Three Men and a Lady: Science Biographies

Grade Level or Special Area: 7th Grade Science Biographies
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Length of Unit: Eight lessons (approximately two weeks, one day = 45 minutes)

I. ABSTRACT

Your seventh graders will take a trip back in time to visit four amazing scientists, three males and one female. Throughout this journey, your students will research, discover and explore the four scientist's lives, both personal and professional. This unit will have your students excited about making their own discoveries in the science area!

II. OVERVIEW

A. Concept Objectives
   1. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
   2. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
   3. Understand how literary works can depict the real life of people.

B. Content from the *Core Knowledge Sequence*
   1. 7th Grade Science
      a. Science Biographies
         i. Antoine Lavoisier
         ii. Dmitri Mendeleev
         iii. Lise Meitner
         iv. Charles Darwin

C. Skill Objectives
   1. Students will learn about the contributions of scientists from different cultures and from different times in history. (adapted from the CMCS for Science 6.3)
   2. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions. (adapted from the CMCS for Reading and Writing 4.7.2)
   3. Students will learn about the contributions of scientists from different cultures and from different times in history by filling out a web of important facts. (adapted from the CMCS for Science 6.3)
   4. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions from an article. (adapted from the CMCS for Reading and Writing 4.7.2)
   5.
   6. Students will use media resources, including technology, to research and produce documents. (adapted from the CMCS for Reading and Writing 5.7.5)
   7. Students will read, respond to and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar. (adapted from the CMCS for Reading and Writing 6.7.2)

III. BACKGROUND KNOWLEDGE

A. For Teachers
   1. *The Scientific 100: A Ranking of the Most Influential Scientists, Past and Present*, by John Simmons
   2. *Lise Meitner: Discoverer of Nuclear Fission*, by Rachel Stiffler Barron
   3. *Great Men of Science*, by Edward Holmes and Christopher Maynard

B. For Students
1. No background information is necessary for students for this unit.

IV. RESOURCES

A. Student copies of Antoine Lavoisier 1743-1794: http://mattson.creighton.edu/History_Gas_Chemistry/Lavoisier.html (Lessons One and Two)
B. Can help students if they are struggling: http://www.woodrow.org/teachers/chemistry/institutes/1992/Mendeleev.html (Lesson Three and Four)
C. Can help students if they are struggling: http://www.corrosion-doctors.org/Biographies/MendeleevBio.htm (Lesson Three and Four)
D. Students to use online: www.AboutDarwin.com (Lesson Seven)

V. LESSONS

Lesson One: Lavoisier: The Father of Chemistry (45 minutes)

A. *Daily Objectives*
1. Concept Objective(s)
a. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
b. Understand how literary works can depict the real life of people.
2. Lesson Content
a. Science Biographies
i. Antoine Lavoisier
3. Skill Objective(s)
a. Students will learn about the contributions of scientists from different cultures and from different times in history by filling out a web of important facts.
b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions from an article.
c. Students will read, respond to and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar.

B. *Materials*
1. Student copies of Antoine Lavoisier 1743-1794: http://mattson.creighton.edu/History_Gas_Chemistry/Lavoisier.html
2. Appendix A: Overhead of terms used in Antoine Lavoisier 1743-1794
3. Student copies of Appendix B: Web of Lavoisier's life
4. One piece of butcher paper hung in the front of the room (to be used for the class web of Lavoisier's life)
5. Markers to write on butcher paper

C. *Key Vocabulary*
1. *Ferme Generale* was a private company that collected taxes for the Crown.
2. *Phlogiston theory* was the theory that there was a substance called phlogiston which was odorless, tasteless, colorless and weightless. This substance was thought to be given off when the material containing this substance was burned.
3. *Calx* is the crumbly residue left over after a mineral or metal has been heated.

D. *Procedures/Activities*
1. **Note to teacher before beginning this unit:** This unit was written to be taught in one of two ways. Either you can teach it as one complete unit covering all of the scientists at one time, or you may choose to teach each scientist individually

from this unit as you cover the material pertaining to that scientist in your classroom.

