K-12 ENVIRONMENTAL EDUCATION: GUIDELINES FOR EXCELLENCE

Environmental Literacy Module

Participant's Manual

naaee

North American Association for Environmental Education

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K-12 Environmental Education: Guidelines for Excellence
Environmental Literacy Module[1]

Participant's Manual

Overview

Through this module, participants will be introduced to a set of competencies for environmental literacy articulated in NAAEE's ***K-12 Environmental Education: Guidelines for Excellence*** (***K-12 Guidelines***)(2019). The ***K-12 Guidelines*** provides students, parents, educators, home schoolers, administrators, policy makers, and the public a set of common, voluntary guidelines for environmental literacy. The guidelines support state and local environmental education efforts by:

- ✔ Setting expectations for achievement in fourth, eighth, and twelfth grades
- ✔ Suggesting a framework for effective and comprehensive environmental education programs and curricula
- ✔ Demonstrating how environmental education can be used to meet standards set by the traditional disciplines and giving students opportunities to synthesize knowledge and experience across disciplines, and
- ✔ Defining the aims of environmental education

You will have the opportunity to unpack the environmental literacy framework and explore how environmental literacy links with national and state academic standards. In addition, you will complete an environmental literacy self-assessment.

Let's get started!

Welcome, How We Will Work Together and Other Logistics

Module Objectives

Upon completion of the online module, you will be able to:

- ✔ Describe the learning framework used in *K–12 Environmental Education: Guidelines for Excellence*
- ✔ Compare the *K–12 Guidelines* to national and state academic standards
- ✔ Correlate the *K–12 Guidelines* to curriculum materials
- ✔ Reflect on your own environmental literacy

[1] This online module was developed by Bora Simmons, Renee Gracon, Bryan Nichols, and Brian Gracon.

Module Outline

Welcome, How We Will Work Together, and Other Logistics
- PowerPoint/video of North American Association for Environmental Education

Getting Started: What is Environmental Literacy?
- Environmental Literacy Self-Assessment (optional)
- Activity #1: Illustrate Environmental Literacy
- Activity #2: Digging into Definitions
- PowerPoint/video Environmental Literacy: A Bit of History and Perspective
- Activity #3: On the Hunt for K-12 Environmental Literacy

Introducing the ***K-12 Environmental Education: Guidelines for Excellence***
- PowerPoint/video National Project for Excellence in Environmental Education
- PowerPoint/video K-12 EE Guidelines
- Activity #4: Communicating the Environmental Literacy Framework
- Activity # 5: K-12 Guidelines Scramble

Environmental Literacy and Curriculum Materials
- Activity #6: Connecting the *K-12 Guidelines* to Curriculum Materials
- Activity #7: Connecting the *K-12 Guidelines to C3 Social Studies Standards*
- Activity #8: Connecting the *K-12 Guidelines* to *NGSS*

Assessing Your Own Environmental Literacy
- Activity #9: Environmental Literacy Self-Assessment and Professional Development Plan

Wrap-Up and Final Reflections
- Activity #10: Final Reflections

NOTE: Underlined titles that are printed in blue font are active hyperlinks. By using the keystrokes “control click” you can access the document without cutting and pasting the URL into your browser.

Getting Started: What is Environmental Literacy?

As a pre-assessment, you may be asked to complete the ***Environmental Literacy Self-Assessment***. The ***Environmental Literacy Self-Assessment***, a Google form, can be found at: *https://docs.google.com/forms/d/e/1FAIpQLScv75LdsHcJUVHSyyd5NmeDYW2bKftIjxnTJKlkUrkMo9vldA/viewform?usp=sf_link*. You will complete a similar version of this self-assessment again at the end of the module.

Environmental Literacy Self-Assessment [15 minutes]

Before you jump into the module activities to learn more about environmental literacy, take time to assess your own level of environmental literacy. This will help you and your instructor gain a better idea of your strengths.

Materials:

This is an internet activity.

Procedure:

1. Complete the ***Environmental Literacy Self-Assessment*** by clicking on the underlined title, or by going to: *https://docs.google.com/forms/d/e/1FAIpQLScv75LdsHcJUVHSyyd5NmeDYW2bKftIjxnTJKlkUrkMo9vldA/viewform?usp=sf_link*
2. Label your completed ***Environmental Literacy Self-Assessment*** with your name and today's date.
3. Post your completed ***Environmental Literacy Self-Assessment*** to your instructor.

Activity #1: Illustrate Environmental Literacy [15 minutes]

In this activity you will be investigating your own conceptions of environmental literacy.

Materials:

Several sheets of paper, pencils/pens/crayons or markers

Procedure:

1. Take out several sheets of paper and a pen/pencil. You may want to gather some colored pens/pencils/crayons and/or markers.
2. In a couple of sentences, what does environmental literacy mean to you? What are the key components? Write your thoughts about environmental literacy on one of the sheets of paper.
3. With those ideas in mind, *illustrate* environmental literacy. Be as creative as you would like. You are free to use words, sentences, drawings, photographs, graphics or any other way of expressing your ideas about environmental literacy.
4. Label the illustration with your name and today's date.
5. When you have completed your illustration, take a picture of it to share with your instructor and others in the cohort.

Activity #2: Digging into Definitions [30 minutes]

Environmental education researchers have given a lot of thought to the definition of environmental literacy. To learn more, dig into how environmental literacy was conceptualized.

Materials:

NAAEE's video ***What is Environmental Literacy?***, the document ***Developing a Framework for Assessing Environmental Literacy,*** and your illustration from **Activity #1**

Procedure:

1. Watch NAAEE's short video ***What is Environmental Literacy?*** by clicking the underlined title or by going to: *https://eepro.naaee.org/learning/eelearn/eelearn-1-what-ee/lesson-4/environmental-literacy/definition*. This video is from ***Lesson 4*** of NAAEE's online module ***What is Environmental Education?***. Depending on your level of interest and experience, you may want to complete the entire module which you can access by going to: *https://eepro.naaee.org/learning/eelearn* It will take approximately *two hours*. **NOTE:** You may want to create an **eePRO** profile at *https://eepro.naaee.org*.(**eePRO** is FREE to use)
2. Read ***Developing a Framework for Assessing Environmental Literacy*** by clicking on the underlined title or by going to: *https://naaee.org/sites/default/files/inline-files/envliteracyexesummary.pdf*
3. Look at your environmental literacy illustration. What environmental literacy knowledge, behaviors, and dispositions (motivations, attitudes, beliefs) did you include in your illustration? Annotate your illustration by circling, underlining, or otherwise labeling the essential components of environmental literacy.
4. Look at **Handout A**, ***Developing a Framework for Assessing Environmental Literacy,*** **Figure 1. The domain of environmental literacy**. A copy of **Handout A** can be found towards the end of this manual. Given your new understanding of environmental literacy, what would you add, delete, or change on your illustration?
5. Label the annotated illustration with your name and today's date.
6. Take a photo of your annotated illustration to share with your instructor and others in your cohort.

