

SCIENCE BIOGRAPHIES FOR RESEARCH DETECTIVES

Grade Level: 2nd Grade Science Biographies and Language Arts

Written by: Vicki Henderson

Length of Unit: Six lessons (each lesson is 45 minutes to an hour long)

I. ABSTRACT

Studying important people who have contributed to science is an excellent way to make science topics relevant to the students. They will discover the trials and tribulations the scientists experienced and learn that perseverance is a key to success. Learning the in-depth study process is a key skill that can be used again and again throughout the *Core Knowledge Sequence* in all subject areas. In this unit, second graders will become "research detectives" and learn the in-depth study process by using science biographies as their topics. Students will also have the opportunity to use higher level thinking skills to analyze their scientist's accomplishments.

II. OVERVIEW

A. Concept Objectives

1. Students will understand interrelationships among science, technology, and human activity and how they can affect the world. (CO Science Standard #5)
2. Students will understand how to locate, select, and make use of relevant information from a variety of media, reference, and technological sources. (CO Reading and Writing Standard #5)

B. Content from the *Core Knowledge Sequence* (2nd Grade)

1. Anton van Leeuwenhoek, page 61
2. Florence Nightingale, page 61
3. Elijah McCoy, page 61
4. Daniel Hale Lewis, page 61

C. Skill Objectives

1. The student will learn to locate and use a variety of resources.
2. The student will learn to record his/her resources in a bibliography.
3. The student will learn to pre-read a selection to find topics, subtopics, and details.
4. The student will learn to find important facts and record the information--note-taking.
5. The student will organize the facts he/she finds into categories.
6. The student will analyze the character traits that contribute to a scientist's (or any person's) accomplishments.
7. The student will learn the elements necessary for an oral presentation to an audience.
8. The student will create a product to show what he/she learned.

III. BACKGROUND KNOWLEDGE

A. For Teachers

1. *The Research Book*, by Nancy Polette, or any other book which teaches about in-depth studies or the research process
2. Familiarity with the library you will use
3. Familiarity with the card catalog, computer encyclopedia, Internet

B. For Students

1. There are a variety of resources in the library
2. The difference between fiction and non-fiction

3. The alphabet
4. The process for brainstorming ideas

IV. RESOURCES

- A. *The Research Book*, by Nancy Polette, or any other book which teaches about in-depth studies or the research process
- B. Siegle, Del, "Independent Study Handouts" <http://coehp.idbsu.edu/gifted/98agate.htm>

V. LESSONS

Lesson One: Research Detectives

- A. *Daily Objectives*
 1. Concept Objective(s)
 - a. Students will understand how to locate, select, and make use of relevant information from a variety of media, reference, and technological sources.
 2. Lesson Content
 - a. Anton van Leeuwenhoek
 - b. Florence Nightingale
 - c. Elijah McCoy
 - d. Daniel Hale Lewis
 3. Skill Objective(s)
 - a. The student will learn to locate and use a variety of resources.
 - b. The student will learn to record his/her resources in a bibliography.
 - c. The student will learn to pre-read a selection to find topics, subtopics, and details.
- B. *Materials* (meet in the library or media center of your school or arrange to take a field trip to your community library; have access to computers or a computer lab, if available, also)
 1. Encyclopedias
 2. Biographies
 3. Computerized or paper card catalog
 4. Science section (Dewey Decimal system)
 5. Periodicals
 6. Computer access to Encarta or some other encyclopedia connected to a printer, if available
 7. Computer access to the Internet connected to a printer, if available
 8. Access to a copy machine
 9. List of scientists who are related to the Core Knowledge science topics in second grade (Appendix A)
 10. In-depth Study Packets (colored pocket folders with brads for 3-ring binder paper; copies of the Appendices (B-I), collated and inserted into study packets)
 11. Pencils for each student
 12. Name tags on the students and volunteers
 13. Large numbers on paper to identify the stations and the order in which students will visit them e.g. seven stations = numbers 1 through 7
 14. Large paper hanging from a rolling easel or an overhead projector and markers
 15. Volunteer sign-up sheet for future lessons in this unit of study
- C. *Key Vocabulary*
 1. Research: the process by which we find information
 2. Biography: the story of a person's life
 3. In-depth study: learning about one topic in great detail

4. Bibliography: a list of resources used to gather information about your topic
5. Encyclopedia: a set of books containing many articles arranged in alphabetical order which deal either with the whole of human knowledge or with a particular part of it
6. Dewey decimal system: a numerical system which classifies all non-fiction books and materials into subject categories
7. Computer card catalog: the list of a library's collection by author, title, or subject
8. Internet: the large system of many connected computers around the world which people use to communicate with each other
9. Periodicals: a magazine or newspaper on a specific topic that is published regularly
10. Rubric: a specific set of rules or criteria for evaluation

