A Great Debate: Who Made the Biggest Difference?

Grade Level or Special Area: Connections
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Length of Unit: 12 lessons, 17-20 forty-five minutes class periods

I. ABSTRACT

A. As part of an "expert" team, students will research the life, struggles and successes of a Core Knowledge scientist in preparation for a culminating class debate. From a menu of activities each student will research and produce a piece of the scientist's life puzzle in order to answer the big question "Which scientist made the biggest contribution to our world?" The activities include projects that allow for differing abilities and learning modality preferences. All learners can make a contribution to the Great Debate and promote their scientist. This model could be used in grades 4-8 across all Core Knowledge content areas.

II. OVERVIEW

A. Concept Objectives

1. Students will understand that science is a human endeavor practiced by individuals from many cultures. (Oregon Common Science Curriculum Goals)
2. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and purpose that engage reader interest; organize information in clear sequence, making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning. (Oregon Common English/Language Arts: Writing Curriculum Goals)
3. Students will investigate topics of interest and importance across the subject areas, selecting appropriate media sources, using effective research processes, and demonstrating ethical use of resources and materials. (Oregon PASS Standards)
4. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control of eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques. (Oregon Common English/Language Arts: Speaking and Listening Curriculum Goals)

B. Content from the *Core Knowledge Sequence*

1. Fourth Grade Science: Science Biographies (page 106)
   a. Benjamin Banneker
   b. Elizabeth Blackwell
   c. Charles Drew
   d. Michael Faraday
2. Seventh Grade Science: Science Biographies (page 177)
   a. Charles Darwin
   b. Antoine Lavoisier
   c. Lise Meitner
   d. Dmitri Mendeleev
3. Fourth Grade Language Arts: Writing and Research (page 87)

a. Produce a variety of types of writing—including stories, reports, summaries, descriptions, poems, letters—with a coherent structure or story line.
b. Know how to gather information from different sources (such as an encyclopedia, magazines, interviews, observations, atlas, online), and write short reports presenting information in his or her own words, with attention to the following:
i. understanding the purpose and audience of the writing
ii. defining a main idea and sticking to it
iii. providing an introduction and conclusion
iv. organizing material in coherent paragraphs
v. documenting sources in a rudimentary bibliography
c. Organize material in paragraphs and understand
i. how to use a topic sentence
ii. how to develop a paragraph with examples and details
iii. that each new paragraph is indented

4. Seventh Grade English: Speaking and Listening (page 157)
a. Participate civilly and productively in group discussions.
b. Give a short speech to the class that is well-organized and well-supported.
c. Demonstrate an ability to use standard pronunciation when speaking to large groups and in formal circumstances, such as a job interview.

C. Skill Objectives
1. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society. (from Oregon Social Science Standards)
2. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information. (from Oregon English/Language Arts Standards)
3. Students will make connections to text, within text, and among texts about Core Knowledge scientists. (from Oregon English/Language Arts Standards)
4. Students will pose relevant questions when evaluating the accomplishments of a Core Knowledge scientist. (from Oregon English/Language Arts Standards)
5. Students will distinguish credible sources. (from Oregon English/Language Arts Standards)
6. Students will convey clear and accurate perspectives on the subject. (from Oregon English/Language Arts Standards)
7. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in favor of a Core Knowledge scientist's contribution to society in written and oral presentations. (from Oregon English/Language Arts Standards)
8. Students will use speaking techniques, including voice inflection, tempo, enunciation, and eye contact for effective presentation during the class debate. (from Oregon English/Language Arts Standards)

III. BACKGROUND KNOWLEDGE

A. For Teachers
1. *Step Up to Writing* – Writing, research, and note-taking strategies developed by Maureen Auman

2. *Inspiration* software – (7412 SW Beaverton/Hillsdale Hwy., Suite 102; Portland, OR 97225-2167; www.inspiration.com) - an organizing software program that allows students to organize research information in graphic organizers and outlines.
3. Guided Language Acquisition Design activities – a project from Fountain Valley School District making curriculum content understandable for all students especially English language learners (National Training Center, Project GLAD, 17210 Oak Street, Fountain Valley, CA 92708)

B. For Students
1. For fourth grade – Research Skills: know how to gather information from basic print sources and write a short report presenting the information in his or her own words. (Core Knowledge Curriculum – third grade)
2. For seventh grade – Research Skills: learn strategies and conventions for writing a persuasive essay, with attention to defining a thesis; supporting the thesis with evidence, examples and reasoning; anticipating and answering counter-arguments and maintaining a reasonable tone. Speaking Skills: participate civilly and productively in group discussions. (Core Knowledge Curriculum – sixth grade)

IV. RESOURCES

A. Fourth Grade Scientists
1. Benjamin Banneker
   a. "Banneker, Benjamin." *Grolier Multimedia Encyclopedia.* Scholastic Library Publishing, 2005 http://gme.grolier.com
   b. Conley, Kevin. *Benjamin Banneker*. New York: Chelsea House Publishers, 1989.
   c. Pinkney, Andrea Davis. *Dear Benjamin Banneker.* San Diego, CA: Harcourt Brace and Company, 1994.
2. Elizabeth Blackwell
   a. Bertschi, Karyn L., "Blackwell, Elizabeth." *The New Book of Knowledge.* Scholastic Library Publishing, 2005 http://nbk.grolier.com
   b. Kline, Nancy. *Elizabeth Blackwell: a doctor's triumph.* Berkeley, California: Conari Press, 1997.
   c. Henry, Joanne Landers. *Elizabeth Blackwell, girl doctor.* New York, NY: Aladdin, 1996.
3. Charles Drew
   a. "Drew, Charles." *Grolier Multimedia Encyclopedia.* Scholastic Library Publishing, 2005 http://gme.grolier.com
   b. Haskins, Jim. "Drew, Charles R." *The New Book of Knowledge.* Scholastic Library Publishing, 2005 http://nbk.grolier.com
   c. Mahone-Lonesome, Robyn. *Charles Drew*. New York: Chelsea House Publishers, 1990.
4. Michael Faraday
   a. Dick, Steven J. "Faraday, Michael." *Grolier Multimedia Encyclopedia.* Scholastic Library Publishing, 2005 http://gme.grolier.com
   b. Miller, Mabel. *Michael Faraday and the dynamo.* Philadelphia: Chilton Book Co., 1968.

B. Seventh Grade Scientists
1. Charles Darwin

a. "Darwin, Charles Robert." Reviewed by Kenneth A. Korey. *The New Book of Knowledge.* Scholastic Library Publishing, 2005 http://nbk.grolier.com
b. Twist, Clint. *Charles Darwin: on the trail of evolution.* Austin, TX: Raintree Steck-Vaughn, 1994.

2. Antoine Lavoisier
a. Grey, Vivian. *The chemist who lost his head: the story of Antoine Lavoisier.* New York: Coward, McCann, & Geoghegan, 1982.
b. Yount, Lisa. *Antoine Lavoisier: founder of modern chemistry.* Springfield, NJ: Enslow Publishers, 1997.

3. Lise Meitner
a. Barron, Rachel. *Lise Meitner: discoverer of nuclear fission.* Greensboro, NC: Morgan Reynolds, 2000.
b. Paul, E. Robert, "Meitner, Lise." *Grolier Multimedia Encyclopedia*. Scholastic Library Publishing, 2005 http://gme.grolier.com

4. Dmitri Mendeleev
a. Kauffman, George B. "Mendeleyev, Dmitry Ivanovich." *Grolier Multimedia Encyclopedia.* Scholastic Library Publishing, 2005 http://gme.grolier.com
b. White, Katherine G. *Mendeleyev and the periodic table.* New York: Rosen Pub. Group, 2005.

V. LESSONS

Lesson One: "Who are those guys anyway?" (one class period)

A. *Daily Objectives*

1. Concept Objective
a. Students will understand that science is a human endeavor practiced by individuals from many cultures.

2. Lesson Content
a. 4th Grade Scientists
i. Benjamin Banneker
ii. Elizabeth Blackwell
iii. Charles Drew
iv. Michael Faraday
b. 7th Grade Scientists
i. Charles Darwin
ii. Antoine Lavoisier
iii. Lise Meitner
iv. Dmitri Mendeleev

3. Skill Objectives
a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.

B. *Materials*

1. A mounted picture of each Core Knowledge scientist
2. Four large pieces of paper for student responses attached to each portrait

3. A separate list of the names of the scientists on board
4. A series of open-ended questions for student's responses

C. *Key Vocabulary*

1. Because of the nature of this introductory activity which is meant to establish connections with prior knowledge and experiences, no specific vocabulary will be taught with this lesson.

D. *Procedures/Activities*

1. Set up the classroom before the students arrive. A quality portrait of each of the four Core Knowledge grade level scientists should be displayed around the classroom. A large piece of newsprint or other suitable paper on which students can record responses should be located near each of the four pictures. Provide colored markers at each "station".
2. As students enter the room, guide their interactions with the pictures by posing a question and instructing them to record their responses on the newsprint sheets. "What do these four people have in common?"
3. Matching Game – List the names of the four scientists and have small groups of students guess which name "goes with" which picture? Each student group is given a different colored marker with which to record their guesses. (This allows the teacher to quickly observe if each group has made a guess.)
4. As a wrap-up activity class discusses a series of open-ended questions about the scientists:
    a. How is this person different from the others?
    b. Why is this person dressed the way he/she is?
    c. When do you think this person lived? Do you think he/she is alive today?
    d. What do you think this person did for a living?
    e. Why were these pictures put up on the wall?
5. Note: This activity is not to answer all questions but to promote student's thinking and to make connections with past learning experiences.