Watch the PowerPoint presentation/video, **Environmental Literacy – A Bit of History and Perspective**, to:

- ✔ Make the connection between environmental literacy and the definition of environmental education
- ✔ Review the components of environmental literacy, and
- ✔ Transition to the investigation into the **K-12 Environmental Education: Guidelines for Excellence**.

Introducing the K-12 Environmental Education: Guidelines for Excellence

With your class, or asynchronously, view the PowerPoint/video presentations, **National Project for Excellence in Environmental Education** and **K-12 EE Guidelines Introduction**, to:

- ✔ Provide background information about the National Project for Excellence in Environmental Education, and
- ✔ Introduce the ***K-12 Environmental Education: Guidelines for Excellence***.

Activity #3: On the Hunt for K-12 Environmental Literacy. [30 minutes]

In this activity, you will complete a scavenger hunt as a way of becoming familiar with the ***K-12 Environmental Education: Guidelines for Excellence***.

Materials:

> ***K-12 Environmental Education: Guidelines for Excellence*** document and **Activity #3: On the Hunt for K-12 Environmental Literacy** (**Handout B.1 or B.2**).

Procedure:

1. Download a copy of NAAEE's ***K-12 Environmental Education: Guidelines for Excellence*** from the NAAEE website by either clicking the underlined title or by going to: *https://eepro.naaee.org/sites/default/files/eepro-post-files/k-12_ee_guidelines_for_excellence_2019_4.pdf*
2. Complete **Activity #3: On the Hunt for K-12 Environmental Literacy** [**Handout B.1 or B.2**].
3. In preparation for your next class meeting, read pages 8-11 and 17-18 of ***K-12 Environmental Education: Guidelines for Excellence***.

Now that you understand the basic framework of the ***K – 12 Environmental Education: Guidelines for Excellence***, how might you communicate the structure to others?

Activity #4: Communicating the Environmental Literacy Framework [20 minutes]

In this activity, you will creatively design a message to explain the four strands of environmental literacy to others.

Materials:

Paper and pencil/pen or computer

Procedure:

1. Create a 30-second "elevator speech," write a Haiku, compose a short song, or develop some other creative way of communicating the full environmental literacy framework (all four strands).
2. When you are finished, share your work with others.

The following activity is intended to promote reflection about how environmental literacy is a lifelong learning process and that our literacy changes as we age.

Activity #5: K-12 Guidelines Scramble [60 minutes]

Now that you have a general idea of what is included in the environmental literacy framework, it's time to explore how environmental literacy develops as we age.

Materials:

Activity #5: K-12 Guidelines Scramble [**Handout C**], ***K-12 Guidelines – Executive Summary***, scissors, four envelopes, and pen or pencil.

Procedure:

1. Download the ***K-12 Guidelines- Executive Summary*** by clicking the underlined title or by going to: *https://eepro.naaee.org/sites/default/files/eepro-post-files/k-12_ee.executive_summary_2019_0.pdf*
2. Download a copy of **K-12 Guidelines Scramble** [**Handout C**] and follow the directions.
3. After you have sorted the guidelines cards into their appropriate grade levels, check your work with the ***K-12 Guidelines – Executive Summary***.
4. Think about how environmental literacy develops from elementary school to middle school to the end of high school.
5. Complete the following sentences with respect to students' cognitive development:
    a. An environmentally literate fourth grader…
    b. An environmentally literate eighth grader…
    c. An environmentally literate high school graduate …
6. Given your examination of the different grade level expectations, what is the role of lifelong learning in the development of environmental literacy?

Environmental Literacy and Curriculum Materials

There are many excellent resources and teaching tools available to educators that support your curriculum. In this Activity, you will better understand how some of your favorites align with the ***K-12 Guidelines***.

Activity #6: Connecting *K-12 Guidelines* to Curriculum Materials [60 minutes]

Now that you have a greater understanding of the ***K-12 Guidelines***, it's time to see how it can be used to think about environmental literacy instruction.

Materials:

Activity Guide such as ***Project Learning Tree***, ***Project WET***, ***WWF's Teaching Tools about Biodiversity***, or local instructional materials, ***K-12 Environmental Education: Guidelines for Excellence***, and **Activity #6: Connecting *Guidelines* to Curriculum Materials [Handout D]**.

Procedure:

1. Select three activities from a favorite environmental education activity guide. We highly recommend that you use instructional materials that have been created locally (e.g., those from a local nature center, school district, etc.). Otherwise, use an activity guide you are familiar with such as ***Project Learning Tree*** or ***Project WILD***. If you don't have access to an activity guide, use three of the student activities posted on the course website from the ***WWF's Teaching Tools About Biodiversity***: *https://www.worldwildlife.org/teaching-resources/toolkits/biodiversity-toolkit*
2. Skim through the selected activities so that you become familiar with how they are organized. Importantly, determine the grade levels targeted by the activities.
3. Make sure that all the activities are from the same grade grouping (e.g., K-4, 5-8, or 9-12).
4. Using **Handout D**, ***Activity #6: Connecting Guidelines to Curriculum Materials***, write the title of each of the three activities you are analyzing in the left-hand column.
5. After reading through the activity carefully identify which guidelines are addressed well, addressed minimally, or depend on how you interpret the guideline and the activity. Record your answers on the chart.
6. After you have completed your analysis of the selected activities, think about what they seem to do well and how they could be improved.
7. Select one of the activities. What improvements *to this activity* would you recommend based on your understanding of the ***K-12 Guidelines***?
8. Post your completed worksheet to your instructor. Make sure you included your name(s) on the completed worksheet.

Connecting the *K-12 Guidelines* to National Standards

K-12 student academic standards (e.g., mathematics, science, English Language Arts, social studies) are used to create curricula in schools and to assess student academic achievement. They are also often used in nonformal, out-of-school education settings to reinforce school-based learnings.

The ability of school systems to provide comprehensive environmental education will depend on its systematic and cohesive integration into the standards-based curriculum. Although we know that curriculum can be designed that supports both academic achievement and the development of environmental literacy, we also know that this type of curriculum planning takes work. It requires a thorough understanding of the standards and of the components of environmental literacy.

