

## RENEWABLE ENERGY SOURCES WEBQUEST

**WebQuest Description:** Students will explore renewable energy options and consider the best option for their community. The WebQuest includes an individual student component and a group presentation.

**Grade Level:** 3-5

**Curriculum:** Science

**Keywords:** renewable energy sources

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### Introduction

Hello Renewable Energy Specialists. Have you heard the latest news? The United Nations has just declared that the world will have exhausted all of earth's non-renewable resources within the next 5 years. They have identified six options of renewable energy sources (wind energy, hydro energy, biomass, solar energy, tidal energy, and geothermal energy) that communities could consider using. What is the best option?

### Tasks

Your team of renewable energy experts has been contacted by your local government to come up with a solution to the problem that the world will run out of non-renewable energy sources within the next 5 years. Within your team each of you is an expert on at least one of the renewable energy options. You have an individual task and a team task. Your individual task is to research your area of expertise and share this information with your team. The team task is to rate each energy option presented by the members of the team and make a recommendation of the best energy source option for your community. Your team will share your recommendations in a 3 - 5 minute presentation. Your audience for your presentation will be representatives from the local government.

### Process

1. With your team, identify each person's area of expertise (wind energy, hydro energy, biomass, solar energy, tidal energy or geothermal energy). Your teacher may allow you to choose or you may be asked to draw a topic out of a hat.
2. Research your specialty area. Use the Research Template to record your notes and resources used. Be sure to include:
  - \* Where does my energy source come from?
  - \* What is the availability of this source of energy?
  - \* How does this energy source work?
  - \* What are examples of how this energy source has been used in the past (or present)?
  - \* What is the impact on the environment?
  - \* What is the impact on humans?
  - \* Are there any dangers related to this energy source?
  - \* What are the advantages of this energy source?
  - \* What are the disadvantages of this energy source?
  - \* Is there a significant cost to this energy source?Rate your energy option as a very good, good, fair or poor energy source for your community. Be prepared to support your rating with evidence from your research. Identify which source is the best option for your community. Consider the following criteria:
  - availability in your community
  - impact on the environment
  - impact on people
  - economic concerns
  - safety concerns
4. Prepare your proposal to share with your group. (This 1 page document will also be handed in for an individual mark):
  - \* Written Proposal (1 page double spaced)
  - \* Include:
    - \* Brief description of energy resource (what it is, how it works, availability, examples of its use, costs, dangers etc.)
    - \* Advantages and disadvantages
    - \* Impact
    - \* Rating and recommendation for use (or non-use) of this energy source. Include at least 3 supporting reasons to support your recommendation.Check the Assignment Guidelines sheet to make sure you cover all of the criteria.
5. Share your research and proposal with your team members.
6. Your team must now discuss energy source options that have been researched by the team members. Discuss the advantages and disadvantages, the impact on the environment and the people, the cost and other concerns for each energy source option. As a group rank the energy source options and decide on the best option for your community.
7. Prepare a 3 - 5 minute group presentation. All team members must participate in the presentation. The presentation should include:
  - \* Description of each of the energy resource (what it is, how it works, availability, examples of its use, costs, dangers etc), advantages and disadvantages, impact and the impact on the environment and the communities
  - \* Group rating (remember to back up your rating with evidence)
  - \* Group recommendation with at least 3 reasons why this is the best option.Be aware of your audience. Remember to convince them that you are the expert and you know what you are talking about. Present your information in a manner that will be interesting to your audience. (Hint: make sure your audience can hear you, don't read to them, and be creative.) Check the Assignment Guidelines sheet to make sure you cover all of the criteria.
8. Present your presentation and hand in your

## Evaluation

Category and Score	Not Yet Meeting Expectation	Meeting Expectations	Fully Meeting Expectation	Exceeding Expectations	Score
Research - content (individual mark)	<p>Little or no evidence of research provided. Most topics not covered. No supporting evidence given.</p> <p>A beginning level of performance and requires significant support during research process.</p>	<p>Evidence of some research provided. Most topics covered. Minimal supporting evidence given.</p> <p>May need some support during research process.</p>	<p>Evidence of research provided. All topics covered with some supporting evidence.</p> <p>Does not require support during research process. Research reflects mastery of performance.</p>	<p>Evidence of extensive research provided. All topics fully covered with supporting evidence.</p> <p>Independently works during research process. Research reflects the highest level of performance.</p>	%25
Written Proposal - content (Individual mark)	<p>Proposal is not clearly explained.</p> <p>Energy source is not rated and/or no supporting reasons are given for recommendation.</p>	<p>Proposal minimally explains energy source.</p> <p>Energy source rated and at least one supporting reason is given for recommendation.</p>	<p>Proposal explains energy source.</p> <p>Energy source rated and at least three supporting reasons are given for recommendation.</p>	<p>Proposal clearly explains energy source.</p> <p>Energy source rated and at least three detailed supporting reasons given for recommendation.</p>	%25
Written Proposal - mechanics (Individual mark)	<p>Problems with grammar, punctuation and spelling errors affect understanding of written proposal.</p> <p>Requires significant support.</p>	<p>Proposal demonstrates satisfactory writing skills.</p> <p>Some problems with grammar, punctuation or spelling errors.</p> <p>Requires some support.</p>	<p>Proposal demonstrates good writing skills.</p> <p>Minimal grammar, punctuation or spelling errors.</p> <p>Does not require any support.</p>	<p>Proposal demonstrates outstanding writing skills.</p> <p>No grammar, punctuation or spelling errors</p> <p>No support is required.</p>	%25
Group Presentation (group mark)	<p>Some components of presentation are included demonstrating a basic level of understanding</p> <p>Difficulty hearing or understanding presenters. Notes are read all of the time.</p> <p>Visuals present, but they are not referred to and do not support or relate to topic.</p> <p>Presentation does not engage audience and confusing to follow. Audience is not convinced the presenters know their material.</p>	<p>Most components of presentation are included (description of each energy source, rating, recommendation, supporting reasons) demonstrating a basic understanding of the material.</p> <p>Team members can be heard and speak clearly some of the time. Notes are read most of the time.</p> <p>Visuals are present, but they are not referred to at all.</p> <p>Presentation lacks creativity, and does not engage audience. Audience is not convinced that the presenters know their material.</p>	<p>All components of presentation are included (description of each energy source, rating, recommendation, supporting reasons) demonstrating an understanding of the material.</p> <p>Team members can be heard, and speak clearly most of the time. Little or no reading of notes.</p> <p>Visuals used in presentation, but they do are not integrated into presentation.</p> <p>Presentation is interesting, creative, and attempts to convince the audience that the presenters know their material but not in an expert level.</p>	<p>All components of presentation are included (description of each energy source, rating, recommendation, supporting reasons) demonstrating a high level of understanding.</p> <p>All members can be heard, and speak clearly.</p> <p>Visuals fully integrated into presentation.</p> <p>Presentation is interesting, creative, and convinces the audience that the presenters are experts and know their material.</p>	%25
				Total Score	%100

