"MINERAL & ROCK COLLECTION STORY BOOK" COURSE GROUP FIELD PROJECT

"Rocks and minerals can be storytellers, if you can read the clues." During this all encompassing course field project it will be you and your group's job to get as many clues out of rocks and a mineral to tell their story of origin infused with graphics.

Instruction:

1. **Get into a Group:** Sign up in CANVAS for a group by going to **COURSE HOME PAGE > PEOPLE > [Project Groups] tab**. Groups are self select with a maximum of 4 students. You will submit only ONE PROJECT PER GROUP. Everyone in the group gets the same grade except "freeloaders" who will received a ZERO (details explained below). Please make sure you get contact info from group members so you can collaborate. Next to phone and email, a video team (e.g. MS Teams or Zoom) might be advantageous. The first person to sign into a group is the group leader. If you want to change the leader, let the instructor know. The leader will submit the final project for the whole group.
    a. If you are uncomfortable working in a group you can sign up as an "**Individual**" for doing the project by your lonely self. IMPORTANT NOTE: If you decide to work as an "Individual" you will need to do ALL THE PROJECT WORK by yourself. There is NO release or less work because you are only ONE person.

2. **Collect:** Plan one or multiple field trips to collect and assess specimens. You may also "divide and conquer" your collection sites, going out as individually to various locations. In the end you MUST have ONE mineral, ONE igneous rock, ONE sedimentary rock, and ONE metamorphic rock. Note where you found the sample (GPS coordinates) and take pictures in the field. You might need to use this later for your research and report compilation! The FREE field trip guide associate with this course can be used to help find specimens: https://earthscienceeducation.net/PUBS/FieldTripGuide.pdf However, you are NOT limited to the destinations in this field trip guide nor are you limited to the State of Colorado. You may use national or international specimens as long as you know the exact location of origin.

    a. COLLECTION RULES:
        i. RULE 1: Samples MUST be at least 4 inches in one direction. Your specimen should be about fist size. You will need to include a quality picture with ruler for scale with your write-up.
        ii. RULE 2: The rock / mineral must be dislodged from an original location, e.g. a rock outcrop; use a hammer to dislodge / break off your specimen
        iii. RULE 3: NO RIVER PEBBLES = NO ROUNDED or PARTIALLY ROUNDED SAMPLES. Rounded rocks have been transported and are no longer at their original location as indicated by rule #2. This is the case with beautiful pebbles / rocks from creek or river beds. Do NOT pick up small rocks directly from the side edge of a road either, which is most likely road base, hauled in from far away by trucks as the road was constructed.
        iv. RULE 4: Each sample must be collected from a different location, AT LEAST ½ MILE DISTANCE (as the crow flies) between each sample. Two or more samples from the same spot are NOT allowed.
        v. RULE 5: You must abide by State and Federal laws and NOT collect in protected areas such as National or State Parks. National Forests and BLM lands are okay unless prohibited by signs.

3. **Field Observation:** Note the location were you found the rock. Anything special about the place? Take a photo and describe the "bigger" picture.

4. **(Home) Lab Observation:** Back at home, clean the specimens with water. IDENTIFY the samples and describe its texture and composition in detail, as you observe it. Do NOT copy generic stuff out of the literature. What is it YOU see! Do any testing, such as density, hardness, streak, magnetism, etc. with your lab kit and report the YOUR measurements.

a. Note: If so desired, we can slice your specimen with our big rock saw at the MSU Denver geology labs to reveal its inside. For this you will need to contact our lab coordinator and bring your specimen to campus. However, this is purely OPTIONAL and NOT required.

5. **Write-up, research, pictures and project compilation:** Write the story of the collected samples, how did they form? What is their age? What do they tell us about the environment when they were formed? To help you get a good grade an outlined DOC template is provided for download. It helps to determine what should be included and which questions need answering.
   a. RULES for FULL CREDIT
      i. #1: When submitting your project, the maps in your report MUST BE TOPOGRAPHIC MAPS. No satellite images or road maps allowed. Maps MUST show map scale (Bar Scale). You must plot the collection locality of your specimen on the topographic map published in your write-up.
      ii. #2 Take a HIGH QUALITY picture (neat, sharp, good illumination) of each of your samples WITH scale and include these picture in your report. Make sure you have a figure caption on each.
      iii. #3: ABSOLUTELY NO HANDWRITTEN PROJECT MATERIALS ACCEPTED. The project with pictures and maps MUST BE ELECTRONICALLY PREPARED!!!!
      iv. #4: Proper and viable citations must be used.
      v. #5: Complete the group member contribution sheet and include with the report. Each group member vote / verify that the other group members deserve credit for the project.
      vi. #6: Turn in your write-up BY THE DEADLINE.

