Kelly Garrick
Thematic Unit Plan

Lang. Arts Methods 6-12 Lesson Plans
Getting to Know Scientists and Explorers of the Past Century

Subject: Earth Space Science or Physical Science
Grade: 9th or 10th grade
Duration: Approximately 4 weeks

Unit Rationale: The purpose of this unit is to encourage students to explore and study scientists and explorers from the past. Students will be given the opportunity to learn about specific scientists and explorers and the impact that they have made on society today. This unit will also persuade students to investigate the essential differences between scientists and explorers. Students will discover what science means to them and what kind of impact they can make if they choose a career in science or exploration.

Unit Objectives:
Students will:

- Determine key differences and similarities between scientists and explorers
- Learn about specific scientists and explorers from the last century.
- Develop an understanding of the impact that these individuals have made on society today.
- Explore how science relates to them as young people.

Sunshine State Standards Addressed:
LA.910.5.2.2: The student will research and organize information for oral communication appropriate for the occasion, audience, and purpose (e.g., class discussions, entertaining, informative, persuasive, or technical presentations)

LA.910.5.2.5: The student will research and organize information that integrates appropriate media into presentations for oral communication (e.g., digital presentations, charts, photos, primary sources, webcasts).

LA.910.1.5.1: The student will adjust reading rate based on purpose, text difficulty, form, and style

LA.910.1.6.2: The student will listen to, read, and discuss familiar and conceptually challenging text;

LA.910.1.7.1: The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection

LA.910.2.2.2: The student will use information from the text to answer questions or to state the main idea or provide relevant details;

LA.910.2.2.5: The student will select a variety of age and ability appropriate nonfiction materials (e.g., biographies and topical areas, such as science, music, art, history, sports, current events) to expand the core knowledge necessary to connect topics and function as a fully literate member of a shared culture

Unit Materials:

- Access to the internet (as all assignments will be completed and submitted through the web).
- *Scientists and Explorers* worksheet
- One of the following books:
  Something Out of Nothing: Marie Curie and Radium, By Carla Killough McClafferty
  Galileo, A Life, By James Reston, Jr.
  Who Was Albert Einstein?, By Jess Brallier
  Newton's Gift: How Sir Isaac Newton Unlocked the System of the World, By David Berlinski
- One of the following books:
  Buzz Aldrin, Reaching For the Moon, By Buzz Aldrin
  Who Is Neil Armstrong?, By Roberta Edwards
  Magellan and the First Voyage Around the World, by Nancy Smiler Levinson
  Pedro Menendez De Aviles Captain General of the Ocean Sea, by Albert Manucy
- *Math is Outa This World* worksheet
- Access to newspapers or online publications.

<u>Lesson 1: Show What You Know</u>

(Day 1)

Objectives:

The student will participate in whole-class online discussion about scientists and explorers

The student will demonstrate prior knowledge of scientists and explorers by answering the following question:

Who are some famous scientists from the century?

Who are some famous explorers from the past century?

What kind of impact have these people made on our lives today?

What are some similarities between scientists and explorers?

What are some differences between scientists and explorers?

Materials:

-Access to the internet

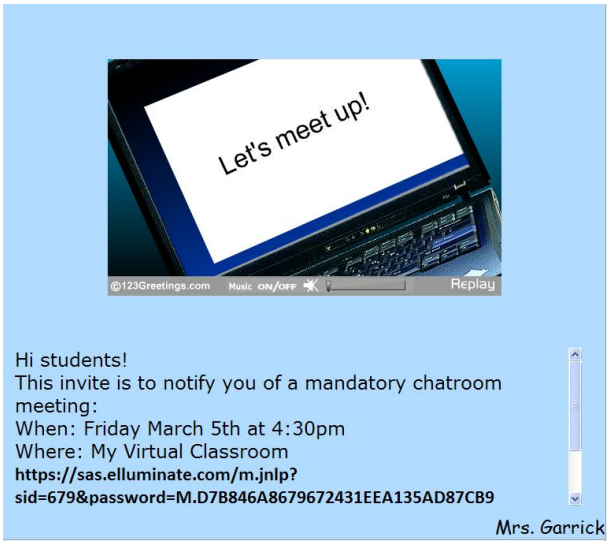
-web address for my virtual classroom: **https://sas.elluminate.com/m.jnlp?sid=679&password=M.D7B846A8679672431EEA135AD87CB9**

-Microphone and speakers for computer

Procedures:

1. The teacher will send out the following e-card, inviting student to the online class discussion.

http://www.123greetings.com/send/view/02505410809652359056



2. The teacher will load the power point presentation (attachment 1: Scientists and Explorers.ppx) onto virtual classroom whiteboard.