D. *Procedures/Activities*

1. Recruit at least seven parent/adult volunteers to help. Encourage parents to volunteer because they will see what the assignment is and then they can help their child with the homework. Include the library/media specialist or assistants if you can. If there is no media specialist, you will need to have extensive familiarity with your library and how to check out materials. Have at least one adult at each of the seven research stations (you may have a different number of stations). Include the following stations, if available at your location: Encyclopedias, Biographies, Computerized or paper Card Catalog, Science Section, Periodicals, Computer access to Encarta (or some other encyclopedia), Computer access to the Internet.
2. Schedule this lesson when the library is available or make this a field trip to your community library. Make an appointment in advance so that you might be able to have docents or library assistants help out. Try to schedule this when the computer lab is available also, or find out where computer(s) are located so that you can access the Internet if you are in your community library.
3. Meet with the volunteers to explain each research station and their duties at the stations.
4. Tell the volunteers that the students will also be looking for a photo or portrait of their scientists.
5. NOTE: The adult at each station needs to help the student record the resources found on the student's bibliography page in the in-depth study packet. Adults stay at their stations; they do not move with the students.
 - a. **Encyclopedias:** The adult at this station will help the children decide which letter/volume they need to look in for their famous scientist. He/she will help the student find the scientist in that volume. If you have a second adult at this station, he/she could make copy of the article for the child.
 - b. **Biographies:** If the biographies are located in one separate area, the adult at this station will help the students decide the letter of the alphabet where the book might be located. He/she can also help the student check out the book on the scientist. If the biographies are located around the library in their Dewey decimal sections, have this adult help out at the computer/card catalog station by taking students to the area where they will find the biography.
 - c. **Computer or card catalog:** The adult at this station will help the students look up their scientists and write down the Dewey decimal numbers where they can find books and other materials about their scientists. If you have a second adult in at this station, he/she could take

- students to other sections if materials are listed that are not in the science section. There will be a volunteer stationed at the science section to help find materials that are in the science section.
- d. **Science Section:** The adult at this station will help the students find the Dewey decimal number they have written down that is a reference for their scientists. This adult will also help the students find general science books that might include information on their scientist. It would be helpful to have more than one adult assisting in this section. **(Note: the card catalog station must precede this station.)**
 - e. **Periodicals:** The adult at this station will help the students find the magazine they have written down at the card catalog station that is a reference for their scientists. He/she can also help the student check out the periodical. **(Note: the card catalog station must precede this station.)**
 - f. **Computer access to Encarta or other compact disc encyclopedia, if available:** The adult at this station will help students find the science category for the scientist and then find articles, if any about the scientist. It will be helpful if this computer is hooked up to a printer so that the adult can print the article for the student. If not, the student needs to write down in his/her bibliography the steps to find the article later so a parent can help him/her find it and take notes.
 - g. **Computer access to the Internet:** The adult at this station will help students find information about their scientists. It is imperative that there is an adult watching each site the students find. It would be ideal if sites for the scientists could be book marked in advance. Use Yahoo!igans, Google, Alta Vista, or other search engines with which you are familiar. Depending on the size of your groups and the number of Internet computers you have, it would be helpful to have more than one adult at this station. It will also be helpful if this computer(s) is hooked up to a printer so that the adult can print the articles to give to the student. If not, the student should write down the site addresses on his/her bibliography so that he/she can find it with the help of a parent and then take notes.
6. NOTE: Students will visit each station but may not find a resource on their scientist at each station. They should remain in the group because they will learn how to find the resource in that section. The goal is for each student to find three resources about his/her scientist.
 7. NOTE: Think about the order of your stations. It may not take students very long at Biographies and periodicals, for example, if there is no resource for their scientist. They can learn what periodicals are available and how they are organized even if they won't be using this as a resource for this project. Place these two stations in between the computer stations to regulate the amount of time needed at the card catalog, the Internet, and the CD encyclopedia.
 8. Assign scientists for the biographies ahead of time. Use Appendix A or modify the list as you like. Perhaps you will want to assign the four scientists listed in the Core Knowledge content to your struggling students so that they have part of their duties in the lessons demonstrated for them.
 9. Introduce the Biography In-depth Study Packet (Appendices B-I)
 - a. Explain to students that they are now going to become "Research Detectives."