SUMMARY:

Collected Specimens	Document	Your story (diagenesis / history) should include:	Location
One (1) Metamorphic, one (1) Igneous, and one (1) Sedimentary Rock.	Give Correct Name with OBSERVED composition. For Sedimentary Rocks ADD grain size and sorting.	Igneous: formation history, Bowen's reaction series, magma type Metamorphic: formation history & depth / PT estimation Sedimentary: Stratigraphic rock Formation name, source area, transport history, depositional environment, geologic time	Print Topographic Location Map with Scale. Mark Sample Location. Give short description of Sample Location.
One MINERAL specimens	Give Correct Name with Chemical Composition and Crystal Form.	Formation of Mineral. How and when did it form! Use Bowen's reaction series when applicable.	
Citations: Use proper and viable references. Using ALL website references is NOT good practice.			

GRADING RUBRIC (same grade for each group member):

COMPOSITION & LAYOUT - one or multiple point deduction per infraction The appearance is neat and orderly and the report is complete with 4 samples. The project is typed and graphics and data are electronically prepared. Subscripts and superscripts are appropriately used. Graphics and data are placed in a coherent form. Proper formatted citations are included. ALL project rules were followed. The group member contribution sheet is included. Minimum of 5 pages PLUS title page.	/10
WRITING, GRAMMAR & STYLE - one point deduction per infraction Spelling and grammar are correct. Word repetition and use of first person language is avoided. Appropriate language and terminology is used.	/20
FACTUALITY & CONTENT - one or multiple point deduction per infraction Statements, assertions and conclusions made are factually correct. Diagenesis (how it was made) is detailed and includes Igneous: formation history, Bowen's reaction series, magma type; Metamorphic: formation history & depth / PT estimation; Sedimentary: stratigraphic rock Formation name, source area, transport history, depositional environment, geologic time. The correct specimen name and other pertinent information, such as applicable chemical formulas, grain size, sorting, texture, etc. are included in the correct context. NOTE: ea. missing sample -10 pts.	/40
GRAPHICS & ILLUSTRATIONS - one or multiple point deduction per infraction **SPECIMEN PICTURES & OTHER GRAPHICS:** Clear, of high quality and resolution to see detail, and with neutral background. Photograph shows scale to size sample. Photo has caption with description and photographer credit. NOTE: ea. missing photo -10 pts.	/30
GRAPHICS & ILLUSTRATIONS - one or multiple point deduction per infraction **TOPOGRAPHIC LOCATION MAP:** A topographic location map (NO satellite imagery) with specimen location is included. The insert is electronically prepared, clear, and shows detail. The map has a bar scale and caption with description. The map is properly cited. NOTE: ea. missing map -10 pts.	/30
CITATION - one point deduction per infraction A minimum of 3 citations per specimen are needed. One of the citations should be the map used. Correct citation of sources, especially web references is imperative. While the citation style can be of your own choosing, it must be consistent throughout. Use a citation manager as explained below which will allow you to collaborate as a group and properly insert and format directly into your word document.	/20

- NOTICE: By accepting & opening this assignment packet you agree to abide by and consent to the MSU Denver Fieldtrip Liability Waiver Regulations -

Printed work MUST BE ELECTRONICALLY PRODUCED! This includes chemical formulas, equations, tables and special characters. Become intimately familiar with these functions in your preferred word processor. Be familiar with placing and sizing visuals into a written document.

Additional fault codes for specimen samples	Including, but NOT limited to: Sample too small or rounded: -8 ea.; Sample within ½ mile of another: -8; Sample missing: -10; Write-up and required sample missing:-40

Note: If you want your samples back, clearly mark the outside of your box. Otherwise samples will be donated to MSU Denver EAS laboratory collections.