2. Introduce this unit by telling the students that for the next two weeks you are going to travel to different countries in search of four scientists that have changed the way the world looks at science. Three of these scientists are male and one is female. Their job is going to be not only to find out what the scientist is famous for, but also to find out as much as possible about that scientist's background.
3. Tell the students that the first stop you are going to make is in Paris, France. In Paris, you are going to learn about the man who is called the father of chemistry. Ask the students if they have ever heard the statement, father of chemistry, before. (Some students may have heard this statement, some may not depending on when you are teaching this unit.) Tell the students that the man that is known as the father of chemistry is Antoine Lavoisier.
4. Hand out the copies of Antoine Lavoisier 1743-1794 to the students.
5. Once every student has a copy of the paper, start reading through the packet about Antoine Lavoisier as a class. Make sure that when you come to the parts containing the vocabulary words that you use Appendix A, which should be put on the overhead, and you stop and go over the definitions of the words with the students.
6. When you are done reading through the packet as a class, have the students pair up.
7. Hand out Appendix B to the students. The students should get one sheet per group.
8. Once each pair has received Appendix B, tell the students that they are going to be making a web of interesting and important facts about Lavoisier. A web is when the students are given the topic, and in this case they are also given the main ideas that are coming off the topic, and the students are to add more bubbles off the already existing bubbles with information that they have learned.
9. Let the students know that they are to add at least two things they learned off each of the main ideas. Tell the students that once they are finished they need to raise their hand so that you can come over and check their work. Allow the students to begin working on their webs.
10. Once a group finishes and they raise their hand, go over to the group and look over their answers to make sure that they understood what to do.
11. Once all or the majority of the groups are done filling out the sheet keep them with their partners, but bring the class back together. Have one person from each group come up to the butcher paper and fill in a circle for the main ideas. Do this until all the answers are covered from all of the partner's sheets. Students may come up to the board more than once after every group has gone if they have another fact to add.
12. Make sure you tell the students before they leave that it is important that they hold on to their Antoine Lavoisier packet, as well as their web that they made in pairs. The students will be using both of these items again tomorrow.

E. *Assessment/Evaluation*

1. Students' completion of Appendix B. You can collect for a grade or just do a quick check to see if groups completed the sheet.
2. Whole class activity filling in the web.

Lesson Two: Lavoisier: Off with His Head, But He Is Not Forgotten! (45 minutes)

A. *Daily Objectives*
   1. Concept Objective(s)
      a. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
   2. Lesson Content
      a. Science Biographies
         i. Antoine Lavoisier
   3. Skill Objective(s)
      a. Students will learn about the contributions of scientists from different cultures and from different times in history.
      b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions.

B. *Materials*
   1. Student copies of Antoine Lavoisier 1743-1794: http://mattson.creighton.edu/History_Gas_Chemistry/Lavoisier.html
   2. Student copies of Appendix B: Web of Lavoisier's Life
   3. Student copies of Appendix C: Tombstone/Obituary Rubric
   4. Tan and gray colored paper for the students to use to draw their tombstones

C. *Key Vocabulary*
   1. *Obituary* is a published announcement that a person has died that contains a short biography about the person's life.

D. *Procedures/Activities*
   1. The first five minutes of class should be spent quickly going over what the students learned yesterday about Antoine Lavoisier. You should refer to the butcher paper with the web of Antoine Lavoisier's life.
   2. After you review with the students, tell them that since they now know so much information about Antoine Lavoisier that they have been given the honor of writing Lavoisier's obituary. Make sure you ask the students what an obituary is. Call on the students with their hands up. Before you move on make sure that the students know that an obituary is a death announcement, but it also contains a biography of the person or it tells of that person's accomplishments.
   3. Go over with the students what they are going to be doing. First, the students are going to get a sheet of tan or gray paper. Once they have the paper they are to draw, as creatively as they want, a tombstone for Lavoisier.
   4. Once they have drawn a tombstone they are to cut them out. When the tombstone is cut out, they need to include on the tombstone Lavoisier's full name, date of birth (needs to include day, month and year), date of death and a saying that would fit Lavoisier.
   5. After they are done with this then they need to start on the obituary for Lavoisier. Lavoisier's obituary needs to be at least two paragraphs long. In these paragraphs, the students need to include four facts about Lavoisier's life, along with their opinion on what type of a man they think that Lavoisier was (good, bad, etc.).
   6. Pass out Appendix C to the students. This is the rubric that the students can use to make sure that they complete everything that needs to be done; this is what you will have just gone over with students.
   7. After you have answered all questions, the students have the rest of the class time to work on what they need to get done.
   8. At the end of class, the students will need to take home what they have not finished and finish it for class tomorrow.

E. *Assessment/Evaluation*
   1. Student completion of Tombstone/Obituary activity – graded according to the rubric in Appendix C.

Lesson Three: Mendeleev: Who Is He? (45 minutes)

A. *Daily Objectives*
   1. Concept Objective(s)
      a. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
      b. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
      c. Understand how literary works can depict the real life of people.
   2. Lesson Content
      a. Science Biographies
         i. Dmitri Mendeleev
   3. Skill Objective(s)
      a. Students will use media resources, including technology, to research and produce documents.
      b. Students will read, respond to and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar.

