

PEI created performance tasks designed to introduce elementary school students to renewable and non-renewable energy resources. To date, these tasks include the following:

Renewable and Non-renewable Energy Renewable Energy: Wind Renewable Energy: Solar Renewable Energy: Hydropower Renewable Energy: Geothermal

Renewable Energy: Biomass

The tasks are designed to provide basic background knowledge about renewable energy including what it is, how it works and the advantages and disadvantages for the environment. Each task focuses on a type of renewable energy, including basic background knowledge, career information, and a variety of print and video resources. Students practice the research skills of locating information, selecting the best information and having enough information to explain or persuade.

The first task, *Renewable and Non-renewable Energy*, culminates in a speech. Teachers are provided with the SBAC Speech rubric for scoring the student presentations. A template is provided for planning speeches. Teachers may adapt these materials as desired.

The Wind, Solar, Hydropower, Biomass, and Geothermal energy tasks are written to culminate in an argumentative essay. Students present a strong argument for the renewable energy source researched, including providing at least one counter argument with rebuttal. Each task includes an essay organizer to support students in writing an argumentative essay. The SBAC Argumentative rubric is included for scoring student work.

Teachers may want to assign additional research for the students prior to writing their essays. Otherwise, students can draw from the information provided in the performance task.

Each task includes a suggested field experience so that students may learn firsthand about the various renewable energy resources. If you are unable to conduct the field experience, you may want to create a virtual experience for the students where they investigate how the renewable energy resource is affecting their local communities.

Field Investigations are being developed for each task. These will be posted on the PEI website as they are created. The field investigations will focus on the science behind energy production and align with the NGSS standards.



Performance Task: Renewable and Non-Renewable Energy



Teachers should implement the performance tasks in a time frame that works best for them. The original model from SBAC has students completing Part 1 on day 1 and Part 2 on day 2. This may be inadequate for diving deeply into the research materials and ELA skills. Most likely, each performance task will fit into a period of three to five-day time period.

The main purpose of these tasks is to integrate ELA skills, including reading, writing, listening and speaking, with science content. Think of the tasks as a gateway into a more in-depth study of renewable energy and an opportunity to practice and apply a wide variety of ELA skills. Make the materials work for you and for your students. And do feel free to contact PEI for additional support!

PART 1: Research Student Directions

Your Assignment:

One of the most important issues for our world today is the production of energy. We rely on energy to run our homes, businesses, and transportation. You have been asked to give a speech that explains the difference between renewable and non-renewable energy and shows your

Steps you will follow:

To plan and compose your speech, you will do the following:

- 1. Read an article, two infographics and watch two videos.
- 2. Answer three questions about the media sources.
- 3. Visit a renewable energy site or listen to speakers.
- 4. Compose and deliver your speech.









Directions for beginning:

You will read the article, view the infographics and watch two videos, taking notes with the template provided. You may refer back to the media sources and your notes when writing your speech.

Source Information:

Source #1:	Article: Energy for Life - Reprinted with permission from Readworks.org. <u>https://www.readworks.org/article/Energy-for-Life/23847089-b0b5-498f-850d-</u> <u>b4410829b465#!articleTab:content/</u> Additional digital reading supports available online.
Source #2:	Infographic #1: Renewable Energy and Infographic #2: Non-renewable Energy
Source #3:	Video (choose one):
	Renewable Energy Sources (3:21) https://www.youtube.com/watch?v=Giek094C 14
	Bill Nye: Renewable Energy (3:07) <u>https://youtu.be/vzzmOy_g0IA</u>
	Renewable Energy 101 National Geographic (3:16) https://youtu.be/1kUE0BZtTRc
Source #4:	Career Video: Careers in Renewable Energy (4:16) <u>https://www.youtube.com/watch?v=o42DtGQPg5k</u>







Note-taking Template

Source	Definition and Examples: Renewable Energy	Advantages of Renewable Energy	Definition and Examples: Non-renewable Energy	Disadvantages of Non-renewable energy
Source #1: Energy Basics: Renewable and Non-renewable Energy Sources				
Source 2: Infographic #1 - Renewable Energy				





Performance Task: Renewable and Non-Renewable Energy



Source	Definition and Examples: Renewable Energy	Advantages of Renewable Energy	Definition and Examples: Non-renewable Energy	Disadvantages of Non-renewable energy
Source #2: Infographic #2- Non-renewable Energy				
Source #3: Video – Renewable Energy Sources or Bill Nye or National Geographic				







Career Video Note-taking Template

Energy Source	Types of Jobs	Key qualifications	Benefits of working in this industry
Solar			
Wind			
Wave			







Source #1: Article

ENERGY IS THE KEY

We use a lot of energy to live. Whether we're playing, studying or eating, energy makes these activities possible. We also use energy for production—to run machines, for instance. Much of this energy comes from fuels like oil, coal or natural gas. These fuels are used to make the blacktop and basketballs at recess, as well as generate the electricity for the lights all around you. Think of all the energy required to plant, grow, harvest, transport and cook your lunch, and you can start to understand that energy is a key to life!