IMPORTANT NOTICE:

Your write-up for the project needs only a **TITLE PAGE** indicating ALL group members, the Professor and the course
(Minimum of 6 pages including the Title page)

!!! WARNING !!!

Don't waste my precious grading time by turning in last minute "trash"!
I reserve the right to REJECT any project that does not meet MINIMUM COLLEGE LEVEL WORK... even if submitted by the deadline!
You have been warned!

PROJECT GOALS & OUTLINE:
In order to prepare you for future Undergraduate Research (UR) projects or investigative assignments in other courses, you will develop important skills by completing an in-depth field project that includes collecting one mineral, one igneous, one sedimentary, and one metamorphic sample from a variety of locations. An integral part of your learning and investigation is answering the following questions for each of your specimens.

What did I find?

Learning Objective: Identification

You will need to identify what you have found and name it correctly. As part of the identification process you will need to record identifying characteristics. (Examples: density, hardness, observed mineral composition, etc.)

What is it that I have found?

Learning Objective: Observation

To answer this question you will need to describe what you can observe about your specimen. What is it made out of, the color, is it transparent / translucent / opaque, identifying marks, fossils, taste, smell... A picture of your specimen is essential. Research the composition and other details of your sample. Make sure you describe what YOU observe, don't just copy descriptions out of a text. Stick with your specific specimen which is most likely different than a similar / same object from Mongolia.

How was it made?

Learning Objective: Interpretation

This is a MAJOR part of your project, figuring out HOW YOUR SAMPLE FORMED, in other words TELL THE STORY OF THE ROCK / MINERAL! Here you will need to do some research. How was your specimen actually formed by Mother Earth? The scientific term for this process is "diagenesis". Try to find out how your rock or mineral was created. Did it crystallize from molten rock? Was it originally deposited in a lake or ocean? Was it precipitated by water or other fluids? Can you find the answer by studying Bowen's Reaction series, or is that series irrelevant to your specimen? Was there a chemical reaction that altered or replaced something that was originally there? Use your observations together with literature research to come up with a plausible explanation for the creation. Document your sources carefully. BE THOROUGH!.

Where was it found?

Learning Objective: Documentation

You need to give enough detail about the collecting location of your sample that a third party could find it. This is done two ways, by written description and by presenting a map, which must be a topographic map. The easiest way to include a map graphic in your report is by using Google Maps. Here is a step by step approach: (1) Locate your collecting site on Google Maps. (2) In map options, click Terrain. *Note: This option will only be available at certain zoom levels. If you are to far out, it isn't there.* The map will turn topographic with appropriate contour lines. (3) Use a snipping tool (like Windows Snipping Tool in the accessories folder) to frame and snip the part of the map you would like to copy. Don't forget to include the map scale. (4) Go to your project document, put the cursor where you would like to insert the map and hit "paste" (Ctrl+v). The map will paste in this location. Now you can size and move it to make it fit your document. (5) Don't forget to properly cite the source of your Google Map Snippet. Here are some examples: APA style citation, MLA style citation. *Note: I do not care which style citation you use, just be consistent.*

Where did I get my information?

Learning Objective: Documentation

Properly citing sources both in your text and in a citation index is very important. Familiarize yourself with PROPER citation. An excellent tool to expedite citations, keeping track of them and automatically generate them in a Word document is Zotero, a FREE open source software app that can be used as stand alone and also in integration with your browser (Zotero.org). This will help you not only in this course, but for all possible research papers you will need to write in the future. Integrated into Word It will automatically format your citation index into the correct style (so you do not have to worry about this). You can keep your bibliography for future reference and you can collaborate with friends with the FREE Zotero cloud server.

GROUP MEMBERS Maximal 4 group members - Everyone in the group will receive the SAME grade!

Group Member 1 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 1 receive Full Credit for the project?	Group Member 2	☐Yes ☐No ____ Initial	
	Group Member 3	☐Yes ☐No ____ Initial	
	Group Member 4	☐Yes ☐No ____ Initial	
Group Member 2 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 2 receive Full Credit for the project?	Group Member 1	☐Yes ☐No ____ Initial	
	Group Member 3	☐Yes ☐No ____ Initial	
	Group Member 4	☐Yes ☐No ____ Initial	
Group Member 3 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 3 receive Full Credit for the project?	Group Member 1	☐Yes ☐No ____ Initial	
	Group Member 2	☐Yes ☐No ____ Initial	
	Group Member 4	☐Yes ☐No ____ Initial	
Group Member 4 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 4 receive Full Credit for the project?	Group Member 1	☐Yes ☐No ____ Initial	
	Group Member 2	☐Yes ☐No ____ Initial	
	Group Member 3	☐Yes ☐No ____ Initial	

Overall Grade for Each Group Member	**Project Grade Points**	**/150 %**

The group leader will submit the final report for EVERYBODY in the group!