B. *Materials*
   1. Computer lab/Library
   2. Student copies of Appendix D, pages 1-2: Worksheet about Dmitri Mendeleev
   3. Teacher copy of Appendix D, page 3: Answer Key

C. *Key Vocabulary*
   None

D. *Procedures/Activities*
   1. Today instruct students that they are going to be traveling to Siberia to learn about another very influential scientist, but that you are not going to reveal anything about him only his name. Tell the students that the scientist's name is Dmitri Mendeleev.
   2. Inform the students that today it is going to be their job to research and explore all about Mendeleev.
   3. Pass out Appendix D to every student and briefly read through the sheet with the students.
   4. Answer any questions the students have. Once you are done answering questions, it is now time to take the students to the computer lab/library to start their research on Mendeleev. For this activity, the students should work on their own, but if there are not enough computers then have the students pair up.
   5. The students will have the rest of the period, except for the last five minutes of class, to research and fill in their worksheet on Mendeleev.
   6. The last five minutes of class do a quick check for understanding to see where the students are. Choose certain questions off the worksheet and ask the class to respond.
   7. The students should have been able to get through most of the questions, but let them know that they will have the first ten minutes at the beginning of class tomorrow to finish what they did not get done. If they feel they have more than ten minutes of work to complete then they will need to take the worksheet (Appendix D) home to work on.

E. *Assessment/Evaluation*
   1. Questions asked to students about the worksheet.
   2. Students' completion of Appendix D – grade according to Appendix D, page 3

Lesson Four: Mendeleev: What an Amazing Guy! (45 minutes)

A. *Daily Objectives*
   1. Concept Objective(s)
      a. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
   2. Lesson Content
      a. Science Biographies
         i. Dmitri Mendeleev
   3. Skill Objective(s)
      a. Students will learn about the contributions of scientists from different cultures and from different times in history.
      b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions.

B. *Materials*
   1. Students will need Appendix D
   2. Eight note cards per group of four
   3. Teacher posted Appendix E, pages 1-3

C. *Key Vocabulary*
   1. *Atomic weight* is the mass of one atom of an element.
   2. *Characteristic properties* are properties of an element that do not change.
   3. *Diffusion* is the process to break up or distribute.
   4. *Tuberculosis* is a contagious lung disease that is caused by bacteria.
   5. *Valences* are how much power a certain element has to combine with another element.

D. *Procedures/Activities*
   1. Most students should have completed most of the worksheet, but give them the first ten minutes of class to finish the worksheet.
   2. Once the ten minutes are up, have the students get into groups of four. Once the students are in the groups of four, have them briefly go through their answers as a group.
   3. After the groups have gone over the answers together, have the groups pick out eight facts about Dmitri Mendeleev that they found to be the most interesting. The groups then need to write their facts on eight different note cards.
   4. Once the groups are done writing their eight facts on their note cards, they are going to need to break their facts into the three different categories. The three categories break Mendeleev's life into three groups, 1834-1854: childhood-college, 1855-1890: post college-resignation from the university, 1891-1907 post university-death. Teachers: you can just copy Appendix E and tape these three sheets up in the room. (I would recommend a bright color!)
   5. The students will need to lay out their eight note cards into the category that it fits. Once they have organized their facts, they will go place the note card under the correct group.
   6. Have all groups place their note cards in the correct grouping, when a group is done have them sit down and check other groups answers as they wait.
   7. After all groups have placed their eight note cards, as a class go through the facts that the students put up in the categories starting with his childhood.
   8. At the end of class, have the students turn in their Appendix D.

E. *Assessment/Evaluation*
   1. Students' completion of Appendix D – grade according to Appendix D, page 3

Lesson Five: Meitner: A Women Scientist (45 minutes)

A. *Daily Objectives*
   1. Concept Objective(s)
      a. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
      b. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
   2. Lesson Content
      a. Science Biographies
         i. Lise Meitner
   3. Skill Objective(s)
      a. Students will learn about the contributions of scientists from different cultures and from different times in history.
      b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions.

B. *Materials*
   1. Old magazines that can be cut (Teachers: If you do not have any old magazines, ask your students to bring some in prior to teaching this lesson.)
   2. Scissors for students to use
   3. Glue for students to use
   4. Colored construction paper, legal size
   5. Student copies of Appendix F, pages 1 and 2 – fact sheet and rubric

C. *Key Vocabulary*
   1. *Nuclear fission* is the splitting of an atom into two parts, resulting in a release of energy.

