PALEOZOIC STRATIGRAPHY

Paleozoic Stratigraphy of Minnesota in Metro Area

Step 1: Wabasha Street Bridge at Kellogg Blvd.
1. Stand at railing on Kellogg Blvd. and look SSW across the river at the bluff.
   Describe what you see.
   Draw a simple sketch of the bluff.
   What are the rock(s) where you are standing?

Step 2: Lilydale Regional Park.
We will park the vans in a parking lot and be facing looking north.

Teacher: Timothy S. Chase
School: Murray Junior High School
2200 Buford Avenue
St. Paul, MN 55105

Class and Grade Level: 7th and 8th grade

Teacher Goal: this student research was designed to facilitate student’s understanding of the stratigraphy of the rocks and their relative positions (stratigraphy).

Student Objectives: Student will be able to:
1. Sketch and describe major characteristics of the rocks in their relative positions (stratigraphy).
2. Identify different rock types found or not found in the area.
3. Hypothesize as to why the strata has the pattern of life that it does.
4. Formulate a hypothesis regarding which rock layer is older/younger.
5. Measure particle size of sandstone fragments using a chart from the field notebook.

SOILS

TIMEs INQUIRY

Times Inquiry

Teacher: J.A. Rafton
School: Dakota Meadows Middle School
N. Mansfield, MN 55003

Grade Level/Class: 9th grade Earth Science

The Geology of Your Backyard

Project Synopsis: Soil investigation is designed for 9th grade students (5 sections), working in groups of 4, to complete in a 45 minute class period.

Courtland clay mini investigation is designed for individual as well as large/small group work.

Students will observe soil types/profiles at three locations within walking distance of class. Students will collect soil samples, sketch soil profiles and determine soil permeability at the three locations. Students will bring a soil sample from home to compare and contrast with school site soils.

Students will be able to:
1. Develop a general understanding of soil horizons.
2. Identify the soil type found in the Mankato area.
3. Identify general soil types of the rock cycle.
4. Use a variety of maps.
5. Construct a simple topographic map.

On this course with John after geology unit and implementation of all these action plans.

Teacher Comments:

What worked?

All students were far more engaged and interested in the soil unit than previous years. They wanted to be involved and actively doing something. Their questions showed marked insight and relevance. Students grasped the concept of hypothesis at a much deeper level than with previous years activities. Students retained more detailed information and more information about methodology because they were active in the field investigation.

Assessment obtained by written reflections on open-ended questions (over the month long unit) showed great care and detail in their understanding.

What didn’t work?

Although I changed how I assessed the students after the geology unit, they seemed to struggle more with the last material than previous years.

The sequencing and pacing of the unit with addition of the field investigation needs some adjustment.

ACKNOWLEDGEMENTS

We would like to thank ALL the teachers who have participated in TIMES; we have learned so much from you. We would also like to thank the Science Museum of Minnesota, North Hennepin Community College, the University of St. Thomas, Winona State University & St. Cloud State University.

The presenters for material illustrated in this poster were Dr. Carrie Jennings Patterson, Dr. Kate Pound, Megan Jones, Jim Meyers, Tony Runkel, and Howard Hobbs.

TEACHER REACTIONS

“This has been very beneficial for me since prior to teaching earth science I had only two geology college classes and no field geology. I have had to learn all the material I teach on my own. Now I feel more confident in my knowledge.”

(TIMES V participant)

“All serious, dedicated earth science teachers should take this course because the opportunity to meet and talk with other earth science teachers is invaluable”

(TIMES II participant)

“I will be ‘turning things upside down’ – no more read first, then discuss. Instead we’ll look first, then discover, then discuss, then read. How exciting!”

(TIMES III participant)

“I have increased my knowledge of Twin Cities geology to the point that I feel I can address any student’s question.”

(TIMES V participant)

This has been the most valuable class I’ve participated in. It was nice to learn some real content in context. So often the classes I take seem to just re-teach what I already know – this class challenged me!”

(TIMES I participant)

THE KEY BOOKEND: TAKING TIME TO DISCUSS AND PLAN CLASSROOM IMPLEMENTATION

Monday

Introduction

Tuesday

Van Discussion Assignments

Wednesday

Pedagogy Discussion Reflection & Action Plans

Thursday

Pedagogy Discussion Reflection & Action Plans

Friday

Pedagogy Discussion Reflection & Action Plans

SOILS

Tuesday

GET WET! Day

Wednesday

Pedagogy Discussion Reflection & Action Plans

Thursday

Pedagogy Discussion Reflection & Action Plans

Friday

Van Discussion Assignments

Groundwater & Karst

Stratigraphy in SE Mn.

Kanto Features

Groundwater, Springs Environmental

Fault

SOILS

Examines soils in Tiller Corp.

Gravel Plains and Quabas

Plate Tectonics Earthquakes

Friday

Evening Free

Late Return

Evening Free

Evening Free

Weekend

Pedagogy Discussion Reflection & Action Plans

URBAN “RESOURCES” INTRO. TO GLACIAL

Science Museum

Welding Tool (Dimension Stone) of St. Paul

River Warren Falls,

Mississippi River Gorge &

Retreat of St. Anthony Falls

Pedagogy Discussion Reflection & Action Plans

Geologic Maps

County Geologic Atlas

Friday

Pedagogy Discussion Reflection & Action Plans

UNREBOLVED GEOSCIENCE

Post-lates

Evaluations

Finish at 2pm

Access to the natural scene as described by a student, and explains the change in facies from sea level. 2. Identify different fossil types found or not found in the area. 3. Hypothesize as to why the strata has the pattern of life that it does. 4. Formulate a hypothesis regarding which rock layer is older/younger. 5. Measure particle size of sandstone fragments using a chart from the field notebook.