

Scientific Discoveries through Time

WebQuest Description: This WebQuest helps students become discoverers of the major scientific findings in biology from the 15th century to today. Students will become aware of accomplishments, people who contributed to discoveries, beliefs, theories and trends of the era they are assigned.

Grade Level: 9-12

Curriculum: Science

Keywords: Discoveries, Biology, Trends, Science, Developments

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Introduction

Do you remember the last time you stayed home from school with a sore throat? You probably went to your doctor's office, received a shot, and left the office with the peace of mind that you would soon be well and able to get back to what you love to do. What if you had not been able to go to a doctor and receive penicillin or some other antibiotic? Because of brave, determined, and knowledgeable people throughout history, our world is a better and safer place to live. It is difficult to think of an aspect of our lives that has not, somehow, been impacted by someone who made a great scientific discovery along the way. In this WebQuest, you will look at biological discoveries throughout history. You will create a timeline to help others take a look into a particular time period and better understand these important scientists and the remarkable things they discovered. You will enable them to have a glimpse at the milestones where history took a turn toward improvement and progress. Help your audience understand the times in which these scientists lived. Explain to them who these pioneers were, and what they meant to the communities in which they lived. You will choose your favorite pioneer, and explain the impact their new ideas had on their lives, as well as on our lives, today. In other words, take your audience on an adventure into the past, and help them grasp the importance of these scientific discoveries. And, help them want to learn more about the events on the timeline of history and the "heroes" of biology. Before you begin your quest review this presentation and reflect on its ideas. Good luck and have fun on your journey!

Tasks

History of Biology Timeline Display
Designing a Timeline of Accomplishments and Historical Significance in Biology: This project involves researching a time period in history as well as accomplishments and/or persons who contributed to the field of biology during that time frame. You will work in a group of three or four to create a biology history timeline display that contains exhibits pertinent to your historical time period. The display, which you will construct by using a Web 2.0 tool, must incorporate a variety of elements – pictures, replications of art and artifacts, graphics, maps, primary source documents, current events – to show a clear view of your era. You will then identify one individual, chosen by your group, who contributed to one of these major discoveries. You will focus on the following questions when researching the major discoverer and discovery of your time period: How has the contribution of the individual impacted people today? What would our world be like without this major discovery? How was this discovery viewed during this time period? Was it rejected? Was it celebrated? At the end of your research, you will become the experts of your time period and your chosen individual. You will be able to present and share this information with the class. Please review the Biology History Timeline Display Rubric attached below to assist you with your timeline.

Process

Process: This assignment provides a structured way for you to examine and explore the major scientific contributions and discoveries throughout history. Be sure to utilize the graphic organizers and pathfinder page for helpful resources. Make sure to follow the rules regarding citing your resources. Your group will be assigned a time period to focus on. You will research the most important historical aspects of that time period to include in your timeline. Then choose one individual who was a major contributor to your era and include a spotlight section for this individual. Use the History of Biology Timeline - Scientist Organizer file to help you with your research. Your group will create a timeline using padlet.com, cadoo.com or piktochart.com. You will then present it to the class.
Requirements:
1. Your display should include most of the statements listed below: Discoveries or accomplishments of the era
People who contributed to the developments or discoveries
Beliefs or theories related to the development or discovery
Trends in the field of biology during your era.
2. Each exhibit of your display must combine at least four elements listed below. A caption should accompany each explaining how the information relates to your topic: Pictures
Timelines
Symbols
Charts, graphs, tables
Music
Diary of accounts of individual
Copies of primary source documents
Illustrations
Maps
Collages
Important Quotes
Replications of art and artifacts
Poetry and literature
3. Each exhibit in your display must have explanations that introduce viewers to the timeline. The explanations should include: An introduction to the topic
The person or people involved
An explanation of the discovery or innovation
The significance of the innovation both then and now.
4. As a group, you will brainstorm ideas, do research and contribute information for each exhibit, create the design elements, and help with the writing and creation of the elements of each timeline.
5. Each of you will also be assigned one of more of the following roles:
Logistics - Designs the layout for each part of the display. Helps with the production and assembly of the online exhibit.
Historical Writer - Oversees the writing of the text for each explanation. Creates brief captions for all parts of the "exhibit".
Graphics - Oversees the design of all graphic elements - illustrations, maps, collages, and the like - for each of the exhibits. List all ideas for the display and the resources needed.
Collector -

Responsible for ensuring that all necessary resources for the exhibit are cited correctly. Also assists with assembly of the online display.6. Your group will be assigned a time period from below. Then your group will decide on which individual to focus on. You can choose an individual from the list or choose your own. If choosing your own, please make sure to check with your instructor before. Assigned Time Periods for your Exhibit: Ancient Egyptians and Chinese Ancient Greeks and Romans; Hippocrates, Aristotle, Galen The Dark Ages and Middle Ages – AD 400 to AD 1400; Alcamoon of Crotona The Renaissance - AD 1350 to AD 1650; Anotonie van Leeuwenhoek, Robert Hook The 16th and 17th Centuries; Nicholas Copernicus, Isaac Newton, Walther Flemming, Andreas Vesalius, William Harvey The 18th Century; Carl Linnaeus The 19th Century; Louis Pasteur, Gregor Mendel, Michael Faraday, Dmitri Mendeleev, Claude Bernard, Rudolf Virchow, Theodore Schwann, Matthias Schleiden, Charles Darwin The 20th Century; Watson & Crick, Campbell & Wilmut, Albert Einstein, Alexander Fleming, James Watson, Robert Gallo et al., Michiaki Takahashi, Jonas Salk The 21st Century; John Craig Venter, Edward Wilson. Using the Pathfinder: The websites on the Pathfinder have been chosen to assist you in your search. These websites are based on reliable information from experts in the field.