D. *Procedures/Activities*
   1. Another adventure takes off for the students today. Inform the students that they are going to be learning about a woman scientist and that this women scientist is from Austria. Tell them that the women scientist that they are going to be learning about is Lise Meitner.
   2. Hand out Appendix F, page 1 to the students.
   3. Read over Appendix F, page 1 with the students. This will give them information on Lise Meinter's life.
   4. Once you have read through Appendix F, page 1 and you have answered any questions that the students have, the students need to get into groups of three.
   5. Pass out Appendix F, page 2. This is the rubric that that groups are going to use for their mini project.
   6. The mini project that the students are doing on Meitner will require them to make a collage of important facts about Lise Meitner's life.
   7. In making this collage, the students are going to pick six facts from Appendix F, page 1. They should pick the six facts that they want to use first, before going on with the project.
   8. Once the students have picked the six facts that they are going to use, they need to brainstorm what pictures they want to use in order to represent this fact. The students should brainstorm and write down their ideas for each of the six facts.

9. After the students have picked their six facts and they have images that they want to represent that fact they need to get some magazines to look through. They then need to return to their seats and begin finding their images in the magazines.
10. After they find their images, they need to glue the images onto a piece of construction paper that is the color of their choosing. Make sure that you let them know that a collage is a collection of items put together neatly, but creatively. Tell the students that it is okay if some of their images overlap. Teachers: For this activity, it might be good to demonstrate or to have an example of a collage that the students can use as a guideline.
11. Once the students have put their images on their poster board, then they are going to either neatly handwrite or type up the year that the event happened and a short description of the event. They will attach this description next to the image it pertains to.
12. When the students complete the collage, they are going to need to prepare a brief three to five minute presentation about their collage. In this presentation, they need to go through the images that they picked and tell the audience why they choose those images.
13. Let the students know that they will have the rest of the class period today to work on their collage, as well as they will have fifteen minutes at the beginning of class tomorrow.
14. Students may use the rest of class time to work on their collage.

E. *Assessment/Evaluation*
1. Check students' collages as they work.

Lesson Six: Meitner: One the Greatest Women Scientists (45 minutes)

A. *Daily Objectives*
1. Concept Objective(s)
   a. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
   b. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
2. Lesson Content
   a. Science Biographies
      i. Lise Meitner
3. Skill Objective(s)
   a. Students will learn about the contributions of scientists from different cultures and from different times in history.
   b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions

B. *Materials*
1. Old magazines that can be cut
2. Scissors for students to use
3. Glue for students to use
4. Colored construction paper, legal size
5. Students will need to bring Appendix F, pages 1-2 – fact sheet and rubric

C. *Key Vocabulary*
None

D. *Procedures/Activities*
1. The first fifteen minutes of class have the students complete their collages.

2. Once the fifteen minutes is up, have the students clean up and get back to their seats.
3. After the students are back in their seat, start their presentations.
4. For every presentation make sure that the group has put all of the group members names on the rubric and it is handed into you before they start their presentations.

E. *Assessment/Evaluation*
1. Students' completion of the collage and presentation – grade according to the rubric in Appendix F, page 2.

Lesson Seven: Darwin: The Timeline of His Life (45 minutes)

A. *Daily Objectives*
1. Concept Objective(s)
   a. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
   b. Understand how literary works can depict the real life of people.
2. Lesson Content
   a. Science Biographies
      i. Charles Darwin
3. Skill Objective(s)
   a. Students will learn about the contributions of scientists from different cultures and from different times in history.
   b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions.
   c. Students will use media resources, including technology, to research and produce documents.

B. *Materials*
1. Computer lab – students can go to www.AboutDarwin.com for a timeline
2. Access to a Library
3. Teacher cut out of Appendix G, page 1 – Timeline broken down
4. Student copies of Appendix G, pages 2-3 – Timeline instruction sheet and rubric
5. One piece of sturdy poster board, cut to 14" X 22" (half sized), for each group of students
6. Colored pencils for students to use
7. Rulers for students to use

C. *Key Vocabulary*
1. *Evolution* is the development or gradual change of a species over time.
2. *Species* have common attributes and a common name, such as the human race.

D. *Procedures/Activities*
1. Today the students are going to learn about Charles Darwin. Ask the students if they know why Charles Darwin is a famous scientist. Responses will vary, but the main answer you are looking for is evolution.
2. Tell the students that when you deal with evolution that you are dealing with a timeline for when certain species lived on the earth. Let the students know that today you are going to deal with a different type of timeline. The students are going to deal with the timeline of Charles Darwin and his life.
3. Hand out Appendix G, pages 2 and 3 to the students.
4. Go over the timeline instruction sheet and rubric with the class. Teachers: The students are going to be split up into six different groups. You can print out Appendix G, page one cut it up and have each group draw one. In these groups, they are going to research that time frame of Charles Darwin and pick out six

interesting facts that happened to him during the time period, along with draw three images. The students can get all the information they need by going to www.AboutDarwin.com. This website has a very extensive timeline of Darwin's life.

