**Critical Thinking in Earth History**

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The department has 8 primary education objectives for the Geology BS, 4 of which are included in Search for Our Past. These include: understanding the basic principles of earth science, performing basic types of geologic analysis, developing critical thinking and research skills, and gaining knowledge of the role of geology in society. Basic principles of earth science are covered in the first third of the course as students are guided through understanding how we obtain, work with, and interpret earth history data. Worksheet activities have students perform basic geologic analyses of historical records. Readings from peer reviewed literature, accompanying essay-style questions, and in class discussions are designed to develop critical thinking skills and to familiarize the students with reading scientific writing. We also spend time discussing past climate events and reports from the Intergovernmental Panel on Climate Change to think about how understanding Earth's past can help us to forecast Earth's future. Search for Our Past is usually taken by geology majors prior to courses in stratigraphy and sedimentation and invertebrate paleontology – Search for Our Past introduces students to concepts addressed by both courses and prepares them for the historical thinking necessary for success those courses. I've noticed that in the invertebrate paleontology course, students that took this version of Search for Our Past are more engaged in invertebrate paleontology discussions and are better able to think through laboratory exercises. Post-tests of students taking invertebrate paleontology also suggested that students retained more information about the basic principles of Earth and life history from this version of Search for Our Past. Search for Our Past is also taken by students in the Interdisciplinary Science BS program where it serves as an elective and thus also serves departments outside of geology.

In the Geology BS program, students are required to design and conduct research that culminates in a senior research project. Search for Our Past introduces students to hypothesis testing in historical geology and classroom discussions often lead to potential senior research projects that students later pursue. Exam questions also ask students to identify unanswered questions in earth history, pose multiple hypotheses, and design potential tests of those hypotheses – this practice in thinking through scientific questions helps students develop research skills and design senior research projects. This exam question appears on the second midterm as well as the final exam and students often improve on their ability pose hypotheses and test them between exams suggesting that the classroom discussions do help develop those skills. Students also seem to appreciate the focus on critical thinking and the time we spend debating different ideas – these elements of the course are often mentioned by multiple students in end-of-course reviews.