The National Project for Excellence in Environmental Education completed an analysis of the possible synergies between environmental literacy and the national standards for science and social studies:

- ***Exploring Synergy: Environmental Literacy and the C3: College, Career, and Civic Life Framework for Social Studies State Standards***
  https://eepro.naaee.org/sites/default/files/eepro-post-files/exploring_synergy_environmental_literacy_and_the_c3_2019_0.pdf

- ***Exploring Synergy: Environmental Literacy and the Next Generation Science Standards***
  https://eepro.naaee.org/sites/default/files/eepro-post-files/exploring_synergy_environmental_literacy_and_the_next_generation_science_standards.pdf

Activity #7: Connecting *K-12 Guidelines* to the *C3 Social Studies Standards*
[20 minutes]

In this activity, you will be examining possible linkages between the ***K-12 Guidelines*** and the ***C3 Social Studies Standards*** and thinking about how each supports the other.

Materials:

> ***Exploring Synergy: Environmental Literacy and the C3: College, Career, and Civic Life Framework for Social Studies State Standards*** and **Handout E**

Procedure:

1. Read pages 1-7 of ***Exploring Synergy: Environmental Literacy and the C3: College, Career, and Civic Life Framework for Social Studies State Standards*** and **Handout E**.
2. Discuss how the ***K-12 Guidelines*** and the ***C3 Social Studies Standards*** are similar and different.
3. Given the suggested linkages between environmental literacy and the ***C3 Social Studies Standards:***
    a. How can environmental literacy instruction best support the *implementation* of social studies?
    b. How can instruction be designed to address the ***C3 Social Studies Standards*** *and* support the development of environmental literacy?

Activity #8: Connecting *K-12 Guidelines* to *NGSS* [20 minutes]

Now you will examine **Handout F** that compares the possible linkages/overlaps between the ***K-12 Guidelines*** and the ***Next Generation Science Standards*** (***NGSS)***.

Materials:

> ***Exploring Synergy: Environmental Literacy and the Next Generation Science Standards*** and **Handout F**

Procedure:

1. Read pages 1-6 of ***Exploring Synergy: Environmental Literacy and the Next Generation Science Standards*** and **Handout F**.
2. Discuss how the ***K-12 Guidelines*** and the ***NGSS*** are similar and different.
3. Given the suggested linkages between environmental literacy and ***NGSS:***
    c. How can environmental literacy instruction best support the *implementation* of science education?
    d. How can instruction be designed to address ***NGSS*** *and* support the development of environmental literacy?

Assessing your own Environmental Literacy

Activity #9: Self-Assessment [45 minutes]

In the next activity, you will be asked to reflect further on the environmental literacy framework and your own capacities as an environmental educator.

Materials:

K-12 Environmental Education: Guidelines for Excellence (pages 66 – 87), ***Environmental Literacy Self-Assessment and Professional Development Plan*** (online access)

Procedure:

1. Read pages 66-87 of ***K-12 Environmental Education: Guidelines for Excellence.***
2. Use the 12th grade ***Benchmarks*** (pages 66-87) to complete ***Environmental Literacy Self-Assessment*** *and* ***Professional Development Plan*** by clicking the underlined title or by going to: *https://docs.google.com/forms/d/e/1FAIpQLSdbSVccCe4Uoo6OzUffwo22qnw5aVuySawSRkoAFkv_VOceyA/viewform*
3. Look back at your self-assessment. What are your strengths? What needs to be developed further?
4. Were you surprised by the results of your self-assessment? If so, what surprised you?
5. Label your completed ***Environmental Literacy Self-Assessment and Professional Development Plan*** with your name and today's date.
6. Post your completed ***Environmental Literacy Self-Assessment and Professional Development Plan*** to your instructor.

Wrap Up and Final Reflections

Activity #10: Final Reflections [30 minutes]

In this final activity, you will reflect on what you have learned about environmental literacy.

Materials:

All module materials, paper, and pen/pencil or computer

Procedure:

1. Think back on what you have discovered about environmental literacy. Start by looking back at your initial illustration of environmental literacy and then, review the ***Environmental Literacy Self-Assessment and Professional Development Plan*** you completed in the previous activity.
2. Write a letter to your principal, supervisor, or course instructor explaining why environmental literacy is important and suggesting *three ways to incorporate* strategies or activities into the curriculum that would advance environmental literacy.
3. Post your letter to your course instructor. Be sure to include your name and today's date on your letter.

As a Reminder

The ***K-12 Environmental Education: Guidelines for Excellence*** is just one of the publications in the ***Guidelines for Excellence series***. Visit the ***NAAEE*** website to learn more about the ***Guidelines for Excellence*** and how you can continue your professional development. NAAEE sponsors webinars, an annual conference, and much more. You may also want to join ***eePRO***, the online platform for environmental education professional development.

Handout A
Activity #2: Developing a Framework for Assessing Environmental Literacy

