



MCIEA Task: Environmental Justice

Course/subject/grade level: 7th Grade Science (Ecology)

Context/prerequisite skills: Grade-level understanding of data and research. With regards to content, students should have an introductory knowledge of ecological science, including population ecology, community and ecosystem ecology, and how these topics can be explored through grade-level approaches to research.

Performance Assessment Quality Criteria

High-quality performance tasks should:

- Align to high-leverage learning goals (competencies, learning targets, standards, transferable skills, etc)
- Be open ended and relevant to the real world
- Require application and transfer using higher-order thinking
- Be fair and culturally responsive
- Outline clear criteria for success in a rubric
- Result in original products, performances, or solutions

Learning Goals

What is being assessed in this task? This includes competencies, standards, learning targets, transferable skills, etc. Remember - application and transfer of high-leverage skills are a hallmark of performance assessments.

MA Science Standards

- 7.MS-LS2-4 Analyze data to provide evidence that disruptions (natural or human-made) to any physical or biological component of an ecosystem can lead to shifts in all its populations.
 - Clarification Statement: Focus should be on ecosystem characteristics varying over time, including disruptions such as hurricanes, floods, wildfires, oil spills, and construction.
- 7.MS-LS2-5 Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design.*
 - Clarification Statements:
 - Examples of design solutions could include water, land, and species protection and the prevention of soil erosion.
 - Examples of design solution constraints could include scientific, economic, and social considerations.
- 7.MS-LS2-6 Explain how changes to the biodiversity of an ecosystem—the variety of species found in the ecosystem—may limit the availability of resources humans use.
 - Clarification Statement: Examples of resources can include food, energy, medicine, and clean water



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Task Summary

Describe the essence of the task. What authentic role is the student taking? Who is the audience? What is the problem they are trying to solve?

Students will take on the role of environmental activist-educators who strive to educate elementary school students about environmental restoration in the wake of natural and human-caused disturbances to ecosystems.

To this end, students will act as environmental activists who research the causes, impacts, and potential solutions to natural or man-made environmental disasters or issues. Their job is to understand the impact that disasters have on both the environment as well as the many ways they impact humans. This includes understanding the social, economic, health, legal, and political impact and effect, so they can begin to develop solutions for returning the environment to its optimal state.

Essential Questions

What challenging and open-ended questions are students exploring in this task? How does this assessment engage students in tackling the essential question?

How can we use our understanding of ecology to protect ecosystems from disturbances?

How can we use our understanding of ecology to help restore ecosystems after disturbances?

Quality Output	Quality Process
<p><i>What original product or solution will students produce as a result of this task? Describe what a quality output looks like, sounds like, feels like.</i></p> <p>While there is student choice in both the ecological issue and final product, students should produce educational materials related to their topical choice that include the following information:</p> <ul style="list-style-type: none"> ● Cause of environmental disturbance ● Impact on the ecosystem (including plant and animal populations) and humans (including social, political, and economic impact). ● Analysis of solutions or actions that prevent future occurrences of the environmental disturbance. There should also be information about the level (individual, local, global, policy) at which the solutions or interventions need to 	<p><i>Without being overly prescriptive, what will students actually do as they complete this task? Describe the flexible quality process learners will engage in to produce the output.</i></p> <p>Step 1: Introduction to assessment & environmental activism Step 2: Selection of topic Step 3: Research Step 4: Design of educational materials based on research Step 5: Sharing of educational findings and materials</p>



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be implemented.

Resources/Materials

What do all students need to have access to in order to complete the task?

- Newsela article “Plastics found in stomachs of deepest sea creatures” Matthew Taylor 11/27/17
- Newsela article “World’s nations adopt plan toward a pollution free planet” Mariette Le Roux 12/12/17
- Newsela Text Set “Marine Plastic” Jim Bentley (videos embedded in assignment)
- Recovery Data or Impact of disruptions
- Videos for Engagement:
 - Mount St. Helens: <https://youtu.be/AYla6q3is6w>
 - California Wildfires

Possible Accommodations

Understanding that accommodations will always need to be adapted for student’s individual needs, what are some accommodations that may be provided for this task?

English Language Learners

- Sentence starters for questions
- Vocab list translated into student’s native language
- Pictures to supplement written instructions.
- Utilizing Google Translate Plugin/App
- Subtitles on videos for ELL in native language when possible

Writing Disabilities

- Sentence starters
- Graphic organizer
- Teacher conference
- Final Product choice (podcast, video, TED talk etc.)

