

Parkers Prairie High School
2012 South Dakota Field Investigations Trip

Journal Assignments

Guidelines for Your Journals

- Put the name of each site (“stop”) on the top of your journal page. Start a new page for each site.
- Use a pencil. It writes best on the special waterproof paper in your journal.
- On bus rides in between sites, it would be a good idea to write the assignments for the next site in your journal – or at least write a clear heading so both of us can find it later.
- Be sure to complete assignments at each site. Check the checklist as you complete each item. Remember, we are not going back!
- At the end of the day, answer the day’s Essential Questions by including all of the learning targets in your explanation. Do a complete job on these every day! This is the big learning picture and the bulk of your score for this trip.
- All journal work is important for you to gain understanding and to be able to address the Essential Questions at the end of the day! There are lots of people to help you. Make sure you are completing all work each day.

Day 1 - Monday, May 14, 2012

Learning Goals: On the bus, as we leave Parkers Prairie, write three LEARNING goals for yourself for this week. What do you hope to learn about GEOLOGY over the next five days? (Think BIG learning goals, rather than small factoids!)

Essential Question 1: How does wind become energy and is it a good thing or a bad thing – or both?

Targets:

I can...

- **Explain how wind is converted to energy**
- **Discuss the advantages and disadvantages of wind as an energy source**

Essential Question 2: How do rocks provide evidence of change over time and how are those environments recorded in the rocks?

Targets:

I can...

- **Recognize regional rock types by their characteristics**
- **Recognize characteristics in the rocks that show evidence of past environments**
- **Use rock types and characteristics to put together the story of the places we see from past to present.**

Stop 1.1: Wind Energy and Electric Power Generation in Southwestern Minnesota

- Make at least three observations and write at least one question about what you see, hear or feel.
- Discuss some advantages and disadvantages of wind energy. Is wind energy the answer to our energy problems? Is it the answer to our climate change problem? Why or why not?

Stop 1.2: Geology and Cultural History of Pipestone National Monument

Before going out on the trail, meet with your group and share your learning goals for the week.

- During your walk to the outcrop, make at least three observations and write at least one question about what you see, hear or feel.
- At the outcrop, look closely at a piece of quartzite through a lens. Draw what you see.
- How do you think the talus got here? Make a hypothesis and support your explanation with evidence. (A drawing might help.)
- You will see signs of “cross-bedding” in the rocks at Pipestone. Think in advance what cross-bedding might look like and write or draw your prediction in your journal.
- Draw an example of cross-bedding and explain how you think it was formed.
- You are a grain of sand. Describe your passage through time as you become quartzite.

Stop 1.3: Devil’s Gulch Recreation Area

- Make at least three observations and write at least one question about what you see, hear or feel.
- How do you think this gulch formed? What is the evidence that led you to this hypothesis?
- Pick any rock that you know other than quartzite – would it erode faster or slower than quartzite. Explain!
- Would the gulch look the same if it was made from your rock? How would it be different?
- What do Devil’s Gulch and Pipestone have in common? How are they different?
- On the bus, as we drive to the KOA, discuss how the landscape has changed since we left Parkers Prairie. Make a list of these changes. (Include detailed observations of the plants,

animals, soils, etc.) What are some earth science reasons why the landscape is different?
(We will process this on the bus.)

NOW...Answer the Essential Questions for today! Be sure to include the items in the learning targets in your explanation.

Day 2 - Tuesday, May 15, 2012

Essential Question 3: How were the Badlands formed and why are they so different from anything around them?

Targets:

I can...

- **Recognize changes in sediment and rock layers from location to location**
- **Use data to generate findings about an area that are clues to its present and/or past**
- **Hypothesize past processes from the present landscape and rock evidence**

During our morning drive to the Badlands, start using your South Dakota map and itinerary to trace our route for the next three days!

Stop 2.1: Chamberlain Rest Stop

- Walk the path to the overlook at the north end of the rest stop. Stop where the sidewalk turns and starts to head down to the trees. Sketch the river valley as you look upriver from this site. How do you think this valley was formed? How do you know?
- How does the rock used to make the Visitor Center building compare to rocks you have seen on this trip?

Stop 2.2: Badlands National Park

- Make at least 3 observations and write at least one question about what you see.
- Pick an area and sketch it in your journal. What details did you observe while making your drawing that you didn't notice before?
- Pick a quiet place to sit and write for 5 minutes. Write about what you see, how it makes you feel, and what thoughts or questions it brings to mind. You **must** do this alone!

Stop 2.3: Door Trail at Badlands National Park

- Make at least three observations and write at least one question about what you see, hear or feel.

- Pick up and feel the soil. Look at it through a lens. Describe it.
- Meet in groups to share your observations about the soil. How is it different from the soil in Parkers Prairie? (Mrs. Schoeneck has a bag of soil from Parkers that you can use for comparison.)
- Together, talk about some observations that you could use to collect data on in this area. Record some experimental questions (based on your those observations) in your journal. Pick a question that you can test, using any of the materials in the “inquiry bag”. Carry out your investigation and record your data. How did your investigation answer your question? Do a whiteboard presentation for your class.
- Are these rocks igneous, sedimentary or metamorphic? How do you know?
- How did this area form? Make a hypothesis and provide at least two pieces of evidence to support it.

