

## Activity Review: Scoring Rubric

Thank you for participating in the review of teaching activities in the Teach the Earth collections. For each of the major review criteria (Scientific Accuracy; Alignment of Goals, Activity, and Assessment; Pedagogic Effectiveness; Robustness; and the Activity Description) we have asked a series of questions that should inform your overall rating in each of these categories. This scoring rubric is intended to help calibrate reviews from across the initiative. Your numerical scores and written recommendations will be used to provide guidance to inform editorial decisions and to advise authors about revisions needed to attain “Exemplary” status in our reviewed collections.

**In each of the 5 review areas, please use these “guiding questions” to assign an Overall Score, rating the activity as Exemplary, Very Good, Adequate or Problematic according to the following scoring rubric.**

### Scientific Accuracy

- *Context:*
  - *Does this activity cover a topic that is **important** to learning essential concepts, content or skills related to the geosciences?*
  - *Is the underlying scientific content accurate? Are principles of scientific inquiry employed properly?*
  - *Is the content sufficiently developed to enhance learning, and unlikely to lead to misinterpretations?*
- Exemplary—Excellent coverage of important scientific topic(s) that will lead to enhanced student learning; this teaching activity includes scientific concepts, content or skills, is well-referenced, avoids inaccuracies or misleading information, and is in accord with contemporary scientific understanding of this topic.
- Very Good—this teaching activity covers scientific concepts, content or skills with sufficient detail to impart understanding, but some background information is missing that could more completely develop the scientific content and place it in contexts that are necessary for understanding.
- Adequate—this teaching activity introduces scientific concepts and content in a rudimentary way, with only a minimal coverage of the underlying scientific principles/methods; lack of detail may introduce inaccuracies or misinterpretations.
- Problematic—the underlying scientific principles presented in this teaching activity are not in accord with contemporary scientific understanding of this topic.

### Alignment of Goals, Activity, and Assessment

- *Context:*
  - *Are the learning goals, teaching activities, and assessments well-aligned such that they will a) enhance learning and b) provide evidence that learning has been achieved?*

- *Learning goals may be subdivided into Objectives, and may include content or concept mastery, skill development, affective aspects, or metacognition. Goals may not be explicitly assessed. Are the objectives assessed explicitly, or in a manner that aligns the activity with traditional objectives related to courses within the discipline?*
- *Are the assessments fair to all students given the nature of the activity? Are there likely scenarios where some students would be “left behind,” even giving full effort?*
- Exemplary—learning goals are clearly stated, the activity itself has been developed to specifically address these goals, and learning outcomes assessments will reveal if the learning goals have been achieved.
- Very Good—teaching activities will likely lead to identified learning goals will likely lead to identified learning outcomes and assessments are identified, but could be further developed to more completely demonstrate learning outcomes by students.
- Adequate—Unclear if learning goals will be achieved; rudimentary mention of learning goals, assessments and learning outcomes are presented but few details are presented that would allow demonstration that student learning has been achieved.
- Problematic—learning goals and assessments are either absent or not aligned in ways that will enable learning.

### **Pedagogic Effectiveness**

- *Context:*
  - *This activity uses instructional practices appropriate for the subject matter that will enable learning, leveraging scientific inquiry and active learning when possible.*
  - *Are the materials appropriate for the audience, including minimizing unnecessary jargon, prefacing the activity with relevance, and establishing clear expectations?*
  - *Has the author addressed any barriers that may need to be addressed before the activity is assigned?*
- Exemplary— A strong exercise that will promote student learning; is engaging and motivating for students; builds on prior abilities and knowledge; promotes higher order thinking skills; encourages reflections on student learning.
- Very Good—Students will likely be engaged; most components of good activity design are present (e.g., active learning, extends student abilities beyond rote memorization or ability to follow directions, reflections on learning).
- Adequate—May lead to some aspects of student learning; some elements of good activity design are present but does not constitute a comprehensive learning experience, e.g. this activity requires basic application of knowledge or skills, without challenging students to go beyond the instructions; does not require independent thought to reflect on connections with other course content or prior knowledge.

