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Hall of Fame Scientists: Exploring identity through the examples of famous scientists using biology and English

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Unit Title	<i>Hall of Fame Scientists: Exploring identity through the examples of famous scientist using biology and English</i>	Course(s)	9th Grade Biology I and English I Pre-AP
Designed by	Ileana Sherry and Si Ying Li	Time Frame	6 Days of 90 minute blocks

Abstract:

In the Hall of Fame Scientists Unit, we hope introduce to students the concept of success and practice skills they will need for the rest of their high school career. The interdisciplinary unit is meant for ninth graders taking biology and English I. The unit concentrates on foundational writing skills: properly formatted paragraph (A.P.E.), citing scholarly sources, and research. Students should also communicate and apply scientific information extracted from various sources. We hope that after this unit, students will be able to independently recognize different perspectives, develop a cross-cultural understanding of what it means to be young, develop a growth mindset, and recognize the different avenues to success. We approached these transfer goals through a 6 day unit (of 90 minute block classes), in which we taught students skills through a research project. The unit concludes with students presenting a famous scientist’s journey to success, focusing on their years of adolescence and their identity.

Stage 1- Desired Results

English and Biology Standards

English I TEKS:

(6) Reading/Comprehension of Literary Text/Literary Nonfiction. Students understand, make inferences and draw conclusions about the varied structural patterns and features of literary nonfiction and provide evidence from text to support their understanding. Students are expected to analyze how literary essays interweave personal examples and ideas with factual information to explain, present a perspective, or describe a situation or event.

(8) Reading/Comprehension of Informational Text/Culture and History. Students analyze, make inferences and draw conclusions about the author's purpose in cultural, historical, and contemporary contexts and provide evidence from the text to support their understanding. Students are expected to explain the controlling idea and specific purpose of an expository text and distinguish the most important from the less important details that support the author's purpose.

(13) Writing/Writing Process. Students use elements of the writing process (planning, drafting, revising, editing, and publishing) to compose text. Students are expected to:

(A) plan a first draft by selecting the correct genre for conveying the intended meaning to multiple audiences, determining appropriate topics

through a range of strategies (e.g., discussion, background reading, personal interests, interviews), and developing a thesis or controlling idea;

- (B) structure ideas in a sustained and persuasive way (e.g., using outlines, note taking, graphic organizers, lists) and develop drafts in timed and open-ended situations that include transitions and the rhetorical devices used to convey meaning;
- (C) revise drafts to improve style, word choice, figurative language, sentence variety, and subtlety of meaning after rethinking how well questions of purpose, audience, and genre have been addressed;
- (D) edit drafts for grammar, mechanics, and spelling; and
- (E) revise final draft in response to feedback from peers and teacher and publish written work for appropriate audiences.

(15) Writing/Expository and Procedural Texts. Students write expository and procedural or work-related texts to communicate ideas and information to specific audiences for specific purposes. Students are expected to:

- (A) write an analytical essay of sufficient length that includes:
 - (i) effective introductory and concluding paragraphs and a variety of sentence structures;
 - (ii) rhetorical devices, and transitions between paragraphs;
 - (iii) a controlling idea or thesis;
 - (iv) an organizing structure appropriate to purpose, audience, and context; and
 - (v) relevant information and valid inferences;

(25) Listening and Speaking/Speaking. Students speak clearly and to the point, using the conventions of language. Students will continue to apply earlier standards with greater complexity. Students are expected to give presentations using informal, formal, and technical language effectively to meet the needs of audience, purpose, and occasion, employing eye contact, speaking rate (e.g., pauses for effect), volume, enunciation, purposeful gestures, and conventions of language to communicate ideas effectively.

Biology I TEKS:

- (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:
- (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;
 - (C) draw inferences based on data related to promotional materials for products and services;
 - (D) evaluate the impact of scientific research on society and the environment;
 - (E) evaluate models according to their limitations in representing biological objects or events; and

(F) research and describe the history of biology and contributions of scientists.

ELAR Performance Outcomes

Investigate the World

How effectively does the student investigate the world's complex and significant issues and ideas?

- Synthesizes and presents the most important and thorough evidence that supports analysis of text(s).

Recognize Perspectives

How effectively does the student understand that an issue may be viewed from a variety of perspectives, and reflect different values and contexts?

- Analyzes the author's perspective on a global topic/issue, and clearly differentiates it from other perspectives. Demonstrates an understanding of the cultural experiences and values reflected in the varied perspectives.

Communicate Ideas

How effectively does the student organize and structure his/her ideas when communicating with a variety of audiences? How skillfully does the student assure the reader with command of language, engage the reader with his/her voice and style, and use digital technology and communication tools?

- Communicates with few errors in Standard English conventions that do not impact readability. Varies sentence and word choice, consistently applies appropriate conventions and style/tone, and cites sources consistently and appropriately.

Science Performance Outcomes

Investigate the World

What is the evidence that the student uses scientific procedures and disciplines to investigate natural and/or human global phenomena?

- Questions build on an evaluation of prior interpretations of evidence, a model, engineering design, or the premise of an argument.
- Develops and explains a clear and logical research thesis that clearly builds on up-to-date scientific evidence drawn from credible sources.
- Gathers and analyzes relevant background information from primary and secondary sources representing domestic and international perspectives. Evidence is directly related to a global issue that either supports or refutes the hypothesis or research thesis.

Recognize Perspectives

What is the evidence that the student interprets and discusses scientific data in the context of complex global systems?

- Expresses and explains a clear personal perspective on a global issue and analyzes how it has been influenced or changed by science.
- Analyzes and explains the perspectives and cultural experiences of multiple scientists with competing views on the same global issue.

Communicate Ideas

What is the evidence that the student understands and discusses global implications of scientific ideas, research, or inquiry results?