- b. Have students look at the In-depth Study Process (Appendix B) and explain that today we will be working on "find the resources" and "survey the topic" and "make a bibliography."
 - c. Tell students that they will learn how to "gather all the clues" in the next lesson.
 - d. Have students look at the "Research Detectives Project Rubric" (Appendix C). This outlines the expectations of the project. Read it to them and explain that for today's lesson, they will be doing steps #1 and 2. They may begin steps #3 and 4 if they are able to find all their resources. Remind them that they will be looking for a photo or portrait of their scientist.
 - e. Have students look at the Bibliography (Appendix D) and explain that this is where they will make a list of all the resources that they find. As they get more and more practice finding and using all the resources in the library, they will become better and better "Research Detectives." Remind them that they may not find a resource at each station.
 - f. Have them note that they should be looking for a photo or illustration of their scientist.
 - g. Have students look at the "Find the Clues" note-taking worksheet (Appendix E). This outlines the information they should try to find. Read it to them and explain that the next lesson will cover this page, but if they find several resources today, they can begin recording some information.
10. Describe and show how the various resources in the library are organized and where they are located. Show them the large numbers identifying each station. Introduce the volunteer at each station.
 - a. Explain to the students that they will be moving from station to station and the volunteers will be helping them find the resources they need.
 - b. Explain that they will be going to the stations in numerical order but that they may not be starting with number one. Be sure they understand that once they go to the last numbered station, they will then go to station number one.
 11. Demonstrate what they will do at each station by using Anton van Leeuwenhoek, or Florence Nightingale, or Elijah McCoy, or Daniel Hale Williams as an example. **(Note: Find your resources ahead of time so that you know which scientist to use as an example at each station.)** Demonstrating each station will work best if most of your stations are in one room and the students can be seated in an area where they can see you at each station without having to move around with you. If some of your stations are in other rooms, you may want to have the adults at those stations give the demonstration for that station.
 12. Demonstrate how to fill in their bibliography page (Appendix D) at each station as they find the resources they will be using. Use large paper hanging from a rolling easel if you have access to one. Or you could use an overhead projector if you have access to one. Or tape a large copy of the bibliography to a wall.
 13. Divide the students into five groups (or equal to the number of stations that you have minus periodicals and science section since they need to visit card catalog before going to these two stations). **(Note: Perhaps you will want to have them divided ahead of time by the color of their folder or name label.)**
 - a. Decide which group is starting at each station and tell them where they are going first. Remind them that they will do the stations in numerical order. Recommend that they do not move to the next station if there are

- already six or seven students there. (Set the maximum number at a station to be the size of your groups plus one or two.)
- b. Ask the group who is going to begin at station one (encyclopedias), where they will go next (two, biographies). Ask the group who is going to begin at station two (biographies), where they will go next (three, card catalog). And ask the group who is going to begin at the last station where they will go next (the first station).
14. Send the group that has been the most attentive (and least disruptive) to their station first. Send the next group. Have any groups who need to go to a different room or area (e.g. computer lab) wait so that you can escort them after the other groups have gone to their stations.
 15. Now you can float to all of the groups and help where it is needed most! Be prepared for bottlenecks at the stations that require more time. Try to have more adults at these stations. Help students who are waiting to go to the next station with their bibliography or their note-taking sheets.
 16. At the end of the lesson, gather all the students together in one group again. Explain to them (and the parent volunteers) that they can find additional resources at their homes or at another library. Ask them to read the information about their scientist with their parents for homework. Explain to them that they will need to bring all of their resources and their Research Detectives In-depth Study packet to class in time for the next lesson.
 17. Have your volunteers sign up if they are able to come to the next lesson to assist with note taking.
- E. *Assessment/Evaluation*
1. List at least three resources for the scientist on the bibliography sheet.

Lesson Two: Find the Clues

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students will understand how to locate, select, and make use of relevant information from a variety of media, reference, and technological sources.
2. Lesson Content
 - a. Anton van Leeuwenhoek
 - b. Florence Nightingale
 - c. Elijah McCoy
 - d. Daniel Hale Lewis
3. Skill Objective(s)
 - a. The student will learn to use a variety of resources.
 - b. The student will learn to pre-read a selection to find topics, subtopics, and details.
 - c. The student will learn to record his/her resources in a bibliography.

B. *Materials*

1. In-depth Study Packets
2. Resources the students have collected about their scientist
3. Pencils for each student
4. Large paper hanging from a rolling easel or an overhead projector and markers
5. Extra "Finding the Clues" hand-outs (Appendix E)
6. Large copies or overhead projector transparencies of some of the text about the four scientists
7. Highlighters of various colors

- C. *Key Vocabulary*
1. Pre-reading: looking over an article or the chapters of a book to see where important facts might be located
 2. Note-taking: the process by which we write down the important facts about a topic
 3. Character traits: the words you would use to describe a person's strengths, abilities, or weaknesses
 4. Occupation: a person's job
 5. Motivation: the reason a person wants to do something
 6. Obstacles: things that get in the way of progress toward a goal
- D. *Procedures/Activities*
1. Make several large "Finding the Clues" worksheets for your easel or overhead projector transparencies.
 2. Have students open their packets to the "Finding the Clues" page (Appendix E).
 3. Read the items on the worksheet so that the students know what information they will be trying to find.
 4. Explain any words they may not know, e.g. character traits, occupation, motivation.
 5. Explain that they will use one "Finding the Clues" page for each of their resources, so, if they have three resources, they will need three worksheets.
 6. Hand out extra worksheets.
 7. Using several of the four science biographies, demonstrate how to pre-read the topic headings and subtopics. Ask the students what information for their "Clues" sheet might they find under those headings.
 8. Demonstrate pre-reading using your large copies or overhead transparencies of some of the text about the four scientists.
 9. Ask students to raise their hands if they hear or see facts that you should fill in on your "Finding the Clues" sheet.
 10. Demonstrate note taking by filling in some facts on your large Clues sheet or your overhead projector transparency.
 11. Explain that each resource will have some similar information and some information that is different.
 12. Give students time to "gather clues" and assist where needed. If you have volunteers helping, make sure they are paired with your students who need some help reading or writing.
 13. Remind students to be sure that they have filled in their bibliography sheet with the resources they found.
- E. *Assessment/Evaluation*
1. At least three "Finding the Clues" sheets with facts and information filled in (Appendix E).