Reading Disabilities

- Text to speech dictation
- Newsela articles written in different lexile
- Use of video to supplement research
- Graphic organizer to promote reading comprehension



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Environmental Justice:
Ecosystem Recovery & Protection Through the Eye of an Activist
Student Instructions

The Context and Your Role: In recent years, we have witnessed a number of disasters that have caused great damage to the environment, including harming plant and animal populations, as well as impacting human resources (e.g. clean water, food sources). You are an environmental activist who researches causes, environmental impact, and potential solutions to natural or man-made environmental issues/disasters. You have the important job of educating the public about how we can help ecosystems recover from disasters, as well as how we can develop solutions that reduce the impact of these disasters.

Task: Your task is to educate an elementary-level audience about an environmental/issue disaster (including causes, environmental impact and potential solutions). As you develop your materials for your presentation, you should complete the following steps:

1. **Background Research:** You should use data to show how natural and human-caused disasters affect the environment, as well as the many different ways they impact humans. Your analysis of disasters must include an understanding of the social, economic, health, legal and political impact and effects.
2. **Develop Potential Solutions:** You should evaluate different solutions about how humans can help protect the ecosystem in the future, and/or return the ecosystem to its natural state.
3. **Presentation:** You should provide engaging educational materials of your choice (e.g. a website, infographic, podcast, pamphlet) that shares your understanding of an important environmental disaster.

Knowledge and skills you will need to demonstrate on this task:

- Summarize the potential causes of the environmental disaster.
- Analyze data to provide evidence that disruptions (natural or man-made) to any part of an ecosystem can lead to shifts in all its populations.
- Summarize how the environmental disaster impacts humans by showing how changes in biodiversity of an ecosystem may limit the availability of resources humans use (food, energy, medicine and clean water).
- Evaluate competing design solutions for protecting or restoring an environment.
 - Discuss the pros and cons of at least two (2) solutions.
 - Explain what impact the solution can have scientifically, economically or socially.

Materials needed:

- Internet/library access for research
- Word processing software

Background Research

You need to complete research on an environmental topic or issue provided for you below. At minimum, you will need to read three (3) articles on the issue and view 1 video clip. You can use the following materials to begin organizing your understanding of your chosen natural disaster/environmental issue. You will translate your research and conclusions into a product that can be used to educate a 5th grade science class about the effects of a disruption in an ecosystem and the solution that was used to try and restore the balance.

Before you make your choices, follow the link to view the 16-minute TEDx Talk: [Activism 2.0 Rebirth of the Environmental Movement](#) by Emily Hunter to understand the role of environmental activists in modern society.

Potential Environmental Topics and Resources: below are some resources to understand the impact of environmental disasters. You should also use your own research as you develop your educational materials.

Website:

OIL-<https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/oil-spills-along-shore.html>

PLASTICS-<https://www.plasticpollutioncoalition.org/>

WILDFIRES-<https://www.nationalgeographic.com/environment/natural-disasters/wildfires/>

Newsela:

OIL-<https://newsela.com/read/exxonvaldez-anniversary/id/3192/>

PLASTICS- <https://newsela.com/read/floating-ocean-trash-collector/id/45215/>

WILDFIRES- <https://newsela.com/read/lib-Why-wildfires-southern-California/id/38735/>

Video:

OIL-<https://www.youtube.com/watch?v=-OVNd6Fa9fg&t=8s>

PLASTICS-<https://www.youtube.com/watch?v=n5KMGZHyUk8>

WILDFIRES- <https://www.youtube.com/watch?v=F8OrmGAIqI4>
<https://www.youtube.com/watch?v=Z-p9kebsAL0>

Restoring the Balance
Questions to Guide Environmental Research

As you complete your research, you should consider the following questions. Thorough answers to these questions should provide the foundation for your educational materials.

1. What is the environmental issue you are researching?
2. Describe some specific real world examples of this environmental issue.
3. What caused or is causing each of these specific environmental issues?
4. Explain how this issue is has an impact on the environment and humans.
 - a. Impacts on the ecosystem
 - b. Impacts on humans
5. Through your research, find different solutions or actions aimed at restoring the ecosystem back to a healthy natural state.
 - a. Find and describe different solutions or actions that could prevent this environmental issue from happening in the future.
 - b. Explain at what level each of your solutions will need to be implemented in order to be successful (e.g. personal, local, national, global levels, or a combination of several of these levels).
6. Cite the different sources you used in your research by (materials found on the internet should include the title and URL of the website).