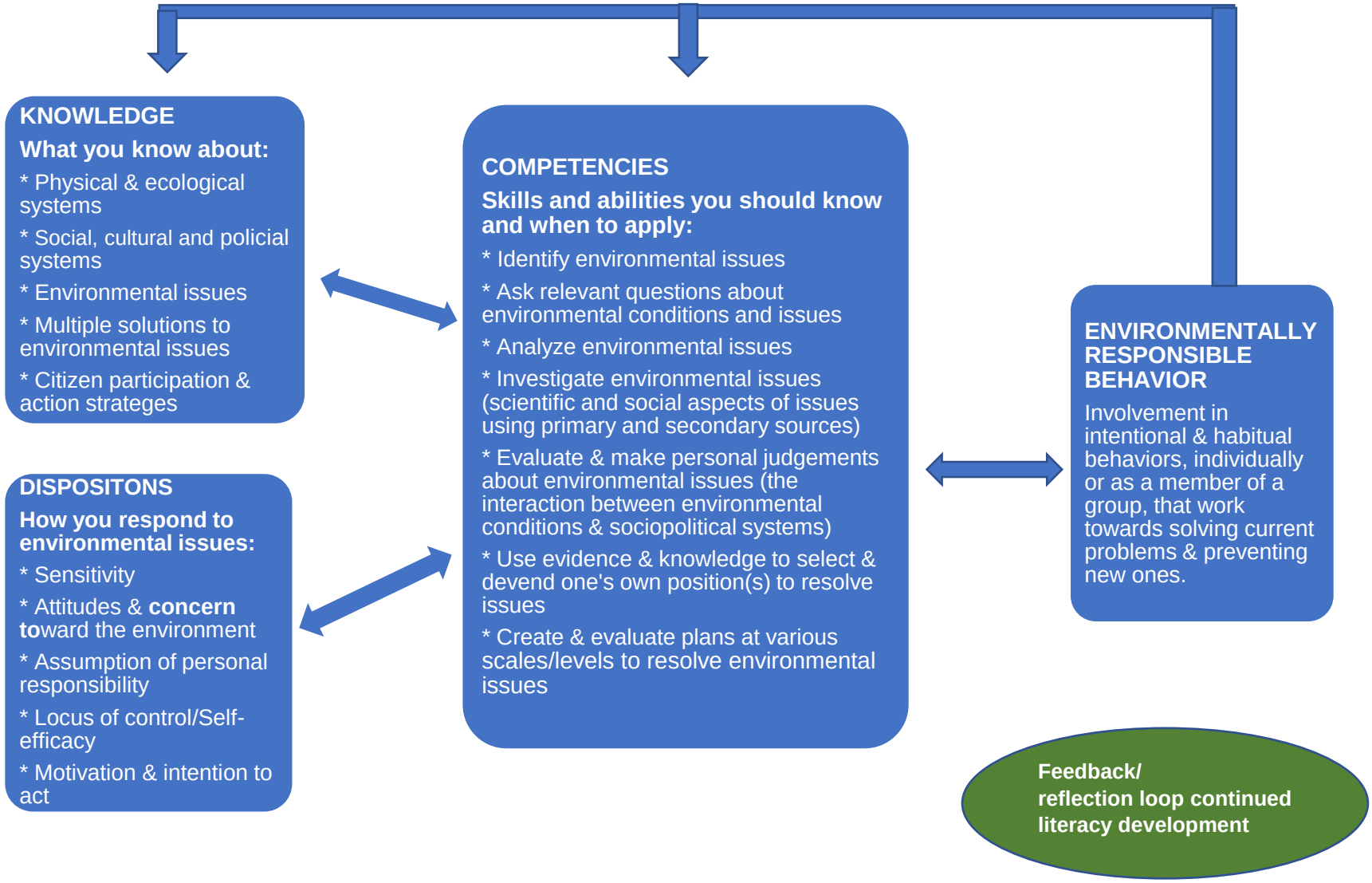

Figure 1: The domain of environmental literacy.

Developing a Framework for Assessing Environmental Literacy, section 3.2, page 17.

Handout B.1
Activity #3: On the Hunt for K-12 Environmental Literacy

1. According to the ***K-12 Environmental Education: Guidelines for Excellence (K – 12 Guidelines)***, what is the **mission** of the North American Association for Environmental Education (NAAEE)? _____

2. According to the ***K-12 Guidelines***, "an **environmentally literate** person is someone who…_____".

3. What are the **Sustainable Development Goals** (SDGs)?

   _____

4. Which of the following is **NOT** one of the **key beliefs** that ground, or underpin, environmental education? _____

   A) If individuals learn how to make informed decisions, they will do so.
   B) Humans can live compatibly with nature and act equitably toward each other.
   C) Environmental education is best taught in the K-12 classroom.
   D) People can make informed decisions that consider future generations and reflect changing circumstances.

5. Page 13 suggests 8 essential **Underpinnings of Environmental Education**. Which of these key principles do you feel is the most essential, and why?

   _____

6. According to the concept of *Systems Thinking* (Cabrera & Cabrera, 2015), there are *four cognitive skills*, or simple rules, that underlie even the most complex forms of thinking: Distinctions (D); Systems (S); Relationships (R); and Perspectives (P). Match the skills with their definitions below (a – d). Write the definition in the space provided on the Chart below:
   a. Any idea can be the point of the view of a perspective
   b. Any idea can be split into parts or lumped into a whole
   c. Any idea can be distinguished from other ideas
   d. Any idea can relate to other ideas

Cognitive Skill/Rule	Definition
Distinctions Rule (D)	
Systems Rule (S)	
Relationships Rule (R)	
Perspectives Rule (P)	

7. (True or False) *Systems thinking* is a cross-disciplinary approach to building knowledge about real world systems and real-world problems, but it is only relevant to students with advanced metacognition, and therefore is recommended only for grades 6 and above. _____

8. Several *general principles* help guide environmental instruction. Fill in the blanks for the following sentences:
    a. The learner is an _____ participant, therefore, instruction should be guided by the learner's interests.
    b. All learners can enhance their capacity for _____ _____ and effective, responsible action.
    c. Because environmental issues can prompt deep feelings and strong opinions, educators must take an _____ approach to instructions.
    d. Environmental literacy depends upon a personal commitment to _____ skills and knowledge. Instructors should foster curiosity by providing early and continuing opportunities to explore their community and environment.

9. Many of the Strands are illustrated by ***Guidelines in Practice***. To expand teacher's classroom materials, there are also segments titled ***Resources You Can Use***. What is the primary source of the activities suggested in the ***PLT Green Schools*** resource on page 16? _____

10. The ***K-12 Guidelines*** are organized into **4 Strands**, each of which represents a broad aspect of environmental literacy. While together the framework creates a vision of environmental literacy, it is important to remember that the process of becoming environmentally literate is non-linear, and the sequence of the guidelines is a tool to bring order and logic to the document rather than establishing a hierarchy of skills and knowledge. Fill in the complete title of each strand.
    a. Strand 1: _____
    b. Strand 2: _____
    c. Strand 3: _____
    d. Strand 4: _____

11. Each strand is further defined by a set of guidelines that articulate knowledge and skill benchmarks to evaluate student success at the end of three grade levels. What are the *grade levels and approximate ages* of students for which they are targeted? _____;
    _____; and _____.

12. What is the name of the NAAEE platform for professional development, resources, learning opportunities, and much more! _____

13. In Grades K – 4, Strand 2, Guideline A, the second performance indicator (2nd bullet) ask students to compare the differences between _____ and _____.

14. The *guidelines* for Grades 5 – 8, beginning on page 42, further illustrate how teachers can integrate cross disciplinary concepts into environmental education. On page 54, ***Guidelines in Practice***, under the Murdock Elementary School in Willows, CA, the teacher incorporates an engineering (STEM activity) by having the students redesign _____ _____.

