

Geoscience Lesson #2: Field Mapping

Topic: Field Mapping

Total Time: 50 minutes

Location: Wallace Hallway, West end of main floor

Required materials:

- Several rolls of masking tape
- Drawing paper
- pencils
- some sort of clipboard/drawing board
- large size paper for demonstration
- markers
- a bunch of limestone and granite rock segments
- tape measure
- a compass (hopefully working)
- The wicked cool Malachite sample (the green rock from Jeff's lab)
- a Paper recycling bin (usually at loading doc just around corner)

Class Setup:

- Under the stairway, lay out a 3m by 6m grid using the tapemeasure and masking tape
- Label the sides of the grid with the masking tape (eg: ABC for the 3m side, and 123456 for the 6m side)
- Lay limestone and granite rocks out on the grid such that it appears that there is a stripe or vein of granite running through the center of a field of limestone. Vein width should be about 1m-2m wide, running diagonally to make it less obvious
- On large papers, taped to the wall (these papers should already exist, so they can be reused):
 - 5 rules
 - Education requirements:
 - High School Graduation
 - Take Math, Physics, Chemistry, Geography
 - Go to University: U of Manitoba or Brandon University have geology programs
 - Job name: Exploration Geologist
 - Why become an exploration geologist?
 - Spend time outdoors (in summer)
 - Travel
 - Make discoveries that can be worth billions
 - This is the modern form of prospecting
 - Making your map in easy steps:
 - Draw a grid
 - Choose a symbol for the different types of rocks (G and L)
 - Map the locations of those rocks on your grid
 - Group the sections together
 - Add a scale
 - Add a direction

Before beginning class (5 minutes):

- Quick lesson summary before class begins
- Lead them past the mineral display cases, pointing out from of the rarer gems (ask them to recall what they learned about gems in the previous lesson as they do this)

- make sure that they know that these are what the gems look like before they are polished
 - Good gems to point out along the way:
 - Case #19 (under stairs): Garnets (labelled pyrope, almandine, spssartine, andradite, etc.): look like soccer balls. Can be much bigger than th ones we saw in the previous lesson.
 - #12: Malachite (green rock across from stairs) - let them know that if they get through the lesson alright today that you will bring out a big piece of this rock, and that they won't believe that it's a rock.
 - #10 Halite (salt)
 - #20 Topaz (precious)
 - #22 Emerald (the green Beryl, precious)
 - #8 Corundum (aka ruby, precious, second hardest mineral in the world)
 - #8 Uraninite (Uranium ore! Radioactive! but in very low levels. Tell them they'll get to talk about this again in another lesson)
 - #25 Crysotile (aka asbsetos!)
 - #5 Pyrite (aka fools gold)
 - #2 Gold, Silver and Diamonds
 - #1 The crystal shapes case - reinforce the content of the first lesson
- Have them drop their bags in front of the bank of lockers in the main hall.
- Warn them not to climb on the buoy

Lecture section (15 minutes):

- Review rules
- Review education requirements
 - Need math to understand angles, and similar relationships
 - Need physics to understand the properties of the rocks and minerals, like Hardness or Density
 - Need chem to understand the molecular structure of the minerals
 - Need geography to be able to understand maps, and think about things in terms of their position and orientations
 - But, you don't really need to know the human geography portions, like history, etc.
- What is Geoscience?:
 - Geology, Geophysics, Earth Physics, Geological Engineering, Gemology and more!
 - Study of the Solid Earth and its processes -- basically, rocks and minerals
 - One of the two main suppliers of raw materials for the world. "If it can't be grown, it has to be mined."
 - Isn't looking at rocks boring? "Well, I hope to show how it can be interesting."
- Why Study Geoscience?:
 - Jobs/Money
 - Social Good: powers the economy
 - Like to travel
- What is Exploration Geology?:
 - The process of searching for new places to mine and mapping the earth's surface rocks
 - Stress the importance of this job to society, because without this job, we wouldn't find any mines, and thus be able to make anything
 - Talk to them about working outside in summer
 - tell the story of living in a fly-in camp

- that the compass is pointing.
- Lastly, reinforce the importance of making maps in geology by pointing at the map of Manitoba that is on the wall across from the stairs. Let them know that the pink areas on the map is where the granite is, and that also happens to be the area where most of our mines are.

Teardown after class (5 minutes):

- Have kids return their mapping supplies to the cart
- If they are not keeping their map, put in nearby paper recycling bin
- Remove your example map grid, and get a fresh piece of paper handy for the next lesson.
- If you are on time, and the class behaved (which they usually do): get out the Malachite sample, put it on the floor, and let the kids go nuts. Recommend that they pick it up or flip it over to prove that it's a rock, but don't let a single kid monopolize it. Tell them Malachite forms near copper, so if you find it, you know that there is copper nearby. (Penny's rust green - that's essentially what malachite is.) In display case #1, there is a sample of malachite that has been cut open and polished, if they are interested in what the rock looks like inside.
- Review the education requirements, and the job description
- Talk about the next lesson (Microscopes - they will be able to look at granite up close, and use the rock saw.)

Teardown (last class of the day):

- The last class of the day can help you return the rocks to the cart, and remove the tape. This takes all of two minutes, and should be done before the Malachite is brought out in order to motivate them.