# The River Mile

## Post Visit Lessons

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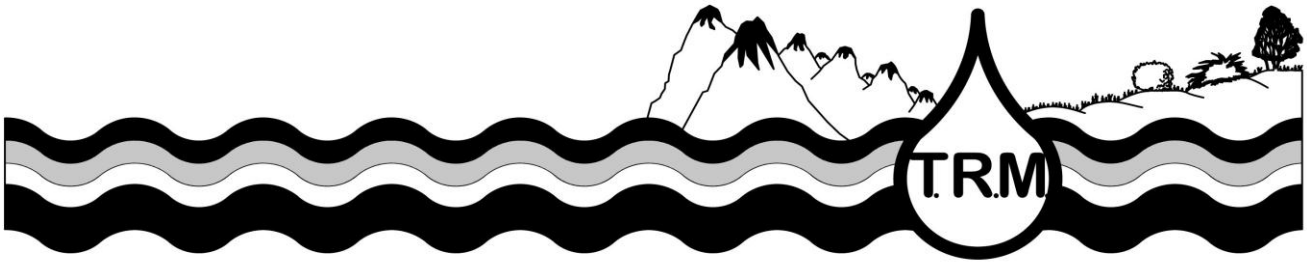

# Learning From Others

**Subject:** What can we learn about environmental stewardship from the President's Environmental Youth Awards (PEYA) Winning Projects?

**ELAR-GLE:** **Component 3.1 Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.**
**3.1.1 Analyze common problems or challenges in which scientific design can be or has been used to design solutions**

**Duration:** Option 1: Student Cooperative Group Presentations 40 – 70 minutes
Option 2: Teacher Presentation 15 minutes

**Location:** School Classroom

**When:** After first site visit

**Grade:** 3rd-12th

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**Overview:**

Option One Students will:

a) Work effectively in cooperative teams
b) Read, analyze, and synthesize information from one of 10 regional projects conducted by the President's Environmental Youth Award Winners
c) Demonstrate understanding by planning and presenting the PEYA information to classmates applying the assessment criteria provided.

**Materials:** Stewardship Power Point Slides 35-46
Handout PEYA Winners Regions 1-10
Chart paper, materials and supplies for visual or dramatic presentation
Freeze Frame Tableau handout

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**Slide # 36 Background: President's Environmental Youth Awards**

http://www.epa.gov/enviroed/peya/index.html

- Since 1971, EPA has sponsored the President's Environmental Youth Awards (PEYA). The program recognizes young people across America for projects which demonstrate their commitment to the environment. Young people in all 50 states and the U.S. territories are invited to participate in the program.
- Projects submitted in the past have covered a wide range of subject areas including recycling programs in schools and communities; construction of nature preserves; major tree planting programs; videos, skits, and newsletters created by students that focused on environmental issues; and environmental science projects.

**Procedure: Option One**

1. Divide students into 10 cooperative groups.
2. Discuss the Presentation Assessment Criteria Rubric
3. Assign each group one of the 10 regional PEYA Winners below and provide the background information handout
    - **Slide # 37: Region 1: Get the Lead Out of Fishing**
      Michael Browne, Eagle Scout, BSA Troop 5, Milton, MA
    - **Slide # 38: Region 2:Bedsidebooks**
      Raphael Spiro Forest Hills, NY
    - **Slide # 39: Region 3: "We'll Bring It to You" Curbside Electronics Recycling**
      HB Woodlawn 6th Grade Science Class Arlington, Virginia
    - **Slide # 40: Region 4: Energy Star**
      Wiser Misers Energy Team 3rd grade, Huntingdon, Tennessee
    - **Slide # 41: Region 5: International Fair**
      Kate 3rd grade, Arlington Heights, Illinois
    - **Slide # 42: Region 6: Public Environmental Awareness Program**
      Bianca 12th grade, Pasadena, Texas
    - **Slide # 43: Region 7: Stream Team #432 Water Quality Monitoring**
      Reeds Spring High School, Reeds Spring, Missouri
    - **Slide # 44: Region 8: EARTH Action Montana**
      Ten 6, 7, & 8th graders, Helena, Montana
    - **Slide # 45: Region 9: Indoor Air Pollution: The Pulmonary Effects of Ozone-Generating Air Purifiers** Otana Jakpor, Riverside, CA
    - **Slide # 46: Region 10: Cool School Campaign**
      Redmond High School, Redmond, Washington
4. Establish the timeline for reading (5 min)., planning (15 min) and presentation (3 min per group = 30-40 min depending on transition time)
5. Student Presentations (student and/or teacher assessment w/rubric

**Procedure: Option Two:**

1. Teacher shows slides # 37-46, briefly describing each project
2. Asks students to analyze which aspects of the PEYA projects could apply to the River Mile Project. .
3. Discuss the common problems or challenges between their River Mile Site and the Regional projects and how a scientific research design can be used to design local solutions
4. Chart ideas generated and save for Lesson 5.