E. *Assessment/Evaluation*

1. This first lesson is an initial assessment. During this activity the teacher can assess students' knowledge about the four scientists. This is also a time when the teacher can assess the students' ability to make inferences and generalizations as well as their ability to put together information in new ways.
2. The success of this introductory lesson is quickly evaluated by checking to see if each group's colored marker has been used on the chart. Also taking note of the amount of participation and involvement in the class discussion of the open-ended questions provides a quick picture of student engagement and depth of understanding.

Lesson Two: Introducing Core Knowledge Scientists (four short, distinct presentations during one day or over several days)

A. *Daily Objectives*

1. Concept Objective
    a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
2. Lesson Content
    a. 4th Grade Scientists
        i. Benjamin Banneker
        ii. Elizabeth Blackwell
        iii. Charles Drew

iv. Michael Faraday

b. 7th Grade Scientists
   i. Charles Davwin
   ii. Antoine Lavoisier
   iii. Lise Meitner
   iv. Dmitri Mendeleev

3. Skill Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.

B. *Materials*
1. Four prepared 36" x 48" pictorial input charts with key facts about the life of each grade level scientist.
2. Biography or other resource about each of the scientists.

C. *Key Vocabulary*
1. Benjamin Banneker
   a. **interracial** – a person who has parents or grandparents of different races
   b. **surveyor** – one who determines boundaries, area or elevations of land
   c. **astronomer** – a specialist in the study of matter in outer space including the positions, dimensions, energy and evolution of stars and planets
2. Elizabeth Blackwell
   a. **first female physician** – first woman to be a medical doctor in modern times
   b. **hygiene** – the science dealing with the promotion and preservation of health
   c. **pioneer** – one who opens up new areas of thought, research, or development
3. Charles Drew
   a. **blood bank** – a place where whole blood or plasma is typed, processed, and stored for future use
   b. **blood preservation** – methods to keep blood for a period of time
   c. **blood plasma** – the fluid portion of blood in which blood cells and platelets are normally suspended
4. Michael Faraday
   a. **speech impediment** – an organic defect preventing clear articulation
   b. **electromagnetism** - magnetism produced by electric charge in motion
   c. **apprentice** – one bound by agreement to work in trade for training and education
5. Charles Darwin
   a. **evolution** – gradually changing into a different and often more complex or better form
   b. **naturalist** – one versed in natural history; an expert in zoology or botany
   c. **natural selection** – process in nature where only the organisms best adapted to their environment tend to survive
6. Antoine Lavoisier
   a. **chemistry** – the science of composition, properties and reactions of matter

b. **combustion** – the process of burning
c. **respiration** – the process of breathing; exhaling and inhaling

7. Lise Meitner
   a. **nuclear fission** – a nuclear reaction in which an atomic nucleus splits into fragments
   b. **Nobel Prize** – international prizes awarded annually by the Nobel Foundation for outstanding achievements in the fields of physics, chemistry, physiology or medicine, literature, and economics and for the promotion of world peace
   c. **uranium** – radioactive toxic metallic element used in research, nuclear fuels, and nuclear weapons
   d. **nuclear energy** – the energy released by a nuclear reaction by fission or fusion
8. Dmitri Mendeleev
   a. **periodic table of elements** – elements arranged in rows and columns, with the elements in groups with similar properties
   b. **atomic mass number -** the number of neutrons and protons in an atomic nucleus
   c. **petroleum** – thick, flammable mixture of hydrocarbons occurring naturally beneath the earth's surface

D. *Procedures/Activities*
1. Prepare a pictorial input chart for each scientist. (For a letter-sized model of a pictorial input chart see Appendix A.) The chart should include pictures and key vocabulary words pertinent to the scientist's life and work. Sketch picture and key words lightly in pencil. The sketches should then be retraced with colored markers as teacher presents pertinent introductory information about each scientist.
2. Teacher gives a concise, mini-lecture on a scientist using the pictorial input chart to focus student attention and to provide a visual illustration for key vocabulary and concepts. Information about the scientist's birth, family, education, career choice, major discovery or accomplishment and an obstacle or struggle that was overcome should be included.
3. Retrace the outline of the scientist's portrait and then add the key ideas and vocabulary to the chart as that information is verbally given to the students.
4. Illustrate with a picture any vocabulary word that can be represented pictorially.
5. The pictorial input chart is then posted in the classroom for students to reread over the next few days.
6. When students find out additional facts about a scientist, they may add their knowledge to the classroom charts after checking in with the teacher.

E. *Assessment/Evaluation*
1. Scientist's Life in a "nutshell" – When teacher has completed the presentation of biographical information about a scientist, the students should turn to a neighbor and tell them something they know about this scientist.
2. As a whole class activity ask students to volunteer individual facts about the scientist. Continue the discussion until the most important facts have all been reviewed.

Lesson Three: Comparison Chart of the Scientists (one class period)

A. *Daily Objectives*
1. Concept Objective(s)

a. Students will understand that science is a human endeavor practiced by individuals from many cultures.

b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.

2. Lesson Content
   a. 4th Grade Scientists
      i. Benjamin Banneker
      ii. Elizabeth Blackwell
      iii. Charles Drew
      iv. Michael Faraday
   b. 7th Grade Scientists
      i. Charles Darwin
      ii. Antoine Lavoisier
      iii. Lise Meitner
      iv. Dmitri Mendeleev
   c. Language Arts: Writing and Research: produce a variety of types of writing – summaries – with a coherent structure.
3. Skills Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
   c. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.

B. *Materials*
1. Large wall sized comparison chart for classroom
2. Colored markers
3. Individual Comparison Charts for each student (See Appendix B)

C. *Key Vocabulary*
1. **categorize** – put information into categories; classify
2. **compare** – examine in order to note similarities and differences
3. **relationships** – a type of connection or association
4. **drawing conclusions** – make a judgment after researching and deliberating

D. *Procedures/Activities*
1. Prepare comparison charts for the four scientists. (See Appendix B) Print a half page size for students and then make a wall chart size for the classroom activity.
2. Using the four pictorial input charts that are still displayed in the classroom as references, ask the students to compare and summarize the information that they know about the four scientists.
3. Record their observations on the classroom comparison chart and then instruct the students to record similar data on their individual charts. The information may be recorded in note form or in complete sentences.

E. *Assessment/Evaluation*
1. Check for student understanding by using the comparison chart scoring rubric to evaluate their individual comparison charts. (See Appendix C)

Lesson Four: What's ahead? / Choosing a Scientist (one class period)

A. *Daily Objectives*
   1. Concept Objectives
      a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
   2. Lesson Content
      a. 4th Grade Scientists
         i. Benjamin Banneker
         ii. Elizabeth Blackwell
         iii. Charles Drew
         iv. Michael Faraday
      b. 7th Grade Scientists
         i. Charles Darwin
         ii. Antoine Lavoisier
         iii. Lise Meitner
         iv. Dmitri Mendeleev
   3. Skill Objectives
      a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
      b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.

B. *Materials*
   1. Unit Outline Poster (See Appendix D)
   2. Interest Ballots for ranking Scientist Choices - one for each student (See Appendix E)

C. *Key Vocabulary*
   1. **preference** – selecting something over other choices
   2. **big picture or scope** – breadth of opportunities or choices
   3. **debate** – to engage in an argument by discussing opposing points of view in order to persuade

D. *Procedure/Activities*
   1. Using the Unit Outline Poster present the scope of the Core Knowledge Scientist Great Debate project.
   2. The explanation should include information about: expert groups, research process; asking questions to guide research; types of references; note-taking procedures; bibliography expectations; projects, debate and display strategies. (See Appendix D)
   3. Given a ballot (See Appendix E) listing the four grade level Core Knowledge scientists, students are to rank their preference for a scientist about whom they would like to learn more.

E. *Assessment/Evaluation*
   1. As their ticket to leave, students hand in their marked "ballot" on the way out of the class.

Lesson Five: Researching the Life and Times (three class periods)

A. *Daily Objectives*
   1. Concept Objectives
      a. Students will understand that science is a human endeavor practiced by individuals from many cultures.

b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and purpose that engage reader interest; organize information in clear sequence, making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
c. Students will investigate topics of interest and importance across the subject areas, selecting appropriate media sources, using effective research processes, and demonstrating ethical use of resources and materials.

2. Lesson Content
   a. Know how to gather information from different sources (such as an encyclopedia, magazines, interviews, observations, atlas, online), and write short reports presenting information in his or her own words, with attention to the following:
      i. understanding the purpose and audience of the writing
      ii. defining a main idea and sticking to it
      iii. providing an introduction and conclusion
      iv. organizing material in coherent paragraphs
      v. documenting sources in a rudimentary bibliography

3. Skill Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.
   c. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
   d. Students will pose relevant questions when evaluating the accomplishments of a Core Knowledge scientist.
   e. Students will distinguish credible sources.

