

Honors Biology Summer Assignment

Cellular Disease WebQuest

<http://www.ccs.k12.in.us/chsteachers/KHallett/Webquests/webquest%20intro.htm>

This Web Quest was designed to be a research based project focusing on the cell unit of an introductory high school biology class. Simply memorizing the names and functions of cell organelles does not give students an appreciation for the amazing processes of cells. While only an overview of cellular metabolism is typically covered, student learning is enhanced when a connection is made with processes with which they are familiar. Research is proceeding at a rapid rate into the cellular basis of many diseases and by participating in this Web Quest students will come to better understand the normal functions of a cell while investigating what happens when metabolic processes do not work. We will be addressing the ascertained information in September when we present our findings in class.

I. Student Introduction:

What do diabetes, Parkinson's disease, and Multiple Sclerosis have in common? They are all diseases caused by cells that do not work properly. Cells are the basic unit of organization of all living things, and humans have over two hundred different types of cells. We have ten trillion cells in our bodies, all working together to keep us alive. What do they do? What happens when they don't work? What other diseases are caused by malfunctioning cells? What can be done to find cures for seemingly incurable diseases?

The purpose of this Web Quest is to examine a type of cell in the human body and create a presentation to Congress (class) asking for additional funding to help find a cure for a cellular disease.

II. The Task*:

You are conducting research on a human disease that is caused by a type of cell that is not working properly. While much is known about the cause of the disease, more research is required to find a cure. You will hand in a research report and create a persuasive letter urging members of Congress to fund your research project.

In order to persuade Congress to fund research projects, you must first provide background information about cells and then explain the cellular basis of the disease. Each student will research the information and create his or her own poster.

* The webquest online is presented as a group project with a PowerPoint presentation. I am asking you to do the research assignment individually and write a persuasive letter. You do not need to create a PowerPoint. Please include the three sections on the following page in your report along with a work cited.

* Disregard the webquest timeline.

Step One: Select a disease from the list below to research:

Cystic fibrosis
Muscular dystrophy
Parkinson's Disease
Leukemia
Huntington's Disease
Multiple Sclerosis

Tay Sachs
Polycystic Kidney Disease
Alzheimer's Disease
Diabetes
Amyotrophic Lateral Sclerosis (Lou Gehrig's Disease)

On the webquest site, each disease is a hyperlink, bringing you to another website specifically addressing your selection.

Step Two: Researching your selected disease. Cover the following information below.

1. Cellular cause of disease

- Type of cell involved with disease
 - What is the specific function of this type of cell?
 - If an organelle or other cell structure is the problem in the disease, include information about it.
 - How is the structure of this type of cell designed to help it perform its function? *Look at pictures of different types of cells and compare their shapes. Are there more of a specific type of organelle in this type of cell?*
- Cellular basis for disease
 - What type of cell or cell part is not performing properly?
 - Why is the cell not performing properly?
 - Does this type of cell affect other parts of the body?
- Communication
 - Does this cell communicate with other cells? Most cells receive signals from other cells.

2. Disease- Basic Information

- Symptoms of disease
 - Describe what someone with the disease would notice, and what doctors find when doing an examination.
 - How serious is the disease? What happens if it is not treated? What effect does it have on normal living?
 - Is it inherited? If so, describe the inheritance pattern and the gene responsible. Include information about the gene from the website we used in the DNA blast activity.
 - What is a typical age of diagnosis?
- How does the malfunctioning cell cause the symptoms? *Usually there is a protein or enzyme that isn't produced properly. How is this related to the symptoms? Some of this information will overlap with the cellular researcher.*

3. Disease- Treatment and Research

- Briefly review what type of cell is involved and how it is not functioning properly.
- Treatment
 - How is the disease currently treated? Is it curable, or is the treatment only for the symptoms?
 - What research is currently being conducted to find a cure/treatment?
 - Is there hope for a cure/treatment?
 - What institutions are doing research? (The website for the disease will summarize this information.)
- Are stem cells or gene therapy used in research? Can they lead to a cure?
 - Do you have any ideas on how this disease might be treated/cured?
 - Why is continued research important?

Sources:

- You must include at least three sources.
- One source must be the official disease website.
- The others must be from this list of sources or sites that are linked to these sources. If you know someone who is affected by the disease you may do a personal interview.
- All sources must be properly cited. Follow instructions in your

III. Evaluation:

You will be evaluated on two parts: 1) the report with work cited 2) the persuasive letter. The rubrics are attached:

Name _____ Period _____

Due: Sept. 11, 2009

Research	Exemplary 10	Accomplished 8	Developing 6	Beginning 4	
Content	All research questions are answered in great detail. Additional information is included.	All research questions are answered, but not in detail.	Most research questions are answered briefly.	Only one or two research questions answered.	X 6 =
Work Cited	three works cited correctly from the provided list	three works cited incorrectly from the provided list	two works cited correctly from the provided list	two works cited incorrectly from the provided list	X 1 =

Letter	Exemplary 8	Accomplished 6	Developing 4	Beginning 2	
Persuasion	The letter is very persuasive with facts and examples.	The letter is fairly persuasive.	The case for research is not compelling.	There is no persuasive writing.	X 1 =
Content	All required information is included.	Almost all required information is included.	Not all required information is included.	Very little required information is included.	X 2 =

- The total point value for this project is 100.
- It will be counted as a test grade.
- The project is due Friday September 11, 2009.