General Writing Instruction Summary:

- Use professional language, which means AVOID first person expressions such as "I", "we", "our". Use normal prose, active voice and third party language. Do NOT use informal wording, contractions, jargon, slang terms, or superlatives. Exclude similes/metaphors (and humor!)
- Use present tense to report well accepted facts, e.g. 'Pyrite is a sulfide mineral'. Use past tense to describe specific results, e.g. 'When acid was applied, the specimen effervesced'
- Be quantitative wherever relevant (stats, numbers etc.).

Subscript & Superscript: Use appropriate subscript and superscript, especially when it comes to chemical formulas and mathematical units..
Acceptable examples: 2.9 g/cm^3, H_2O, PO_4^{3-}, a_g=9.8m/s^2
Unacceptable examples: 2.9 g/cm3, H2O, PO4 3-, ag=9.8m/s^2

- Use precise concrete language, no ambiguity e.g, 'correlated' ≠ 'related'. Use simple language – no unnecessary "frills" (distractions). Pay attention to sentence structure and grammar

COMPILING FIGURES

GRAPHICS are the heart of any report. Nothing is more true than in science that a picture is worth a thousand words. Always compile graphics first and then write your text focusing on your graphic. In order to create good graphics and photographs, follow the instructions below.

Cameras and Photos:

Modern cell phones have excellent cameras, but CLEAN your lense! When taking pictures, lighting and background is key. This means dark objects should be photographed with light or white backgrounds (sheet of paper) and visa versa for light objects. Having adequate lighting will also help to get sharp, crisp, in focus pictures. Blurry and out of focus pictures are not acceptable.

Graphics:

You should be able to modify, enhance, annotate or overlay graphics. Make sure graphics are crisp, clear and any label is easily readable. All graphics should have a caption stating a short description of the graphic, the author and/or the citation.

Screen Capture Software: A screen capture or snipping software is advantageous in order to grab a map or parts of a map from the screen. Windows 10 & 11come with a screen snipping tools. Use the "Windows + Shift + S" keys and the screen-snipper will open. Frame the portion of the screen that you would like to copy by holding the left mouse button. When you let go of the button, the selected are will be automatically copied to your clip-board to be inserted (CRTL + V) into a document.
Note: When snapping a picture, make sure it is large enough on the screen to capture enough pixels to have adequate resolution for the final product.

NOTE: Compiling acceptable and good looking graphics and photographs is very involved and can not be rushed. These are often the heart of any report and should be compiled BEFORE writing. Last minute thrown together graphics will without doubt lower your grade on the client report significantly.

Citation Manager:

It is highly recommended that you will use a citation's manager and database that will autoformat and incorporate into Word. In this way you can easily keep track of your (online) resources and it will automatically format your citations correctly, including things you find on the web. My suggestion is the following powerful, FREE open source software:

ZOTERO citations database	ZOTERO is a citations database that incorporates itself into Word and your Browser.	Free open source software available at https://www.zotero.org/

Note: You may use a different citations database.

It comes with a incorporate cloud based system that will allow you to collaborate and share information between group members and to update while in various locations doing your research.

NOTE: After downloading and installing ZOTERO, take an hour or two to become familiar with the operation of the software. Use either MLA or APA citation style.

COMPOSITION, LAYOUT, WRITING & GRAMMAR SUMMARY

Language

The following list is an example of common faults in language usage and attribution.