B. Materials

1. Printed resources on the lives of the Core Knowledge scientists.
2. Access to online information
3. Graphic Organizer for each student (See Appendix H)
4. Bibliography Information Sheets (recording slips of various types – See Appendix G)
5. Seven questions for web-site evaluation (See step 9 below)

C. Key Vocabulary

1. **database** – a collection of data arranged for ease of retrieval (commonly used online)
2. **Graphic Organizer** – note-taking aide; a web-like diagram for recording of information
3. **bibliography** – a list of writings considered by an author in preparing a report or project
4. **Bloom's Taxonomy** – a system for organizing the way people learn; the cognitive domain is used here from the lowest level of thinking - simple recall to the highest level – evaluating information
5. **key words** – main ideas about a topic that lead a learner to pertinent information when conducting a search of sources

D. Procedures/Activities

1. Set parameters of students' research. Now that students know that the end product of their research and projects is to be the Great Debate, the individual, expert groups of students need to write questions to guide their research. These questions should be inspired by Bloom's Taxonomy and should allow them to make sound arguments in support of their scientist.
2. Have a list of sample questions available for the groups to peruse. Samples should include questions at all levels of thinking. (See Appendix F)
3. Teacher meets with each expert group to help with a research design. The student expert groups will develop questions on their own or select questions from the sample list. The group must have at least two questions from each level of inquiry. These questions will then be used as the guiding questions for research.
4. Begin research with establishing key search words. In the case of the Core Knowledge scientists the name would obviously be a useful key word.
5. As they begin to learn more about the scientists the students' first resources should be books. Begin with biographies and encyclopedias found in the school library. Have a collection of these materials in the classroom for the first day of research. The students in each expert group will be sharing the resources and sharing their insights.
6. For the purpose of compiling a bibliography and citing sources, students should record the necessary documentation information for each reference source they use. (See Appendix G for handy bibliography information recording strips)
7. For note-taking and organization of information, provide each student with a graphic organizer that can be filled in as information is gathered from various sources. (See Appendix H) For seventh grade students the organizer could be created in Inspiration (software program), and the students could fill in the information at the computer. This organizer should then be printed in the outline format.
8. Online resources may also provide more information for students, but teachers must limit their searches. Online databases such as EBSCO Host and the databases available at public libraries provide good sources of biographical information available in magazines, journals, newspapers, etc. Online encyclopedias are also easily accessible for young students.
9. Give students guidelines when using search engines, so that their searches are limited and they can evaluate the credibility of the web-sites. They should be able to determine if the information is accurate and appropriate. The following seven questions inspired by QUICK (The QUality Information ChecKlist - http://www.quick.org.uk/menu.htm.) are very helpful for students to consider when checking out a web-site.
    a. Is it clear who has written the information on the web-site?
    b. Are the aims and goals of the web-site clear?
    c. Does the web-site accomplish these goals?
    d. Is the web-site relevant to me and my research goals?
    e. Can the information be checked or verified?
    f. Is the information biased in any way?
10. Note: The research step is a great place to encourage cross-age mentoring. Seventh grade students can help their younger peers with online searches and how to use an Inspiration graphic organizer. Younger students are able to have direct supervision and get their questions answered quickly in a buddy/mentor session in the computer lab when the older students share their skills and knowledge.

E. Assessment/Evaluation

1. In order to monitor progress check to see if students have been able to fill out their graphic organizers with appropriate details and facts.

Lesson Six: Six Paragraph Summary (one class period)

A. *Daily Objectives*

1. Concept Objectives
   a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
   b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and purpose that engage reader interest; organize information in clear sequence, making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
2. Lesson Content
   a. Fourth Grade Science: Science Biographies (page 106)
      i. Benjamin Banneker
      ii. Elizabeth Blackwell
      iii. Charles Drew
      iv. Michael Faraday
   b. Seventh Grade Science: Science Biographies (page 177)
      i. Charles Darwin
      ii. Antoine Lavoisier
      iii. Lise Meitner
      iv. Dmitri Mendeleev
   c. Produce a variety of types of writing – including stories, reports, summaries, descriptions, poems, letters – with a coherent structure or story line.
   d. Know how to gather information from different sources (such as an encyclopedia, magazines, interview, observations atlas, online), and write short reports presenting information in his or her own words, with attention to the following:
      i. understanding the purpose and audience of the writing
      ii. defining a main idea and sticking to it
      iii. providing an introduction and conclusion
      iv. organizing material in coherent paragraphs
      v. documenting sources in a rudimentary bibliography
   e. Organize material in paragraphs and understand
      i. how to use a topic sentence
      ii. how to develop a paragraph with examples and details
      iii. that each new paragraph is indented
3. Skill Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
   c. Students will convey clear and accurate perspectives on the subject.
   d. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in

favor of a Core Knowledge scientist's contribution to society in written and oral presentations.

B. *Materials*
   1. Paragraph by Paragraph Planner for a Six-Paragraph Paper (See Appendix I)
   2. Graphic Organizer from Lesson 5 – Each student's completed notes on a Core Knowledge scientist
   3. *Step Up to Writing* by Maureen Auman
   4. yellow highlighter

C. *Key vocabulary*
   1. **Introductory Paragraph** – a paragraph that introduces the main topic and/or reason for writing and gives a "hint" about what the writer plans to prove, describe or explain
   2. **Topic Sentence** – an "umbrella" sentence that states the reason for writing and often presents the writer's opinion that will be supported by the facts contained in the rest of the paper (In this assignment the topic sentence will be found in the introductory paragraph.)
   3. **Body Paragraphs** – paragraphs presenting facts, reasons with accompanying examples and explanations
   4. **Conclusion** – a final paragraph that drives home the writer's point of view and convinces readers about the validity of this perspective
   5. **Block Out** – to quickly jot down a very brief or skeletal plan for essay; usually expressed with a word or two
   6. (7^{th} grade) **Thesis Statement** – a "topic sentence" for a multiple paragraph essay

D. *Procedures/Activities*
   1. Provide color–coded "paragraph by paragraph planner" strips for each student. (See Appendix I. These plans should be copied on green and pink paper.)
   2. Distribute a green introductory planning strip to each student. Using the completed graphic organizer notes about the individual Core Knowledge scientist, students begin by giving their essay a title. This is written on the introductory paragraph plan.
   3. Next students quickly jot down their ideas to include in the introductory paragraph. They should select facts that will engage the reader and make readers want to "read on". Students should be cautioned about getting too specific too soon.
   4. A topic sentence should be written next. This sentence introduces the scientist and gives the reader a clue about the position the writer intends to take in the essay. Remind students that the goal of the whole project is to recommend their scientist as the person who may have benefited society the most.
   5. At the bottom of the introductory paragraph plan students should block out the rest of the essay in the four body paragraph topic boxes. Just a word or two will help students see the overall plan of the essay. Ideas for these paragraphs may include: background, accomplishment; struggles/obstacles, and contribution/s.
   6. Distribute four pink body paragraph planning strips to each student. Once the topics of the four body paragraphs have been indicated on the first planning strips, the students are ready to use four body paragraph planning strips to outline the details to include in each of these paragraphs.
   7. A transition topic sentence should be developed for each of the body paragraphs. This may be done before or after the details have been chosen.
   8. Distribute a green conclusion planning strip to all students. The last paragraph is the place for the students to formally recommend their scientists for the greatest contributor honor. This paragraph should be written like a nomination speech and

will be very useful in the actual debate that is coming up soon. This plan should include very convincing reasons for picking this scientist.

9. Once the six planning strips are completed the students are ready to write the rough draft of the six paragraph biographical/persuasive essay. The topic sentences are already written, so students should put their brainstormed notes into sentences.
10. When the rough draft is complete, students should edit their work.
11. Summary essay may be put in final form at this point or put aside to be used in the next steps of the Great Debate preparation.

E. *Assessment/Evaluation*

1. If a final edition of the summary, persuasive essay is produced, a writing scoring guide should be used to evaluate the student work. (See Oregon Department of Education Web Site <http://www.ode.state.or.us/teachlearn/testing/scoring/guides/2004-05/asmtwriscorguide0506eng.pdf to see the Writing Scoring Guide)

Lesson Seven: Menu of Activities (three to four class periods)

A. *Daily Objectives*

1. Concept Objectives
   a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
   b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and purpose that engage reader interest; organize information in clear sequence, making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
   c. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control of eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques.
2. Lesson Content
   a. 4th Grade Scientists
      i. Benjamin Banneker
      ii. Elizabeth Blackwell
      iii. Charles Drew
      iv. Michael Faraday
   b. 7th Grade Scientists
      i. Charles Darwin
      ii. Antoine Lavoisier
      iii. Lise Meitner
      iv. Dmitri Mendeleev
   c. Produce a variety of types of writing—including stories, reports, summaries, descriptions, poems, letters—with a coherent structure or story line.
   d. Know how to gather information from different sources (such as an encyclopedia, magazines, interview, observations atlas, online), and

write short reports presenting information in his or her own words, with attention to the following:
i. understanding the purpose and audience of the writing
ii. defining a main idea and sticking to it
iii. providing an introduction and conclusion
iv. organizing material in coherent paragraphs
v. documenting sources in a rudimentary bibliography

e. Organize material in paragraphs and understand
i. how to use a topic sentence
ii. how to develop a paragraph with examples and details
iii. that each new paragraph is indented

2. Skill Objectives
a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
b. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
c. Students will convey clear and accurate perspectives on the subject.
d. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in favor of a Core Knowledge scientist's contribution to society in written and oral presentations.

B. *Materials*
1. Poster of project choices (See Appendix J)
2. Project description (See Appendix J)
3. Project Rubrics (See Appendix K)

C. *Key Vocabulary*
1. **timeline** – a record of events written in chronological order
2. **journal** – a personal record of occurrences, experiences, and reflections kept on a regular basis; a diary
3. **rap** – a popular form of music characterized by spoken or chanted lyrics with syncopated, repetitive rhythmic accompaniment, may rhyme or be in free verse
4. **nominate** – to propose by name a candidate for election or selection
5. **brochure** – a small booklet or pamphlet often used in advertising
6. **rubric** – an evaluation tool of detailed descriptions of expectations and levels of performance

D. *Procedures/Activities*
1. Prepare a large poster-sized version of the Project Menu (See Appendix J). This poster will be used as the different projects are introduced in class and then remain posted as a reminder and reference for the students.
2. Present the project choices and give a copy of the letter size Project Menu to each expert group. (See Appendix J) Review the guidelines for each project and the expectations for the groups. Four of the projects must be completed by the expert groups – portrait, journal entries, introductory speech and nomination poster. (These items will be foundational to the expert group's presentation in the Great Debate.)
3. During the first class period that is devoted to the Menu of Projects, students are to sign up for the different projects in their expert groups. Depending on skills and preference students can work in pairs or individually as long as the four essential projects are "covered". Once projects have been selected give the appropriate rubric to each group or individual student. (If students are unable to

come to a consensus about project selection, teacher may enter into the process more directly.)

