

# Pre-assessment: Gauging Students' Preparedness for Sedimentary Geology

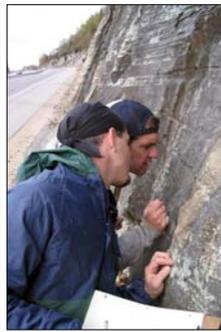
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How ready are your students to observe, describe, and interpret sedimentary rocks? How readily can they recall and transfer knowledge and skills taught in earlier geology or cognate courses? How much class time should you devote to review before launching into new material? Which of your students are most likely to have the most difficulty jumping into sedimentary geology at the beginning of the semester?

Here are two assessment tools that can be used to help you answer these types of questions and get your semester off to a running start.



## Student Experience Survey

### GEL 3400 Sedimentation and Stratigraphy: Student Information Sheet

Name: \_\_\_\_\_ I am enrolled for \_\_\_\_\_ credits this semester (including GEL 3400).  
Email: **contact info**

1. I have been to / experienced the following (check all that apply):
- |  |  |  |
|--|--|--|
| <input type="checkbox"/> The Grand Canyon      | <input type="checkbox"/> The Appalachian Mountains       | <input type="checkbox"/> Another Continent |
| <input type="checkbox"/> The Rocky Mountains   | <input type="checkbox"/> Yosemite National Park          | <input type="checkbox"/> A Delta           |
| <input type="checkbox"/> A Desert (any desert) | <input type="checkbox"/> A road cut rock exposure        | <input type="checkbox"/> A Swamp           |
| <input type="checkbox"/> A Glacier             | <input type="checkbox"/> Skiing (downhill or recreation) | <input type="checkbox"/> A Marsh/Wetland   |
| <input type="checkbox"/> A Coral Reef          | <input type="checkbox"/> A Sea Shore or Beach            | <input type="checkbox"/> Sand Dunes        |
| <input type="checkbox"/> An Earthquake         | <input type="checkbox"/> A Volcano (active or dormant)   | <input type="checkbox"/> Sky Diving        |
| <input type="checkbox"/> Underground in a Mine | <input type="checkbox"/> Underground in a Cave           | <input type="checkbox"/> Surfing           |
| <input type="checkbox"/> Canoeing on a River   | <input type="checkbox"/> White Water Rafting             | <input type="checkbox"/> Rock Climbing     |

*workload*

*relevant experience*

*prior coursework*

*computer literacy*

*motivation*

2. I have taken college courses in the following (check all that apply):
- |  |   |   |
|--|---|---|
| <input type="checkbox"/> physical geology (1010) | <input type="checkbox"/> stratigraphy           | <input type="checkbox"/> geochemistry       |
| <input type="checkbox"/> mineralogy              | <input type="checkbox"/> algebra                | <input type="checkbox"/> physics            |
| <input type="checkbox"/> igneous petrology       | <input type="checkbox"/> trigonometry           | <input type="checkbox"/> fluid mechanics    |
| <input type="checkbox"/> structural geology      | <input type="checkbox"/> calculus               | <input type="checkbox"/> geostatistics      |
| <input type="checkbox"/> groundwater hydrology   | <input type="checkbox"/> differential equations | <input type="checkbox"/> engineering math   |
| <input type="checkbox"/> exploration geophysics  | <input type="checkbox"/> chemistry              | <input type="checkbox"/> geology field camp |

3. Rank your level of familiarity/expertise with the following software applications:

	Never heard of it	Can't Use	Expert User
Word (or other word processing software)	1	2	3
Excel (or other bibliographic manager)	1	2	3
Excel	1	2	3
Powerpoint	1	2	3
Explorer (or other web browser)	1	2	3
Google (or other search engine)	1	2	3

4. The most interesting place I have ever been (geologically speaking) is:  
**a great conversation starter**

5. Suppose you were given 10 pebbles. Distribute your 10 pebbles within the five jars drawn below in proportion to your motivation for taking this class:



The course is required \_\_\_\_\_  
I have curiosity about sed. rocks or depositional environments. \_\_\_\_\_  
I have an interest in Earth history as recorded in the sed. rock record. \_\_\_\_\_  
Sedimentology or Stratigraphy are related to my career plans. \_\_\_\_\_  
Other: \_\_\_\_\_

## Sed/Strat Skills Assessment Quiz

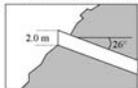
### GEL 3400 - Sed/Strat Skills and Knowledge Assessment

1. How familiar are each of the following terms to you (1=never heard of it, 5=I know it well)? Please try to write a brief definition for any term you recognize.

- 1 2 3 4 5 Lithofacies \_\_\_\_\_  
1 2 3 4 5 Walther's Law \_\_\_\_\_  
1 2 3 4 5 Arkose \_\_\_\_\_  
1 2 3 4 5 Formation \_\_\_\_\_  
1 2 3 4 5 Oolite \_\_\_\_\_

*familiarity with sed/strat vocabulary*

2. A sandstone bed is dipping into a hillside at 26° relative to horizontal. The vertical height of the bed along its outcrop measures 2.0 m.  
(a) Is the stratigraphic thickness of the bed greater than, less than, or equal to 2.0m?  
(b) Calculate the bed thickness using trigonometry:



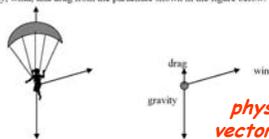
*trigonometry, stratigraphic thickness, three-dimensional thinking*

3. Put each of the Geologic times in order from oldest (1) to youngest (16):

Palaeozoic	Mesozoic	Cenozoic (Tertiary)
1. Cambrian	Jurassic	Paleocene
— Silurian	Triassic	Pliocene
— Mississippian	Cretaceous	Pleistocene
— Pennsylvanian		Oligocene
— Devonian		Miocene
— Ordovician		Eocene
— Permian		

*geologic time scale*

4. After an exhilarating freefall, a skydiver is floating safely back to earth under her parachute. Ignoring any other forces that may be acting upon her, **redesign** the vectors representing forces of gravity, wind, and drag from the parachute shown in the figure below:



*physics and vector addition*

5. Match the following sedimentary minerals with their chemical formulae:

- |                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/> Quartz     | a. FeS <sub>2</sub>                                 |
| <input type="checkbox"/> Dolomite   | b. CaMg(CO <sub>3</sub> ) <sub>2</sub>              |
| <input type="checkbox"/> Halite     | c. K <sub>2</sub> AlSi <sub>6</sub> O <sub>14</sub> |
| <input type="checkbox"/> Calcite    | d. CaSO <sub>4</sub> ·2H <sub>2</sub> O             |
| <input type="checkbox"/> Pyrite     | e. Fe <sub>2</sub> O <sub>3</sub>                   |
| <input type="checkbox"/> Gypsum     | f. NaCl   |
| <input type="checkbox"/> Hematite   | g. CaCO <sub>3</sub>                                |
| <input type="checkbox"/> Orthoclase | h. SiO <sub>2</sub>                                 |

*sedimentary minerals*

6. Use algebra to solve the following system of equations (show your work):

$$2a + 4b = 32$$

$$3a + b = 13$$

*Algebra - oh no!*

7. How large can a sediment grain be and still be considered a sand-sized particle?

*sand grain size*

8. What is the log<sub>10</sub>(10,000)? \_\_\_\_\_ log<sub>10</sub>(32)? \_\_\_\_\_

*exponents and logarithms*



Both tools can be used to identify students who may need extra attention early in the course and to plan for supplementary instructional sessions on topics for which many students are deficient.