15. The *guidelines* for Grades 9 – 12, beginning on page 65, provide numerous examples of how high school teachers can incorporate scientific investigation and civic responsibility into their curriculum through environmental issues. On page 80, Strand 3, Guideline A, Performance Indicator 4, encourages the use of print and digital sources to seek information on _____ and _____influences as well as indigenous and traditional knowledge sources.

16. Use the ***K-12 Guidelines*** to identify the resource that is used as an example for Grades 9 – 12 that takes a "Systems Approach". _____

17. Where can you find free downloadable pdfs (and hard copies available for purchase) for all *six* of the ***Guidelines for Excellence*** publications?

_____

Handout B.2
Activity #3: On the Hunt for K-12 Environmental Literacy

1. According to the ***K-12 Environmental Education: Guidelines for Excellence (K-12 Guidelines)***, what is the **mission** of the North American Association for Environmental Education (NAAEE)? _____

2. According to the ***K-12 Guidelines***, "an **environmentally literate** person is someone who…_____".

3. What are the **Sustainable Development Goals** (SDGs)?
   _____

4. Which of the following is **NOT** one of the **key beliefs** that ground, or underpin, environmental education? _____

   A) If individuals learn how to make informed decisions, they will do so.
   B) Humans can live compatibly with nature and act equitably toward each other.
   C) Environmental education is best taught in the K-12 classroom.
   D) People can make informed decisions that consider future generations and reflect changing circumstances.

5. Page 13 suggests 8 essential **Underpinnings of Environmental Education**. Which of these key principles do you feel is the most essential, and why?
   _____

6. According to the concept of *Systems Thinking* (Cabrera & Cabrera, 2015), there are *four cognitive skills*, or simple rules, that underlie even the most complex forms of thinking: Distinctions (D); Systems (S); Relationships (R); and Perspectives (P). Match the skills with their definitions below (a – d). Write the definition in the space provided on the Chart below:
   a. Any idea can be the point of the view of a perspective
   b. Any idea can be split into parts or lumped into a whole
   c. Any idea can be distinguished from other ideas
   d. Any idea can relate to other ideas

Cognitive Skill/Rule	Definition
Distinctions Rule (D)	
Systems Rule (S)	
Relationships Rule (R)	
Perspectives Rule (P)	

7. (True or False) *Systems thinking* is a cross-disciplinary approach to building knowledge about real-world systems and real-world problems, but it is only relevant to students with advanced metacognition, and therefore is recommended only for grades 6 and above. _____

8. Several *general principles* help guide environmental instruction. Fill in the blanks for the following sentences:
    A) The learner is an _____ participant, therefore, instruction should be guided by the learner's interests.
    B) All learners can enhance their capacity for _____ and effective, responsible action.
    C) Because environmental issues can prompt deep feelings and strong opinions, educators must take an _____ approach to instructions.
    D) Environmental literacy depends upon a personal commitment to _____ skills and knowledge. Instructors should foster curiosity by providing early and continuing opportunities to explore their community and environment.

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10. The ***K-12 Guidelines*** are organized into **4 Strands**, each of which represents a broad aspect of environmental literacy. While together the framework creates a vision of environmental literacy, it is important to remember that the process of becoming environmentally literate is non-linear, and the sequence of the guidelines is a tool to bring order and logic to the document rather than establishing a hierarchy of skills and knowledge. Fill in the complete title of each strand.
    A) Strand 1: _____
    B) Strand 2: _____
    C) Strand 3: _____
    D) Strand 4: _____

11. Each strand is further defined by a set of guidelines that articulate knowledge and skill benchmarks to evaluate student success at the end of three grade levels. What are the *grade levels and approximate ages* of students for which they are targeted? _____; _____; and _____.
12. What is the name of the NAAEE platform for professional development, resources, learning opportunities, and much more! _____

13. In Grades K – 4, Strand 2, Guideline A, the second performance indicator (2nd bullet) ask students to compare the differences between _____ and _____.

14. The *guidelines* for Grades 5 – 8, beginning on page 42, further illustrate how teachers can integrate cross disciplinary concepts into environmental education. On page 54, ***Guidelines in Practice***, under the Murdock Elementary School in Willows, CA, the teacher incorporates an engineering (STEM activity) by having the students redesign _____ _____.

15. The *guidelines* for Grades 9 – 12, beginning on page 65, provide numerous examples of how high school teachers can incorporate scientific investigation and civic responsibility into their curriculum through environmental issues. On page 80, Strand 3, Guideline A, Performance Indicator 4, encourages the use of print and digital sources to seek information on _____ and _____influences as well as indigenous and traditional knowledge sources.

16. Use the ***K-12 Guidelines*** to identify the resource that is used as an example for Grades 9 – 12 that takes a "Systems Approach". _____

17. Where can you find free downloadable pdfs (and Hard copies available for purchase) for all *six* of the ***Guidelines for Excellence*** publications?

    _____

18. Using the ***K-12 Guidelines*** for Grades K-4 and the **Guidelines in Practice** example on page 24, give *two* examples from the reading to illustrate how elements of Strand 1 were exemplified.

    _____

19. Using the ***K-12 Guidelines*** for Grades K – 4 and the ***Guidelines in Practice*** example on page 37 & 38 (Wolverine Park, Anchorage: Students Serving Community), identify *at least two* actions that the students engaged in that relate to Strand 3. Clearly articulate the sub-category (either 3.1 or 3.2), the guideline (A, B, C, or D), and the performance indicator (bullet point) in your response.

    _____

20. Using the **K-12 *Guidelines*** for Grades 5 – 8 and the ***Guidelines in Practice*** segment Murdock Elementary School in Willows, CA on Page 54, provide *at least two* examples illustrating how the fifth graders efforts align with Strand 2.

    _____

21. After responding to the previous question, site *at least two* other ways where the Murdock Elementary School example aligns with other strands (Strands 1, 3, or 4.) _____

22. Using the ***K-12 Guidelines*** for Grades 9 – 12 Strand 2.2 (pages 74 & 75) and the ***Guidelines in Practice*** (National Park with Local Connections– page 76), describe *at least two* ways that educator Kat Robbins integrates the school's interdisciplinary curriculum with important performance indicators.
_____

Handout C

Activity #5: K–12 Guidelines Scramble

Now that you have a general idea of what is included in the environmental literacy framework, it's time to explore how environmental literacy develops as we age.

Materials:

K-12 Environmental Education: Guidelines for Excellence- Executive Summary, Activity cards, printer, scissors, 4 envelopes, pen or pencil.

