

## **Forming an Opinion**

### **A WebQuest for To Dam or Not To Dam**

#### **Introduction**

When a country builds a dam in order to generate hydroelectricity, officials must consider negative impacts the dam might have on the environment. In Brazil, a proposed dam is coming under fire from people who are concerned about the effects the dam will have on the rainforest and the indigenous peoples who live there. The Belo Monte Dam, which would be the third largest dam in the world, is scheduled to be constructed on the Xingu River, a tributary of the Amazon River. The reservoir formed by the dam would flood hundreds of square kilometers of the rainforest. In this WebQuest, you will learn about the proposed Belo Monte Dam. Then, you will write a letter to the editor of the local newspaper about the dam.

#### **Task**

The local newspaper is reporting on the Belo Monte Dam and has asked for opinions from community members. Your task is to write a letter to the editor that states your opinions about the dam and explains the reasons for your opinions. In the letter, you will try to sway readers to your point of view.

#### **Process**

Use the resources listed in the Resources section to begin your research. The Web sites listed are good starting points, but further Internet research will be necessary. Record your answers to the following questions. You will use them to write a letter at the end of the project.

1. Why does Brazil's government want to build the dam?
2. How will the proposed dam affect the environment?
3. How does untouched rainforest benefit the environment?
4. How will the proposed dam affect indigenous peoples?
5. What concerns do some engineers have about the dam?
6. If the dam is built, will further development follow?

#### **Letter**

~~Once you have completed your research, organize what you have learned about the Belo Monte Dam into a "pro" list and a "con" list. Use the list to form your opinions about the dam. Then write a letter to the editor, expressing your opinions and stating the reasons for them. Don't forget to include evidence from your research that supports your opinions. Try to persuade other readers to share your view of the dam.~~

#### **Resources**

Brazil: Belo Monte Dam

Conservation Strategy Fund

Rainforest Foundation

United Nations Human Rights (Report on Indigenous Peoples' Rights)

United Nations Cyber School Bus

International Energy Agency  
Rainforest Action Network

**Evaluation**

Read this rubric to see how you will be scored on this activity.

	Criteria				Points
	0	5	10	15	
<b>Task</b>	The task was not completed.	It appears that some effort was made to complete the task, but few opinions were included in the letter.	The task was completed as assigned, but some of the rationale for opinions on the dam was questionable.	The task was completed with great attention to detail and thorough documentation.	
<b>Process</b>	The process was not followed.	The process was followed, but not all of the questions were answered.	The process was followed, and the rationale for the opinion about the dam was based on sound evidence.	It is clear that much research went into the project. The opinions about the dam show that the students spent a lot of time thinking about the issues.	
<b>Letter</b>	The letter is sloppy and not well prepared.	The letter includes key ideas but lacks general cohesiveness.	The letter is well organized, and opinions are clearly stated. Opinions are backed up with evidence from research.	The letter is well organized, opinions are clearly stated, and the attempt to persuade readers to share the students' views is highly convincing.	
<b>Total Score</b>					

## **The Ever-Expanding World of Nanotechnology**

### **A WebQuest for Exploring Nanotechnology**

#### **Introduction**

During the last two decades, more and more scientists began research into nanotechnology, the branch of science that deals with the development and use of devices on the nanometer scale. Although it is used in many products today, many people know little about nanotechnology, its benefits, or its risks. In this WebQuest, you will explore the vast field of nanotechnology and learn about its benefits and potential drawbacks. Then, you will choose a current or future application of nanotechnology and create a presentation about it.

#### **Task**

The National Nanotechnology Initiative (NNI) is beginning an advertising campaign to explain current and future benefits of nanotechnology to the general public. The NNI has hired your advertising firm for this campaign. Your task is to create a whiteboard or computer presentation that highlights a current or future use of nanotechnology and how it benefits society.

#### **Process**

Use the resources listed in the Resources section to begin your research. The Web sites listed are good starting points, but further Internet research will be necessary. Record your answers to the following questions. You will use them to create a whiteboard or computer presentation at the end of the project.

1. How is nanotechnology currently being used to benefit society?
2. How might nanotechnology be used in the future to benefit society?
3. Are there any potential negative effects of nanotechnology?
4. Describe an application of nanotechnology that interests you.