Lesson Three: Organize the Information

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students will understand how to locate, select, and make use of relevant information from a variety of media, reference, and technological sources.
 2. Lesson Content
 - a. Anton van Leeuwenhoek
 - b. Florence Nightingale
 - c. Elijah McCoy

- d. Daniel Hale Lewis
 - 3. Skill Objective(s)
 - a. The student will organize the information he/she finds into categories.
- B. *Materials*
 - 1. In-depth Study Packets
 - 2. Pencils for each student
- C. *Key Vocabulary*
 - None
- D. *Procedures/Activities*
 - 1. Now that students have gathered facts and information from at least three different sources, they can organize that information into one format so that they can prepare for an oral presentation about their famous scientist.
 - 2. Have students find their “Master Plan” (Appendix F) in their In-depth Study Packets.
 - 3. Read the plan and then find the categories for information on the “Find the Clues” pages.
 - 4. Demonstrate how to record information and check the vital statistics on each of the “Find the Clues” sheet for discrepancies using your notes on one or more of the four scientists you have been demonstrating all along. Do this on your large copy of the “Master Plan” page or the overhead projector.
 - 5. Explain that if they do have discrepancies, they will need to choose the information from the source that they think is the most accurate. Encyclopedias, if fairly current, have accurate information. Anyone can make an Internet site and no one oversees the accuracy of the information, so Internet sites are sometimes less reliable.
 - 6. Explain that their oral presentations will be more interesting if they have found any personal stories about their scientist.
- E. *Assessment/Evaluation*
 - 1. Master Plan filled in (Appendix F)

Lesson Four: Analyze the Information

- A. *Daily Objectives*
 - 1. Concept Objective(s)
 - a. Students will understand interrelationships among science, technology, and human activity and how they can affect the world.
 - 2. Lesson Content
 - a. Anton van Leeuwenhoek
 - b. Florence Nightingale
 - c. Elijah McCoy
 - d. Daniel Hale Lewis
 - 3. Skill Objective(s)
 - a. The student will analyze the character traits that contribute to a scientist’s (or any other person’s) accomplishments.
- B. *Materials*
 - 1. In-depth Study Packets
 - 2. Pencils for each student
- C. *Key Vocabulary*
 - 1. Analyze: to separate into parts or categories and discover the relationships among the elements

- D. *Procedures/Activities*
1. The discussions for this lesson will be more effective if you can work with smaller groups. **Be sure to line up your volunteers ahead of time.** Explain the “Master Plan” (Appendix F) to your volunteers and give them the list of questions for the discussions (Appendix G). Explain that whenever possible, they should allow the students to discover the similarities and differences and themes among their scientists.
 2. Gather the students together in one room first. Have the students find their “Character Analysis” (Appendix G) page in their In-depth Study Packets
 3. Read the questions for discussion.
 4. Explain to the students that they will be breaking into smaller groups and going with volunteers to have discussions of their scientists’ characteristics.
 5. Introduce the volunteers and divide the students into groups. **(You may want to have these groups decided ahead of time.)** Tell them where each volunteer will be and which students will be with each one.
 6. Have the volunteers take their students to their location one group at a time.
- E. *Assessment/Evaluation*
1. The character analysis sheet filled in Appendix G.

Lesson Five: The Story Teller

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students will understand interrelationships among science, technology, and human activity and how they can affect the world.
 - b. Students will understand how to locate, select, and make use of relevant information from variety of media, reference, and technological sources.
 2. Lesson Content
 - a. Anton van Leeuwenhoek
 - b. Florence Nightingale
 - c. Elijah McCoy
 - d. Daniel Hale Lewis
 3. Skill Objective(s)
 - a. The student will learn the elements necessary for an oral presentation to an audience.
- B. *Materials*
1. “Practicing Your Oral Presentation Checklist,” Appendix H
 2. In-depth Study Packets
 3. Pencils for each student
 4. Extra copies of Appendix H, one for each student
- C. *Key Vocabulary*
1. Monotone voice: the same tone without any changes in inflection
 2. Inflection: the pitch of the voice
 3. Eye contact: looking at the audience and speaking instead of reading a paper
- D. *Procedures/Activities*
1. Ask students if they have ever listened to and seen a great storyteller. Brainstorm the traits that make a great storyteller.
 2. Have the students look at their “Practicing Your Oral Presentation Checklist” page in their packets, Appendix H.
 3. Explain that when they give an oral presentation to the class, they are like a storyteller. There are several basic elements that will make their story about their scientist a great presentation.

