

Green Wish's **Green Science Fair**

Grades 6-8 Common Core Aligned

The goal of this lesson is for students to investigate environmental issues. The lesson begins with an introduction to climate change via the Green Wish video, "Is There Hope for Planet Earth?" Next, a science fair project is presented with guidelines for questions, displaying the project, and final paper guidelines.



Earth-friendly reading for all



Green Science Fair Steps

Use the discussion generated from watching “Is There Hope for Planet Earth?” for a Green Science Fair.

Brainstorming Topics

Engage the class in developing possible topics for a Green Science Fair by using the film as a starting point. The following are possible questions to investigate about the environment:

- How does water get polluted?
- Which materials pollute water more?
- What can be filtered out of water?
- What materials can I use to filter water?
- What happens when oil is spilled in water? Can oil spilled in water be cleaned up?
- How are melting glaciers increasing sea level?
- What does it take to recycle paper?

Display Board

After conducting their investigations, students will use a display board to showcase their projects. The board should have the following sections:

Experiment	Question	Results
<i>Explain the experiment and the steps done to complete it.</i>	<i>Question investigated</i>	<i>Results, including analysis and interpretation of the data collected, and a conclusion.</i>

Final Paper

In addition to the display board, students should develop a paper that will include:

1. The question under investigation;
2. The experiment;
3. The steps followed to conduct the experiment;
4. The results, including how students conducted the experiment; and
5. Any mathematical computations done during the analysis of data.

An interpretation of the data and conclusion should also be included.

Showcasing the Work, Holding a Green Science Fair

After your students complete their display boards and final papers, they are ready to showcase their work to a larger audience. The following are some tips to help put on a Green Science Fair at your school:

- **Pick an accessible time and location:** Consider having the Green Science

TIP: Teamwork

Consider pairing or teaming up students into small groups to accomplish their Green Science Fair projects. Teamwork can help students learn to work collaboratively around scientific inquiries.

TIP: Find a Science Fair Idea!

For more ways to help investigate about the environment, check out Science Buddies, at www.sciencebuddies.org/.

TIP: Reuse Cardboard!

Encourage students to make their own display boards out of cardboard. This way, you can money and resources while modeling green behavior!

Fair for an entire school by working with school administrators to set up specific times for teachers in other classes to visit the students' displays.

- **Collaborate with the local library or community center:** Students can share their projects with the larger community at public venues such as the library or a community center.
- **Parent Nights/Open House:** Students can display their work during Parent Nights or Open House Night to share their projects with friends and family members.

Grading Green Science Fair Projects based on the Science and Engineering Practices in the NGSS

Below are the eight practices for science and engineering in the NGSS. You can use these practices as a grading rubric for the Green Science Fair projects. Each project should have the following steps incorporated into them:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Name: _____

“Is there hope for planet Earth?” Post-video Question Guide

After watching the video, what are you wondering about?

What makes sense? What doesn't make sense?

Have you heard these messages before? How would you explain them in your own words?

How does what you learned from the video connect to what you already know?

What is one big takeaway from the video?

Green Science Fair Assignment Guide

There are two assignments to turn in for the Green Science Fair Project: a display board for the project, and a final paper.

1 The first step is to select a question to investigate. You can select any question that will allow you to conduct an experiment. Need more help? Check out Science Buddies at <http://www.sciencebuddies.org/>. To get started, here are some possible questions to investigate about the environment:

- How does water get polluted?
- Which materials pollute water more?
- What can be filtered out of water?
- What materials can I use to filter water?
- What happens when oil is spilled in water? Can oil spilled in water be cleaned up?
- How are melting glaciers increasing sea level?
- What does it take to recycle paper?

2 The next step is to develop an experiment to test your hypothesis. Keep a record of the materials and steps you use for the experiment to include on your display board. Take pictures of the experiment to display as well. Record your results. Analyze and interpret the data collected to develop your findings.

3 **Display Board**
Create your display board to display your project. The board should have the following sections:

Experiment	Question	Results
<i>Explain the experiment and the steps done to complete it.</i>	<i>Question investigated</i>	<i>Results, including analysis and interpretation of the data collected, and a conclusion.</i>

Final Paper

4 The final paper will include the question under investigation, the experiment, the steps followed to conduct it, the results, including how you conducted the experiment, and any mathematical computations done during the analysis of data. An interpretation of the data and conclusion should also be included.

1. What was the question you asked? Why did you ask it?
2. Explain the steps of the experiment, including your hypotheses and what you did to answer the question.
3. Record, analyze, and interpret the data. Include any mathematical processes you used to interpret and analyze the data.
4. Explain your results. Restate your question and how it was answered. What did you learn along the way?

Appendix A: Common Core Standards & Next Generation Science Standards¹

Common Core Standards for Grades 6-8 Students

Speaking and listening—comprehension and collaboration

2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

Reading Standards for Literacy in Science and Technical Subjects — Integration of Knowledge and Ideas

7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Writing Standards for Literacy in Science and Technical Subjects – Research to Build and Present Knowledge

7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

Next Generation Science Standards

ESS3.C: Human Impacts on Earth Systems

- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
- Typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4)
- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-3)

¹ Source: Source: Common Core State Standards for English Language arts & Literacy in History/Social Studies, Science, and technical Subjects; <http://www.corestandards.org/ELA-Literacy/> The College and Career Ready (CCR) anchor standards and high school grade-specific standards work in tandem to define college and career readiness expectations—the former providing broad standards, the latter providing additional specificity. Next Generation Science Standards <http://www.nextgenscience.org/>