

Beecher Lafever

Taipei Adventist American School

Beecherf @ gmail .com

Science Fair Unit

Eighth Grade

Description

This unit will introduce the students to the steps in the scientific method. The steps are as follows:

- State a question.
- Research the question.
- Form a hypothesis.
- Design an experiment or test of the hypothesis with a constant and a variable.
- Collect data.
- Analyze data.
- Make and evaluate a conclusion.

This unit will also give the students practical experience in using the scientific method with hands on science projects (problems). It will challenge the students to analyze data, reason from cause to effect, and use artistic skills for displaying their projects. Science concepts, computer technology, and Faith will be integrated into the unit.

The Science Fair will give the students experience in displaying and presenting their science projects to the public (classmates and parents).

Faith Integration

Faith will be integrated into the preparations for the Science Fair during my homeroom Bible class. The faith integration will include the following:

- a study of the six days of Creation with emphasis being placed on everything being made perfect for it to function perfectly.
- a review of the anatomy and physiology of the eye and ear will be presented to illustrate the concept of intelligent design. Two videos will be used as supplements to the concept of intelligent design. They are the following: The Privileged Plant and Unlocking the Mystery of Life (Illustra Media – www.illustramedia.com).

Curriculum Benchmarks

The technology standards that will be met by the eighth grade students are as follows:

- number 1 – Students are proficient in the use of technology.
- number 3 – Students use technology tools to enhance learning, increase productivity, and promote creativity.
Students use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and other creative work.
- number 5 – Students use technology tools to locate, evaluate, and collect Information from a variety of sources.

Materials/Hardware/Software

The students will be utilizing the following materials, hardware, software, websights:

- a computer (ASUS Barebone Terminator – www.asus.com).
- printer – color ink jet or black and white laser – HP Corp..
- Excel – 2003.
- M.S. Word – 2003.
- Publisher – 2003.
- Yahoo.com – Search.
- Google.com – Search.

Teacher Preparation

I will be arranging for the students to use the computer lab. This will involve the lab instructor having a free period in the lab for the students and her supervision. There is the possibility for after school use under my supervision.

I will need to prepare for the use of the following videos:

- Scientific Method Problem Solving – TMW Sales Co. Inc.
- The Privileged Planet – Illustra Media – www.illustramedia.com
- Unlocking the Mystery of Life – Illustra Media – www.illustramedia.com

I will prepare a rubric for assessing the final science project and a schedule form for monitoring project progress during the six weeks. The following is an example of the Schedule Form:

Schedule Form for Science Fair

Week One

Review of the steps in the scientific method.

- State a question.
- Research the question.
- Form a hypothesis.
- Design an experiment or test for the hypothesis.
 - include a control and variable.
- Collect data.
- Analyze and present data.
- Make and evaluate a conclusion.

An example of a question and the steps used to find an answer.

Quiz over the steps of the scientific method next week.

The following steps are due next week: Your question you want to research, the research done concerning your question, and your hypothesis.

Week Two

Quiz over the steps of the scientific method.

Your question:

Research done and discoveries:

Your hypothesis:

Student presentations of question, research, and hypothesis.

The following step is due next week: Experiment or test information,

control and variable, and methods and materials.

Week Three

Student presentations of their experiment or test preparations.

The following steps are due next week: Data collected and analyzed, and how it is going to be presented – graph or tables. What software will be used? Excel?

Week Four

Student presentations: Data collected and analyzed, how it will be presented, and what software will be used? Any problems?

Next week, reports of progress toward completion of project.

Final instructions concerning when project to be brought to school, and where to set up.

Week Five

Student reports of progress toward completion. Any problems? Any results to share. Any questions?

Week Six

Science Fair day. Presentation will be viewed by other students and parents. Project and presentation will be evaluated or graded.

Student Preparation

The students will need to know how to use the internet for research, how to use a word processing program, how to use a color printer, and how to make tables, graphs, and charts. (See the section entitled, Materials/Hardware/Software). Most of the students will have acquired these skills from past technology classes.

The students will review the rubric that will be used for assessing their science projects.

Activities/Procedures

The students will have a schedule form to record their information, decisions, and activities in relationship to each step of the scientific method. This form will include a schedule for completion of each step. (See the schedule form under the section entitled, Teacher Preparation)

They will conduct an experiment or test as needed to prove or disprove their hypotheses. This is usually done in the home environment with support from the science teacher.

