



THE TCRR, APOLLO 11, AND THE NEXT MOON SHOT

GRADES 4-8

Title :The TCRR, Apollo 11, and the Next Moon Shot

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Summary

Students will learn about the concept of a “moonshot,” the American realization of reaching the Moon, and how that effort shared many similar attributes with the completion of the transcontinental railroad (TCRR). In particular, the vision, hard work, dedication, innovation, and collaboration that was at the heart of the effort to put a man on the moon was also evident in the effort to build the TCRR. Students will consider a current innovation or challenge that they think should be addressed, and will craft an argument in support, citing textual evidence from the TCRR effort to bolster their position. They will then write a summary of their findings in a letter to an elected official who could play a role in the student’s current “moonshot” idea.

While arguments normally have both claims and consideration of counterclaims, this lesson is not designed to fully engage in the consideration of counterclaims. This is intentional, but extensions of this lesson could allow for these considerations.

Main Curriculum Tie

While the historic and contemporary issues are social studies topics of study, the writing requirement is also an essential ELA performance task.

Grade 4 - Utah Studies	
Standard 1 Objective 2.d	Students will understand the relationship between the physical geography in Utah and human life. Analyze how physical geography affects human life in Utah. Make inferences about the relationships between the physical geography of Utah and the states communication and transportation systems.

Standard 2 Objective 2.a	Students will understand how Utah's history has been shaped by many diverse people, events, and ideas. Describe the historical and current impact of various cultural groups on Utah. Chart the routes that diverse cultural groups took from their places of origin to Utah, using maps and other resources.
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Grade 5 - United States History I	
Standard 4 Objective 1	Students will understand that the 19th century was a time of incredible change for the United States, including geographic expansion, constitutional crisis, and economic growth. Investigate the significant events during America's expansion and the roles people played.

Grade 7 - Utah Studies	
Standard 2.5	Students will construct an evidence-based argument to explain how the development of transportation and communication networks across the state changed Utah's economy and human geography.
Standard 2.6	Students will explain how agriculture, railroads, mining, and industrialization created new communities and new economies throughout the state.

Grade 8 - United States History II

Standard 6.3	Students will identify the economic and geographic impact of the early Industrial Revolution's new inventions and transportation methods, such as the Erie Canal, the transcontinental railroad, steam engines, the telegraph, the cotton gin, and interchangeable parts.
Standard 6.4	Students will make a case for the most significant cultural, political, and economic impacts of territorial and/or industrial expansion.

Additional Curriculum Ties

This reading and writing task will also support ELA core anchor standards in reading and writing:

Reading: Informational Text Standard 1

Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Reading: Informational Text Standard 2

Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

Reading: Informational Text Standard 9

Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Writing Standard 1

Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Writing Standard 4

Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience

Writing Standard 7

Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Time Frame

Two time periods that run 50 minutes each. Essentially one day for the lesson and one day of student writing.

Group Size

Describe: Whole group, some think/pair/share opportunities, and individual writing practice.

Life Skills

Aesthetics Character Communication Employability
 Social & Civic Responsibility Systems Thinking Thinking & Reasoning

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Materials

Primary and secondary source text sets.

Graphic organizers for brainstorming and note taking.

Powerpoint with lesson pacing, video links.

Letter templates, sentence stem support.

Background for Teachers

The 1969 Moon shot and the 1869 TCRR share many similar themes. This lesson can be adjusted according to time and student skills. The writing can be scaffolded and supported with sentence stems and a skeletal structure for the writing task as necessary.

This lesson is not intended to be a comprehensive historical analysis of the Moon shot or of the construction of the TCRR. In particular, this lesson does not consider all the complexities or perceived negative consequences. It is intended to encourage students to "think big" about solving issues or challenges that they care about, and to learn to use historical precedents as examples that they can learn from, and that they can use to bolster their argument.

It is always useful to help students place historical events in context using representations of material culture. If you have an opportunity to create a timeline of history on your wall and show representations of living rooms from different eras, for example, modes of transport, a typical bedroom, or toys students would have played with at different times in history, this addition of material culture can help make the abstraction of these times become more concrete. For examples, having students sort images from the 1860's and 1960's as part of timeline creation could be a fun, quick activity that would help

students make the time connections. You can even have them do so while listening to music from the 1860's and 1960's for a more complete sensory experience.

Student Prior Knowledge

Students should be able to engage with this task regardless of their personal knowledge of the Moon shot or the building of the TCRR. The information regarding both is embedded within the materials they will encounter in the lesson delivery.

Because they will need to locate their local state representatives on the Utah legislative web site, they should be aware of the role elected officials play in decision-making in representative government.