4. Depending on the students' production rate two or three more class periods can be given to working on the projects. The students in the expert group can collaborate and share information during the work sessions.
5. Instruct students to check the progress of their work alongside the project rubrics.

E. *Assessment/Evaluation*

1. Project Rubrics (See Appendix K) are used as guidelines for the project's completion. Final evaluation of the projects by the teacher will be done after the students have had an opportunity to share their projects in their expert groups and have received feedback from their peers.

Lesson Eight: Share with the Expert Group (one class period)

A. *Daily Objectives*

1. Concept Objectives
   a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
   b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and purpose that engage reader interest; organize information in clear sequence, making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
   c. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control of eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques.
2. Lesson Content
   a. 4th Grade Scientists
      i. Benjamin Banneker
      ii. Elizabeth Blackwell
      iii. Charles Drew
      iv. Michael Faraday
   b. 7th Grade Scientists
      i. Charles Darwin
      ii. Antoine Lavoisier
      iii. Lise Meitner
      iv. Dmitri Mendeleev
   c. Produce a variety of types of writing—including stories, reports, summaries, descriptions, poems, letters—with a coherent structure or story line.
   d. Participate civilly and productively in group discussion
3. Skills Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Student will convey clear and accurate perspectives on the subject.

B. *Materials*
   1. Completed Scientist Projects
   2. Peer Project Feedback Forms (three for each student – See Appendix L)

C. *Key Vocabulary*
   1. **informative** – providing sufficient information; instructive
   2. **accurate** – conforming exactly to fact; errorless
   3. **effective** – having intended or expected impact; producing a strong impression

D. *Procedures/Activities*
   1. Teacher distributes and gives directions regarding the effective use of the Peer Project Feedback Form (See Appendix L).
   2. Students gather in expert groups with completed scientist projects.
   3. Each student is given time to display, explain his/her project and demonstrate what they know about the Core Knowledge scientist.
   4. The other members of the expert group then fill out a Peer Project Feedback Form for each presenter.
   5. Students are subsequently given time and opportunity to make adjustments to their projects before the Great Debate and the Cross-Grade Celebration when all projects are shared and displayed.

E. *Assessment/Evaluation*
   1. The focus of this lesson is student/peer evaluation.

Lesson Nine: Interview Preparation and Practice with Expert Groups (one class period)

A. *Daily Objectives*
   1. Concept Objectives
      a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
      b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
      c. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control fo eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques.
   2. Lesson Content
      a. 4th Grade Scientists
         i. Benjamin Banneker
         ii. Elizabeth Blackwell
         iii. Charles Drew
         iv. Michael Faraday
      b. 7th Grade Scientists
         i. Charles Darwin
         ii. Antoine Lavoisier
         iii.. Lise Meitner
         iv. Dmitri Mendeleev

c. Know how to gather information from different sources (such as an encyclopedia, magazines, interviews, observations, atlas, online), and write short reports presenting information in his or her own words.
d. Participate civilly and productively in group discussions.
e. Give a short speech to the class that is well-organized and well-supported.
f. Demonstrate an ability to use standard pronunciation when speaking to large groups and in formal circumstances.

3. Skills Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.
   c. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
   d. Students will pose relevant questions when evaluating the accomplishments of a Core Knowledge scientist.
   e. Students will distinguish credible sources.
   f. Students will convey clear and accurate perspectives on the subject.
   g. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in favor of a Core Knowledge scientist's contribution to society in written and oral presentations.
   h. Students will use speaking techniques, including voice inflection, tempo, enunciation, and eye contact for effective presentation during the class debate.

B. *Materials*
1. Interview Directions and Questions (one per student – See Appendix M)
2. Completed Projects – completed student work
3. Six Paragraph Summaries – completed student work

C. *Key Vocabulary*
1. **obstacles** – something that stands in the way or holds up progress
2. **tombstone** – a stone marker placed on a grave with the name and often a description of the person
3. **qualities** – essential character or nature of a person
4. **traits** – a distinguishing feature of a person's character or what he/she is like
5. **contribution** – gift given for the common good

D. *Procedures/Activities*
1. Instruct expert groups to work together in order to answer the interview questions.
2. Each expert group should have a facilitator or discussion leader and a recorder.
3. The facilitator makes sure that all of the questions are discussed by the group and that all members of the group have an opportunity to participate.
4. The recorder writes down the group's responses.
5. When the group has completed all the questions, they should review and edit their answers.
6. The expert group's answers are now duplicated for each group member.
7. The expert group now divides into pairs and practices asking the questions and giving the answers from the prepared answer sheet.

8. Remind students that they are answering questions as if they were the Core Knowledge scientist.
9. The group now selects different partners and practices a second time.

E. *Assessment/Evaluation*

1. This lesson is not formally evaluated, but each group should have prepared answers that can be used in the actual interview.

Lesson Ten: Interview in Groups of Four (one class period)

A. *Daily Objectives*

1. Concept Objectives
   a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
   b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
   c. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control fo eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques.
2. Lesson Content
   a. 4th Grade Scientists
      i. Benjamin Banneker
      ii. Elizabeth Blackwell
      iii. Charles Drew
      iv. Michael Faraday
   b. 7th Grade Scientists
      i. Charles Darwin
      ii. Antoine Lavoisier
      iii. Lise Meitner
      iv. Dmitri Mendeleev
   c. Know how to gather information from different sources (such as an encyclopedia, magazines, interviews, observations, atlas, online), and write short reports presenting information in his or her own words.
   d. Participate civilly and productively in group discussions.
   e. Give a short speech to the class that is well-organized and well-supported.
   f. Demonstrate an ability to use standard pronunciation when speaking to large groups and in formal circumstances.
3. Skills Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.

c. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
d. Students will pose relevant questions when evaluating the accomplishments of a Core Knowledge scientist.
e. Students will distinguish credible sources.
f. Students will convey clear and accurate perspectives on the subject.
g. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in favor of a Core Knowledge scientist's contribution to society in written and oral presentations.
h. Students will use speaking techniques, including voice inflection, tempo, enunciation, and eye contact for effective presentation during the class debate.

B. *Materials*
1. Prepared responses to interview questions (done in expert groups)
2. Interview Questions (See Appendix M)
3. Interview Scoring Rubric (See Appendix N)

C. *Key Vocabulary*
No new vocabulary is taught this lesson.

D. *Procedures/Activities*
1. The class is broken up into groups of four comprised of students from the four different expert groups.
2. Using the interview questions (See Appendix M) three students interview the fourth member of the group of four. The interview should last 10 minutes.
3. After each interview the three listeners should complete an evaluation using the Interview Scoring Rubric. (See Appendix N)
4. The group should continue until all four of the experts have had a chance to be interviewed and evaluated.

E. *Assessment/Evaluation*
1. Students turn in their evaluations of the other three group members.
2. After the teacher has had the opportunity to review the evaluations, they are returned to the individual speakers.

Lesson Eleven: Team Preparation for the Debate (one or two class periods)

A. *Daily Objectives*
1. Concept Objectives
a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
b. Students will communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and making connections and transitions among ideas, sentences, and paragraphs; and use precise words and fluent sentence structures that support meaning.
c. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control fo eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques.
2. Lesson Content

a. 4th Grade Scientists
   i. Benjamin Banneker
   ii. Elizabeth Blackwell
   iii. Charles Drew
   iv. Michael Faraday
b. 7th Grade Scientists
   i. Charles Darwin
   ii. Antoine Lavoisier
   iii. Lise Meitner
   iv. Dmitri Mendeleev
c. Produce a variety of types of writing – including stories, reports, summaries, descriptions, poems, letters—with a coherent structure or story line.
d. Know how to gather information from different sources (such as an encyclopedia, magazines, interviews, observations, atlas, online), and write short reports presenting information in his or her own words.
e. Organize material in paragraphs and understand
   i. how to use a topic sentence
   ii. how to develop a paragraph with examples and details
   iii. that each new paragraph is indented
f. Participate civilly and productively in group discussions.
g. Give a short speech to the class that is well-organized and well-supported.
h. Demonstrate an ability to use standard pronunciation when speaking to large groups and in formal circumstances.

3. Skills Objectives
   a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
   b. Students will listen to, read, and understand a wide variety of informational sources including teacher presentations, magazines, reference materials and online information.
   c. Students will make connections to text, within text, and among texts about Core Knowledge scientists.
   d. Students will pose relevant questions when evaluating the accomplishments of a Core Knowledge scientist.
   e. Students will distinguish credible sources.
   f. Students will convey clear and accurate perspectives on the subject.
   g. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in favor of a Core Knowledge scientist's contribution to society in written and oral presentations.
   h. Students will use speaking techniques, including voice inflection, tempo, enunciation, and eye contact for effective presentation during the class debate.

B. *Materials*
   1. Completed Projects (completed student work)
   2. Six Paragraph Summaries (completed student work)
   3. Interview Responses (expert group product)
   4. Outlines for Debate Speeches (at least one per expert group - See Appendix O)
   5. Debate Expectations and Format (one per expert group – See Appendix P)

6. Great Debate Rubric (Appendix Q)

C. *Key Vocabulary*
   1. No new vocabulary is taught this lesson.

D. *Procedures/Activities*
   1. Students reconvene in their four expert groups.
   2. Teacher distributes the Outlines for Debate Speeches, the Debate Expectations and Format, and Great Debate Rubric. (See Appendices O, P & Q)
   3. Teacher explains that during the debate each team will make three short oral presentations about their Core Knowledge scientist in order to place his/her name in nomination for the person who made the biggest difference.
   4. Students use their summaries, interview responses and completed projects to "pool" their information in order to prepare the three nomination speeches. Speaker notes should be made for each speech.
   5. Students determine how each group member will participate during the Great Debate.
   6. Expert groups conference with the teacher for presentation plan approval.
   7. Expert groups practice their presentations.