Errors / Mistakes / Faults	Examples with margin *Fault Counts & Codes*	
Spelling: incl. capitalization errors & spacing	| |	The mineral florite has a mohs hardness of four. Nicolas Steno was trained in the classical texts on science.
Grammar: incl. punctuation, superfluous words, transpositions	|	Isometric crystals are also isotropic Here light propagates at the same speed.
	| |	Rocks are composed of many many minerals mixed.
Style: incl. paragraph, repetitive expressions / words erroneous expression / words, sub- or superscription, unprofessional style, word insertion	|*Para.* ||*rep*	... in the geologic sciences.¶Near the end of the 19th a new theory ... ... is a light colored mineral. These light colored minerals are often light...
	|	Stalactites hang from the sealing? of a limestone cave.
	|*sup*	The density of quartz is 2.65 g/cm3.
	| |	I was investigating the outcrop with my group.
	|	Sodium sulfate forms a chalky, incoherent precipitate. *amorphous?*
Sentence: incl. grammar, run-on, strings of nouns	|	The density of gold is greater then? the density of silver.
	|	Pyrite has a symmetrical crystal structure, it is cubic.
	| |	Skarn mineral zonation? is apparent in the sample.

Content

Errors in content are spelled out. Severe infractions may count for multiple errors.

Errors / Mistakes / Faults	Examples with margin *Fault Counter & Codes*	
Unclear / erroneous statements	|*unclear, units?*	Mohs hardness of the mineral in question is 16.5.
False / nonsense	||*Nonsense*	Glaciation cause severe metamorphism of the region

PROJECT LAYOUT SAMPLE ... what should be included for a PERFECT report
- remove brackets and superfluous text -

[PROJECT TITLE]
[Your title should summarize the purpose of the project]

[NAMES including group partners]

[INSTRUCTOR]

[DATE]

[COURSE ID]

[PROJECT TITLE] [YOUR NAME] Page #

[Insert group member logs and credit votes]

Group Member 1 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 1 receive Full Credit for the project?	Group Member 2	☐Yes ☐No ____ Initial	
	Group Member 3	☐Yes ☐No ____ Initial	
	Group Member 4	☐Yes ☐No ____ Initial	
Group Member 2 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 2 receive Full Credit for the project?	Group Member 1	☐Yes ☐No ____ Initial	
	Group Member 3	☐Yes ☐No ____ Initial	
	Group Member 4	☐Yes ☐No ____ Initial	
Group Member 3 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 3 receive Full Credit for the project?	Group Member 1	☐Yes ☐No ____ Initial	
	Group Member 2	☐Yes ☐No ____ Initial	
	Group Member 4	☐Yes ☐No ____ Initial	
Group Member 4 Name: Contact Info:	Activity Description	Date	Hours (Hrs:min)
Job Summary:			
Should Group Member 4 receive Full Credit for the project?	Group Member 1	☐Yes ☐No ____ Initial	
	Group Member 2	☐Yes ☐No ____ Initial	
	Group Member 3	☐Yes ☐No ____ Initial	

[MINERAL NAME]

[Chemical Formula]
[Crystal Class]
[Describe the mineral using correct terminology]
[Insert **Picture** of YOUR specimen here! Do NOT copy from other sources. Use figure captions for all figures, pictures, or graphs you include. Make sure scale is included]
[Insert any other graphic(s) you may find helpful. These could include crystal models or atomic models. Make sure these are cited properly]
[Summary of physical mineral parameters, such as hardness, streak, density, etc.: Should be observed / measured by you! Can be tabulated or in bullet format]
[Other pertinent information! and may be copied from resource material, AS LONG AS IT IS PROPERLY CITED]

Diagenesis: [= how did the mineral form? This is the heart of the mineral page. Tell the story of how the mineral formed. E.g. Bowen's reaction series, precipitation story, metamorphism / metasomatism. Focus in detail on how the mineral actually formed at your specific sampling location. What is your evidence for your hypothesis?]

[AVOID copying general rock forming descriptions from the literature. Research and make it specific to the mineral found at your location.]

[Insert **TOPOGRAPHIC map** of sample location. Make sure scale and location marker are included]
[With the map, enter a short location description, detailed enough to find without map. Add Longitude - Latitude GPS position.]

Citation:
[At minimum, cite the map used! Indicate any other references used for the mineral here!]