Intended Learning Outcomes

Citing textual evidence from historical events to help bolster an argument is an essential skill. While any undertaking or initiative as complex as the Moon shot or the TCRR will have both negative and positive consequences, this particular assignment is designed to help students learn to find and cite evidence that *supports* their point.

In addition, students will learn how to identify who represents them in the Utah state legislature, and how to contact them with their opinion on this or other civic issues.

Finally, students will write a letter to their representative, practicing both their writing skills and their civic participation skills.

In summary, students will practice:

- Civic engagement

- Evidence - gathering

- Summarizing

- Argument development

- Writing

Instructional Procedures

Begin with the powerpoint. Introduce the concept of a "moonshot" and where the term gets its name.

Share the timeline on the PPT that moves back from the current day to the 1960's.

If you have time, play for them President Kennedy's speech about the travel to the moon. "We choose to go to the Moon" is the takeaway line from the speech about the effort to reach the Moon delivered by President Kennedy at Rice Stadium in Houston, Texas on September 12, 1962. His speech outlines his case for the moon landing. He makes a number of specific arguments, but the visionary aspect of his speech is to be heard at right around 8:46 on the transcript.

"We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too."

<https://www.youtube.com/watch?v=TuW4oGKzVKc>

President Kennedy set forth that goal in 1962, and seven years later, on July 16, 1969, Neil Armstrong said this:

https://www.nasa.gov/wav/62284main_onesmall2.wav

How did the United States manage to set the goal of going to the moon on a rocket, and get there seven years later?

Clearly, it required first a clear **goal and visionary people**, which President Kennedy expressed in his speech.

It required **investment**. President Kennedy, in his speech, asks for money from the Congress to help pay for it.

It required **innovation**. The United States had only sent their first person into space in 1961, and manned spacecrafts – and especially a spacecraft to the moon – had never been done before.

It required **collaboration** among a diverse team of workers, including scientists and thinkers from all over the world, and men and women of all backgrounds. Some of the stories of the African-American women mathematicians who helped with the space program are just now being told.

It required **hard work** and **risk-taking**. Some people even lost their lives in the effort, including three astronauts on the launch pad in 1967 lost in a flash fire as they rehearsed.

It required **dedication**. Even after that terrible fire, people did not give up on the goal and vision for the program.

The moon landing is an example of thinking big and doing something extraordinary.

There are two options presented here as ways to continue this lesson.

Option one is to brainstorm big issues of concern to students that they think we, as a state and nation, should try to solve with a “moonshot.” This option is intended to personalize their writing task and focus on an issue that they care about, increasing their personal stake in the writing task.

Option two is to provide students with the vision of a new innovation, in particular a bullet train that would travel nearly 400 miles an hour and could get them from the Utah Capitol of Salt Lake City to Los Angeles in two hours. This option is intended to continue the theme of transportation innovations.

Option One:

(Skip to option two if you have chosen that option.)

Ask students to identify “moon shot” possibilities. What are areas, topics, or issues that deserve or could benefit from a moon shot approach?

Students will probably generate a list that may include:

Climate change

Wildfires

Bullying

Suicide

Air quality in Utah

Drunk driving

The need for electric cars or other modes of transport

Make a list and validate and help clarify, if necessary, the responses.

The point is not to edit these issues at this point, but to allow students to raise them as issues that need to be addressed.

If necessary, you can mention a few issues that seem big or challenging.

The point here is to make it clear that in this country we have faced big challenges in the past and we have, sometimes, successfully met those challenges. For examples, there are medical advances that have been confronted, such as polio or smallpox. While there are still environmental concerns, there have been some successes with bringing back species like the bald eagle that faced extinction.

OR:

Option Two:

Introduce the idea of a bullet train that could travel across Utah, leaving from Ogden, for example, and traveling to California in less than two hours. In fact the hyperloop could reach speeds of 700 mph and that would mean in one hour you could be at the beach in California. You can show them video of the maglev high speed trains in Japan or the hyperloop.

https://www.youtube.com/watch?v=O_FyOBCVGWE

Do you think something like that would be possible? Do you think it would be fun to be able to travel to Los Angeles and check out Disneyland or the California beach in a couple of hours? Are there other benefits for something like this? (Possibilities include economic development, possible reduction in carbon footprint, increases in tourism, economic growth in a variety of possible rural regions)

Endeavors like this require that we as a people, as a nation, dream big.

Have there been other times in history when we have had big projects that required us to dream big?

Elicit responses and record them to validate them.

Our task, for either option: Craft an argument for (option one: solving that big issue) or (option two: building that bullet train).