3. When students arrive at specified time, the teacher will explain the instructions and move through the slides, asking questions and facilitating discussion.

Assessment:

The chatroom discussion will be recorded so that the teacher can review the participation of individual students. Informal evaluation will be made based on his/her findings.

Lesson Two: Scientists and Explorers
(Day 2)

Objectives:
The student will recognize characteristics of scientists and explorers.
The student will consider the impact that scientists from the past have had on their lives.

Materials:
-Access to the Internet
-Resource Site One: "Traits of Explorers". The copyrights for these materials are held jointly by Jamie McKenzie, their author, and the Bellingham Public Schools. It lists traits of explorers for students to study.
http://fno.org/bio/kinds.htm
-Resource Site Two: "Traits of Scientists". This site is posted by the Department of Energy for the United States of America. It lists important traits of scientists.
http://www.newton.dep.anl.gov/askasci/gen01/gen01233.htm
-Resource Site Three: "People and Discoveries". This site is posted by PBS – Public Broadcasting Systems. It allows students to click on various scientists and learn about their discoveries.
http://www.pbs.org/wgbh/aso/databank/bioindex.html
-Scientists and Explorers worksheet

Procedures:

As an introduction to this unit, students will be completing the following worksheet and discovering what it takes to be a scientist or an explorer. This activity will also give them the opportunity to research two scientists, as well as tell the teacher what kind of scientist they would want to be.

1. Students must first read through the worksheet and the resource sites.
2. Student can then complete the worksheet with the knowledge that they have gained from studying the sites provided.

Scientists and Explorers

Resource sites:
Site One: "Traits of Explorers" http://fno.org/bio/kinds.htm
Site Two: "Traits of Scientists" http://www.newton.dep.anl.gov/askasci/gen01/gen01233.htm
Site Three: "People and Discoveries" http://www.pbs.org/wgbh/aso/databank/bioindex.html

Task 1: Characteristics of an Explorer
Using RESOURCE SITE ONE, list 5 characteristics of an explorer
1.
2.
3.
4.
5.

Task 2: Characteristics of a Scientist
Now go to RESOURCE SITE 2 and read about the characteristics that are needed to be a scientist. Write a paragraph summary here describing at least five characteristics listed that you think are most important and why.

Task 3: Compare and Contrast Scientists and Explorers

Write a paragraph comparing and contrasting scientists and explorers. What characteristics do they have in common? What is different about them? Use a Venn Diagram to plan your paragraph if you would like.

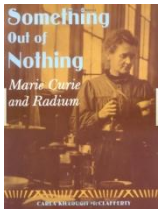
Task 4: Tell Me About Two Scientists

Use RESOURCE SITE 3 to find information about two scientists, one male and one female. Write a paragraph about each scientist. Tell me what kind of science they practiced, what discoveries or innovations they are famous for. How have these innovations affected you, your family or society?

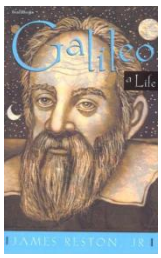
Tell me what kind of scientist would you like to be if you were to choose a career in science and why?

Lesson Three: Get To Know a Scientist
(Days 3-7)
Objectives:
The student will read a book about a well-known scientist, chosen from a list.
The student will complete a presentation of their choice (options provided) about that scientist and post it to YouTube.
The student will view two other students' presentations and respond.

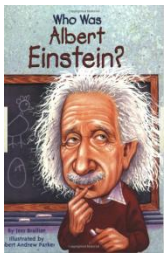
Materials:
-One of the following books (can be bought inexpensively on Amazon.com or borrowed from a local library)



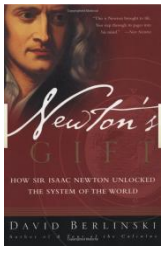
Something Out of Nothing: Marie Curie and Radium", By Carla Killough McClafferty



Galileo, A Life, By James Reston, Jr.



