**The Methods of Geoscience—Unit 1**

**Activity 1—The Scientific Method**

1. Independently, write a paragraph that answers the following questions below:

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| *a) What is the scientific method as you understand it? b) Is your description of the scientific method a valid description of the way that all science is conducted? Why or why not?* |

1. In groups, share your paragraph with your peers. Then, create a poster that describes “the scientific method.”

**Activity 2—Geoscience Methods**

1. Independently, read the following article about the methods of geoscience: **Geoscience and geoscientists: Uniquely equipped to study the Earth**, *Geol. Soc. Am. Spec. Pap. 486, pp. 1-12*. You will read this article using the QRS (**Q**uestion, **R**eaction, and **S**ummary) method (see description below).

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| A QRS consists of three parts:  *Q = Questions; these are questions that you think of as you read. Please write them as they occur to you.*  *R = Reaction; this is how you feel as you read. Is it confusing? Do you enjoy it, hate it? etc.*  *S = Summary; this is a brief description of the MOST IMPORTANT points in the reading.*  *QRS is an active reading strategy that is designed to get you to think more carefully about what you are reading. Using this strategy, you should discover that you get much more out of each reading.* |

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| **Questions** | **Responses** |
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| **Summary** | |
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**Revising Your Ideas about the SCI Method:**

1. Post your poster. Then, evaluate each group’s poster. To do this, obtain sticky notes in two different colors. One color will be agree statements; the other will be disagree statements.
2. Based on the findings from your poster and others, in small groups, generate an outline for a short (< 300 words) synthesis paper summarizing your position on the question: ***"How can you modify that classic (stereotypical) scientific method to be more inclusive of what all scientists do, including geoscientists?"*** You can create the outline below. The composition of the paper itself should be done individually. You will be evaluated according to the rubric on the next page.

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| Outline |

**Rubric for Evaluation of Essay for Unit 1 in the InTeGrate Module about Geoscientific Thinking**

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| **Criterion** | **4 A-level qualities (90–100)** | **3 B-level qualities (80–89)** | **2 C-level qualities (70–79)** | **1 F-level qualities (below 70)** | **Score** |
| **Purpose** | Introduces and presents paper effectively and clearly; purpose is readily apparent to the reader | Introduces and presents paper adequately; purpose is not consistently clear throughout the paper | Introduces and presents paper somewhat effectively; writing has a clear purpose but may sometimes digress from it | Introduces and presents paper poorly; purpose is generally unclear |  |
| **Development and content** | Develops paper as assigned, providing metacognitive summary of changes to own ideas about scientific method and a robust and accurate analysis of the article; critiques claims with great insight | Develops paper as assigned, providing metacognitive summary of changes to own ideas about scientific method and with a full and effective summary and analysis of article; critiques claims with adequate insight | Does not fully develop paper as assigned, may fail to provide metacognitive summary of changes to own ideas about scientific method or an accurate summary or an effective analysis of the article; critique of claims is basic or general | Paper is undeveloped, fails to provide metacognitive summary of changes to own ideas about scientific method and completely ignores or misunderstands the article; paper does not relate to the assignment; analysis of the papers is vague or there is no evidence that the writers have read them |  |
| Provides a strong, compare/contrast assessment of geoscience methods vs stereotypical experimental scientific method | Provides an effective compare/contrast assessment of geoscience methods vs stereotypical experimental scientific method | Provides some compare/contrast assessment of geoscience methods vs stereotypical experimental scientific method but does so in a vague or confusing manner | Does not provide compare/contrast assessment of geoscience methods vs stereotypical experimental scientific method or makes statements that indicate little understanding of these concepts |  |
| **Documentation and support** | Ideas are supported effectively and sources are clearly attributed | Ideas are generally supported and paper includes clear attribution | Attribution may be present, but sources are questionable or style is incorrect; some statements are unsubstantiated and the source of some ideas is unclear | Attribution is missing, or sources given are poorly chosen, or sources have not been used |  |
| **Organization** | Arranges ideas clearly and logically to support the purpose or argument; ideas flow smoothly and are effectively linked; reader can follow the line of reasoning | Arranges ideas adequately to support the purpose or argument; links between ideas are generally clear; reader can follow the line of reasoning for the most part | Arranges ideas adequately, in general, although ideas sometimes fail to make sense together; reader remains fairly clear about what writer intends | Arranges ideas illogically; ideas frequently fail to make sense together; reader cannot identify a line of reasoning and becomes frustrated or loses interest |  |
| **Writing mechanics** | Writing demonstrates a sophisticated clarity, conciseness, and correctness | Writing is accomplished in terms of clarity and conciseness; contains few errors | Writing lacks clarity or conciseness and contains numerous errors | Writing is unfocused, rambling, or contains serious errors |  |
| **APA format** | Uses APA format accurately and consistently | Uses APA format with minor violations | Reflects incomplete knowledge of APA format | Does not use APA format |  |
| **Note:** Criteria are evaluated on a 4-3-2-1-0 basis. Total rubric points are converted first to a letter grade and then to a numerical equivalent based on a 0–100 scale: 30–32 = A (93–100); 29 = A– (90–92); 28 = B+ (88–89); 23–27 = B (83–87); 22 = B– (80–82); 21 = C+ (78–79); 15–20 = C (73–77); 14 = C– (70–72); 7–13 = D (60–69); 0–6 = F (below 60). | | | | |  |