We are each going to write a letter to our representatives, and use examples from the past to remind them that we have a tradition of doing big things in this country.

At this point, help students identify who their state representatives are, and if they are addressing a national issue, they will need to know how to locate their U.S. representatives in the U.S. house and senate. This is a great opportunity to remind them of the differences and similarities between their state government and their national, or federal government.

The Utah legislature has an award-winning website that is very user-friendly. Here is the link to find legislators based on home addresses:

<https://le.utah.gov/GIS/findDistrict.jsp>

It has been clear that there have been times when the U.S. has “dreamt big.” Explain that you are going to share one more examples from history, this one from nearly 150 years ago. In fact, we are celebrating, next year, the Sesquicentennial, or 150th anniversary, or the big event of 1869.

Nearly exactly one hundred years before the walk on the moon, this country managed to complete a railroad across the nation.

This may not seem like a huge deal, but let’s think about how people had traveled before the railroad. For thousands of years, for all of human history and even before recorded human history, how did people manage to move and migrate from one place to another?

It took only roughly sixty years from the invention of the steam locomotive to the completion of the TCRR. That is, relatively speaking, a blink of an eye in terms of human history.

How was this massive undertaking completed?

With many similar themes as the trip to the Moon.

Vision/Clear Goal

Innovation

Investment

Diverse Workers

Hard Work

Risk Taking

Political Leadership

Contemporary Historic Importance

Your task, students: find examples of at least four of these similarities in the assorted historical texts I will hand out, as you will use them in what you produce for your elected representative.

Summarize what you find, and when possible, takes notes so you can quote and cite the examples that show similarities between the effort to go to the moon, and the building of the first transcontinental railroad.

Then use the examples in your letter or presentation to your elected representative. These examples will make your argument stronger, and there is an added bonus. You will sound really, really smart.

What you will produce: A letter or other presentation to your congressperson and/or U.S. senator, or to your local representative or senator.

Pass out the text excerpts and the graphic organizer for note taking of the evidence they find.

Assist students as needed in finding evidence to support their writing/presentation.

When ready, or as needed, provide the sentence stems for their own essays.

At the completion of their writing, actually sending their edited and polished letters on to their elected officials is encouraged. The act of civic engagement is an important and essential life skill.

Strategies for Diverse Learners

Graphic organizers, visual representations, and additional textual supports including cloze statements will be essential. With the fact that all of human history is now at our fingertips via the internet, there is no reason not to saturate the classroom with images and sounds from the historical eras in question in an effort to make the content as comprehensible as possible.

Feel free to supplement the readings with additional images. The readings themselves have been modified when necessary to eliminate arcane language.

Extensions

Students can further their study of the TCRR with additional lessons that will go deeper into the vision, hard work, dedication, innovation, and collaboration that was central to the success reached that day in May, 1869. In addition, the important role of the diverse workers who comprised the teams of railroad workers, in particular the Chinese, Irish, and Mormon workers, will be important to share.

Assessment Plan

Student-created letters, citing textual evidence from the text sets presented, or from additional independent research, will be the final authentic assessment task. A successful letter will cite evidence of vision, hard work, dedication/persistence, innovation, diverse workers, and collaboration.

In addition, or as an extension, you could also encourage them to find examples of Investment, Risk Taking, Political Leadership, and an awareness of the Contemporary Historic Importance

In addition, it will be possible to assess students on their ability to identify key words and phrases in text sets while conducting their evidence-gathering.

It would also be wise to assess whether students can independently locate their representatives on their own via the legislative website. A quick check would be for you to provide a Jane Doe and her address as the school's address to see if they can see which state senator and member of the house represents the school's neighborhood.

In so doing, students will practice:

- Civic engagement
- Evidence gathering skills
- Summarizing skills
- Argument-development skills

They will also learn specific content about the 1969 Moon landing and the 1869 completion of the TCRR, which should be evident in their writing.

Teacher Materials

1. Brainstorming Note Sheet:

Moonshot Ideas

Can you think of issues today that could use a moonshot approach? Push yourself, with your partner or team, to come up with as many as you can. Shoot for the moon! (Or at least try to think of ten issues, challenges, opportunities, or concerns that you think might be worthy of a moonshot.)

Remember:

- **Moonshots** require significant breakthroughs in attitude, innovation, leadership, processes, management, and technology.

2. Notes for similarities between the two “Moonshots”

Evidence Sheet

Name: _____

Record the evidence for each of these points that you can use in your project for your elected representative.