4. Demonstrate a not-so-good presentation by reading your information about one of the four scientists in a voice that is too quiet and is monotone, without looking at the students. Mix up your information so that it is not well organized.
 5. Ask students for suggestions about how you could improve your presentation. Remind them that they should carefully choose their words for their suggestions so that they don't hurt your feelings. Discuss the fact that it may be the first time that many of the students have given a presentation to the class and that they may be a little nervous to do so. Remind them that positive suggestions for ways to improve a presentation will be very helpful.
 6. Divide the students into pairs. Give them two minutes to practice reading their information about their scientist to their partner. After two minutes, have them switch who is the reader and who is the audience. Give them two minutes again to practice reading their information.
 7. Give them two minutes to think about a couple of positive suggestions for their partner's presentation. Remind them that they can use the checklist items.
 8. Have them share those suggestions with each other in the same order they did the practice presentation.
 9. For homework, they must practice their presentation in front of some family members at home.
- E. *Assessment/Evaluation*
1. Have them take home an extra "Practicing Your Oral Presentation Checklist" (Appendix H). Ask them to have a parent or other adult be part of their audience when they practice their presentation. That person needs to put a plus next to the items they did well and a check next to the items they need to improve. Have them leave blank any items that have to do with the product they are going to create.

Lesson Six: The Scientists on Display

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students will understand interrelationships among science, technology, and human activity and how they can affect the world.
 - b. Students will understand how to locate, select, and make use of relevant information from variety of media, reference, and technological sources.
2. Lesson Content
 - a. Anton van Leeuwenhoek
 - b. Florence Nightingale
 - c. Elijah McCoy
 - d. Daniel Hale Lewis
3. Skill Objective(s)
 - a. The student will create a product to show what he/she has learned.

B. *Materials*

1. Tri-fold display boards cut in half horizontally so that each board makes two (use the display boards like those that are often used for science fairs)
2. Various colors of construction paper
3. Glue sticks or bottles (one for every four students, at least)
4. A package (50 sheets) of plain white paper
5. A package (50 sheets) of ruled white paper
6. Scissors (one for every four students, at least)
7. A paper cutter (**please note that you will need a volunteer to help students cut their paper**)

8. Pencils for each student
 9. Large erasers (one for every four students, at least)
 10. Colored markers in fine tips and broad tips
 11. In-depth Study Packets with information completed
 12. Photo or illustration of the scientists (each student should have found one)
- C. *Key Vocabulary*
1. Visual display board: the tri-fold, cardboard, stand up display board
 2. Layout: balancing the text and images so that the combination is visually pleasing
- D. *Procedures/Activities*
1. Now that students have done a great deal of research and they know quite a lot of information about their scientist, they can make a product that shows what they have learned. This will be a visual aide they can refer to when giving their oral presentation. And for those people who do not see their presentation, it will be informative enough to tell someone all about their scientist.
 2. Have groups of students working around several tables each with its own set of supplies. Any supplies you do not have enough of to distribute to the tables should be at a convenient location so that everyone can have access to them.
 3. Have students find the “Display Board Checklist” (Appendix I) in their In-depth Study Packet.
 4. Brainstorm some ideas about what makes a great poster or display board. If the students have participated in science fair before, they may have some good ideas from those guidelines.
 5. Read the guidelines on the checklist.
 6. Explain that everyone should make everything they plan to put on the board but they should not glue anything until everything is finished. This way they can do the layout before anything is glued.
 7. Remind them that they need to have one illustration that they have drawn themselves.
 8. Remind them also that they need to have one photo or drawing of their scientist, if one is available.
- E. *Assessment/Evaluation*
1. Use the “Display Board Checklist” (Appendix I) as an evaluation rubric.

VI. CULMINATING ACTIVITY: “MEET THE SCIENTISTS”

- A. Plan a day or several days when students can give their oral presentations.
1. Tell students they may dress up as their scientist if they like or bring a couple of items to use as props (e.g. Anton van Leeuwenhoek could be holding a model of the microscopes that he built.)
 2. You may want to put the scientists in chronological order.
 3. If you have 6-8 students give their presentations, plan it for the end of the day when parents may be picking their children up from school and have them come early for the presentations. Plan about 5 minutes for each presentation. Add a little time at the end for mingling with the scientists or a question and answer period.
 4. Perhaps you will want to have juice and cookies and make it a “Meet the Scientists Tea.” You may want to allow ten minutes after the presentations where parents can mingle with the “scientists” and ask questions. Or have a question and answer period after the individual presentations where all of the scientists who gave presentations sit in a semi-circle at the front of the room and