Who Was Albert Einstein?, By Jess Brallier



Newton's Gift: How Sir Isaac Newton Unlocked the System of the World, By David Berlinski

- Rubric for grading
-Access to the internet
-video camera, camera phone, or webcam (having one of these is a requirement for FLVS students)

Procedures:

1. Students will have five days to complete this assignment.
2. The teacher will allow students to choose a book from the list that interests them.
3. After taking a couple of days to read and study their chosen book, students will create a presentation about the scientist they studied. Including family members, friends, and neighbors is encouraged. Students can chose one of the following options:
    a. News cast – student acts as either the newscaster or the interviewee and creates and interview of their famous scientist.
    b. Short Drama – Students and volunteers create a drama about the individual chosen
    c. Song or Rap – Students write and perform a song or rap that tells about the scientist they chose.
    d. Chose your own presentation style – must be approved by the teacher.
4. Required in the presentations are the following:
    a. Name of scientist
    b. Dates of birth and death
    c. Most well-known accomplishment (described in detail)
    d. Why is this person's accomplishment important in our lives today?
    e. Personal reflection - What does this mean to you?
5. Once students have completed their videos they will post them to YouTube and turn the link in to the discussion area of our online classroom.
6. After posting their video, the students will be told to view two other students videos and write a reflection. Some questions to consider:
    a. Did they choose the same scientist as you?
    b. How did their presentation differ from yours?
    c. What was one thing that you learned from their presentation that you didn't know before?
    d. Tell them one positive thing that you really liked about their video.

Assessment:

This assignment will be worth 100 points and they will be assigned as follows:
-50 pts – video presentation (see rubric for details; Attachment 2)
-25 pts – first student reflection
-25 pts – second student reflection

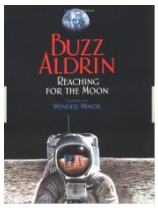
Rubric for Grading ***Get To Know A Scientist***

Graded Criteria	45-50 Points	40-44 Points	35-39 Points	30-34 Points	Must Redo
Content Accuracy	Information is correct and clearly communicated. All required information is included. Work is the original work of the student. 35 points	There is one point of confusion or inaccuracy and/or one or two required pieces of information are left out. The work is the original work of the student. 32 points	There are two points of confusion or inaccuracy and/or three or four required pieces of information are left out. The work is the original work of the student. 30 points	There are three or more points of confusion or inaccuracy and/or five or six required pieces of information are left out. The work is the original work of the student. 25 points	There are more than three points of confusion or inaccuracy, more than six required pieces of information are left out, and/or the work is not the original work of the student.
Delivery Method	Presented in an approved format. Neat, organized, and easy to follow. 10 points	Presented in an approved format. Neat and easy to follow, but somewhat disorganized. 7 points	Presented in an approved format. Adequate organization but messy and/or somewhat difficult to follow. 5 points	Presented in an approved format. Messy, disorganized, and difficult to follow. 4 points	Presented in an unapproved format and/or disorganized and impossible to follow.
Overall Project Appeal	Information presented in the project goes above and beyond what was required and shows creativity. 5 points	Information presented includes, but does not go beyond what is required. Shows some creativity. 3 points	Information presented includes, but does not go beyond what is required. Lacks creativity. 2 points	Information presented does not cover all topics required and lacks creativity. 1 point	Does not attempt to cover required information or present in an appealing way.

Lesson Four: Exploring famous Explorers
(Days 8-12)

Objectives:
The student will read a book about a well-known explorer, chosen from a list.
The student will complete a brochure about that explorer, focusing on the information requested in the rubric.
The student will learn the importance of an explorer from the past.

