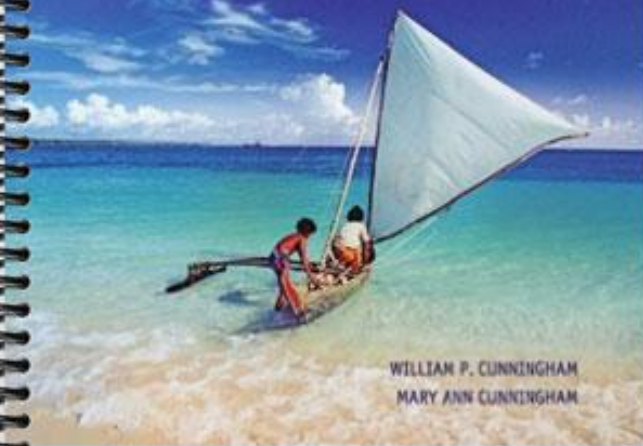


SOLUTIONS MANUAL



TWELFTH EDITION

Environmental Science
A Global Concern



WILLIAM P. CUNNINGHAM
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INSTRUCTOR'S MANUAL

CLASS ACTIVITIES

TO ACCOMPANY

**ENVIRONMENTAL SCIENCE A GLOBAL
CONCERN**

Twelfth Edition

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Activities

- Activity #1 Developing a Scoring Guide
- Activity #2 Evaluating Internet Information
- Activity #3 Constructing Concept Maps
- Activity #4 Group Presentation Scoring Guide
- Activity #5 Take a Stand
- Activity #6 Position Paper
- Activity #7 Hypothesis Generation and Testing
- Activity #8 Energy Pyramids and Biomagnification
- Activity #9 Exploring Risk
- Activity #10 STDs and Pregnancy
- Activity #11 Gathering and Interpreting Internet Information
- Activity #12 Ecosystem Values
- Activity #13 Wildlife Species Poster Session
- Activity #14 Peer Teaching: Air Pollution
- Activity #15 Environmental Organization Poster Session

ACTIVITY #1 DEVELOPING A SCORING GUIDE

Purpose

This activity assists students in preparing to be successful in completing course assignments.

Connected Chapters

This activity is not connected to any specific text content. It can be completed after the students have read “Learning to Learn”. The instructor can share scoring guides with the students prior to the summative assessment of course content in order to help students prepare for successful completion of course assessment items.

Learning Outcomes

- Form a plan to organize your efforts and become a more effective and efficient student (L.1).
- Assess student understanding of any of the specific course outcomes.

Class Size and Required Time

This activity is not dependent on class size or delivery mode (face to face [F2F] or on line). Class time can be used to prepare or share a particular scoring guide with students prior to assessing the course item(s) with the guide.

Materials Needed

No special materials are needed.

Description

The process of developing a scoring guide helps identify the important components of a topic that the instructor wants to teach and to assess that students have learned. Well-written and concise scoring guides can clearly communicate instructor expectations to students for individual course assessment items. The initial development of a scoring guide or rubric can take a considerable amount of time but will become easier as the instructor continues developing scoring guides for a variety of course assessment components. Scoring guides will need updates and revisions as class outcomes and expectations are regularly updated.

Steps in Developing a Scoring Guide

Scoring guides are beneficial to use for instructional goals that are difficult to assess using more traditional methods such as select response test questions (multiple choice, matching, or true/false). It is essential to make sure that the scoring guide is aligned with specific course instructional goals.

1. **Identify Important Criteria.** What criteria are to be assessed? List all of the potentially important behaviors or skills that are to be assessed. Keep in mind the essential and relevant parts of the learning activity.
2. **Choose the Most Important and Relevant Criteria.** If there are too many important criteria that make meaningful assessment difficult, eliminate redundant or less important ones, and combine any that are related. The final number of criteria should be manageable.
3. **Develop a Scale.** Determine how many points the activity is worth and develop a scale. The scale can range from a few points to over one hundred points. The important thing to keep in mind is to develop a balanced scale in relation to the overall worth of the assignment, as well as the total points for the course.
4. **Describe Indicators for the Scale.** Using the final pared-down list of criteria, describe high-performing, mid-performing, and low-level student work, and any other intermediate levels of work along the scale. Make sure the descriptions are specific and measurable.
5. **Share the scoring guide** as a grading rubric with students prior to their completion of the assignment to be assessed. Clearly state expectations for them, allowing them to ask questions for clarification. Any questions that the students may ask might reveal that the scoring guide is not clearly or completely written.
6. **Revise.** After using the scoring guide in class, revise it as needed to make sure it is practical and complete. Keep in mind that some descriptions may be too similar or vague, or the scale may need revision.