Environmental Justice Rubric Template

	Exceeds	Meets	Not Yet
Evidence that disruptions to ecosystems lead to shifts in population (7.MS-LS2-4)	In addition to using data to explain changes in biodiversity populations after a disruption in the ecosystem, I have analyzed trends to show how long it takes for populations to recover or for new ecosystems to develop.	I have analyzed various data sources to create a clear argument about how plant and animal populations change when their ecosystem/habitat faces a disruption.	I still need to work on:
Evaluation of solutions for protecting ecosystem (7.MS-LS2-5)	After analyzing the benefits and limitations of solutions for protecting ecosystems, I have provided a detailed plan about how the best solution can be implemented.	I have provided a clear evaluation of multiple solutions for protecting ecosystems that outlines both the benefits and limitations of each solution.	I still need to work on:
Explanation of changes to the biodiversity of the ecosystem (7.MS-LS2-6)	I have explained how changes to biodiversity impact the availability of human resources, and provided alternative solutions for providing these human resources.	I have clearly shown how changes to the biodiversity (plant and animal life) in an ecosystem can impact availability of human resources.	I still need to work on:



MCIEA Rubric Guiding Principles

The following outlines the MCIEA way of thinking about rubric design. While MCIEA shared rubrics will generally be designed with the following principles in mind, you may decide to design your locally developed rubrics in a different way. We share the following details to both guide you in understanding the format and coherence behind MCIEA shared rubrics as well as to share our current understanding of best practices for the design of high-quality rubrics.

- **Task Neutral** - MCIEA rubrics will be aligned to learning goals (competencies, standards, high-leverage skills, learning targets), rather than aligned to the task. This means that the items that go into the leftmost column are a description of what you want students to understand and be able to do, rather than a description of different elements of the task. Rubrics designed in alignment to tasks tend to read like student directions, rather than a tool for assessment and feedback. Anything you want students to do can be added to student directions as a checklist. Further, task neutral rubrics can be used across multiple tasks, meaning that teachers are not designing rubrics every time they create a new task and, more importantly, students develop metacognition around the idea that they are building a consistent set of high-leverage skills and understandings across multiple learning experiences.
- **Selection of Learning Goals** - These are important considerations when selecting items for the leftmost column. The principles below may lead teachers to combine groups of smaller standards (sometimes called power standards).
 - **Appropriate Type** - Rubrics are the opportunity to highlight the most high-leverage learning goals. The goals should be important enough to be built over time and applied/transferred to new contexts.
 - **Appropriate Number** - Brain science tells us that students can reasonably focus on between 2-5 high-leverage learning targets at a time. Said another way, just because an assessment can assess something, doesn't mean it has to.
 - **Grain Size** - Also known as the "Goldilocks Principle", learning goals should not be so broad that students have little information on what they are trying to do, but should not be so narrow that they form a checklist. Additionally, items should all be of a similar grain size, so that you avoid having something as important as critical thinking take up as much space (in student's minds) as something like neatness.
- **Performance Levels** - Our rubrics are designed with 3 performance levels (Exceeds, Meets, Not Yet). We place them in that order from left-to-right to put the highest performance level in student's view first. The following list is in the order which we suggest you develop rubrics. We find that many bad practices develop when performance levels are designed to produce scores consistent with traditional grading systems.
 - **Meets** - The student has satisfactorily demonstrated that they are on level in this learning goal.
 - **Exceeds** - There are many ways to approach the development of this category, the important consideration is that you decide on a coherent system for developing your exceeds category and apply it consistently. For MCIEA, we tend to look at the deepening of the skill or understanding in the following grade level and design our exceeds category from there.
 - **Not Yet** - We do not include an approaching category as teachers tend to spend undue time agonizing over what this level means, often only to find that it wasn't very meaningful when they get student work back. Rather we invite teachers to leave space in the Not Yet category for written feedback. As a rule, when the performance level increases, the skill or understanding gets more nuanced, rather than there just being more of the previous level. We avoid entirely the language of *never*, *sometimes*, *all the time*.