- parents and students can ask questions. If you do this, you may want to have guidelines for questions so that students ask meaningful questions.
- B. Turn the presentations into a learning experience for the other students.
 1. Make a grid with headings across the top and spaces down the left side for the scientists' names. Students can take notes and fill in the grid.
 2. On another day you can do a compare-and-contrast activity with the whole class. This activity will ensure that all the students learn the recurring themes of perseverance and overcoming obstacles in all the scientists' accomplishments.
 - C. If you are doing this unit with a small group of students, e.g. gifted and talented students, you may want to have a "Meeting of the Minds" instead of each student giving a separate presentation.
 1. Students would sit together in a semi-circle at the front of the room as if they are scientists who have come together for a discussion. They take turns sharing their information in the order of themes, e.g. vital statistics, education and occupations, obstacles overcome, etc.
 2. The students would need assistance writing transition sentences or lead-in sentences between each student's parts.

VII. HANDOUTS/WORKSHEETS

- A. Appendix A: List of Scientists for Second Grade Science Biographies
- B. Appendix B: Research Detectives In-depth Study Process
- C. Appendix C: Project Rubric
- D. Appendix D: Bibliography
- E. Appendix E: Find the Clues
- F. Appendix F: Master Plan
- G. Appendix G: Character Analysis
- H. Appendix H: Practicing Your Oral Presentation
- I. Appendix I: Display Board Checklist

VIII. BIBLIOGRAPHY

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- G. *Elijah McCoy, Inventor*, URL: <http://www.ncalifblackengineers.org/Elijah%20McCoy.html>
- H. *Elijah McCoy, Inventor and Engineer*, URL: <http://www.princeton.edu/~mcbrown/display/mccoy.html>
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Research Detectives

In-depth Study

List of scientists for biographies:

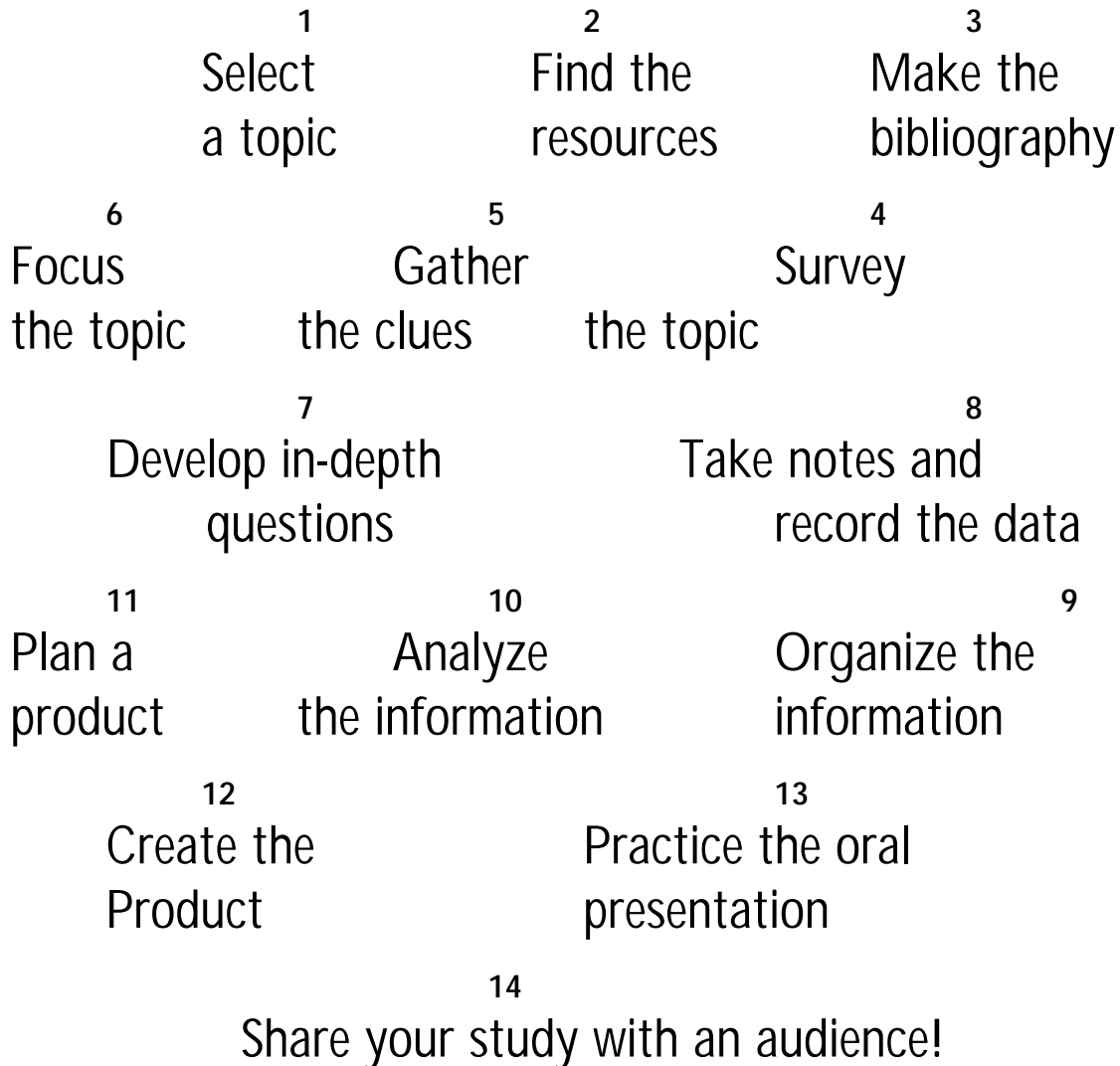
Most of these scientists are from the Core Knowledge curriculum, or from one of the countries studied in the second grade curriculum, or are associated with a second grade science topic, or are African American scientists or inventors (Civil War and Civil Rights topics).