- Problematic—rote application only; no evidence of requiring independent thought, or awareness of how the exercise fits into the larger curriculum.

## **Robustness**

- *Context:*
  - *Can this activity be easily adopted or adapted in its current form, including the necessary technology? Does the author provide instructions where an adopter may need to acquire technology or materials?*
  - *Does this activity include all components needed to successfully complete the exercise?*
  - *Are any technological components stable and work as described?*
  - *Are there an overabundance of web links? Are links dependent on stable sources (government sites, perennial and reputable sites)?*
  - *Does the activity depend upon data from outside sources? Could similar data be acquired from multiple sites? Or could the author include the data or a hypothetical equivalent within the activity description?*
- Exemplary—All activity components are present, all work well, and are in a stable form (e.g. activity assignment, data, images, software, URLs, ...). Users will have confidence that they can directly use this in their class, can be used "as is".
- Very Good—The activity works very well, with only minor glitches but users can figure it out with little effort; the required components of this exercise are available and can be used with little or no modification;
- Adequate—the activity works to some degree, but users have to expend energy to make all the components work. The components of this exercise are available but may need to be modified or updated to successfully complete the exercise.
- Problematic—Doesn't work, components work so poorly, are missing or not accessible that they impede use, preventing successful completion of the activity.

## **Activity Description**

- *Context:*
  - *The Activity Sheet includes sufficient information to allow an instructor/student to make an informed decision about whether or not this is an appropriate activity to use in their learning situation.*
  - *All components of the activity description are included with few errors or omissions.*
- Exemplary—the Activity Sheet provides all information needed for instructors to select this exercise for use in a class; and, provides guidance about how to optimally use this exercise; empowers instructors to effectively use this activity to enhance student learning. Information is provided to help instructors adopt or adapt to their own situation, including teaching tips.
- Very Good—most of the information is present in the Activity Sheet, but some

- of the fields could be further developed as noted in the text box below.
- Adequate—basic information about this activity is provided, but more detail is required to help an instructor know what the activity entails and how to best use this in their class.
  - Problematic—Not useful critical information is missing.

### **Summary: Revisions needed to Qualify as “Exemplary”**

- Based on the review scores recorded above, please provide some specific advice to authors and editors about changes that would be needed to qualify for the “Exemplary” teaching collection. For reference, we anticipate that 10-20% of the resources in our teaching collections will be recognized as “Exemplary”. Resources in this top-level collection a) must have scored Exemplary or Very Good in all categories and must also rate as “Exemplary” in at least three of the five review categories. Your constructive advice will be greatly appreciated as we continue to work towards the best possible collection of resources to support teaching and learning.
- In your review, have you encountered a justification to “reward” an author for the following items, or could you provide advice or recommendations to help the author make adjustments that would improve the activity with respect to these items:
  - Persistence
    - The activity collection has been available for upwards of 20 years. During that time, some activities have become obsolete, while others have stood the test of time.
    - Are there items within the activity that are likely to “expire” within a few years? Is the activity dependent upon external data, software, materials, or web links that are outside of the control of the author?
  - Accessibility
    - As an inherently tactile, visual discipline, earth science teachers often take for granted that our students have all the necessary abilities that would allow them to be immersed with traditional teaching methods and formats. However, a host of disabilities can make our topics and related activities unavailable to swaths of our students. While we cannot satisfy everyone, we can make efforts to reach as wide an audience as possible, regardless of their challenges.
    - Are there modifications that would make this activity adaptable for students with disabilities? Consider the following:
      - Blindness/color blindness
      - Deafness
      - Mobility impairment (especially considering field experiences)
  - Diversity, Equity, and Inclusion
    - We should be mindful, as reviewers, of the inherent biases we

all have, often unconscious, and attempt to make our activities available to all, without belittling or excluding based on the following:

- Race, ethnicity, cultural association
  - Sexual orientation
  - Socio-economic status
- Are there opportunities to improve inclusiveness with subtle or wholesale changes?
  - Does the activity promote long-held biases in geoscience or society at large that should be changed?
  - Would this activity be equally approachable or appropriate for any audience regardless of race, socioeconomic status, gender, ethnicity, sexual orientation?