Procedure:

1. Clear off a table or your desk as a workspace.
2. Print the Scramble Cards.
3. Cut the grade level descriptions (Fourth Grade, Eighth Grade, Twelfth Grade) into individual cards. Place them on your workspace as headers forming three columns.
4. Cut the individual guidelines (e.g., Questioning, Designing investigations, etc.) into separate cards. For each guideline there will be three cards. (Note: Strand 1 will have 21 cards, Strand 2 will have 30 cards, Strand 3 will have 24 cards, and Strand 4 will have 9 cards.)
5. Keep the cards in their strand grouping (e.g., Strand 1, Strand 2).
6. Label each of the envelopes to represent one of the strands (e.g., Strand #1)
7. Place the cards into their designated envelopes for storage. That is, all the STRAND 1: Questioning, Analysis and Interpretation Skills cards should be placed into Envelope #1 and all the Strand 2: Environmental Processes and Systems cards should be placed into Envelope #2, etc.
8. Taking one envelope/Strand at a time, place all the cards from that individual envelope out onto your workspace. After you have emptied Envelope #1, mix up the cards so they are no longer in order.
9. Make sure that all the cards are face up.
10. Take one card at a time and read it (e.g., Questioning). From the description, determine whether that guideline is most appropriate as a benchmark for fourth, eighth, or twelfth grades.

11. Place the card under the appropriate grade level.
12. Find the remaining two cards for that same guidelines (e.g., Questioning). Read them and determine which benchmark grade level is most appropriate for each. Remember, for each guideline (e.g., Questioning) there can only be one card placed under each grade level.
13. Continue with the rest of the cards in Strand 1.
14. Take a photo of your work and post it to your instructor. Make sure you included your name and date in the photo.
15. Open up a copy of ***K-12 Environmental Education: Guidelines for Excellence Executive Summary*** and check your work for Strand 1.
16. As time permits, complete the card sorting activity for all four Strands.
17. Using a copy of the ***Executive Summary***, pick one grade level to look at a bit more closely (e.g., fourth grade). Read down the column. This will give you a good idea of what environmental literacy looks like for a fourth grader.
18. Now, pick one or more of the guidelines (e.g., Questioning). Read across the chart – fourth grade to eighth grade to twelfth grade. How does the guideline change?
19. What does this tell you about how environmental literacy develops from elementary school to middle school to the end of high school?
20. Complete the following sentences with respect to cognitive development:
    a. An environmentally literate fourth grader…
    b. An environmentally literate eighth grader…
    c. An environmentally literate twelfth grader…
21. What does it tell you about the relationship between life-long learning as we age and environmental literacy?

Fourth Grade Learners should be able to meet the guidelines included in this section by the end of fourth grade. The kindergarten through fourth grade years are a time of tremendous cognitive development. By third and fourth grades, learners have developed some basic skills that help them construct knowledge. Instructors in earlier grade levels should use these fourth-grade guidelines as a target, extrapolating from this end goal appropriate activities and lessons for younger learners. In these early years of formal education, learners tend to be concrete thinkers with a natural curiosity about the world around them. Environmental education can build on these characteristics by focusing on observation and exploration of the environment—beginning close to home.	**Eighth Grade** Learners should be able to meet the guidelines included in this section by the end of eighth grade. In the fifth through eighth grades, learners begin to develop skills in abstract thinking and continue to develop creative thinking skills —and along with these, the ability to understand the interplay of environmental and human social systems in greater depth. Environmental education can foster this development by focusing on investigation of local environmental systems, problems, and issues. As learners become actively engaged in deciding for themselves what is right and wrong, educators can use environmental problems to help learners explore their own responsibilities and ethics.
Twelfth Grade Learners should be able to meet the guidelines included in this section by the time they graduate from high school. By the end of twelfth grade, learners are well on their way to environmental literacy. They should possess the basic skills and dispositions they need to understand and act on environmental problems and issues as responsible community members—and to continue the learning process throughout their lives. In the ninth through twelfth grades, environmental education can promote responsible civic action by challenging learners to hone and apply problem-solving, analysis, persuasive communication, and other higher-level skills—often in real-world contexts.	

Envelope #1: Strand 1 - Questioning Analysis and Interpretation Skills

Questioning—Learners develop questions that help them conduct simple investigations and learn about the environment.	**Questioning**—Learners develop, refine, and explain questions that help them conduct environmental investigations and learn about the environment.	**Questioning**—Learners develop, modify, clarify, and explain questions that guide environmental investigations of various types. They describe criteria that influence the questions they pose and explain their reasoning.
Designing investigations—Learners design simple environmental investigations.	**Designing investigations**—Learners design environmental investigations to answer specific questions – often their own questions.	**Designing investigations**—Learners design investigations to explore environmental questions, problems, issues, phenomena, and models. They explain their reasoning.
Collecting information—Learners locate and collect information about the environment and environmental topics.	**Collecting information**—Learners locate and collect quantitative and qualitative information about the environment and environmental topics, using a range of methods and sources. They explain why they used selected information collection methods.	**Collecting information**—Learners use established protocols to locate and collect information for environmental investigations of many types. They use increasingly sophisticated methods and technology to access, gather, store, and display the information they collect.
Evaluating accuracy and reliability—Learners identify basic criteria to judge the merits of information and information sources.	**Evaluating accuracy and reliability**—Learners compare the weaknesses and strengths of the information and the information sources they are using in their environmental inquiries.	**Evaluating accuracy and reliability**—Learners apply logic and reasoning skills to evaluate the completeness and reliability of a range of environmental information and information sources.

Organizing and analyzing information—Learners describe data and organize information to search for relationships and patterns concerning the environment and environmental topics.	**Organizing and analyzing information**—Learners classify, organize, and display data and information they collect in ways that help them analyze and interpret their environmental investigations.	**Organizing and analyzing information**—Learners organize, analyze, and display data and information from their environmental investigations for a variety of audiences and purposes.
Working with models and simulations—Learners use models to represent environmental relationships, patterns, and processes.	**Working with models and simulations**—Learners use models to analyze information that support their environmental investigations. They explain the purposes and limitations of these models.	**Working with models and simulations**—Learners create, use, test, and evaluate models to analyze environmental questions, problems, issues, or phenomena.
Drawing conclusions and developing explanations—Learners develop explanations that address their questions about the environment.	**Drawing conclusions and developing—explanations** – Learners synthesize their environmental observations and findings into coherent explanations.	**Drawing conclusions and developing explanations**—Learners propose explanations that address their initial environmental questions using quantitative and qualitative data and evidence that has been collected and analyzed.

