

Geology Writing and Information Literacy Learning Outcomes

The Geology faculty developed the following six learning outcomes as part of UVM's Writing and Information Literacy in the Disciplines (WILD) initiative. Student learning related to these outcomes is embedded throughout the Geology curriculum. For each learning outcome identified, we list stages of learning developed by coursework/activities that introduce (I), reinforce (R), or promote mastery (M) of the desired skill sets. Criteria for the I, R, and M levels are described at the end of this document.

1. Students communicate observations and measurements, and concisely describe data using appropriate vocabulary.

I: Students communicate observations and measurements.

R: Students communicate observations and measurements utilizing sophisticated disciplinary vocabulary.

M: Students communicate observations and measurements utilizing sophisticated disciplinary vocabulary and integration of visual displays of data.

2. Students design and create figures, graphs and diagrams that communicate information and concepts

I: Students create of basic graphs, such as in Excel

R: Students are able to create figures and graphs utilizing common software platforms such as Adobe Illustrator, ArcGIS, Stereoplot, etc.

M: Students are able to create publication-ready figures with meaningful and complete captions.

3. Students create new information based on field and laboratory studies and appropriately catalogue this data such that it is available to others

I: Students create new information based on field and laboratory studies (field notebook, excel spreadsheets).

R: Students create new information as well as archive and share data at class, departmental, or collaborative level.

M: Students create new information and meet standards and protocols for cataloguing data in published appendices and/or submitted electronically to national and international repositories (e.g. community databases such as EarthChem).

4. Given empirical data or observations, students craft an interpretation and explain its significance in a geological context.

I: Students identify scientific claims or central thesis statements and are able to articulate how data differs from interpretation.

R: Students evaluate empirical data and observations, make interpretations, and evaluate the significance of their findings.

M: Students craft and test a hypothesis utilizing empirical data and observations, evaluating assumptions in both data collection and analysis, and critically assesses alternative interpretations.

5. Students are able to gather information from a variety of sources, including the web, peer-reviewed literature and online databases, and represent sources of information fairly and accurately.

I: Students search for information, distinguish between sources of information and types of publications, and properly cite sources.

R: Students evaluate sources of information for validity and/or bias, and citations are appropriate and consistent with the evolution of the science.

M: Students conduct advanced searches, integrate relevant information, and meet citation standards required for peer-reviewed publication.

6. Students are able to translate complex concepts, data and terminology to a variety of audiences.

I: Students communicate the significance of the scientific concept or problem.

R: Students communicate concepts and information in non-technical language.

M: Students communicate the nature of the scientific process, how data are used to address the problem, and the interpretation of results to a lay audience.

Criteria for I, R, M levels:

Introduce

- First application of idea or concept
- Active learning
- Assessment can be formal or informal

Reinforce

- Repeated experience with an objective of doing or applying
- Informal and formal assessment allow progress to be evaluated
- Students interact with ideas/concepts in multiple ways

Mastery

- Culminating experience
- Level of independence; self-generated data and observations
- Professional standards applied to products
- Informal and formal assessment