Anton van Leeuwenhoek	(microscope lenses)
Florence Nightingale	(medicine, nursing)
Elijah McCoy	(locomotive lubricating cup)
Daniel Hale Lewis	(first heart surgery)
Julia Hammond	(device to hold yarn for knitting)
Sarah Boone	(ironing board for women's clothing)
Sarah Goode	(folding cabinet bed)
Judy W. Reed	(machine to knead dough)
Isaac Newton	(physical forces)
Aristotle	(nature, scientific method)
Thales of Miletus	(first philosopher of nature)
Hippocrates	(medicine, causes of diseases)
Herophilus	(anatomy)
Erasistratus	(anatomy)
Galen	(medicine, surgeon)
Archimedes	(simple machines, mathematics)
Ctesibius	(simple machines)
Philon of Byzantium	(mechanical instruments)
Heron of Alexandria	(mechanical instruments)
Hans Janssen	(microscope)
Robert Hooke	(microscope)
Thomas Savery	(steam engine)
Thomas Newcomen	(steam engine)
Evangelista Torricelli	(atmospheric pressure, barometer)
Chang Heng	(seismograph)
Al-Khwarizmi	(algebra)
Al-Zahrawi	(medicine, surgical instruments)
Al-Razi	(medicine, infectious diseases)
Ibn Sina	(medicine)
William Gilbert	(magnetism)
Theodor Schwann	(cells)

Appendix B-Science Biographies for Research Detectives

A drawing of a detective goes on the left below. You can box each step and connect them with arrows.

Research Detectives In-depth Study Process



Appendix C-Science Biographies for Research Detectives

Research Detectives Project Rubric

Student's Name: _____

Date: _____

Biographee's Name: _____

Date Due: _____

- Step 1: Visit all the research stations and find resources on your biographee. _____ points
 - Step 2: Make a bibliography of the resources you will use. (Find at least _____ resources.) _____ points
 - Step 3: Pre-read your resources and take notes on the "Find the Clues" sheets. (Use one sheet for each resource) _____ points
 - Step 4: Find a photo or illustration of your biographee. _____ points
 - Step 5: Organize your information on the "Master Plan." _____ points
 - Step 6: Analyze your information on the "Character Analysis" sheet. _____ points
 - Step 7: Practice your oral presentation and have your checklist signed by an adult in your audience (a parent if possible). _____ points
 - Step 8: Create a product and evaluate it with the checklist. _____ points
 - Step 9: Give your oral presentation and show your product to an audience. _____ points
- Total: _____ points

Appendix D-Science Biographies for Research Detectives

Bibliography

Student's Name: _____ Date: _____

Biographee's Name: _____ Date Due: _____

Encyclopedias:

Title of the set: _____

Title of the article: _____

Volume: _____ Pages: _____

Biographies:

Title of the book: _____

Author: _____

Title of the book: _____

Author: _____

Science Section:

Title of the book: _____

Author: _____ Dewey Decimal Number: _____

Title of the book: _____

Author: _____ Dewey Decimal Number: _____

Other Section:

Name of section: _____

Title of the book: _____

Author: _____ Dewey Decimal Number: _____

Computer Encyclopedia: (Encarta or Grolier or _____)

Title of article: _____

Section: _____ Subtopic: _____

Title of article: _____

Section: _____ Subtopic: _____

Internet:

Title of article: _____

www. _____

Appendix E-Science Biographies for Research Detectives

Find the Clues

Student's Name: _____ Date: _____

Biographee's Name: _____ Date Due: _____

Resource: _____ Pages: _____

Each resource may have different clues. One resource may not have all the clues. Leave blank(s) if the resource doesn't include the information or if it repeats info you already have on one of these sheets.