NATURAL, BUT NOT FOREVER

Fuels like natural gas, oil and coal are important natural resources. They are known as fossil fuels and take millions of years to form. We've used them for hundreds of years, and they've powered everything from planes and trains to cars and computers. Unfortunately, fossil fuels are non-renewable forms of energy. Our power plants burn them faster than nature makes them, and when they are burned, power plants create emissions harmful to the environment.

To use fossil fuels, we first need to get them out of the earth with technologies like oil rigs, coal mines and natural gas wells. The drilling, mining and pumping of these natural resources often requires very large operations. These procedures result in producing the important energy we need, but they need fossil fuels themselves to operate and can often negatively impact the land where these fuels are found.

POWERING THE FUTURE

Fortunately, there are forms of renewable energy out there. They also come from nature and don't harm the environment as much as fossil fuels. Furthermore, they aren't consumed to produce energy, so we can use them again and again. One form of renewable energy is solar energy. Solar energy uses solar panels, which collect sunlight and convert it directly into electricity.

Another form of renewable energy is wind energy. Like an extremely large pinwheel, wind turbines have blades that rotate when the wind blows, and this movement generates electricity. Some solar and wind energy power plants are connected to batteries so they can supply electricity even when the sun isn't shining or the wind isn't blowing.

One form of renewable energy that has been around for a very long time is hydropower. Hydropower is energy produced by falling and running water. Hydropower technologies







can be as simple as a watermill on a stream or as complex as a hydroelectricity dam. Hydropower is a great source of renewable energy: in Washington state (in the USA), for instance, it produces approximately 75% of the entire state's energy!

THE RIGHT PLAN

Using renewable energy is a good way to reduce our dependence on fossil fuels, though renewable energies have some negative impacts on the earth as well. Solar power plants are usually built in deserts where sunshine is reliable and strong, but the desert land that is disrupted for the construction and operation of these power plants is actually rich with plant and animal life.

Wind energy power plants are called wind farms and require a lot of land. Though each turbine only takes up a small area of land, wind farms can easily have hundreds or thousands of turbines. With that many turbines together, their presence can easily affect birds, bats and other wildlife in the area.

Hydropower plants can generate a lot of energy and electricity, but their existence can dramatically alter the environment around them. Many hydropower plants use dams to create the electricity. Fish can be easily blocked by a dam and prevented from swimming to important spawning grounds. Dams can also fail and cause massive flooding. Also, in the event of a drought, the electricity produced could truly be limited to a trickle!

However, by carefully planning the locations of renewable energy power plants, their harmful impact to the planet can be minimized and their renewable and sustainable benefits maximized.

LOOKING FORWARD

Almost everything we do requires some sort of energy. It's important to understand where our energy comes from, how it is produced and what effect each type has on our environment. As technology improves, we can balance the use of non-renewable fossil fuels with renewable energy for a healthier planet.







Source #2: Infographic #1 - Renewable Energy







Source #2: Infographic #2 - Non-renewable Energy







Research Questions: Answer the questions below. They will help you think about the sources you have read and viewed, which should help you to compose your speech. You should refer back to the sources and your notes to answer the questions.

1. Define renewable energy and non-renewable energy using information from the article, videos and infographics. Cite your sources. (ELA Research Target 2: Locating Information)





2. Which source is the most helpful in explaining the value of renewable energy resources: the video you chose, the infographics, or the article? Explain your choice with at least two reasons. Be sure to compare the source you choose to the other choices. (*ELA Research Target 3: Selecting the best information*)







3. Explain the following statement: *The types of energy we use have either a positive or a negative effect on the environment.* Use information from at least two of the sources. Name your sources. *(ELA Research Target 4: Having enough information to explain or persuade)*





PART 2: Renewable Energy Field Experience

Arrange to take your students on a visit to a renewable energy site such as a wind farm, a business using solar energy, a hydropower plant or a farm where biofuels are used to generate electricity. Plan the field experience prior to the students writing and presenting their speeches. Encourage the students to use information they learn about the benefits of using renewable energy, including employment opportunities, in their speeches.

Renewable Energy Field Experience

Note-taking Template

Date:

Brief description of experience:

Benefits of this type of renewable energy:

Challenges we face using this type of renewable energy:

How we can address these challenges:

Career opportunities available for this field of renewable energy:





PART 3: Speech

Student Directions:

You will have time to review your notes and plan your speech. You may use notes from the sources and from the renewable energy field experience to write your speech. You may also refer back to the sources., if needed. Read your assignment and the information about how your speech will be scored, then begin your work.



How your speech will be scored:

Your assignment:

You have been asked to speak at an awareness night, helping community members understand issues we face with our energy resources. In your speech, be sure to include the following:

- Explain what we mean by renewable verses non-renewable energy
- Share why it is important to make the shift to renewable energy resources. Consider the availability of the resource, impact on the environment and potential employment opportunities.