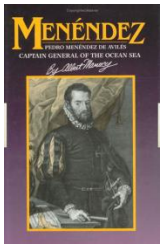
Materials:
-One of the following books (can be bought inexpensively on Amazon.com or borrowed from a local library)



Buzz Aldrin, Reaching For the Moon, By Buzz Aldrin

Who Is Neil Armstrong?, By Roberta Edwards

Magellan and the First Voyage Around the World, by Nancy Smiler Levinson



Pedro Menendez De Aviles Captain General of the Ocean Sea, by Albert Manucy

- Rubric for grading
-Access to the internet
-Microsoft PowerPoint, Microsoft Publisher, or some other comparable tool

Procedures:

1. Students will have five days to complete this assignment.
2. The teacher will allow students to choose a book from the list that interests them. After taking a couple of days to read and study their chosen book, students will create a presentation in the form of a power point, brochure, or option chosen by the student and approved by the teacher.
3. Required in the presentations are the following:
    a. Name of Explorer
    b. Dates of birth and death
    c. Most well-known accomplishment (described in detail)
    d. Why is this person's accomplishment important in our lives today?
    e. Personal reflection
    f. Eye-catching cover/title page and graphics required.
4. After students have completed their presentations, they will submit them to the teacher for grading.

Assessment:

This assignment is worth 50 points and will be graded according to the following rubric:

Rubric for Grading ***Exploring Famous Explorers***

Graded Criteria	45-50 Points	40-44 Points	35-39 Points	30-34 Points	Must Redo
Content Accuracy	Information is correct and clearly communicated. All required information is included. Work is the original work of the student. 35 points	There is one point of confusion or inaccuracy and/or one or two required pieces of information are left out. The work is the original work of the student. 32 points	There are two points of confusion or inaccuracy and/or three or four required pieces of information are left out. The work is the original work of the student. 30 points	There are three or more points of confusion or inaccuracy and/or five or six required pieces of information are left out. The work is the original work of the student. 25 points	There are more than three points of confusion or inaccuracy, more than six required pieces of information are left out, and/or the work is not the original work of the student.
Delivery Method	Presented in an approved format. Neat, organized, and easy to follow. 10 points	Presented in an approved format. Neat and easy to follow, but somewhat disorganized. 7 points	Presented in an approved format. Adequate organization but messy and/or somewhat difficult to follow. 5 points	Presented in an approved format. Messy, disorganized, and difficult to follow. 4 points	Presented in an unapproved format and/or disorganized and impossible to follow.
Style and Format	There are no more than two grammar and/or spelling errors, and those errors do not interfere with understanding the content. 5 points	There are three to five grammar and/or spelling errors, but those errors do not interfere with understanding the content. 3 points	There are six or seven grammar and/or spelling errors, but those errors do not interfere with understanding the content. 2 points	There are more than seven grammar and/or spelling errors, but those errors do not interfere with understanding the content. 1 point	There are grammar and/or spelling errors that interfere with understanding the content and/or make the content inaccurate.

Lesson Five: Young Scientist Reflection
(Day 13)

Objectives:

The student will view the assigned YouTube video.

The student will reflect on the video in a one page typed paper.

Materials:

- Access to Internet

-YouTube video link - http://www.youtube.com/watch?v=SRwaN4JHvFk

- Microsoft Word

Procedures:

1. The teacher will assign students to watch the following YouTube video about young scientists: **http://www.youtube.com/watch?v=SRwaN4JHvFk**

2. After viewing the video, students will write a one-page paper (12pt, Arial, 1 ½ spaced) in which they will reflect upon what they saw and what science means to them, as a young person.
3. The purpose of this is to be a 'free-write.' However, some prompting items for struggling students would be:
    a. Do you think that you would like to be a young scientist?
    b. What type of science interests you?
    c. What do you think made these students so adept at science?

    d. Have you ever used the scientific method to make a decision or figure out a problem?
4. Upon completion, students will submit their writing for grading.

Assessment:

This assignment is worth 20 points and grading will be based on completion. Due to the fact that this is a 'free-write' and students are not required to answer specific questions, this will be more of an informal assessment. I will ask myself if the students indicated in their writing what science means to them as a young person and if the students wrote the full page that was required.

Lesson Six: Math is Outa this World

(Day 14)

Objectives:

The student will learn the correct equations for calculating velocity and acceleration.

The student will complete the 'Math is Outa This World' worksheet to demonstrate their understanding.

The student will see the important connection between math and science.