# River Mile Stewards

**Subject:** What is my role as a steward of our River Mile?
What do we want to accomplish together this year?

**ELAR-GLE:** **Component 2.1 Investigating Systems:** Develop the knowledge and skills necessary to do scientific inquiry

**2.1.1** Understand how to ask a question about objects, organisms, and events in the environment

**2.1.1** Understand how to ask, generate, and evaluate a question that can be answered through scientific investigation

**Component 3.1 Designing Solutions:** Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.

**3.1.2** Understand how the scientific design process is used to develop and implement solutions to human problems

**3.1.2** Apply and evaluate the scientific design process to develop and implement solutions to problems or challenges

**Duration:** 20 – 40 minutes introduction and on-going throughout River Mile Project

**Location:** Classroom and River Mile Site

**When:** Post First Site Visit and preparation for Second Site Visit

**Grade:** 3rd-12th

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**Overview:**

Students will:

1. Reflect on all of the River Mile experiences to date
2. Create a personal mission statement for participation in the River Mile Project
3. Collaborate in small groups and as a class to plan a scientific research design which can be implemented to solve problems or challenges found in their River Mile Site
4. Design a scientific process to provide the National Park Service with needed data about their site
5. Collect data to share with other schools engaged in the River Mile Project at the end of year Student Science Summit.

**Materials:** **Stewardship Power Point Slides 47-50**
GLE 3.1 Handout (3-5, 6-8, and 9-12): Designing Solutions
Science journal

**Procedure:**

**Slide #47:** The Teacher introduces students to the concept of a personal mission and to designing a scientific research project that will provide data to the NPS and possibly solve problems or challenges found during their visit to the River Mile Site

**Slide #48**: Students reflect individually and respond in writing to the questions. Students may choose to share their ideas or not.

> What is your personal mission for participating in The River Mile Project?
>
> 1. What do you hope to accomplish?
> 2. What do you think will be challenging
> 3. What could be exciting?
> 4. What actions are you already thinking about?

**Slide #49**: In small working groups, students discuss the question and develop one recommendation for research on use and one recommendation for research on the protection of their River Mile Site.

Each group will have an opportunity to refine their ideas and share them with the class. It is not necessary to come to a consensus yet, rather let students consider all recommendations for a few days

> What do we want to accomplish this year?
>
> Now that we have been to our River Mile site and assessed its conditions, what ideas de we have and what do we want to do to promote the simultaneous use and protection of this section of our watershed?

**Slide #50**: Discuss ELAR-GLE 3.1 for designing scientific solutions to problems

**3.1.2 Understand how the scientific design process is used to develop and implement solutions to human problems (3-5)**

- (3, 4, 5) Propose, implement, and document the scientific design process used to solve a problem or challenge:
  - ☐ define the problem
  - ☐ scientifically gather information and collect measurable data
  - ☐ explore ideas
  - ☐ make a plan
  - ☐ list steps to do the plan
  - ☐ scientifically test solutions
  - ☐ document the scientific design process
- (3, 4, 5) Describe possible solutions to a problem (e.g., preventing an injury on the playground by creating a softer landing at the bottom of a slide).
- (3, 4, 5) Describe the reason(s) for the effectiveness of a solution to a problem or challenge.

**3.1.2 Apply the scientific design process to develop and implement solutions to problems or challenges. (6-8)**

- (6, 7, 8) Propose, implement, and document the scientific design process used to solve a problem or challenge:
  - ☐ define the problem
  - ☐ scientifically gather information and collect measurable data
  - ☐ explore ideas
  - ☐ make a plan
  - ☐ list steps to do the plan
  - ☐ scientifically test solutions
  - ☐ document the scientific design process
- (6, 7, 8) Explain possible solutions to the problem (e.g., use pulleys instead of levers to lift a heavy object).
- (6, 7, 8) Explain the reason(s) for the effectiveness of a solution to a problem or challenge.

**3.1.2 Evaluate the scientific design process used to develop and implement solutions to problems or challenges (9-10)**

- (9, 10) Research, propose, implement, and document the scientific design process used to solve a problem or challenge:
  - ☐ define the problem
  - ☐ scientifically gather information and collect empirical data
  - ☐ explore ideas
  - ☐ make a plan
  - ☐ list steps to do the plan
  - ☐ scientifically test solutions
  - ☐ document the scientific design process
- (9, 10) Evaluate possible solutions to the problem (e.g., describe how to clean up a polluted stream).
- (9, 10) Evaluate the reason(s) for the effectiveness of a solution to a problem or challenge

When consensus is reached on the problem to solve, the teacher will guide students through the process of designing a research project.

# Getting Involved

**Subject:** How can I get more involved? Are there other groups I can join?
**ELAR-GLE:**
**Duration:** 10 minute introduction. Follow-up Based on Student Interest
**Location:** Classroom, Home, and Community Service
**When:** Optional Anytime Post First Site Visit
**Grade:** $6^{th}$-$12^{th}$

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**Overview:**
Students will experience community service or service learning through individual interest in projects promoted by various national, regional and local organizations.

**Materials: Stewardship Power Point Slides #51-61**

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**Procedure: Optional**

1. Using slides 51-61, the teacher introduces students to environmental organizations which sponsor community engagement in a variety of projects.
2. Students reach projects of interest and get involved based on interest and family approval.
3. Where applicable, students could earn credit for service learning hours.