E. *Assessment/Evaluation*
   1. No formal assessment during this lesson.
   2. Teacher informally assesses expert team performance during the team/teacher conference.

Lesson Twelve: The Great Debate (one to two class periods)

A. *Daily Objectives*
   1. Concept Objectives
      a. Students will understand that science is a human endeavor practiced by individuals from many cultures.
      b. Students will communicate supported ideas across the subject areas using oral, visual, and multimedia forms in ways appropriate to topic, context, audience, and purpose; organize oral, visual, and multimedia presentations in clear sequence, making connections and transitions among ideas and elements; use language appropriate to topic, context, audience, and purpose; and demonstrate control of eye contact, speaking rate, volume, enunciation, inflection, gestures, and other nonverbal techniques.
   2. Lesson Content
      a. 4th Grade Scientists
         i. Benjamin Banneker
         ii. Elizabeth Blackwell
         iii. Charles Drew
         iv. Michael Faraday
      b. 7th Grade Scientists
         i. Charles Darwin
         ii. Antoine Lavoisier
         iii. Lise Meitner
         iv. Dmitri Mendeleev
      c. Participate civilly and productively in group discussions.
      d. Give a short speech to the class that is well-organized and well-supported.
      e. Demonstrate an ability to use standard pronunciation when speaking to large groups and in formal circumstances.
   3. Skills Objectives

a. Students will identify, research and clarify the facts about the life and accomplishments of a Core Knowledge scientist in order to determine significance to society.
b. Students will pose relevant questions when evaluating the accomplishments of a Core Knowledge scientist.
c. Students will convey clear and accurate perspectives on the subject.
d. Students will include evidence compiled during research and note-taking process in order to communicate a point of view and effectively argue in favor of a Core Knowledge scientist's contribution to society in written and oral presentations.
e. Students will use speaking techniques, including voice inflection, tempo, enunciation, and eye contact for effective presentation during the class debate.

B. *Materials*
1. Expert Team Presentation Plans
2. Completed Projects (completed student work)
3. Speaker Notes for each Speech (made in Lesson Eleven)

C. *Key Vocabulary*
1. No new vocabulary is introduced in this lesson.

D. *Procedures/Activities*
1. Classroom is set up for debate with adequate presentation area for expert team and project display. The rest of room is set up for audience.
2. Each expert group is given 2-3 minutes to "set up".
3. Timer Use Optional. A timer may be used to keep the presentation times uniform.
4. Groups present portrait, poster and speeches.
5. Optional: the fourth and seventh grade classes may combine to hear each other's debate presentation.

E. *Assessment/Evaluation*
1. Great Debate Rubric is used to evaluate the presentations. (See Appendix Q) The rubric is generally used for the group, but can be used for individual students.

VI. CULMINATING ACTIVITY: Showing It Off

A. **Cross-Grade Celebration**

1. **Display Set Up**
Expert Teams set up all completed projects in hallway, school foyer, outside the library, etc. Thought and care should be given to arrangement of presentation similar to an art show.

2. **Great Debate Celebration**
The whole school is invited to attend the Great Debate Celebration. Expert teams are stationed at their displays. They perform raps, make speeches, explain posters, talk about the portraits and other projects as different groups of students tour the hallways. Expert teams' presentations should be quite persuasive in nature.

3. **Get Out the Vote**
When students have finished touring all displays, they are asked to cast their ballots for a 4th Grade and a 7th Grade scientist who made the biggest difference or the greatest contribution to the world. (See Appendix R)

VII. HANDOUTS/WORKSHEETS

1. Appendix A – Example of Pictorial Input Chart
2. Appendix B - Comparison Charts for 4th and 7th Grades
3. Appendix C – Comparison Chart Scoring Rubric
4. Appendix D – Big Picture Poster
5. Appendix E – Interest Ballots
6. Appendix F – Sample Questions for Research
7. Appendix G – Bibliography Information Sheets
8. Appendix H - Graphic Organizer for Note-taking
9. Appendix I – Paragraph by Paragraph Planner
10. Appendix J – The Great Debate Project Menu
11. Appendix K – Project Rubrics
12. Appendix L – Peer Project Feedback Form
13. Appendix M – Interview Directions and Questions
14. Appendix N – Interview Scoring Rubric
15. Appendix O – Outlines for Debate Speeches
16. Appendix P - Debate Expectations and Format
17. Appendix Q – Great Debate Rubric
18. Appendix R - Core Knowledge Scientist Celebration Ballot

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Appendix A
A Great Debate

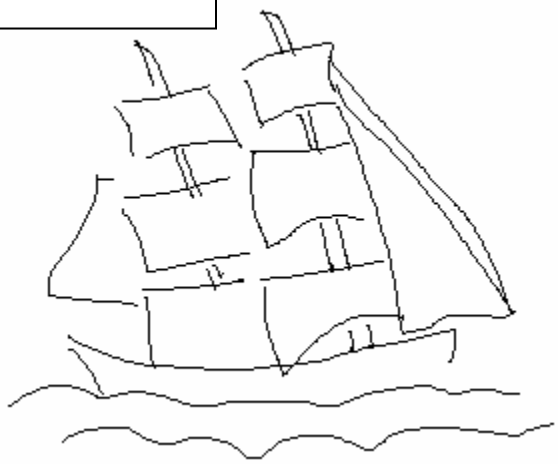
British Naturalist

Charles Darwin

Shrewsbury, England

HMS Beagle

Westminster Abbey



voyage

Theories:
Evolution
Natural Selection

millions of years

1831-1836

Common Ancestors

Galapagos Islands

Pacific Ocean

Appendix B
A Great Debate

4th Grade Comparison Chart **Name: _____**

Scientist's Name	Hometown/ Country	Schooling	Job	Reason for Fame	Struggles/ Obstacles
Benjamin Banneker					
Elizabeth Blackwell					
Charles Drew					
Michael Faraday					

7th Grade Comparison Chart **Name: _____**

Scientist's Name	Birthplace/ Country/ Family	Education	Career	Reason for Fame	Struggles/ Obstacles
Charles Darwin					
Antoine Lavoisier					
Lise Meitner					
Dmitri Mendeleev					

Appendix C
A Great Debate

Comparison Chart Scoring Rubric **Name: _____**

	Unsatisfactory (1 point)	Partially Proficient (2 points)	Proficient (3 points)	Advanced (4 points)
Information is recorded in each box (amount of writing)				
Key Concepts/ Main Ideas are recorded				
Active Participation and Engagement in Activity				
Total				/ 12

Appendix D
A Great Debate

Expert Groups
You will be part of an expert group that will learn more about one of our four Core Knowledge scientists. Together you will become experts about this person and share your knowledge with other students.

Research Process
- Ask questions
- Work alone, in pairs, as a group
- Types of Sources
  Books
  Databases
  Online sources

Note-taking
- Two column notes
- T-chart

Bibliography
- Author
- Title
- City
- Publisher
- Copyright Date
- Online Sources
- Print Sources
- Encyclopedia

The Interview

Projects:
Journal
Poster
Rap or Chant
Timeline
Brochure
Draw a Portrait
Nomination Speech

The Great Debate

Gallery of Projects

Appendix E

A Great Debate: 4th Grade Ballot- Please number your choices in order of preference.

	Benjamin Banneker
	Elizabeth Blackwell
	Charles Drew
	Michael Faraday

A Great Debate: 7th Grade Ballot – Please number your choices in order of preference.

	Charles Darwin
	Dmitri Mendeleev
	Antoine Lavoisier
	Lise Meitner

Ballots cards run four to a page and cut apart for individual students.

Appendix F
A Great Debate

Questions You Might Ask About Your Scientist

Knowledge:

Where did _____ grow up?
Where was _____ educated?
What was _____'s field of study?
Who were _____'s teachers or mentors?
What careers did _____ have?
What obstacles or hurdles did _____ need to overcome?

Comprehension:

How would you classify _____'s work or discovery?
What facts or ideas show that _____'s work was important?
Can you explain what _____ did?
What code or set of beliefs seem to dictate _____'s choices?

Application:

How would you use _____'s discovery? Example?
What facts about _____'s life would be impressive?
What questions would you ask in an interview with _____?
Did _____ make any major mistakes or bad decisions?

Analysis:

Why do you think _____ was chosen as a Core Knowledge Scientist?
What evidence did you find to support _____'s importance to the world?
What facts justify your recommendation of _____'s being the most valuable contributor?

Synthesis:

If _____ were alive today, on what project/s might he/she be working?
How would you change _____'s discovery, accomplishment or work?
What do you theorize might have been the motivation for _____'s work?

Evaluation:

What is your opinion of _____'s work?
What would you recommend if _____ were to come to you for advice?
How would you evaluate _____'s use of his/her time and energy?
Based on what you know, how would you explain _____'s success or failure?

Appendix G
A Great Debate

Bibliography Information Sheets for various kinds of resources. Sheets of the individual slip types can be duplicated and cut into strips for student use as needed.