Materials:

-'Math is Outa This World' worksheet

Procedures:

1. Students will read and complete the worksheet
2. Once completed, they will submit for grading

Assessment:

This assignment is worth 20 points. The questions are worth 5 points each and the answers are as follows:

1. 80 m/s/s

2. -77.77 m/hour/second

3. 35 km/hr

4. 186 seconds

Math is Outa This World

In this lesson, we are going to explore **velocity** and **acceleration**. These two concepts are very important for NASA scientists when calculating movement in space.

Velocity is the rate of change of position. You are actually very familiar with velocity. We measure velocity in many everyday activities such as driving a car, competing in sporting events and space travel.

Velocity is measured as a distance over time. For example, you are most likely very accustomed to the term miles per hour. That is probably the most common way we measure velocity since it is used in our cars. But what does that mean?

Traveling 30 miles per hour, it would take you two hours to go 60 miles. You can probably figure this out in your head. Velocity is a rate. If you were in this car, you would be traveling at the rate of 30 miles for every hour you drive. Keep in mind that velocity is usually measured in km/hr or m/s in the scientific world.

Acceleration is a bit more complicated to understand. Acceleration is defined as the change in speed over the change in time. Let's look at an example to help with this concept.

You are in a wagon race with your friend. Both of you sit at the top of a hill waiting to start. At the gun, you lift your feet and let the wagon begin to roll down the hill. Shortly into the race a friend clocks you at 2 km per hour. 24 seconds later another friend clocks you at 10 km per hour. What was your acceleration from the first friend to the second friend?
Your ending speed was 10 miles per hour (at the second friend) and the beginning speed was 2 miles per hour (at the first friend). 10 km/hr – 2 km/hr = 8 km/hr. Change of speed is measured by the ending speed less the beginning speed.
Your ending time was 24 seconds and the beginning time was 0 seconds. 24 seconds – 0 seconds = 24 seconds. Change in time is measured by the ending time less the beginning time.

Now, let's plug in the numbers.

$$\text{Acceleration} = \frac{8\text{km/hr}}{24 \text{ seconds}}$$
$$= 0.33 \text{ km/hr/second}$$

Notice that none of the units cancel out. You read this answer as km per hour per second. What it means is that your speed increases 0.3 km per hour every second. If an object is slowing down, it has a negative acceleration and the answer will be negative.

Imagine that you are part of an expedition leaving from Earth to explore Mars. Help the captain reach Mars by answering the following questions.

VELOCITY

How fast you are going

Measured in distance/time

$$\text{Velocity} = \frac{\text{Distance}}{\text{Time}}$$

ACCELERATION

How fast your velocity is changing

Measured in distance/time/time

$$\text{Acceleration} = \frac{\text{Change in Speed}}{\text{Change in Time}}$$

1. Your rocket takes off from Earth and goes from 0 m per second to 560 m per second in the first 7 seconds of flight. What is your acceleration?

2. Once your rocket reaches space, the captain adjusts the speed. Your captain goes from 24,000 km/hr to 17,000 km/hr over 90 seconds. What is your acceleration?

3. Once you land on Mars, you get in your rover to begin exploring the surface. Your rover accelerates at a pace of 3.5 km/hr/second for 10 seconds. What is the velocity of your rover after 10 seconds?

4. Light travels at 300,000 km per second. Mars is 56 million km away from Earth. How many seconds does it take light to travel from Mars to Earth?

Lesson Seven: Be On The Lookout!

Day 15

Objectives:

The student will locate, read, and reflect on a recent article about a scientist or explorer.

The student will talk with a community member or adult about the article and ask his/her opinion.

The student will gain an understanding of the important role that modern day scientists and explorers have on our lives.

Materials:

-Internet access

-access to newspapers/online articles

-assignment directions

Procedures:

1. The teacher will instruct students to 'Be on the lookout' for an article in their local newspaper, a national newspaper, or an online publication that deals with or is related to a modern day scientist or explorer.
2. Students will read the article and write a summary of what they have read.
3. After this, students will need to call someone from a local agency or someone who is involved with the topic. Students will share their article and record what they had to say about the subject.
4. Students will post their work to the discussion group, being sure to include the following information:

   -The name of the article, the name of the newspaper where it appeared, and the date it appeared.