Evaluation

The recording and analysis tools you have at your disposal are the Organizers for the Timeline and the Scientist. Be sure to use the "History of Biology Display Rubric" to evaluate your work. Let it guide you in evaluating your work and in leading you toward the grade you are working to achieve. In addition to these tools, please use the Project Checklist. It will let you evaluate your work, step by step, to assure that you have included each step that is required. In order to polish any project, it is important to double check your work, step by step. The Project Checklist will help you to be sure you have created the quality project you strive to create. Every job is a self-portrait of the person who does it. Autograph your work with excellence. –Anonymous

| Category and Score | | | | | Score |
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Conclusion

This WebQuest was designed for you to become familiar with some of the world's greatest scientific discoveries. You researched the scientists and their discoveries that were considered advanced and groundbreaking for their time. You created a timeline display to showcase these discoveries and presented it to your audience. As you completed the WebQuest, did you make connections to your own life? Imagine how life as we know it would be without the scientific discoveries you and your class studied in this Webquest assignment. Review and reflect your own findings and what you learned from your classmates' presentations. Of all the discoveries presented by the class, including your own, which do you believe is the most important discovery? Explain your choice and provide evidence for your answer. Post your answer in short answer (paragraph) form and tag it with your First Name initial, last name, and class period to linoit.com. Now think about any scientific discoveries yet to be made. In the next ten years, what scientific discovery would you like to make? How will this discovery impact others' lives? Reflect on the learning you did in this WebQuest. What steps will you need to take to prepare for making this discovery. Who knows? You may just be the one on the next Top Ten List of Biologists from the 21st Century! Watch the Prezi presentation you were introduced to at the beginning of the WebQuest again. Has your thinking about biology and its many discoveries changed in any way? As you continue with your high school science classes, continue to reflect and build on what you learned in this WebQuest.

Teacher Page

Objectives of this WebQuest: Students will be able to: Identify scientific milestones that have led to advances in the biology field. Predict where and how factors such as beliefs, culture, technology, and advances in science, may affect various scientific delivery system models. Incorporate research activities into computer based visual presentation using online interactive tools that focus on building team skills in all content areas. Meet above objectives to 80% mastery or above. About our WebQuest: Biology today has evolved throughout history. The purpose of this activity is to promote thinking through inquiry about the history of the biology field. As students gather related data on their particular topic and individual, ask students to share their responses on the checklist with you. This will

assist students with the correct pronunciation of scientists names and other scientific words. This will also allow you to help students include thorough descriptions of their time period, beliefs, discoveries and discoverers. Teacher Reflection: Answer the following questions after students complete the project to refine your strategies with WebQuest tools. What did your analysis tell you about how your students learn using the WebQuest tool? What did your analysis tell you about the success of the strategies you used? How useful were the assessments in terms of student learning? How will you differentiate instruction so that all students achieve content mastery? How will you differentiate instruction for students who easily achieved the performance criteria and need to move forward?

Standards

Texas Essential Knowledge and Skills (TEKS) addressed in this WebQuest:

Biology

(3) Scientific processes. The Student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:

(B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal activities, and marketing materials;

(D) evaluate the impact of scientific research on society and the environment;

(F) research and describe the history and biology and contributions of scientists.

English Language Arts

(1) Writing/purposes. The student writes in a variety of forms, including business, personal, literary, and persuasive texts, for various audiences and purposes. The student is expected to:

(A) write in a variety of forms using effective word choice, structure, and sentence forms with emphasis on organizing logical arguments with clearly related definitions, theses, and evidence.

(23) Research/Organizing and Presenting Ideas. Students organize and present their ideas and information according to the purpose of the

research and their audience. Students are expected to synthesize the research into a written or an oral presentation that:

(A) marshals evidence in support of a clear thesis statement and related claims;

(B) provides an analysis for the audience that reflects a logical progression of ideas and a clearly stated point of view;

(C) uses graphics and illustrations to help explain concepts where appropriate;

(D) uses a variety of evaluative tools (e.g., self-made rubrics, peer reviews, teacher and expert evaluations) to examine the quality of the research; and

(E) uses a style manual (e.g., Modern Language Association, Chicago Manual of Style) to document sources and format written materials.

ISTE NETS*S Standards 2016

(6) Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals

AASL Standard Indicators (selected)

Standard 1.4.3: Monitor gathered information, and assess for gaps or weaknesses.

Standard 2.2.4: Demonstrate personal productivity by completing products to express learning.

Standard 3.1.2: Participate and collaborate as members of a social and intellectual network of learners.

Standard 3.1.4: Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess.

Credits

Other