5. Once all questions have been answered, pass out one piece of construction paper to each group.
6. After every group has a piece of construction paper, take the students to the computer lab/library and let them begin working on their research, along with working on making their timeline.
7. Make sure that the students know that they will have the rest of the period today and then only half the period tomorrow to work on the project.

E. *Assessment/Evaluation*

1. Students' completion of the Timeline – grade according to rubric in Appendix G, page 2

Lesson Eight: Darwin: What an Amazing Guy (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
   a. Understand major discoveries in science, some of their social and economical effects, and the scientists and inventors primarily responsible for them.
   b. Develop an appreciation of people of varied backgrounds who have made contributions to science throughout history.
2. Lesson Content
   a. Science Biographies
      i. Charles Darwin
3. Skill Objective(s)
   a. Students will learn about the contributions of scientists from different cultures and from different times in history.
   b. Students will use reading, writing, speaking, listening and viewing to solve problems and answer questions.

B. *Materials*

1. Students' copies of Appendix F, pages 1-2 – Timeline instruction sheet and rubric
2. Colored pencils for each student
3. Rulers for each student

C. *Key Vocabulary*

None

D. *Procedures/Activities*

1. Have students continue working on their timeline projects. The students should be done researching and they should be drawing, writing and coloring on their timeline. Also, make sure that the students start preparing their short presentation to the class on what they learned about Charles Darwin during their part of his life. The students will have half of the class period to complete there projects and to be ready to present.
2. Once half of the class period is over have the students get back into their seats.
3. Start calling up the different time frames of Charles Darwin's life, starting at the beginning of his life and working through his life chronologically. The groups that are not presenting at the time should have a piece of paper and pencil out. They are to take down one interesting fact about each part of the timeline.

4. When a group comes up to present, have them tape their part of the timeline up. Then have the group describe what six points and three pictures they choose for their time frame.
5. Once they are done, the next group will come up and tape their part of the timeline directly after the last part of the timeline. Continue this all the way through the parts of the timeline. Once every group has presented then you will be left with a long timeline of Darwin's life that the students can look at.
6. Have the groups turn in their rubrics with all of the group members names on it; you may also collect each student's sheet with the one fact from each time frame on it.

E. *Assessment/Evaluation*
1. Students' one fact from each time frame sheet.
2. Students' completion of the Timeline – grade according to rubric in Appendix F, page 2

VI. CULMINATING ACTIVITY

A. For this unit, since it can be taught as a whole or in parts, the culminating activity is one that can be used either way of teaching the unit, but will be most beneficial if used when taught as a whole unit.
1. Pass out the quiz over the unit, Appendix H, page 1. Use Appendix H, page 2 to correct the quiz.

VII. HANDOUTS/WORKSHEETS

A. Appendix A: Definitions for Antoine Lavoisier
B. Appendix B: Web of Antoine Lavoisier
C. Appendix C: Lavoisier Tombstone/Obituary Rubric
D. Appendix D: Dmitri Mendeleev Worksheet (three pages)
E. Appendix E: Dmitri Mendeleev's Life Broken Down (three pages)
F. Appendix F: Lise Meitner Facts and Rubric (two pages)
G. Appendix G: Charles Darwin Dates, Timeline and Rubric (three pages)
H. Appendix H: Quiz and Answer Key (two pages)