The example below is used to assess oral presentations that students make as an evaluation of a current news article germane to the course content. The instructor fills them out during the presentations, and reviews them for

consistency in assessment after all presentations have been made. Check marks are placed above components assessed as “WD” (well done) and circles are placed around components that are considered “OI” (opportunities for improvement). After the instructor records the grades, the graded rubrics are then returned to the students, who can then use this graded scoring guide to prepare for successful completion of subsequent presentations in class.

ARTICLE REVIEW	SCORE
SOURCE and current DATE clearly stated	/10
CONTENT —main points clearly and accurately stated in your own words as an explanation of the article content; evidence of preparedness in the organization of material; use of appropriate course level vocabulary; 5–6 minutes in length	/20
RELEVANCE of topic discussed in the article to course content clearly stated	/10
DELIVERY with minimal use of note cards; eye contact made with classmates; appropriate volume; obvious conclusion	/20
OPINION of issue discussed in the article clearly stated in the conclusion	/10

Start Developing Scoring Guides

The best way to become proficient in developing and using scoring guides is to begin developing them. An initial rubric may be sparse but after initial use in class revision may be made for more detail. There are many examples of scoring guides in the Assessment Guide and Test Item File. Among these are the short answer/essay questions for each chapter. Also, many activities in this Instructor’s Manual have scoring guides/rubrics included (Activities #2, #3, #4, #6, #11, #13, #15).

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ACTIVITY #2

EVALUATING INTERNET INFORMATION

Purpose

This activity prepares students to locate and evaluate relevant current information on the Internet.

Connected Chapters

This activity is not connected to any specific text content. It can be completed after the students have read “Learning to Learn” and is relevant to the research of any current environmental topic.

Learning Outcomes

- Be prepared to apply critical and reflective thinking in environmental science (L.6).
- Evaluate current Internet information.
- Contribute to building a class Internet resource.
- Evaluate materials that classmates find on the Internet.

Class Size and Required Time

This activity is not dependent on class size or delivery mode. The time required to complete this activity can vary depending upon how much experience students have with using the Internet appropriately; lack of experience may require more class time to identify and discuss relevant criteria useful for the evaluation of Internet sites and information.

Materials Needed

Students are required to have access to the Internet.

Description

This activity is useful because students have difficulty distinguishing accurate and course-relevant current information from all that is available on the Internet today. Many students assume that any information found on the Internet is appropriate for use in a college level course. Prior to students completing this activity, they can be engaged in a guided discussion about what constitutes “appropriate” course information on the Internet (relate this process to the content of “How you can detect bias in a blog or news report” in Learning To Learn). With the class, the instructor could lead a discussion of the criteria for how the information on the Internet can be evaluated for appropriate use in class. The students can be involved in the process by suggesting criteria that they might use to evaluate information that they would use in a particular academic situation. This list can be placed on the board or posted online. Key criteria such as the following can be emphasized by the instructor after the student contributions are discussed:

- ✓ Is the information accurate?
- ✓ Is the information appropriate for a college-level course? (At this time it would be appropriate to discuss why Wikipedia, as well as general encyclopedias and dictionaries would not be acceptable sites for use in researching information in a college-level course.)
- ✓ Is the information current? (Define what this means as it relates to your class expectations.)
- ✓ Is the information authentic? (Who is the author? What is his/her area of expertise? Is the author associated with any professional organization?)
- ✓ What is the purpose of the site? (to inform or persuade?)

Variation 1: Sustainability

Conduct an Internet search of the term “sustainability.”