They will produce a display board giving the steps of the scientific method

with drawings, graphs, pictures, and tables or charts as needed for presenting their data and experiment or test results.

They will produce a written paper presenting a general description and summary of their science project. They will answer the following questions:

-Does your conclusion prove or disprove your hypothesis? And why?

Management Plan

My management plan will include a review of The Ten Commandments for Computer Ethics, and the presentation and discussion of plagiarism and honesty. It will also include the computer instructor giving help as needed concerning the research and word processing the students will be doing. All material quoted or taken from a resource will be reviewed for references.

The Schedule Form each student receives will have a time frame for each step of the scientific method. This is to prevent procrastination.

The following are two management resources that will be available to the science teacher and the computer lab instructor:

- Classroom Management Techniques, YOC, created by Jane Scaplen.
- Plagiarism and Pixels, by Diane Christian Boehm.

Ethics Plan

In the regular science class during the six weeks an emphasis will be given to plagiarism and honesty. This will be discussed in relationship to their science projects. The Ten Commandments for Computer Ethics (Computer Ethics Institute) will be reviewed. The need for all materials used from resource to be referenced will be emphasized.

Assessment/Evaluation

A rubric will be used for assessment of the final project and its display. The Schedule Form will be collected and will become part of the project grade.

The following is an example of the rubrics that will be used to assess the students final projects and its presentation:

Science Fair Experiment : Science Fair Rubric

Teacher Name: **Mr. Lafever**

Student Name: _____

CATEGORY	4	3	2	1
Idea	Independently identified a question which was interesting to the student and which could be investigated.	Identified, with adult help, a question which was interesting to the student and which could be investigated.	Identified, with adult help, a question which could be investigated.	Identified a question that could not be tested/investigated or one that did not merit investigation.
Hypothesis Development	Independently developed an hypothesis well-substantiated by a literature review and observation of similar phenomena.	Independently developed an hypothesis somewhat substantiated by a literature review and observation of similar phenomena.	Independently developed an hypothesis somewhat substantiated by a literature review or observation of similar phenomena.	Needed adult assistance to develop an hypothesis or to do a basic literature review.
Descripton of Procedure	Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. No adult help was needed to accomplish this.	Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. Some adult help was needed to accomplish this.	Procedures were outlined in a step-by-step fashion, but had 1 or 2 gaps that require explanation even after adult feedback had been given.	Procedures that were outlined were seriously incomplete or not sequential, even after adult feedback had been given.
Diagrams	Provided an accurate, easy-to-follow diagram with labels to illustrate the procedure or the process being studied.	Provided an accurate diagram with labels to illustrate the procedure or the process being studied.	Provided an easy-to-follow diagram with labels to illustrate the procedure or process, but one key step was left out.	Did not provide a diagram OR the diagram was quite incomplete.

Display	Each element in the display had a function and clearly served to illustrate some aspect of the experiment. All items, 6, graphs etc. were neatly and correctly labeled.	Each element had a function and clearly served to illustrate some aspect of the experiment. Most items, 6, graphs etc. were neatly and correctly labeled.	Each element had a function and clearly served to illustrate some aspect of the experiment. Most items, 6, graphs etc. were correctly labeled.	The display seemed incomplete or chaotic with no clear plan. Many labels were missing or incorrect.
Conclusion/Summary	Student provided a detailed conclusion clearly based on the data and related to previous research findings and the hypothesis statement(s).	Student provided a somewhat detailed conclusion clearly based on the data and related to the hypothesis statement(s).	Student provided a conclusion with some reference to the data and the hypothesis statement(s).	No conclusion was apparent OR important details were overlooked.

Date Created: Jul 31, 2006 03:53 am (CDT)

Copyright © 2006, 2005, 2004, 2003, 2002, 2001 Advanced Learning Technologies in Education Consortia [ALTEC](#)

To view information about the Privacy Policies and the Terms of Use, please go to the following web address:

Follow-Up Activities

All students that participated in the Science Fair will receive a Certificate of Participation. These certificates would be made by using Microsoft Publisher.

The project boards that were the better ones would be kept as examples for the next science fair if the students agree.