   -summary of the article

   -The name and position of the person contacted.

   -Brief synopsis of their response to the article.
5. After posting, students will be asked to respond thoughtfully to two other students' posts.

Assessment:

This assignment is worth 30 points. Breakdown of points is as follows:

15 points – article reflection

5 points – adult response

5 points – response to another students' post

5 points – response to another students' post

Lesson Eight: Show What You Know, Part 2
(Day 16)

Objectives:

The student will participate in whole-class online discussion about scientists and explorers

The student will demonstrate what they have learned about scientists and explorers by answering the following questions:

Who are some famous scientists from the century?

Who are some famous explorers from the past century?

What kind of impact have these people made on our lives today?

What are some similarities between scientists and explorers?

What are some differences between scientists and explorers?

Materials:

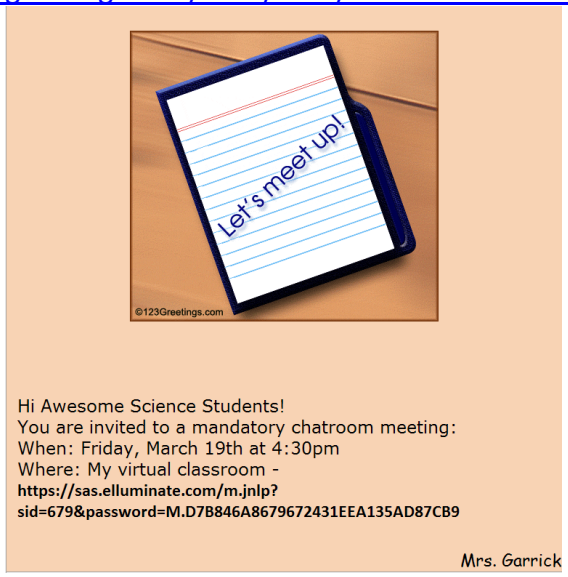
-Access to the internet

-web address for my virtual classroom:
https://sas.elluminate.com/m.jnlp?sid=679&password=M.D7B846A8679672431EEA135AD87CB9

-Microphone and speakers for computer

Procedures:

1. The teacher will send out the following e-card, inviting student to the online class discussion.
   http://www.123greetings.com/send/view/02711610112331310336



2. The teacher will load the power point presentation (attachment 1: Scientists and Explorers.ppx) onto virtual classroom whiteboard.

3. When students arrive at specified time, the teacher will explain the instructions and move through the slides, asking questions and facilitating discussion.

4. This discussion should be much different from the discussion at the beginning of the unit. Students should be engaged and knowledgeable.

Assessment:

The chat room discussion will be recorded so that the teacher can review the participation of individual students. Informal evaluation will be made based on his/her findings.

Lesson Nine: Culminating Activity
(Days 17-21)

Objectives:
Students will create a website using www.weebly.com
Students will demonstrate their understanding of the impact that scientists and explorers of the past century.

Students will determine key differences and similarities between scientists and explorers
Students will show what they have learned about specific scientists and explorers from the last century.

Students will explore how science relates to them as young people.

Materials:
-Internet access
-Weebly tutorial - http://www.youtube.com/watch?v=UMBknOSR0CA
-assignments completed thus far in the unit.

Procedures:
1. The teacher will assign the weebly tutorial
2. Students are to create a weebly website. The following pages are *required:*
   -Welcome Page – Tell the reader about yourself. Be specific and detailed.
   -Reflection - Reflection of what you have learned throughout the unit (1-2 paragraphs)
   -Comparison Page – compare and contrast scientists and explorers on this page
   -Featured Scientist Page – Discuss the scientist that you read about and post your YouTube video here
   -Featured Explorer Page – Discuss the Explorer that you read about and post your presentation here.
   -Science and Me Page – Reflection on what science means to you. What role can you play? What kind of scientist would you want to be and why?
   -Free Page – Your Choice!! Fill this page with something creative. Some ideas are: a blog, photo gallery, FAQs about scientists and explorers, etc.) . It is a requirement that this page has something to do with the unit.

Assessment:
This assignment is worth 100 points. Points will be assigned as follows:
10 points per page (7 pages)
10 points for creativity
10 points for accuracy of content
10 points for overall presentation