1. List (*instructor clarify a number*) the web addresses you found.
2. Briefly describe the types of sites you found.
3. Post any sites of interest to the class web page.

Note: Students will most likely come up with a wide range of resources from academic discussions about current resource management techniques to business applications. This would be a good opportunity to explain to students how vocabulary can have a specific meaning germane to the study of biology, that is, we use some words differently in our day to day vocabulary as the meaning in the life sciences. Also, the instructor can explain why Wikipedia would not be an acceptable resource to use for this type of research.

Variation 2: Ecosystem Components: Energy and Matter

Select three of the key terms in the Reviewing Learning Outcomes section at the end of Chapter 3 of the text.

1. List each term.
2. Clearly define each term.
3. Conduct an Internet search of each of the terms.
4. List the complete URL and briefly describe the content of four or five sites visited.
5. Post the most relevant site on the class website

Variation 3: Biodiversity: Landscapes

Search for “ANWR” on the Internet. Review at least three current sites that result from your search.

1. List the complete URL of the three sites that you reviewed.
2. State for what the acronym ANWR stands.
3. Explain in a few sentences the history of ANWR.
4. Explain, in a well-written paragraph, the current status of ANWR (include a discussion of the current controversy over the management of ANWR).
5. State your opinion of how this area should be managed today.

Note: This activity can be a good introduction to the discussion of the federal wildlife refuges which are managed differently than National Forests or National Parks; as well as the use of acronyms in the field of Environmental Biology.

Assessment

This assignment can be assessed both formatively (e.g. Variation 1) or summative (e.g. Variations 2 and 3). For example, you might assess Variation 1 of this exercise based on whether a student posts the site successfully (clearly explain what this means to the students). The evaluation of the sites can be done as a class with discussion about the relevance of the different sites. Posting on the class web site has the benefit of showing how students can contribute to build a web resource, and seeing what the other students found.

Alternatively, the students could write a short paragraph evaluating the sites including the web addresses. Two criteria could be used for the summative assessment of this activity.

1. Did the students post the site successfully?
2. Did the students evaluate the site appropriately? In other words, did they use the criteria you provided (see scoring guide below) or developed as a class?

This is a good opportunity to help your students to prepare for future success in completing course requirements. Besides assessing the Learning Outcomes listed with this activity, you can clearly explain what it is that you expect of the students from written assignment submission. For example, you can clarify for students what it is that you expect from them as it relates to completeness of sentences when a verb such as “explain” is used in the prompt.

You also may think about your assessment criteria before you facilitate the development of a scoring guide. After you have developed a guide with the class, you can compare and contrast it with the one provided on the next page. It might be more meaningful to use the criteria that were developed in your class for assessment of this activity.

A possible scoring rubric for Variation 1 is indicated below.

For a total of 20 points (the numbers can be changed to fit your assessment needs):

20 points =

- Posted the site successfully.
- Described the accuracy of the site information.
- Discussed the reliability and trustworthiness of the site.
- Identified the motivations and interests of the producer of the site.
- Discussed how the accuracy, reliability, and motivations affect the information posted on the site.

15 points =

- Posted the site successfully.

Described the accuracy of the site information.
Discussed the reliability and trustworthiness of the site.
Identified the motivations and interests of the producer of the site.
Did not discuss how the accuracy, reliability, and motivations affect the information posted on the site.

10 points =

Posted the site successfully.
Described the accuracy of the site's information.
Discussed the reliability and trustworthiness of the site.
Did not identify the motivations and interests of the source of the site.
Did not discuss how the accuracy, reliability, and motivations affect the information posted on the site.

5 points =

Posted the site successfully.
Did not describe the accuracy of the site's information.
Did not discuss the reliability and trustworthiness of the site.
Did not identify the motivations and interests of the source of the site.
Did not discuss how the accuracy, reliability, and motivations affect the information posted on the site.

0 points =

Did not post the site successfully.
Did not describe the accuracy of the site's information.
Did not discuss the reliability and trustworthiness of the site.
Did not identify the motivations and interests of the source of the site.
Did not discuss how the accuracy, reliability, and motivations affect the information posted on the site.

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