VIII. BIBLIOGRAPHY

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Appendix A

Definitions: Antoine Lavoisier

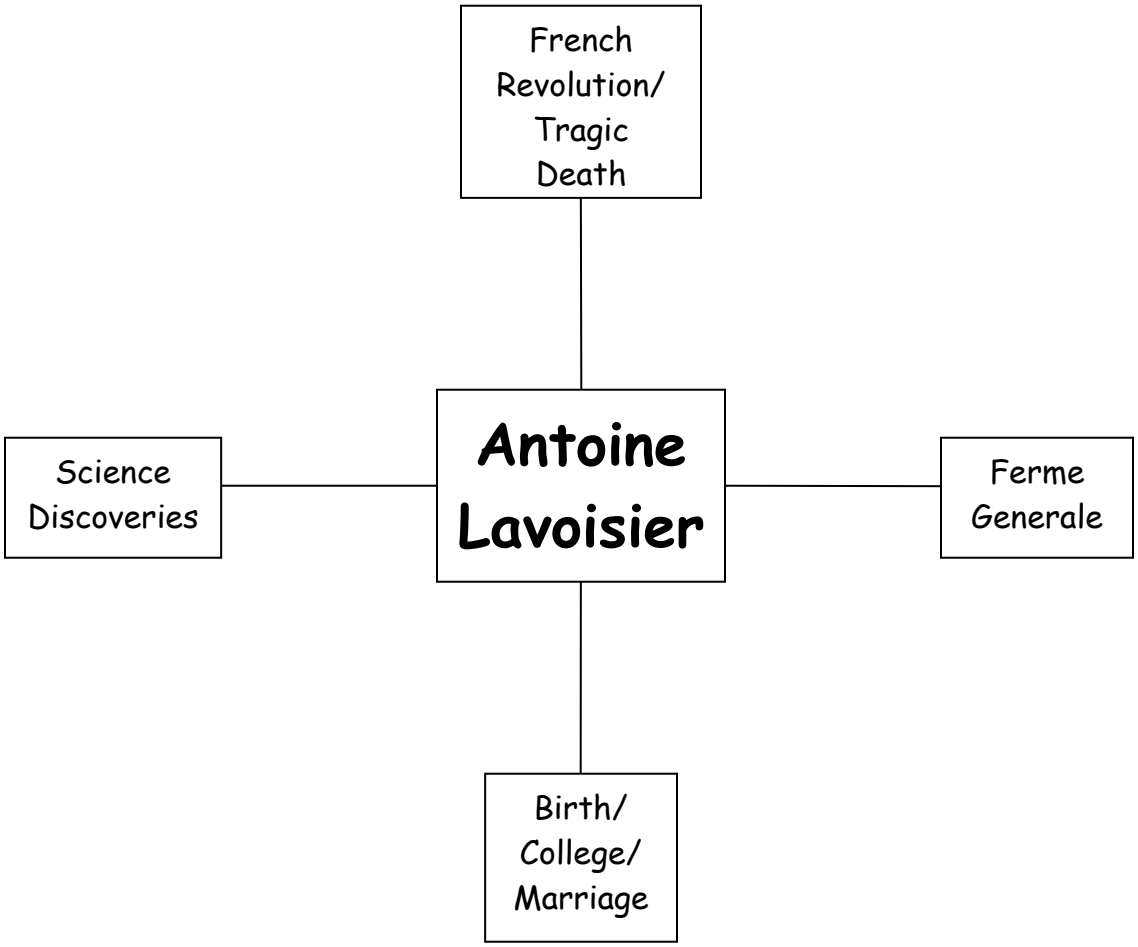
Ferme Generale was a private company that collected taxes for the Crown.

Phlogiston theory was the theory that there was a substance called phlogiston which was odorless, tasteless, colorless and weightless. This substance was thought to be given off when the material containing this substance was burned.

Calx is the crumbly residue left over after a mineral or metal has been heated.

Appendix B

Names: _____ **Date:** _____



Appendix C

Lavoisier Tombstone/Obituary Rubric

Student Name: _____

CATEGORY	4	3	2	1
Tombstone	Creatively drew a tombstone. Cut the tombstone out neatly. The appearance of the tombstone looks good.	Cutting is not neat and appearance is okay.	Drew a tombstone, but did not cut it out.	Did not cut out or draw a tombstone.
Labeling	The labeling is easy to read. They included the full name, date of birth (month, date, year), date of death (month, date, year) and a phrase that fits Lavoisier.	They labeling is easy to read, but forgot one part of the labeling.	Hard to read the tombstone. They forgot parts of the labeling for the tombstone.	Cannot read the labeling on the tombstone. The tombstone is not labeled.
Paragraphs **(Double)**	Complete Sentences Listed at least four facts about Lavoisier. Consists of two well-organized paragraphs. (8)	Complete Sentences Listed three facts about Lavoisier. Consists of two paragraphs that organized. (6)	Not all complete sentences. Listed only a couple of facts about Lavoisier. There are one to two paragraphs that are not organized. (4)	No complete sentences. Listed one fact. There are no paragraphs. (2)

Total points: _____ / 16

Who is Dmitri Mendeleev?

Name: _____ Date: _____

1. When was Dmitri Mendeleev born? (month, date, year) _____
2. Where was Dmitri Mendeleev born? (country and state) _____
3. How many brothers and sisters did Dmitri Mendeleev have? _____
4. Was Dmitri the oldest or the youngest? _____
5. Dmitri's mother and father's name. _____
6. Where did his mother find work after his father's death? What was her job position at this job? _____
7. What people guided Mendeleev when he was young and introduced him to science?