Book (one author)	
Example: Parson, Alexander. Amazing Spiders. New York: Knopf, 1990.	
Author's Last Name	
Author's First Name	
Title of Book	
City where the book was published	
Publisher	
Copyright Year (yyyy)	

Online Encyclopedia Article on the Web	
Example: Minch, Edward W. "Spider." World Book Online . April 9, 2003 http://wbonline.worldbook.com/>.	
Author's Last Name	
Author's First Name	
Title of Article	
Encyclopedia Title	
Date of Visit to Site	
URL of Article	

Encyclopedia Article (book)	
Example: Minch, Edwin W. "Spiders." The World Book Encyclopedia. 1997 ed.	
Author's Last Name	
Author's First Name	
Title of Article	
Encyclopedia Title	
Copyright Year (yyyy)	

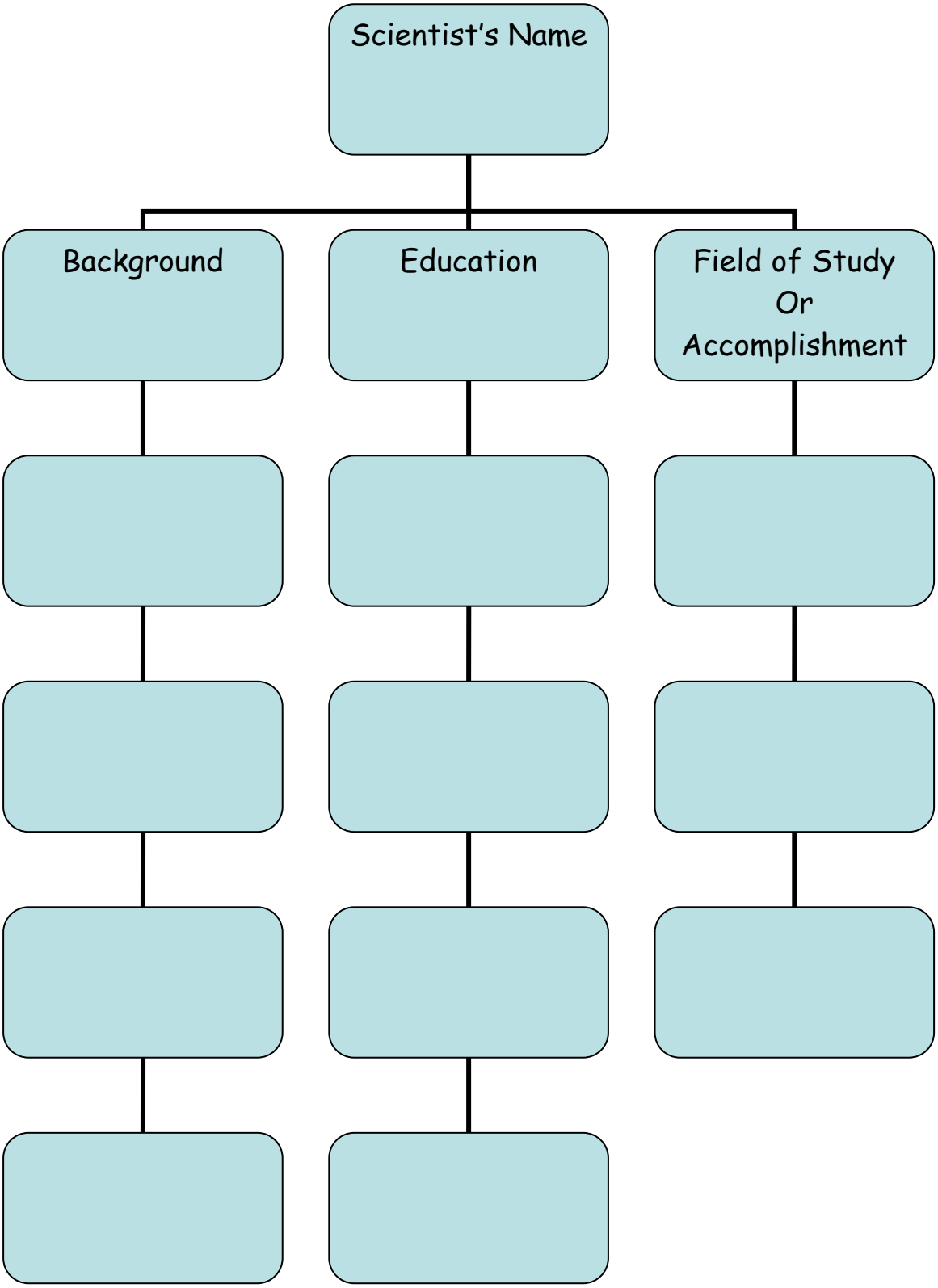
Web Page	
Example: Gilbert, Tim. Anansi The Spider. Manteno Community Unit School District #5, Manteno, IL. 9 April 2003 <http://www.manteno.k12.il.us/webquest/elementary/LanguageArts/Anansi/timgilbertwebquest.html>.	
Author's Last Name	
Author's First Name	
Title of Page or Site	
Name of Institution or Organization	

Date of Visit to Site	
URL of Page or Site	

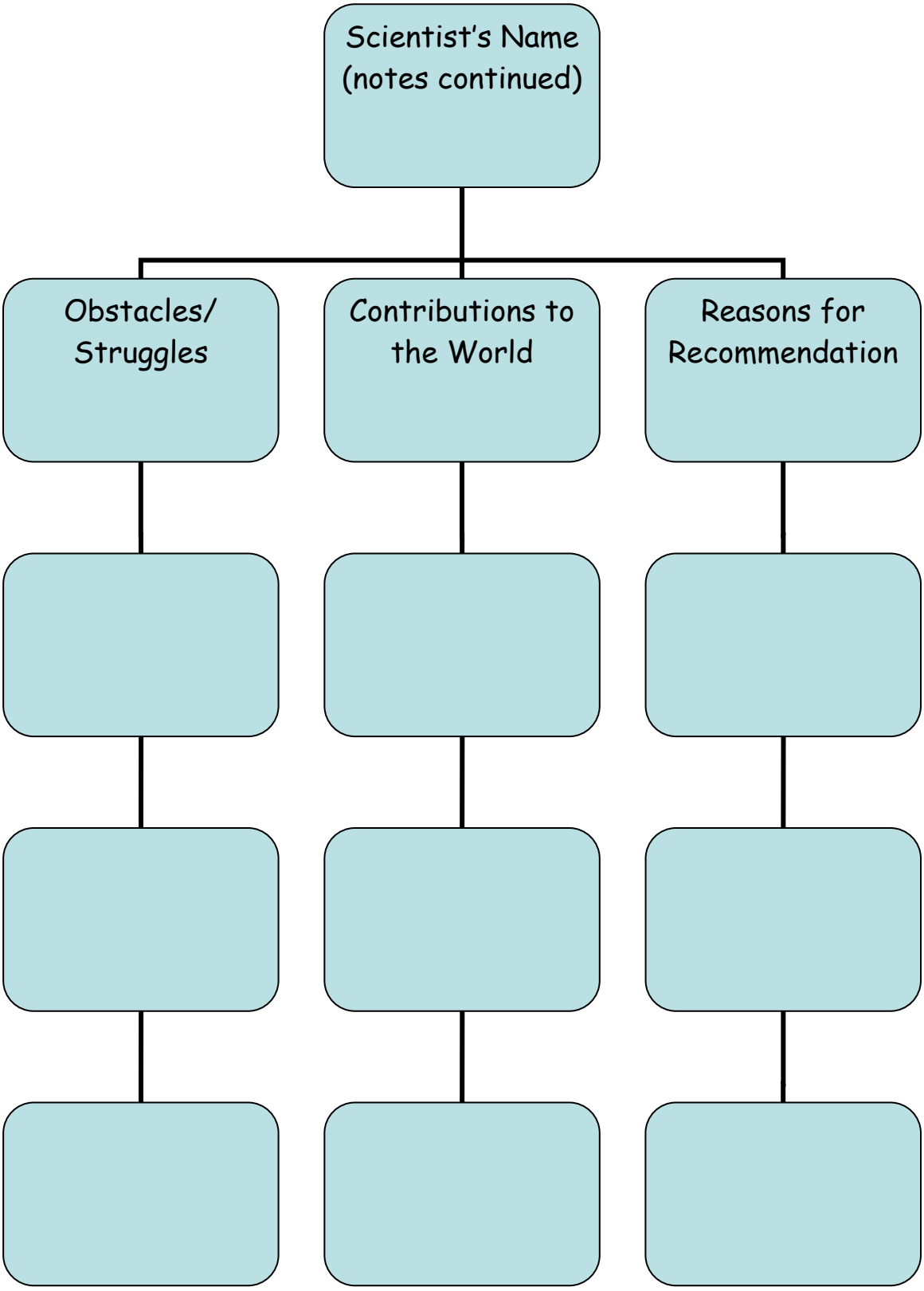
Appendix G (continued)
A Great Debate

Magazine Article on the Web (online database)	
Example: Churchman, Deborah. "Super Spider Silk." Ranger Rick. May 1995: 36. Primary Search. EBSCOhost. April 9, 1003 http://search.epnet.com/.	
Author's Last Name	
Author's First Name	
Title of Article	
Original Source of Article	
Date of original Source {Day, Month, year (yyyy)}.	
Pages	
Database Title	
Name of Service Provider	
Date of Visit to Site	
URL of Site	

Appendix H
A Great Debate



Appendix H (continued)
A Great Debate



Appendix I
A Great Debate

Introduction					
Title					
Topic Sentence					
Plan					
Block Out	◊	◊	◊	◊	
Introduction					**Conclusion**

Conclusion	
Jot three ideas to help you plan a conclusion	
•	
•	
•	
Hint	• Use synonyms. • Remind the reader of the topic. • Your conclusion will have at least three sentences

The Introductory and Concluding Plan should be copied on green paper.

The Body Paragraph Plan should be run on pink paper with yellow highlighter to indicate the transition topic sentences.