Include at least two visuals in your speech. Your

- 1. *Focus* how well your speech clearly introduces and communicates your ideas.
- Organization how well your ideas flow from the opening to the conclusion and how well you stay on topic throughout the speech.
- 3. *Elaboration of Evidence* how well you use sources, facts, pictures, and details as evidence.
- **4.** Language and Vocabulary- how well you effectively express ideas using precise language that is appropriate for your audience and purpose.
- 5. *Presentation* how well your speech is presented, including eye contact, pronunciation and awareness of audience.

Now begin work on your speech:

- Review your notes
- Plan your speech using the template provided
- Your speech should be three minutes long









Outlining My Speech

Speech Components:	Supporting Visuals (Minimum of two)
Introduction: capture the audiences' attention!	
Explain the difference between renewable versus non-renewable energy sources with examples:	
Explain why we should continue to make the shift to renewable energy sources including the following:	
Availability of the resource:	
Impact on the environment:	
Potential employment opportunities:	
Provide a persuasive conclusion:	







SCORING VERSION

4 – Point Speech Rubric (Grades 3-11)					
Score	4	3	2	1	
Focus	 The speech is consistently and purposefully focused: controlling idea, opinion, or claim is clearly stated and strongly maintained controlling idea, opinion or claim is introduced and communicated clearly within the context 	 The speech is adequately and generally focused: controlling idea, opinion, or claim is clear and for the most part maintained though some loosely related material may be present some context for the controlling idea, opinion, or claim 	 The speech is somewhat unclear and unfocused: controlling idea, opinion, or claim is for the most part maintained though there may be a minor drift controlling idea, opinion, or claim may be lacking an appropriate context 	 The speech is unclear and unfocused: controlling idea, opinion, or claim may have a major drift controlling idea, opinion, or claim may be confusing or ambiguous 	
Organization	 The speech has a clear and effective organizational structure helping create unity and completeness: employs a strong opening and logical progression of ideas effective introduction and conclusion for audience and purpose 	 The speech has an evident organizational structure and a sense of completeness, though some ideas may be loosely connected: adequate use of transitional strategies with some variety ideas progress from beginning to end introduction and conclusion are adequate adequate, if slightly inconsistent, connection among ideas 	The speech has an inconsistent organizational structure: • inconsistent use of transitional strategies with little variety • ideas progress unevenly from beginning to end • introduction and conclusion, if present, any be weak • weak connection among ideas	 The speech has little or no discernible organizational structure: few or no transitional strategies are evident frequent extraneous ideas may intrude 	
Elaboration of Evidence	The speech provided thorough and convincing support/evidence for the writer's controlling idea, opinion, or claim that includes the effective use of sources, facts, and details: • use of evidence from sources is smoothly integrated	 The speech provides adequate support/evidence for the writer's controlling idea, opinion, or claim that includes the use of sources, facts, and details: some evidence from sources is smoothly integrated though may be general or imprecise 	The response provides uneven, cursory support/evidence for the writer's controlling idea, opinion, or claim that includes partial or superficial use of sources, facts, and details: • evidence from sources is weakly integrated	 The speech provides minimal support/evidence for the writer's controlling idea, opinion, or claim that includes little or no use of sources, facts, or details,: use of evidence from the source material is minimal, absent, in error, or irrelevant 	
Language and Vocabulary	 The speech clearly and effectively expresses ideas: use of precise language (including academic and domain-specific language) consistent use of syntax and discourse appropriate to the audience and purpose 	 The speech adequately expresses ideas employing a mix of precise with more general language: use of use of academic and domain-specific language is adequate use of syntax and discourse generally appropriate to the audience and purpose 	 The speech inconsistently expresses ideas employing simplistic language: use of domain-specific insufficient use of academic and domain- specific language use of syntax and discourse may at times be inappropriate to the audience and purpose 	 The speech expresses vague ideas, lacks clarity, or is confusing: uses limited language or domain-specific vocabulary rudimentary use of syntax and discourse inappropriate for the audience and purpose 	
Presentation	 The speech is clearly and smoothly presented: use of effective eye contact and volume with clear pronunciation understandable pace adapted to the audience consistently aware of audience's engagement use of strong visual/ graphics/ audio enhancement, when appropriate, to effectively clarify message. 	 The speech is adequately presented with minor flaws:: appropriate use of eye contact volume, and pronunciation generally understandable pace adapted to the audience sufficiently aware of audience's engagement sufficient use of visual/graphics/audio enhancements, when appropriate, to clarify message 	 The speech is unevenly presented with evident flaws: inconsistent use of eye contact, volume, and pronunciation pace partially adapted to the audience partially aware of audience's engagement sufficient use of visual/graphics/ audio enhancement, when appropriate, to clarify message 	 The speech is presented with serious flaws that obscure meaning: infrequent eye contact, and inappropriate volume and pronunciation pace not adapted to the audience little or no sense of audience's engagement 	

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