   _____
8. What tragedy happened that left the family with no money?

   _____
9. Where was the first university that Mendeleev tried to get into but was rejected?

   _____
10. At what university was Mendeleev finally accepted to go to school?

    _____
11. What two family members died shortly after Mendeleev was accepted to the university from Tuberculosis? _____
12. What happened Mendeleev's third year at the university? Explain.

    _____
13. Where did Mendeleev move to for a year after college and why?

    _____
14. In 1860, who did Mendeleev hear speak and on what topic did this person speak? Why was this an important part of Mendeleev's life?

    _____

    _____

15. What was Mendeleev named and where was he working in 1866?

    _____

16. What position did Mendeleev resign from on August 1890? _____
17. What was Mendeleev's first wife's name, what year where they married and how many children did they have? _____
18. What was Mendeleev's second wife's name, what year where they married and how many children did they have? _____
19. When was Dmitri's first publication? _____
20. What is said to be Mendeleev's greatest accomplishment?

    _____

21. On March 6, 1869 a formal presentation was made at the Russian Chemical Society entitles "The Dependence Between the Properties of the Atomic Weights of the Elements." Who gave this presentation for Mendeleev, because he was ill?

    _____

22. Briefly describe the first four points and the eighth point to this presentation.
    1. _____
    2. _____
    3. _____
    4. _____
    8. _____
23. When did Dmitri Mendeleev die? (month, date, year) _____
24. List three interesting facts that you learned that where not included.
    1. _____
    2. _____
    3. _____

Answer Key: Who is Dmitri Mendeleev?

1. February 7, 1834
2. Tobolsk, Siberia
3. 14 brothers and sisters
4. Youngest
5. Maria Dmitrievna Korniliev and Ivan Pavlovitch Mendeleev
6. She managed the family's glass making factory.
7. Chemists at the glass factory, Mendeleev's sisters husband Bessargin
8. The family glass factory burnt down.
9. Moscow
10. St. Petersburg
11. Mother, Maria and sister, Elizabeth
12. He became bed ridden for a year with illness thought to be Tuberculosis.
13. Simferopool near the Black Sea, to try and cure his sickness
14. He heard Cannizzaro speak on atomic weight, this was very important because it influenced Mendeleev to research this topic.
15. He was named the Professor of Chemistry at the Technology Institute.
16. The University
17. Feozva Nikitchna Lascheva, 1863, had two children
18. Anna Ivanova Popova, 1882, had four children
19. 1854
20. Periodic Law and the Periodic Table
21. Professor Menshutken
22. 1. Elements can be arranged by atomic weight because of apparent periodicity.
    2. Elements that are similar have atomic weights that are similar.
    3. The arrangement of elements by atomic weights correspond to their valences.
    4. Elements that are widely diffused have small atomic weights
    8. Certain characteristic properties of elements can be told from their atomic weight.
23. January 20, 1907
24. Answers will vary

1834 – 1854

BIRTH

Through

COLLEGE

1855-1890

POST COLLEGE

Through

RESIGNAITON

FROM

COLLEGE

1891-1907

POST

UNIVERSITY

Through

DEATH

Lise Meitner: Wow, All the Facts!

- 1878 – Born November, 7 in Vienna, Austria
- 1902 – Enters the University of Vienna
- 1905 – Starts to study radioactivity
- 1906 – Receives her doctrine in physics (Was the first women to receive her doctrine in physics.)
- 1907 – Begins experiments with Otto Hahn in Berlin on radioactivity; at this time women where not allowed to enter the institute so Meitner had to practice in the basement
- 1912 – Otto Hahn and Meitner move their laboratory to a newly opened Kaiser Wilhelm Institutes
- 1914 – WWI begins
- 1915 – Serves in German medical corps during WWI
- 1918 – Discovers the element protactinium
- 1919 – Named first woman professor in Germany
- 1938 – Her passport is revoked; She escapes to Sweden
- December 1938 – Discover that you can split an atomic nucleus; She publishes an article on nuclear fission with her nephew
- 1939 – Meitner and her nephew write a paper on nuclear fission; WWII begins
- 1944 – Otto Hahn is secretly awarded the Nobel Prize for the discovery of nuclear fission
- August 1945 – U.S. drops atomic bombs on Hiroshima and Nagasaki; WWII ends
- 1946 – She visits the United States and is named "Women of the Year"
- 1947 – Meitner continues research in Sweden
- 1954 – Retires
- 1955 – Receives the Otto Hahn Prize
- 1960 – Moves to Cambridge, England to be with family
- 1964 – Suffers from a heart attack
- 1968 – Otto Hahn passes away on July 28
- 1968 – Breaks her hip and suffers from many mini strokes. Dies in Cambridge, England on October 27