Body Paragraph
◊(include transition)
•
•
•
•
•

*From *Step Up to Writing* by Maureen Auman

Appendix J

A Great Debate Project Menu

Name _____ Project Due Date_____

Guidelines for Menu ✓ Everyone on team participates. ✓ Each *** project must be completed. ✓ Nomination Poster, Portrait & Speech will be presented at the Great Debate. ✓ All other projects will be shared at Cross-Grade Celebration.	**Make a Timeline…** of your scientist's life. Include at least 10 dates and important events. Include 4 or more hand-drawn pictures, computer graphics, etc. Visual should be neat and organized with accurate information! Person(s) responsible	**Prepare a Hand-Drawn Portrait…***** of the face, head, and shoulders of your scientist. Use 8 ½" x 11" paper. Include clothing appropriate to the time period. Make a frame and plaque to identify your scientist. Person(s) responsible
Journal Entries…*** Think like your scientist. Design a journal with a cover and several pages. Write a one-page entry expressing frustration with your project. Then write a one-page entry that describes a triumph. Sketches are encouraged. Person(s) responsible	**Project Menu About** **Major Contributions**	**Write a Rap…** Think rhythm and rhyme. Write a rap about your scientist –include background information, appropriate vocabulary, and facts about science successes. Rap must be 20 lines or 5 stanzas long. Pack it full of knowledge. Person(s) responsible
Prepare your Introductory Speech…*** for the Great Debate. This one page biographical sketch will introduce your scientist to the voting audience. Consider word choice. Practice your speech and present it with enthusiasm. Person(s) responsible	**Design a Nomination Poster…***** This visual will promote your scientist as "The Person Who Made the Biggest Difference". It should be visually appealing and persuasive. It will be used in the Great Debate. Person(s) responsible	**Design a Brochure using Publisher Program…** to highlight key events in your scientist's life. Sections to cover could include: early life, education, important science contributions. A minimum of four graphics is needed. _____ Person(s) responsible .

Appendix K

A Great Debate, Rap Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work.	The rap is well written and interesting. It is organized and easy to understand. It gives complete, accurate information.	The rap is interesting. It is organized and understandable. It gives complete and accurate information.	The rap is confusing at times. It gives accurate but only partial information.	The rap is confusing. It gives inaccurate or incomplete information.
Format	Has 20 lines or 5 stanzas.	Has fewer than 20 lines or 5 stanzas.	Has fewer than 16 lines or 4 stanzas.	Has fewer than 12 lines or 3 stanzas.
Performance	Background music and sound effects greatly enhance the performance.	Background music and sound effects enhance the performance.	Some background music or sound effects used. Slightly enhances performance.	No background music or sound effects, or they distract from performance.
Delivery	Effective eye contact. Speaks clearly with variations in rate, volume, tone and inflection. Fluent delivery. Strong use of facial expressions, gestures, body language.	Eye contact good. Speaks clearly with effective rate, volume, tone and inflection. Generally fluent delivery. Appropriate use of nonverbal techniques.	Some eye contact. Incorrect pronunciation with ineffective rate, volume, tone. Few appropriate, non-verbal techniques used.	No eye contact. Poor pronunciation. Ineffective rate, volume, tone and inflection. Nonverbal techniques are distracting.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; minimal assistance needed to complete project on time. Student works cooperatively.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project. Student hinders group efforts.

Appendix K (continued)

A Great Debate, Introductory Speech Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work	The content is organized and easy to understand. Message is clear, focused and interesting. It gives complete and accurate information.	The content is understandable; Purpose and main ideas are clear. Message stays on topic and gives an adequate amount of accurate information.	The content is hard to follow and confusing at times. Message has limited details. It gives accurate but only partial information.	The content is confusing and disorganized. It gives inaccurate or incomplete information. Message shows a lack of knowledge.
Delivery of Speech—The Great Debate	Effective eye contact. Speaks clearly and correctly. Rate, volume & tone appropriate. Gestures & facial expressions make message clear and interesting.	Eye contact with most of audience. Speaks clearly with minor mistakes. Rate, volume & tone appropriate. Gestures and facial expressions help explain message.	Eye contact inconsistent. Usually speaks clearly & correctly. Rate, volume & tone-may be too fast/slow, too soft, monotone. Some gestures and expressions.	Reads from notes, little eye contact. Many fillers (um, you know). Frequently speaks too fast/slow, too soft, monotone. Few gestures or they are used in distracting way.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; minimal assistance needed to complete project on time. Student works cooperatively in group.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project or turn in on time. Student hinders group efforts.

Appendix K (continued)

A Great Debate, Brochure Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work	The content is organized and easy to understand. It gives complete and accurate information. Brochure includes headlines and bylines appropriately placed. No corrections are needed.	The content is mostly organized and understandable. It gives complete and accurate information. Brochure includes headlines and bylines appropriately placed. Few corrections are necessary.	The content is hard to follow and confusing at times. It gives accurate but only partial information. Brochure includes some headlines and bylines. Some corrections are necessary.	The content is confusing and disorganized. It gives inaccurate or incomplete information. No headlines or bylines are used. Many corrections are necessary.
Technology	Brochure includes at least four appropriate graphics that enhance publication and help explain content. All graphics are cited correctly. Color and design add interest. Style sheet is followed.	Brochure has fewer than four graphics or graphics are not representative of content. Most graphics are cited correctly. Color and design are fine. Style sheet is followed.	Few graphics are used, and they do little to explain content. Graphics are not cited. Color and design are satisfactory. Style sheet is partially followed	No graphics or effects are used. Design is not interesting. Style sheet is not followed.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; minimal assistance needed to complete project on time. Student works cooperatively in group.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project or turn in on time. Student hinders group efforts.

Appendix K (continued)

A Great Debate, Portrait Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work. ***Format***	The portrait is hand drawn and interesting. It is representative of time period and field of science. Plaque gives complete, accurate information. Frame greatly enhances portrait.	The portrait is hand drawn. It is somewhat representative of time period and field of science. Plaque gives complete, accurate information. Frame enhances portrait.	The portrait is hand drawn. It is not representative of time period or field of science. Plaque gives partial or inaccurate information. Frame does little to enhance portrait.	The portrait is not hand drawn. It is not representative of time period nor field of science. No plaque. No frame.
Elements of Art	Applies knowledge of essential elements, organizational principles, and aesthetic criteria to portrait. Expresses ideas, moods, and feelings about scientist through art.	. Applies 2 of 3: knowledge of elements of art, organizational principles, or aesthetic criteria to portrait. Expresses ideas and feelings about scientist through art.	Applies 1 of 3: knowledge of elements of art, organizational principles, or aesthetic criteria to portrait. Expresses ideas about scientist through art.	Does not apply knowledge of elements of art, organizational principles, or aesthetic criteria to portrait. Expresses vague ideas about scientist through art.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; minimal assistance needed to complete project on time. Student works cooperatively in group.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project. Student hinders group efforts.

Appendix K (continued)

A Great Debate, Nomination Poster Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work. ***Format***	Main theme is clear and strongly supports purpose of poster. Title and words enhance understanding of scientist's contributions. Poster gives complete, accurate information. There is wholeness to poster. It is appropriate to audience.	Main theme is clear and supports purpose of poster. Title and words show an understanding of scientist's contributions. Poster gives complete, accurate information. It is appropriate to audience.	Main theme is unclear or does not support purpose of poster. Title and words show little understanding of scientist's contributions. Poster gives incomplete or inaccurate information. It is appropriate to audience.	Main theme does not support purpose of poster. Title and words show no understanding of scientist's contributions. Poster gives minimal and inaccurate information. It is not appropriate to audience.
Design	Use of space, texture, and colors add greatly to over-all effectiveness. Pictures, photographs, and drawings enhance visual message. Design is neat and presentable.	. Use of space, texture, and colors add to over-all effectiveness. Pictures, photographs, and drawings support visual message. Design is neat and presentable.	Use of space, texture, and/or colors add little to over-all effectiveness. Pictures, photographs, and drawings do not support visual message. Design is weak.	Does not use space, texture, and colors. Pictures, photographs, and drawings do not support visual message. Design is poor.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; minimal assistance needed to complete project on time. Student works cooperatively in group.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project. Student hinders group efforts.

Appendix K (continued)

A Great Debate, Journal Entry Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work. ***Format***	Journal entries are well written and interesting. They are organized and easy to understand. They give complete and accurate information. No corrections are needed.	Journal entries are interesting. They are organized and understandable. They give complete and accurate information. Few corrections are needed.	Journal entries are confusing at times. They give accurate but only partial information. Some corrections are needed.	The journal entries are confusing. They give inaccurate or incomplete information. Many corrections are needed.
Creative Elements	Sketches and diagrams explain content. Cover design greatly enhances the product. Writing expresses ideas, moods, and feelings of scientist during a frustrating time as well as successful time.	Sketches or diagrams help explain content. Cover design adds interest to product. Writing expresses ideas and feelings of scientist during a frustrating time as well as a successful time.	Some sketches or diagrams are used but do little to explain the content. Cover is adequate. Writing expresses ideas of scientist during a frustrating or a successful time.	No sketches or diagrams are used. Cover is poor or not made. Writing expresses vague ideas about a scientist.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; some assistance needed to complete project on time. Works cooperatively in group.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project on time. Student hinders group efforts.