Moon Shot

Transcontinental Railroad

Clear Goal:

Visionary People:

Investment:

Innovation:

A Diverse, International Workforce:

Hard Work:

Risk Taking:

Economic Impact/Significance:

Historic:

3. Text Sets

Search through the following texts to find evidence to support the claim that the Transcontinental Railroad was similar to the effort to land on the moon, further evidence that Americans can dream big! When you find evidence, make a note of it on your Evidence Sheet.

Document 1:

An excerpt from an essay found at the Library of Congress website. For the full essay, please go here: <https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-transcontinental-railroad/>

The Transcontinental Railroad

The possibility of railroads connecting the Atlantic and Pacific coasts was discussed in the Congress even before the treaty with England which settled the question of the Oregon boundary in 1846.[8] Chief promoter of a transcontinental railroad was Asa Whitney, a New York merchant active in the China trade who was obsessed with the idea of a railroad to the Pacific. In January 1845 he petitioned Congress for a charter and grant of a sixty-mile strip through the public domain to help finance construction.[9]

Whitney suggested the use of Irish and German immigrant labor, which was in great abundance at the time. Wages were to be paid in land, thus ensuring that there would be settlers along the route to supply produce to and become patrons of the completed line

In 1849 Whitney published a booklet to promote his scheme entitled *Project for a Railroad to the Pacific*. It was accompanied by an outline map of North America which shows the route of his railroad from Prairie du Chien, Wisconsin, across the Rocky Mountains north of South Pass....This is one of the earliest promotional maps submitted to Congress and was, according to its author, conceived as early as 1830[10].

Although Congress failed to sanction his plan, Whitney made the Pacific railroad one of the great public issues of the day...lawmakers, however, could not agree on an eastern terminus, and they did not see the merits of the several routes west. To resolve the debate, money was appropriated in 1853 for the Army Topographic Corps "to ascertain the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean."

Under the provisions of the Army Appropriation Act of March 1853, Secretary of War Jefferson Davis was directed to survey possible routes to the Pacific. Four east to west routes, roughly following specific parallels, were to be surveyed by parties under the supervision of the Topographical Corps...

The ill-fated party under Capt. John W. Gunnison was to explore the route along the 38th and 39th parallels, or the Cochetopoa Pass route... After Gunnison's death at the hands of hostile Indians, Lt. Edward G. Beckwith continued the survey along the 41st parallel ...surveys showed that a railroad could follow any one of the routes, and that the 32nd parallel route was the least expensive. The Southern Pacific Railroad was subsequently built along this parallel.

...no decision was forthcoming from Congress on the Pacific railroad question. Theodore D. Judah, the engineer of the Sacramento Valley Railroad, became obsessed with the desire to build a transcontinental railroad. In 1860 he approached Leland Stanford, Collis P. Huntington, Mark Hopkins, and Charles Crocker, leading Sacramento merchants, and soon convinced them that building a transcontinental line would make them rich and famous. The prospect of tapping the wealth of the Nevada mining towns and forthcoming legislation for federal aid to railroads stimulated them to incorporate the Central Pacific Railroad Company of California. This line later merged with the Southern Pacific. It was through Judah's efforts and the support of Abraham Lincoln, who saw military benefits in the lines as well as the bonding of the Pacific Coast to the Union, that the Pacific Railroad finally became a reality.