- Presents data with multiple visual representations that enhance understanding of the global issue and findings for diverse audiences.
- Communicates with few errors in grammar, usage, and mechanics that do not impact readability. Applies scientific conventions and a style/tone appropriate to the audience and purpose. Accurately provides basic bibliographic information from all sources. Cites sources within the text appropriately.

Transfer

Students will be able to independently use their learning to....

What kinds of long-term independent accomplishments are desired? (Delete question and write)

- Recognize different perspectives
- Develop a cross-cultural understanding of what it means to be young.
- Develop a growth mindset
- Recognize the different avenues to success

Meaning

UNDERSTANDINGS

Students will understand that...

What specifically do you want students to understand?

What inferences should they make?

- There are many ways to tell a story.
- Culture affects identity and perspective.
- Reading a work allows you to better understand different perspectives and cultures.
- Reading and writing promotes self-reflection and understanding.
- Events of war, migration, and revolution become central elements of a person's identity.

Essential Questions

Students will keep considering...

- What makes our identities?
- How does where we come from affect our identities?
- How does when we lived affect our identities?
- What is success?
- Who am I?

- It takes hard work and perseverance to succeed.
- Giving credit is an ethical imperative.
- The success of predecessors make future success possible.

Acquisition

Students will know...

- Examples of famous scientists from various backgrounds
- Impact of scientific research on society and the environment
- What a works cited page is
- Learning is a process of revision and editing

Students will be skilled at...

- Writing a properly formed paragraph (APE paragraph).
- Research and analyze primary and secondary sources.
- Cite sources in MLA format.
- Create works cited page.
- Form a hypothesis.
- Reflecting on their learning and the personal significance of that learning.
- Providing constructive feedback

Stage 2- Evidence

PERFORMANCE TASK(S):

Students will show that they understand by evidence of...

A presentation in the role of a famous scientist. The presentation should include why the person became famous in the scientific field, a brief history of their adolescent years, and how factors of adolescence, place, and time contributed to who they were as a person and their identity. Students will present using a previously written and revised paragraph in A.P.E. (answer, prove, explain) format. Presentation should only be aided with index card.

Students will present through a gallery format, in which a third of the class will present at different places in the room while the other two-thirds circulate and listen to presentations. Therefore, each student will present their speech multiple times but in front of a small audience.

OTHER EVIDENCE:

Students will show they have achieved Stage 1 goals by...

Portfolio Post: Students will write a reflective blog post on how this project has helped them to think about identity and success in their own lives. Students should incorporate links or pictures to the work created in this unit. Students can also incorporate knowledge gained from outside life or other classes during this same time.

Journal Check: Students will write creatively and reflectively for warm-ups during this week. They will also use their journals to take notes on the presentations. These will be checked on Friday.

Stage 3- Learning Plan

Learning Events

Student success at transfer, meaning, and acquisition depends upon...

Each class is 90 minutes. Please view the agenda slides for a complete vision of the lesson plan.

Day 1: Introduction--Teachers will come dressed as their teenage-selves. Then they will present the project's end product (the presentation) on their success, adolescence, and how their adolescence, time, and place affected their identities. Then students will participate in a microlab on identity, success, and grit--writing their responses in their journal to use in the reflective portfolio post at the conclusion of the project. Ms. Sherry will lead and debrief the microlab. Ms. Li will introduce the project directions. Students will then receive 10 minutes to research the list of scientists. By the end of the period they must sign up for a scientist. First come first serve for sign up. Each teacher will have half the list of scientists.

Day 2: Ms. Sherry teaches the format of APE paragraphs using slides and teacher examples from the day before. Students will analyze and use rubric to assess. One will be emerging the other advanced. Then we walk the students to the Library for the librarian to show the tutorial and tools on research. We will provide them with a "research cheat sheet" to help them.

Day 3: Students will finish researching their scientist and begin their draft of the APE format paragraph. Teachers will the paragraphs at the end of class.

Day 4: Ms. Sherry teaches on creating a works cited page in MLA using the Direct Instruction of *Strategic Teacher*, meanwhile Ms. Li check APEs (Silver, Perini, Strong). Then the kids will practice creating citations using rotation stations.

Day 5: Work day: Revising APEs and finishing citation page. At the halfway point in the period, we will divide the class to do the wagon wheel protocol, in which students will practice presenting their speech with a partner, receive feedback, and then switch. Do as many rounds as seems necessary or as time allows.

Day 6: The class will start with 10 minutes for finishing touches and practice time. Then students will present through a gallery format, in which a third of the class will present at different places in the room while the other two-thirds circulate and listen to presentations. Therefore, each student will present their speech multiple times but in front of a small audience. Allow 8 minutes for each round. Then we will debrief using a chalk talk on 3 sheets of butcher paper: how was it to present in front of an audience, what was the most interesting thing you learned, and on a third sheet they can choose one of the essential questions to respond to. The rest of class will be given to the kids to write their reflective portfolio post.

Resources / Materials:

- [UbD Document for BioEng Unit](#)
- [Agenda Slides for unit](#)
- [Hall of Fame Project Instructions](#) (for students)
- [List of Scientists](#) with description
 - [Sign-Up Sheet](#)
- [Rubric for presentation](#) (performance assessment)
 - [Printable version of rubric](#) for easy grading
- [Citation Rotation Station](#)
- Teacher Examples--[Ms. Li](#) (needs improvement version) and [Ms. Sherry](#) (follows APE format version)
- [Guide to Internet Research](#)

Mission Bay High School UbD Unit Planner is from Wiggins, Grant and McTighe, Jay. *Understanding by Design Guide to Creating High-Quality Units*. Alexandria, VA: Association for Supervision and Curriculum Development. 2011.