Appendix K (continued)

A Great Debate, Timeline Rubric

Name _____ Date _____

	4	3	2	1
Content A score of 5 will be given to exceptional work.	The layout is well organized and understandable. Timeline gives complete and accurate information. A minimum of ten major events are evident. No corrections are needed.	The layout is organized and understandable. Timeline gives complete and accurate information. A minimum of eight major events are evident. Few corrections are needed.	The layout is disorganized. Timeline gives accurate but only partial information. A minimum of six major events are evident. Some corrections are necessary.	The layout is confusing. It gives inaccurate or incomplete information. A minimum of four major events are evident. Many corrections are necessary.
Graphics	Timeline includes at least four appropriate graphics that enhance product and help explain content. Color and design add interest.	Timeline has fewer than four graphics or graphics are not representative of content. Color and design are fine.	Few graphics are used and they do little to explain content. Color and design are satisfactory.	No graphics are used. Design is not interesting.
Self-Directed Learner	Student stays on task and follows directions; uses time well to meet due dates. Student works cooperatively in group.	Student stays on task and follows directions; minimal assistance needed to complete project on time. Student works cooperatively in group.	Student needs a lot of teacher direction to complete project on time. Student hinders group efforts.	Student does not complete project or turn in on time. Student hinders group efforts.

Appendix L
A Great Debate

Name: _____

Peer Project Feedback Form

Name of Presenter: _____

Core Knowledge Scientist: _____

Project: _____

Parts of Project Complete	Yes	No
Informative	Yes	No
Accurate	Yes	No

Workmanship	Excellent	Good	Poor
Neatness	Excellent	Good	Poor
Overall Effectiveness	Excellent	Good	Poor

Specific Suggestions for Changes:

1. _____

2. _____

3. _____

Name: _____

Peer Project Feedback Form

Name of Presenter: _____

Core Knowledge Scientist: _____

Project: _____

Parts of Project Complete	Yes	No
Informative	Yes	No
Accurate	Yes	No

Workmanship	Excellent	Good	Poor
Neatness	Excellent	Good	Poor
Overall Effectiveness	Excellent	Good	Poor

Specific Suggestions for Changes:

1. _____

2. _____

3. _____

Appendix M
A Great Debate

A Great Debate: Interview Directions and Questions

You have become an expert about a Core Knowledge scientist. Now you will be given an opportunity to present what you know during an interview conducted by three of your classmates. In this interview you will **answer questions as if you are the actual Core Knowledge scientist**. You will have all of the questions for the interview ahead of time, so you can prepare your answers and practice before the actual interview. Your expert group will work together to develop accurate and interesting responses. Be sure to select a recorder who will write down the answers as your group works through these questions.

1. Tell us a little about your birthplace, your family and your growing up years?

2. Where and how were you educated? What schools did you attend?

3. How do you like to spend your time?

4. In what field are you considered to be an expert?

5. Did you encounter any obstacles or struggles in your life? What were they? How did you overcome them?

6. Which of your qualities or traits has proven to be most beneficial to you?

7. In what ways was your career or life remarkable? Why do people know or remember your name?

8. What would you like written on your tombstone?

9. What do you consider your most important contribution to society or the world?

Appendix N

A Great Debate, Interview Rubric

Speakers Name: _____ Date: _____

	4	3	2	1
Content A score of 5 will be given to exceptional work	The content of the answers was complete and easy to understand. The responses were focused and interesting.	The content of the answers was understandable; main ideas clear. Responses stayed on topic and gave an adequate amount of accurate information.	The content of the answers was hard to follow and confusing at times. Responses had limited details. The speaker gave accurate but only partial information	The content of the answers was confusing and disorganized. Responses gave inaccurate or incomplete information. The speaker showed a lack of knowledge.
Convincing	The answers seemed believable, reasonable, and were convincing. The speaker really seemed to become the Core Knowledge scientist in this interview.	The answers were reasonable for the most part and seemed fairly convincing. The speaker was believable as a Core Knowledge scientist.	Some of the answers were hard to believe. At times the responses didn't really seem like they would be stated by a Core Knowledge scientist.	The answers were not reasonable and did not give a convincing presentation of what a Core Knowledge scientist would be like.
Delivery	Effective eye contact. Speaks clearly and correctly. Rate, volume & tone appropriate. Gestures & facial expressions make message clear and interesting.	Eye contact with most of audience. Speaks clearly with minor mistakes. Rate, volume & tone appropriate. Gestures and facial expressions help explain message.	Eye contact inconsistent. Usually speaks clearly & correctly. Rate, volume & tone-may be too fast/slow, too soft, monotone. Some gestures and expressions.	Reads from notes, little eye contact. Many fillers (um, you know). Frequently speaks too fast/slow, too soft, monotone. Few gestures or they are used in distracting way.

Appendix O
A Great Debate

What Should We Include in Our Debate Speeches?

Your group will be asked to present three separate speeches as you nominate your scientist for the Biggest Difference award. Each speech needs to be carefully planned before the Great Debate.

Attention Grabber –

- State a particularly interesting or surprising fact about your scientist.
- Present the portrait of your scientist.
- Formally introduce your scientist by name.

Introductory Speech

- Background, Growing Up, Education
- Interests – Career – Area of Expertise/Accomplishment
- Obstacles or Struggles
- Motivation for his/her Life Work
- Discovery/Accomplishment/Contribution

Placing Scientist's Name in Nomination

- State Opinion about Scientist's Life's Work
- Give Evidence that supports this Recognition
- "I would like to nominate _____ as the scientist who made the biggest difference."

Appendix P
A Great Debate

A Great Debate Expectations and Format

Expectations:

- Your entire expert team will be in front of the class for the presentation.
- A job in the debate may be shared or done by one person.
- Make sure everyone has something to do for the Great Debate.
- You will have 10 minutes (4th grade); 15 minutes (7th grade)
- After the 5 required debate activities are completed, you may add optional elements that fit into your allotted time.

Debate Format:

1. **Attention Grabber**

2. **Presentation/Display of Scientist's Portrait**

3. **Introductory Speech**

4. **Poster Presented and Explained**

5. **Placing the Scientist's Name in Nomination**

Optional Ideas:

- Rap Presentation
- Drama inspired by the life story or journal entries of your scientist
- Brief "Jeopardy" game played by the expert team in order to present additional facts and information
- Display and explain your scientist's brochure.
- Narrate the timeline created by your expert group.

Appendix Q

Great Debate Rubric

Name: _____ Date: _____

	4	3	2	1
Content A score of 5 will be given to exceptional work	All required components of the Great Debate included in the presentation. Speeches on target and on topic. Optional elements included, and add "punch", interest to the presentation.	All required components of the Great Debate included in the presentation. Speeches on target and on topic.	Most required components of the Great Debate included in the presentation. Speeches generally on topic.	Parts of the Great Debate components were omitted from presentation. Speeches were disorganized and confusing. Information was incomplete.
Organization	The debate format followed. The presentation logical; transitions between speakers smooth. Visuals organized and clear.	The debate format followed. The presentation logical; transitions between speakers fairly smooth. Visuals organized.	Most parts of the debate format were followed. The presentation lacks some organization; transitions between speakers disjointed.	Parts of the debate format omitted. The presentation disorganized and confusing.
Effectiveness	"Contact" was made with the audience. Opinions and point of view about the scientist communicated powerfully. Visuals effectively arranged to be persuasive.	The audience was directly addressed. Opinions and point of view communicated. Visual's point of view could be understood.	"Contact" with the audience was inconsistent. Opinions not always clear. Visuals not persuasive or did not support evidence.	The audience seemed to be left out during the presentation. Opinions unclear and no clear point of view was communicated.
Delivery	Effective eye contact. Speaks clearly. Rate, volume & tone appropriate. Gestures and facial expressions make message clear.	Eye contact with most of audience. Speaks clearly with minor mistakes. Rate, volume & tone appropriate. Gestures and facial expressions help explain message.	Eye contact inconsistent. Usually speaks clearly & correctly. Rate, volume & tone may be too fast/slow, too soft, monotone. Some gestures and expressions.	Reads from notes, little eye contact. Many fillers (um, you know). Frequently speaks too fast/slow, too soft, monotone. Few gestures or they are used in distracting way.

Appendix R
A Great Debate

Core Knowledge Scientist Ballot

You have seen and heard about several men and women of renown and accomplishment. Who do you think made the greatest contribution to the world? Please vote for a 4th grade and a 7th grade scientist.

4th Grade

- ☐ Benjamin Banneker
- ☐ Elizabeth Blackwell
- ☐ Charles Drew
- ☐ Michael Faraday

7th Grade

- ☐ Charles Darwin
- ☐ Antoine Lavoisier
- ☐ Lise Meitner
- ☐ Dmitri Mendeleev

Core Knowledge Scientist Ballot

You have seen and heard about several men and women of renown and accomplishment. Who do you think made the greatest contribution to the world? Please vote for a 4th grade and a 7th grade scientist.

4th Grade

- ☐ Benjamin Banneker
- ☐ Elizabeth Blackwell
- ☐ Charles Drew
- ☐ Michael Faraday

7th Grade

- ☐ Charles Darwin
- ☐ Antoine Lavoisier
- ☐ Lise Meitner
- ☐ Dmitri Mendeleev

Core Knowledge Scientist Ballot

You have seen and heard about several men and women of renown and accomplishment. Who do you think made the greatest contribution to the world? Please vote for a 4th grade and a 7th grade scientist.

4th Grade

- ☐ Benjamin Banneker
- ☐ Elizabeth Blackwell
- ☐ Charles Drew
- ☐ Michael Faraday

7th Grade

- ☐ Charles Darwin
- ☐ Antoine Lavoisier
- ☐ Lise Meitner
- ☐ Dmitri Mendeleev

Core Knowledge Scientist Ballot

You have seen and heard about several men and women of renown and accomplishment. Who do you think made the greatest contribution to the world? Please vote for a 4th grade and a 7th grade scientist.

4th Grade

- ☐ Benjamin Banneker
- ☐ Elizabeth Blackwell
- ☐ Charles Drew
- ☐ Michael Faraday

7th Grade

- ☐ Charles Darwin
- ☐ Antoine Lavoisier
- ☐ Lise Meitner
- ☐ Dmitri Mendeleev