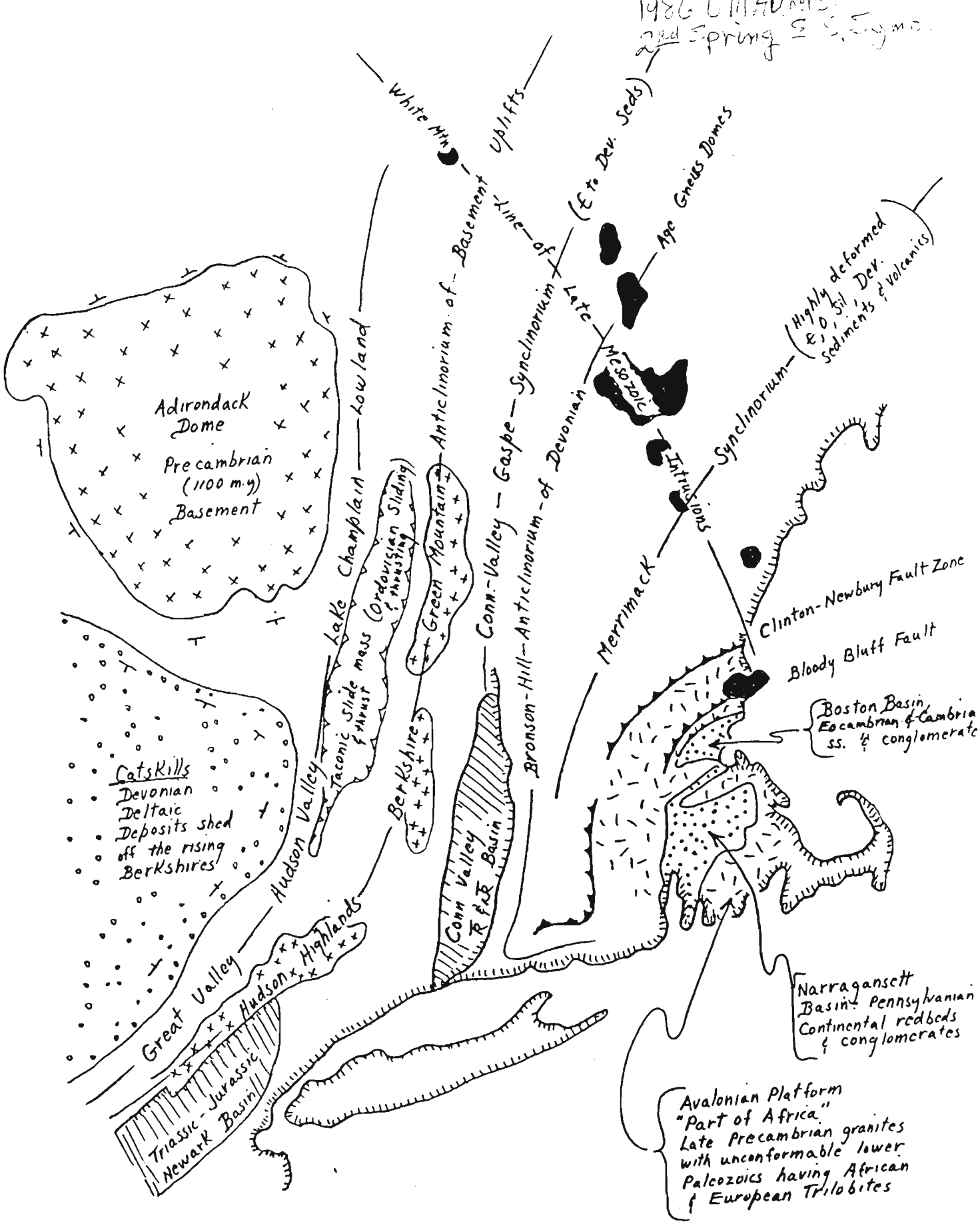
Rock TYPES

IGNEOUS: rocks formed from a liquid ⇒ hot molten volcanic materials cool to form this

SEDIMENTARY: rocks formed from layers of sand deposits i.e. Roxbury Conglomerate

METAMORPHIC: rocks formed from a pre-existing rock which is altered by heat & Pressure

(6)



DUW - 1977/1986