Collage of Lise Meitner Rubric

Student Name: _____

CATEGORY	4	3	2	1
Pictures	There are six pictures on the poster that pertain to Lise Meitner's life.	There are four-five pictures on the poster.	There are three pictures on the poster.	There are two or less pictures on the poster.
Facts	There are six dates and captions next to the pictures.	There are four-five dates and captions next to the pictures.	There are three dates and captions next to the pictures.	There are two or less dates and captions next to the pictures.
Organization	The poster is eye catching and demonstrates a collage form.	The poster is eye catching and for the most part demonstrates a collage.	The poster is unorganized and has very little collage form.	The poster is unorganized and has no collage form.
Presentation	All group members participated in the presentation. The group was organized in what they where saying.	All group members participated in the presentation. The group was partly organized in what they where saying.	Not all group members talked. The group was partly organized in what they where saying.	Group member did not know when to talk. The group was very disorganized.

Total: _____ / 16

Cut out and have groups pick for their part in the timeline!

1809 – Aug, 1831

End Aug, 1831 – Oct. 2, 1836

Oct. 4, 1836 – July 22, 1842

Sep, 1842 – Nov, 1859

Dec, 1859 – Jan, 1871

March, 1871 - 1882

Timeline of Charles Darwin

Items that must be INCLUDED

1. A line that goes from one side of the paper to the other.
2. Six facts that happened and are MOST important for the time frame you are researching. These must be written neatly on the poster board, as well as they must be in chronological order.
3. Three drawings of something that took place during the time (these can come from your facts).
4. The poster must be neat, colorful and eye catching!

Steps to Follow:

1. Get into groups. (Six groups total)
2. Grab a time frame of Charles Darwin's life from your teacher.
3. Designate a part of the project to each of your group members. ** Choose your part wisely because you will be held accountable for the part you choose!!
    a. **Researcher:** Goes on the computer and looks up the information and reports back to the group.
    b. **Drawer:** Is responsible for drawing the timeline and the three images.
    c. **Writer:** Is responsible for writing the six facts about Darwin that are most important.
    d. **Designer:** Colors in the drawings, makes sure that the project is neat and organized.

Darwin Timeline Rubric

Student Name: _____

CATEGORY	4	3	2	1
Researcher	Demonstrates knowledge on that time of Darwin's life. There are six important points on the poster.	Demonstrates knowledge and has four-five important points on the poster.	Demonstrates little knowledge and has three important points on the poster.	Demonstrates little knowledge and has one-two important point on the poster.
Drawer	The timeline has three neatly drawn images on the poster and has a line indicating the timeline.	The timeline has two neatly drawn images on the poster and has a line indicating the timeline.	The timeline has one neatly drawn image on the poster and has a line indicating the timeline.	The timeline has no images drawn, but has a line indicating the timeline.
Writer	There are six facts that are neatly written on the poster.	There are four-five facts that are neatly written on the poster.	There are three facts that are neatly written on the poster.	There are two or less facts neatly written on the poster.
Designer	All drawings are colored and the overall appearance of the poster is great!	All drawings are colored and the overall appearance is good.	Two of the three drawing are colored and the overall appearance is okay.	One or two drawings are colored and the overall appearance is messy.
Presentation	Well organized and everyone participates.	Mostly organized and everyone participates.	Not organized and most of the group participates.	Not organized and only a few of the group members participate.

Total: _____ / 20

UNIT QUIZ

Name: _____ Date: _____

1. How did Antoine Lavoisier die? _____
2. Antoine Lavoisier is know as the Father of _____
3. Something interesting that I learned from studying Antoine Lavoisier was

   _____

   _____
4. Dmitri Mendeleev is famous for _____
5. One thing that I could not believe about Dmitri Mendeleev was

   _____

   _____
6. Why did Lise Meitner have to leave the country in 1938?

   _____
7. Lise Meitner discovered _____
8. Her discovery leads to the U.S dropping the first _____ on Hiroshima and Nagasaki in 1939.
9. Describe three important events that happened to Charles Darwin during his life.
   1. _____

      _____
   2. _____

      _____
   3. _____

      _____

Answer Key: UNIT QUIZ

1. His head was cut off on the guillotine.
2. Chemistry
3. Answers will vary
4. The Periodic Law or the Periodic Table
5. Answers will vary
6. WWII or because she was Jewish or because of the Nazis taking control
7. Nuclear fission
8. Atomic bomb
9. Answers will vary