Vital Statistics:

Year born: _____ Place: _____

Year died: _____ Place: _____

Family:

Parents: _____

Parents' occupations: _____

Brothers, sisters, other family members who may have influenced this person: _____

Mentors (other people who influenced this person's work or accomplishments): _____

Childhood:

Hobbies, interests, education: _____

Adult life:

Hobbies interests: _____

Occupation(s): _____

Character traits: Which traits best describe your biographee?

imaginative sets goals sticks to a plan keeps trying problem-solver
risk-taker conquers fears can change ideas to fit what works
overcomes obstacles learns from mistakes doesn't give up

Other traits you found:

What this person is famous for: _____

What obstacles did this person have to overcome? _____

Why this accomplishment was good for society: _____

Did this accomplishment lead to others in the future? _____

Appendix F-Science Biographies for Research Detectives

Master Plan

Student's Name: _____

Date: _____

Biographee's Name: _____

Date Due: _____

This is a guideline for what you might say during your oral presentation. You may make changes as needed.

My name is _____. I was born in _____
in the year _____. I died in _____ in the year _____.
I came from a _____ family. My parents names were
_____ and _____. They were _____
_____. I had _____ brothers
and _____ sisters. They were _____
_____.

While I was growing up, my favorite things to do were _____
_____. I was educated
by or at _____. The
person who encouraged me the most was probably _____.
_____. I am grateful to this person
because _____

_____.

As an adult, I enjoyed _____
_____. My job(s) were _____

_____.

I am known best for _____
_____. The reason

I wanted to do this is _____

_____. I am proud of this accomplishment because _____

_____. In order to succeed, I think I had to be _____

_____. One example of this is when _____

_____.

My accomplishments led to other peoples' accomplishments, for example, _____

_____.

Summary paragraph:

In addition to my oral presentation, the product I plan to create will be:

Visual: display board poster chart, graph, map, time-line
Other: _____

Optional:
3-dimensional diorama model info cube
Other: _____

If you choose to make the optional model, please describe your plan here: _____

Appendix G-Science Biographies for Research Detectives

Character Analysis

Student's Name: _____

Date: _____

Biographee's Name: _____

Date Due: _____

This is a list of questions for you to discuss in a group with other students. Pretend you are the scientist that you are researching. Think about how your scientist would answer these questions. And as you listen to the other scientists try to think of similarities and differences among the scientists.

Please introduce yourself and say when you lived.

My name is _____ and I lived from _____ to _____.

What are you famous for?

Did it take you a long time to accomplish this?

Why did you want to do this?

Were you able to work toward your goal as part of your job or was it something you worked on in your spare time?

Describe some of your trials and tribulations along the way.

How did you overcome these obstacles?

Was there anything interesting or unusual about your childhood?

In what ways did your parents help you succeed?

Were there any other people who were important to your progress?

Why was this accomplishment good for society?

Did your success bring you fame and fortune in your lifetime?

Practicing Your Oral Presentation

Student's Name: _____

Date: _____

Biographee's Name: _____

Date Due: _____

Keep these guidelines in mind as you practice your presentation. Circle the ones you need to improve and then practice again. Check off the ones you are doing well. Have your parent(s) or an adult in your audience sign this page and bring it back to class for our next meeting.

1. ____ Speak in complete sentences.
2. ____ Speak clearly and loudly enough so the students in the back of the room will be able to hear you.
3. ____ Be sure you can pronounce any new words correctly.
4. ____ Look at your audience often. Do not just read the entire report.
5. ____ Be confident! After all, you are a very famous scientist!
6. ____ Know your information well so that you sound like you really are the scientist! And if you know the information, you will be able to answer questions.
7. ____ Stand to the side of your display board and point to the items as you talk about them.
8. ____ Do not read the captions on your display board. The audience can read them later.
9. ____ If you are asked a question and you do not know the answer, just say so. Do not make up answers. You need to give factual information.
10. ____ If someone asks a non-fact question, for example, one about your thoughts or feelings, you may role-play and make your best guess answer.

Student's Name: _____

Adult in the audience _____

This student has practiced _____ times. Date: _____

Display Board Checklist

Student's Name: _____

Date: _____

Biographee's Name: _____

Date Due: _____

Keep these guidelines in mind as you create your product.

1. ___ Show as many facts about your topic as you can on your display board.
2. ___ Include at least one drawing or illustration that you have made.
3. ___ Include at least one photo or portrait of your scientist.
4. ___ Make sure that all of your pictures or illustrations have captions.
5. ___ You may include pictures, quotes, charts, graphs, and explanations with your written text.
6. ___ Create a pleasing layout with all of your information. Organize all of the information so that it is easy to see and understand.
7. ___ Use colorful designs, or backgrounds, and large, bold headings.
8. ___ Make your handwriting very neat. Use very light pencil lines before going over them in marker.
9. ___ Check your spelling, grammar, capitalization, punctuation, and sentences to be sure they are correct.
10. ___ Use only factual information. Do not make anything up.