Envelope #2: Strand 2 - Environmental Processes and Systems

Earth's physical systems—Learners describe characteristics of Earth's physical systems, including air, water, and land. They explain how these systems interact with one another and identify changes in the physical environment over time. They provide examples of how physical systems affect living organisms, including humans.	**Earth's physical systems**—Learners describe the physical processes that shape Earth, including weather, climate, plate tectonics, and the hydrologic cycle. They explain how matter cycles and energy flows among the abiotic and biotic components of the environment. They describe how humans affect and are affected by Earth's physical systems.	**Earth's physical systems**—Learners describe the major processes and systems that form Earth and relate these processes, especially those that are large-scale and long-term to characteristics of Earth. They explain how changes in one system (hydrosphere, atmosphere, geosphere, and biosphere) result in changes to another. They describe how human sustainability depends on Earth systems.
Earth's living systems—Learners identify basic similarities and differences among a wide variety of living organisms. They explain ways that living organisms, including humans, affect the environment in which they live, and how their environment affects them.	**Earth's living systems**—Learners describe how living things, including humans, are dependent on their environment and are adapted to live in particular ecosystems under particular environmental conditions. They describe major interactions among organisms and populations of organisms and explain the importance of biodiversity to ecosystem health. They describe how humans affect and are affected by the biosphere.	**Earth's living systems**—Learners describe basic population dynamics, genetic mechanisms behind biological evolution, and the importance of diversity in living systems. They explain how changes in the hydrosphere, atmosphere, and geosphere affect the biosphere. They describe how human sustainability is dependent on the biosphere.

Individuals, groups, and societies—Learners generate examples of how people act, as individuals, as members of a group, and as members of society, toward the environment. They articulate their own beliefs and the beliefs of family and community members about the environment and environmental issues.	**Individuals, groups, and societies**—Learners explain ways that individual traits and group membership or affiliation influence perceptions of and actions toward the environment. They describe how their environmental beliefs and values are shaped by their community and the larger society. They compare their beliefs and values to those held by others in their community.	**Individuals, groups, and societies—**Learners observe and describe ways that individual and group action affects the environment, and how each can work to promote the common good. They analyze differing beliefs and values within the same community and the larger society and explain how sustainable solutions rely on reconciling diverse perspectives.
Culture—Learners identify ways that people express different cultural backgrounds and how these can influence environmental perceptions and activities.	**Culture**—Learners describe examples of the interconnection between cultural perspectives and the environment.	**Culture**—Learners recognize and describe examples of different cultural perspectives and dynamics and apply their understanding to current and historical environmental situations.
Political systems—Learners identify characteristics of political systems and how they help people by providing basic services, maintaining order, managing conflict and caring for the environment.	**Political systems**—Learners describe how political systems at varying scales account for, manage, and affect natural resources and environmental quality.	**Political systems**—Learners analyze how political systems and political decision-making, from the local to international levels, impact environmental quality and long-term sustainability.
Economic systems—Learners identify basic characteristics of economic systems that help people make choices about how to use resources, including natural resources, to satisfy human needs and wants.	**Economic systems**—Learners describe how economic systems and economic decision-making influence natural resource use and management as well as environmental and human well-being.	**Economic systems**—Learners analyze how economic systems and economic decision-making affect environmental quality and long-term sustainability at local, tribal, national, and global levels.

Human-environment interactions—Learners identify ways that people depend on, change, and are affected by the environment.	**Human-environment interactions**—Learners describe human-caused changes that affect the immediate environment as well as other places, other people, and future times.	**Human-environment interactions**—Learners analyze ways that humans interact with their environment and how these interactions change with technological developments. Learners determine costs and benefits to different groups in society as well as unintended consequences.
Resource distribution and consumption—Learners describe ways people harvest, re-distribute, and use natural resources.	**Resource distribution and consumption**—Learners explain that uneven geographic distribution of natural resources influences their use and perceived value.	**Resource distribution and consumption**—Learners analyze ways that the perceived value and use of natural resources change over time and vary under different economic, political, social, and technological systems.
Places—Learners identify ways that places differ in their physical and human characteristics.	**Places**—Learners describe the meaning of "place" both close to home and around the world.	**Places**—Learners describe "place" as humans endowing a location with meaning and that this meaning can be created through individual and group interactions with that environment.
Change and conflict—Learners recognize that change is a normal part of individual and societal life. They describe examples of ways that conflict related to the environment or natural resources may be rooted in different points of view.	**Change and conflict**—Learners explain that human social systems are dynamic and that conflicts sometimes arise over differing and changing viewpoints about the environment and natural resource use and management.	**Change and conflict**—Learners analyze the functioning of public processes for promoting and managing change and conflict, and can evaluate their effects on the environment, society, and the economy.

Envelope #3: Strand 3 - Skills for Understanding and Addressing Environmental Issues

Identifying and investigating issues—Learners identify and investigate issues in their local environment and community.	**Identifying and investigating issues**—Learners use primary and secondary sources of information and apply research and analytical skills to investigate environmental issues, beginning in their own community and region.	**Identifying and investigating issues**—Learners apply their research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
Sorting out the consequences of issues—Learners use their knowledge of how ecological and human systems are interconnected to describe the environmental, social, and economic consequences of local environmental issues.	**Sorting out the consequences of issues**—Learners apply their knowledge of ecological and human processes and systems to describe the short and long-term consequences of selected environmental issues on environmental, social, and economic sustainability.	**Sorting out the consequences of issues**—Learners evaluate the consequences of a broad range of environmental changes, conditions, and issues on environmental, social, and economic sustainability. They identify environmental justice and social equity implications.
Identifying and critiquing alternative solutions and courses of action—Learners develop plans, including possible design solutions, for addressing selected local environmental issues.	**Identifying and critiquing alternative solutions and courses of action**—Learners identify and develop action strategies, including design solutions, appropriate for addressing a range of environmental issues at community and regional levels. They describe how their action strategies and design solutions might impact environmental quality and other people now and in the future.	**Identifying and critiquing alternative solutions and courses of action**—Learners identify and propose environmental action plans, including design solutions, and evaluate their likely effectiveness in specific environmental, cultural/social, and economic contexts. They identify ways that these action plans and design solutions might affect different groups of people, including possible environmental justice and social equity implications.