[PROJECT TITLE] [YOUR NAME] Page #

[IGNEOUS ROCK NAME]
[Descriptors: such as intrusive, extrusive, aphanitic, phaneritic, porpheritic, etc.]
[Magma Type & approx. formation temperature]
[Insert **Picture** of YOUR specimen here! Do NOT copy from other sources. Use figure captions for all figures, pictures, or graphs you include. Make sure scale is included]
[Insert any other graphic(s) you may find helpful. Examples might be Bowen's reaction series or specific types of volcanoes or eruptions. Make sure these are cited properly]
[Description & size range (metric) of VISIBLE minerals present and their estimated percentages. Do NOT copy from other sources. This is a description of what YOU observe using your handlense.]

Diagenesis: [= how did the igneous rock form? This is the heart of the igneous rock page. Tell the story of how the rock formed. E.g. Bowen's reaction series, intrusive or extrusive, etc.. Focus in detail on how the igneous rock actually formed at your specific sampling location. What is your evidence for your hypothesis?]

[AVOID copying general rock forming descriptions from the literature. Make it specific to the mineral at your location.]

[Insert **TOPOGRAPHIC map** of sample location. Make sure scale and location marker are included]
[With the map, enter a short location description, detailed enough to find without map. Add Longitude - Latitude GPS position.]

Citation:
[At minimum, cite the map used! Indicate any other references used for the igneous rock here!]

[PROJECT TITLE] [YOUR NAME] Page #

[SEDIMENTARY ROCK NAME]

[Descriptors: such as arkosic, siliceous, fossiliferous, sorting, grain size, etc.]
[Stratigraphic Formation Name & Age]
[Insert **Picture** of YOUR specimen here! Do NOT copy from other sources. Use figure captions for all figures, pictures, or graphs you include. Make sure scale is included]
[Insert any other graphic(s) you may find helpful. Sedimentary rocks lend themselves especially to additional information. Photos of outcrops, cliffs and hogbacks, or trace fossils or layering may be helpful. Diagrams of transport and depositional environment or stratigraphy and age illustrations can all be added. Make sure these are cited properly]
[Description & size of VISIBLE minerals present and their estimated percentages. Do NOT copy from other sources. This is a description of what YOU observe using your handlense.]

Diagenesis: [= how did the sedimentary rock form? This is the heart of the sedimentary rock page. Tell the story of how the rock formed. Describe in detail how the sedimentary rock was transported, deposited, and cemented based on your observations. What is its original depositional environment? How did the sedimentary rock actually form at your specific sampling location. What is your evidence for your hypothesis?]]

[AVOID copying general rock forming descriptions from the literature. Make it specific to the mineral at your location.]

[Insert **TOPOGRAPHIC map** of sample location. Make sure scale and location marker are included]
[With the map, enter a short location description, detailed enough to find without map. Add Longitude - Latitude GPS position.]

Citation:
[At minimum, cite the map used! Indicate any other references used for the igneous rock here!]

[PROJECT TITLE] [YOUR NAME] Page #

[METAMORPHIC ROCK NAME]
[Metamorphic Grade & Descriptors: such as foliated, non-foliated, micaceous, etc.]
[Burial Depth & Pressure/ Temperature estimate]
[Insert **Picture** of YOUR specimen here! Do NOT copy from other sources. Use figure captions for all figures, pictures, or graphs you include. Make sure scale is included]
[Insert any other graphic(s) you may find helpful. A pressure and temperature diagram, for example, might be helpful. Al;so diagrams that show the metamorphic plate tectonic environment may enhance your write-up. Make sure these are cited properly]
[Description & size range (metric) of VISIBLE minerals present and their estimated percentages. Do NOT copy from other sources. This is a description of what YOU observe using your handlense.]

Diagenesis: [= how did the metamorphic rock form? This is the heart of the metamorphic rock page. Tell the story of how the rock formed. E.g. maximum pressure, maximum temperature, approximate burial depth, metamorphic or metasomatic, regional or contact metamorphism caused by what, etc.. Focus in detail on how the metamorphic rock actually formed at your specific sampling location. What is your evidence for your hypothesis?]

[AVOID copying general rock forming descriptions from the literature. Make it specific to the mineral at your location.]

[Insert **TOPOGRAPHIC map** of sample location. Make sure scale and location marker are included]
[With the map, enter a short location description, detailed enough to find without map. Add Longitude - Latitude GPS position.]

Citation:
[At minimum, cite the map used! Indicate any other references used for the igneous rock here!]