Stop 2.4: Collecting Activity and Investigation: Rocks, Agates and Buffalo National Grasslands

- Make at least three observations and write at least one question about what you see, hear or feel.
- Collect 5 stones that you think are cool. Get in a small group with other students. Compare the rocks and try to find two that are the same. What evidence do you have for thinking so?
- What do you think it would be like to stand here 10,000 years ago when most of these stones were deposited? Include sounds, sites, colors, and smells in your description.

NOW...Answer the Essential Question for today! Be sure to include the items in the learning targets in your explanation.

Day 3 - Wednesday, May 16, 2012

Essential Question 4: How do water processes shape the landscape?

Targets:

I can...

- Use rock type to infer past environments
- Use landscape evidence to infer water processes, past and present

Essential Question 5: What do fossils tell us about the past?

Targets:

I can...

- **Use fossil structures to hypothesize how they are related to environments in past times.**

Stop 3.1: Wind Cave National Park

Bring a small flashlight today and be sure to wear long pants and sturdy shoes!

- Make at least three observations and write at least one question about what you see.
- Observe the rocks in and around Wind Cave. Are these rocks igneous, sedimentary or metamorphic? How do you know?
- With your group, do a quick overview of the landscape at the surface of Wind Cave. What are the characteristics of this particular ecosystem? Decide what data that we need to collect to find out more. Break into smaller groups to collect data on any interesting, observable characteristics of the land. You are not running a controlled experiment, but gathering data on landscape features. Be prepared to come back and report on what you found out.
- What was the most interesting thing you learned at Wind Cave?

Stop 3.2: Black Hill Geology Research Institute.

- Look around the museum first – Write a question for Neal.
- Select one similar structure (like the shells, teeth, jaws, toes, hips, etc.) from two dinosaurs or two other related creatures. Sketch both, then compare and contrast the structures of the two animals.

NOW...Answer the Essential Question for today! Be sure to include the items in the learning targets in your explanation.

Day 4 - Thursday, May 17, 2012

Essential Question 6: How do mountain building and erosion processes interact to make the landscape that we see?

Targets:

I can...

- **Use rock type to infer past environments**
- **Use the present landscape to infer past processes and their interactions, including plate tectonics and erosion**

- Make at least three observations about the rock outcrops we see on our drive to Devil's Tower. (Sketching one might help.)

Stop 4.2: Devil's Tower: Igneous Rock and Area Plate Tectonics

- At Devil's Tower, make at least three observations and write at least one question about what you see, hear or feel.
- On the trail, look at a talus sample through a lens. Draw what you see. How is this rock different from all the rocks we have seen so far?
- At the overlook, compare the rock material at the tower with the rocks you observe in the valley. Describe both in your journal. How are they different?
- How do you think Devil's Tower was formed? Write a hypothesis in your journal and give EVIDENCE to back it up!

Stop 4.3: Spearfish Canyon

- Are these rocks igneous, sedimentary or metamorphic? How do you know?
- How do you think this canyon was formed? How do you know it was not formed by a glacier?

Stop 4.4: Homestake Gold Mine, Lead, SD

- Make a quick sketch of the open mining pit. (Don't worry about the roads. Draw the rocks.) You are looking at the inside of a mountain! Write at least three observations of what you see.
- Are these rocks igneous, sedimentary or metamorphic? How do you know?

Stop 4.5: Mount Rushmore

- Make at least three observations and write at least one question about what you see, hear or feel.
- Make at least three observations of the boulders along the walkway just on the other side of the black metal fence. Draw the crystal of one mineral of your choice. Are these rocks igneous, sedimentary or metamorphic? How do you know?
- On the bus, talk to your friends about what you observed in general about the Black Hills and the Badlands. Why do you think these two areas are so different? Write your thoughts and observations in your journal.

- *Quaquaversal* is a cool and fun geology word. Write the word in your journal and what you think it means. Find out what it really means and what it has to do with the formation of the Black Hills. Say it ten times really fast!

NOW...Answer the Essential Question for today! Be sure to include the items in the learning targets in your explanation.

Day 5 - Friday, May 18, 2012

Essential Question 7: Why is geology important to learn and understand?

Targets:

I can...

- **Describe why I should care about the GEOLOGY I have seen and experienced this week on the trip!**
- On the bus, write some comments about why this trip was important to you. How do you think you will remember these last five days?
- Look at the learning goals you wrote on the first day. Did you meet or exceed these goals? **EXPLAIN!**
- After five days of field investigations, what new or unanswered questions do you have about geology? (Yes, you must have some!)

NOW... for the final time...Answer the Essential Question for today! Be sure to include the items in the learning targets in your explanation.