Working with flexibility, creativity, and openness—Learners demonstrate openness and receptivity while listening to and working with others who have perspectives about the environment that are different from their own.	**Working with flexibility, creativity, and openness**—Learners demonstrate active listening, tolerance, adaptability, and openness as they work with others to gather a range of perspectives and information.	**Working with flexibility, creativity, and openness**—Learners engage each other in evidence-based peer review and work collaboratively and cooperatively in the spirit of open deliberation, especially in contexts that bring to the surface deeply held priorities and values.
Forming and evaluating personal views—Learners examine and express their own views on environmental issues.	**Forming and evaluating personal views**—Learners identify, justify, and clarify their views on environmental issues and alternative ways to address them.	**Forming and evaluating personal views**—Learners evaluate, justify, and communicate their own views on environmental issues and possible ways to address them.
Evaluating the need for action—Learners determine whether action is needed on selected environmental issues and whether they should be involved. They describe their reasoning.	**Evaluating the need for action**—Learners evaluate whether action is needed in specific situations, using environmental, cultural/social, and economic criteria. They decide whether they should be involved in that action.	**Evaluating the need for action**—Learners apply their research and analytical skills to systematically determine whether action is needed in specific environmental, cultural/social, and economic contexts and whether they should be involved.
Planning and taking action—Learners develop an action strategy or design solution for a specific local environmental issue of their choosing.	**Planning and taking action**—Learners use their research results to develop action strategies and design solutions at levels consistent with their maturity and preparation. As appropriate, they implement their plans.	**Planning and taking action**—Learners develop action strategies and design solutions based on their research and analysis of an environmental issue. If appropriate, they implement plans that are within the scope of their rights and consistent with their individual abilities and responsibilities as members of the community.

Evaluating the results of actions—Learners identify environmental, social, and economic consequences of design solutions and civic actions, including their own actions.	**Evaluating the results of actions—**Learners analyze the effects of design solutions, their own civic actions, and actions taken by other individuals and groups. They describe the short- and long-term effects of these actions and design solutions in terms of environmental, social, and economic consequences.	**Evaluating the results of actions**—Learners evaluate the intended and unintended consequences of design solutions, their own civic actions and actions taken by other individuals and groups, including implications for long-term environmental, social, and economic sustainability.

Envelope #4: Strand 4 - Personal and Civic Responsibility

Recognizing rights and responsibilities—Learners describe their basic rights and responsibilities as members of a community and the importance of these rights and responsibilities in promoting environmental quality and community well-being.	**Recognizing rights and responsibilities**—Learners explain the rights and responsibilities of community membership and their role in promoting environmental, social, and economic sustainability.	**Recognizing rights and responsibilities**—Learners describe the relationships between exercising their individual rights and responsibilities and addressing environmental, social, and economic sustainability.
Recognizing efficacy and developing agency—Learners describe how they can realistically and meaningfully contribute to their community and environmental quality.	**Recognizing efficacy and developing agency**—Learners possess a realistic self-confidence in their effectiveness as community members to make changes in their community that address environmental, social, and economic sustainability.	**Recognizing efficacy and developing agency**—Learners exhibit personal agency by working independently and making choices to bring about change in their community that addresses environmental, social, and economic sustainability**.**
Accepting personal responsibility—Learners identify ways in which they are responsible for the environmental, social, and economic effects of their actions.	**Accepting personal responsibility**—Learners describe the broad environmental, social, and economic consequences of their personal and group actions and as appropriate, accept responsibility for their actions.	**Accepting personal responsibility**—Learners evaluate the broad environmental, social, and economic consequences of their actions. They accept responsibility for recognizing those effects and changing their actions when warranted.

Handout D

Activity #6: Connecting *K-12 Guidelines* to Curriculum Materials

Name(s): _____

Date: _____

Activity Guide Title: Activity Guide Grade Level(s):			
Activity Title	*Addressed Well*	*Addressed Minimally*	*Depends on Interpretation*
EXAMPLE: *Activities, Activities, Activities*	1E, 1F	1C, 1G, 2.2C, 2.3A, 2.3F, 2.3E	2.2A, 2.2D, 2.3D

After selecting and critiquing three environmental education activities, select one of the Activities you listed above. What improvements to this Activity would you recommend based on your understanding of the ***K-12 Guidelines***? (Use the space below for your answer.)

Handout E

Activity #7: Linkages between the *K-12 Guidelines* and the *C3 Social Studies Standards*

Key: Level or degree of linkage	None	Limited	Moderate	Strong
		**********		

C3 Framework/ Environmental Literacy Framework	Strand 1: Questioning, Analysis & Interpretation Skills	Strand 2: Environmental Processes & Systems			Strand 3: Skills for Understanding & Addressing Environmental Issues		Strand 4: Personal & Civic Responsibility
		2.1: Earth's Physical & Living Systems	2.2: Human Systems	2.3: Environment & Society	3.1: Analyzing & Investigating Environ. Issues	3.2: Decision-making & action skills	
Dimension 1: Developing Questions and Planning Inquiries							
Constructing Compelling Questions							
Constructing Supporting Questions							
Determining Helpful Sources							
Dimension 2: Applying Disciplinary Concepts and Tools							
Civics							
Economics							
Geography							
History				**********		**********	
Dimension 3: Evaluating Sources and Using Evidence							
Gathering & Evaluating Sources							
Developing Claims & Using Evidence							
Dimension 4: Communicating Conclusions and Taking Informed Action							
Communicating Conclusions							
Critiquing Conclusions							
Taking Informed Action							

Handout F

Activity #8: Linkages between *K-12 Environmental Education: Guidelines for Excellence* and *NGSS*

Key: Level or degree of linkage	None	Limited	Moderate	Strong
		**********		

***NGSS* Framework/ Environmental Literacy Framework**	**Strand 1: Questioning, Analysis, & Interpretation Skills**	**Strand 2: Environmental Processes & Systems**			**Strand 3: Skills for Understanding & Addressing Environmental Issues**		**Strand 4: Personal & Civic Responsibility**
		2.1: Earth's Physical & Living Systems	2.2: Human Systems	2.3: Environment & Society	3.1: Analyzing & Investigating Environmental Issues	3.2: Decision-making & action skills	
Science and Engineering Practices					**********		
Crosscutting Concepts							
Engineering Design							
Earth & Space Science							
ESS1 Earth's Place in the Universe		**********					
ESS2 Earth's Systems							
ESS3 Earth and Human Activity			*********				
Life Science							
LS1 From Molecules to Organisms		**********					
LS2 Ecosystems							
LS3 Heredity							
LS 4 Biological Evolution				**********			
Physical Science							
PS1 Matter & its Interactions							
PS2 Motion & Stability							
PS 3 Energy							
PS4 Waves & Their Applications							