## Conclusion

Congratulations Renewable Energy Sources specialists. By now you are familiar with several different options for renewable energy sources. This was just a simulation, but the reality is that the world is exploring different options for renewable energy sources because we are starting to run out of the non-renewable energy sources (ie. coal, and natural gas). You are the future. The choices you make today will affect your life in the future. Can you change what you are doing now that will help sustain the non-renewable energy sources? Can you find ways your family or community can start using (or increase the use of) some of the renewable energy sources? What is the best renewable energy source option for your community? What will you do now?

## Teacher Page

Learners: This WebQuest was designed to be used with Grade 6 students following the British Columbia Science Curriculum. Curriculum Connections: Science Language Arts Learning Outcomes: Ministry of Education, British Columbia Science 6 Prescribed Learning Outcomes (<http://www.bced.gov.bc.ca/irp/irp.htm>) Science 6: differentiate between renewable and non-renewable methods of producing electrical energy Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions. Language Arts 6: Oral Language (Speaking and Listening) A1 use speaking and listening to interact with others for the purposes of discussing and comparing ideas and opinions (e.g., debating) improving and deepening comprehension discussing concerns and resolving problems completing a variety of tasks A4 select and use strategies when interacting with others, including accessing prior knowledge making and sharing connections asking questions for clarification and understanding taking turns as speaker and listener paraphrasing to clarify meaning Reading and Viewing B2 read fluently and demonstrate comprehension of grade-appropriate information texts with some specialized language, B4 demonstrate comprehension of visual texts with specialized features (e.g., visual components of media such as magazines, newspapers, web sites, comic books, broadcast media, videos, advertising, and promotional materials) Writing and Representing C2 write a variety of effective informational writing for a range of purposes and audiences that communicates ideas to inform or persuade Resources: Computer access See Website resource list found on the Process page Process: The students will need to be divided into groups of four. Each group must choose four renewable energy source options and then decide which member will be the expert for each energy source. In order to ensure that the class covers all energy source options the teacher may want to assign four energy sources to each group. If groups cannot decide how the expert topics, you may choose to have the students pick a topic out of the hat. Students will need access to computers. If you do not have access to one computer per student then students could rotate off computers and use books and other resources for research. Prior to starting this WebQuest it is assumed that students have the following prior learning experiences or knowledge: familiar with how electricity is generated understanding of non-renewable energy sources familiar with researching and taking jot notes students are familiar with cooperative learning strategies and have the skills to collaborate and reach a consensus through discussion and sharing of ideas familiarity with multimedia skills such as PowerPoint, I-Movie if they choose to use one of these mediums for their presentation Time Frame: The amount of time required for this WebQuest will vary depending on the availability of computers. A possible timeline could be: 1 period for groups to meet and choose individual topics 2 - 3 periods of computer access for individual research 1 - 2 periods to prepare their individual proposal 2 - 5 periods for teams to share research, rate energy source options, make recommendation, plan, prepare and practice group presentation Evaluation: Rubric has been created for use by teacher and student. Adaptations: Groups can be arranged by the teacher to ensure that stronger students can support weaker students. The number of content area topics to be researched can be adapted for students with special needs. For students with written output challenges the written component of the proposal could be replaced with an individual oral presentation. Instead of having students working together in teams to make recommendations for the best option, a teacher could choose to have all students present an individual presentation of their topic. Following the individual presentations a "town hall" style meeting could be used to make a class decision. Enrichment: Students could choose another community, region or country and make recommendations for the best renewable energy source option for that area. Credits: Images used in this WebQuest have been retrieved from the following websites: [http://www.ngdir.ir/http://aq48.dnraq.state.ia.us/prairie/Biomass\\_En.htm](http://www.ngdir.ir/http://aq48.dnraq.state.ia.us/prairie/Biomass_En.htm) <http://www.jamstec.go.jp/jamstec/MTD/Whale/mwwe b1.html> <http://www.kidzworld.com/article/1375-hydro-energy> <http://www.abc.net.au/news/stories/2007/07/26/1989070.htm> <http://school.discoveryeducation.com/clipart/>

### Standards

### Credits

### Other