#### **Whiteboard or Computer Presentation**

~~Once you have completed your research, create a whiteboard or computer presentation about the nanotechnology application that you described in your answer to Question #4. Use your answers to the other three questions to inform your presentation. Make sure to use as many photographs, illustrations, and other graphics as possible and to footnote your sources in the presentation. You will show your presentation to "representatives of the NNI" (your classmates), who will ask you questions about how the presentation explains nanotechnology to the general public.~~

#### **Resources**

National Nanotechnology Initiative

U.S. Department of Energy

Lawrence Berkeley National Laboratory

How Stuff Works

MedlinePlus

Environmental Protection Agency (EPA)

## Mitochondrial DNA: Key to Genetic Mysteries

### A WebQuest for Tracking Human Evolution

#### Introduction

Mitochondrial DNA has revolutionized scientists' quest to trace the evolution of humans and other species. Because it is inherited only from the mother, scientists can use it to trace the maternal lineage of a species. In this WebQuest, you will research a topic related to mitochondrial DNA (mtDNA). Then, you will create a blog post so that you can share your research with your classmates.

#### Task

Because of the large number of scientific discoveries that are being made with mitochondrial DNA, your teacher thought your class would learn more if students researched a variety of topics. Your task is to search the Internet for topics related to mtDNA and human (or animal) evolution. Then, choose a topic and learn all you can about it. You will write a blog post about the information you find.

#### Process

Use the resources listed in the Resources section to begin your research. The Web sites listed are good starting points, but further Internet research will be necessary. Record your answers to the following questions. You will use them to write a blog post at the end of the project.

1. Describe mitochondrial DNA, giving as much detail as you can.
2. Choose a topic relating to mitochondrial DNA and describe the scientific discoveries researchers have made using mtDNA. If you have difficulty finding a topic to research, your teacher may be able to suggest a topic.

#### Blog

Once you have completed your research, go to the blog page your teacher has set up for you on Kidblog (<http://kidblog.org/>). Write a blog post about what you have learned about mitochondrial DNA and the specific topic you have chosen. Make sure to include the sources from which you got your information. Your teacher will provide you with time to read your classmates' blog posts.

#### Resources

National Institutes of Health

National Geographic

Bradshaw Foundation

Public Broadcasting Service (PBS)

Archaeology

The DNA Initiative

## **A Timeline of Progress**

### **A WebQuest for Stem Cells: Paralysis Cured?**

#### **Introduction**

Fewer than 30 years ago, scientists and doctors believed that paralysis caused by damage to the spinal cord was permanent. They thought that the neurons in the spine could not be regenerated. But in the early 1980s, researchers found evidence to the contrary. Today, major progress in the treatment of paralysis is being made with the use of stem cells. In this WebQuest, you will research the use of stem cells in the treatment of spinal cord injuries. Then, you will make a timeline showing how scientists' knowledge of the possibilities of stem cell usage has steadily grown over the years.

#### **Task**

The National Institutes of Health (NIH) wants to make a timeline to explain to high-school students the progress that scientists are making in the use of stem cells to treat spinal cord injuries. Your task is to research the history of the use of stem cells in the treatment of spinal cord injuries and to make an illustrated timeline showing important dates and discoveries.

#### **Process**

Use the resources listed in the Resources section to begin your research. The Web sites listed are good starting points, but further Internet research will be necessary. Record your answers to the following questions. You will use them to create a timeline at the end of the project.

1. What are stem cells?
2. Why did scientists and doctors think spinal cord injuries were permanent, and what changed their minds?
3. How have stem cells been used to treat spinal cord injuries?
4. How do scientists and researchers think stem cells will be used to treat spinal cord injuries in the future?

#### **Timeline**

~~Once you have completed your research, create a timeline that shows major advances in the use of stem cells to treat spinal cord injuries. You might draw your timeline on a poster, or you might choose to use computer software. Include photographs and other graphics to illustrate stem cells advances and discoveries. Make sure to include a separate document that lists the sources of your information.~~

#### **Resources**

Christopher and Diana Reeve Foundation

MedlinePlus

National Institutes of Health

Centers for Disease Control and Prevention

University of Wisconsin Stem Cell and Regenerative Medicine Center