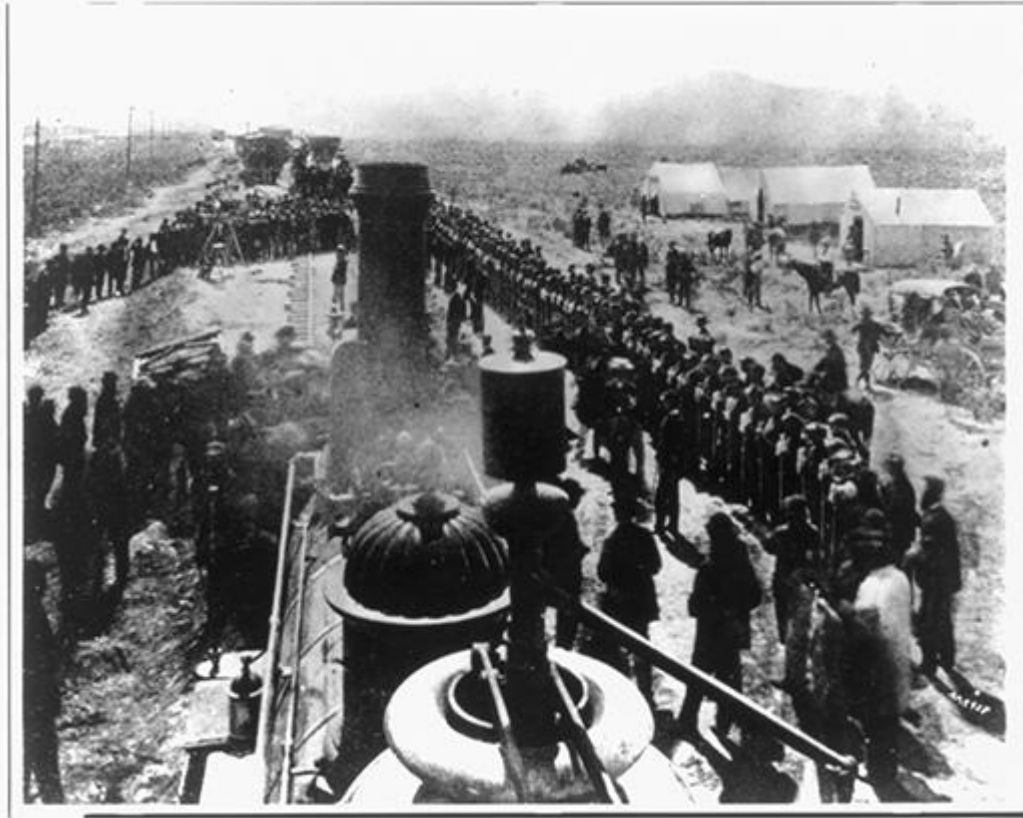
The Railroad Act of 1862 put government support behind the transcontinental railroad and helped create the Union Pacific Railroad, which subsequently joined with the Central Pacific at Promontory, Utah, on May 10, 1869, and signaled the linking of the continent.

Document 2

A photograph of the ceremony held at the driving of the Golden Spike. Found at the Library of Congress site: [Ceremony at "wedding of the rails," May 10, 1869 at Promontory Point, Utah](#)

The Wedding of the Rails

Officials and workers of the Union Pacific and the Central Pacific railways held a ceremony on Promontory Summit, in Utah Territory—approximately thirty-five miles away from Promontory Point, the site where the rails were joined—to drive in the Golden Spike on **May 10**, 1869. The spike symbolized completion of the first transcontinental railroad, an event that connected the nation from coast to coast and reduced a journey of four months or more to just one week.



[Ceremony at “wedding of the rails,” May 10, 1869 at Promontory Point, Utah](#)

Document 3

An excerpt from the Library of Congress blog “Today in History.” For the full entry: <https://www.loc.gov/item/today-in-history/may-10/>

Today in History: May 10

The Central Pacific Railroad began construction eastward from Sacramento, California, and the Union Pacific Railroad began construction westward from Omaha, Nebraska. The majority of the track was built by Irish laborers from the East, Chinese who entered the country from the West, veterans of both the Union and Confederate armies, and Mormons who wished to see the railroad pass through Ogden and Salt Lake City. (The Mormon leader Brigham Young became a member of the Board of Directors of the Union Pacific). The men worked for an average of between one and three dollars a day. Between 1865 and 1869 the Union Pacific laid 1,086 miles of track; the Central Pacific laid 689 miles of track.

The years immediately following the construction of the transcontinental railroad were years of astounding growth for the United States. Between 1860 and 1890 the miles of railroad track interlacing the U.S. increased ninefold—

from 30,000 miles to 270,000 miles, and the population leapt from 31,000,000 persons to over 76,000,000 people; many were recent immigrants.

Document 4

The following is a slightly modified and excerpted newspaper account of the big day from The Weekly Arizonian, Tucson, Arizona Territory, June 5, 1869. . Link to the original and many more at this site:

<http://www.loc.gov/rr/news/topics/goldenspike.html>

Ceremonies on Laying the Last Rail

Promontory Summit, May 10.

The morning was most auspicious. At 7 a. m. the superintendent of the telegraph company hoisted the Stars and Stripes at the terminus of the Central Pacific track.

The Union Pacific Railroad closed the gap of half a mile in their track, leaving but the space to be filled by the last rail. At 9 a. m. the first passenger train of the Union Pacific railroad arrived at this point, coming within a rail's length of the Central Pacific track- The train consisted of one sleeping car and one passenger car, bringing about 30 passengers. At 11:30 the President's train moved to the front, drawn by the fine locomotive Jupiter --appropriate name -- gaily decorated with flags and streamers. George Booth is engineer and Eli Foster conductor of the train. The enthusiasm is great and still increasing. At least 2,000 persons will meet in mid-desert, and warm and earnest greetings are being exchanged between all, for the event makes even strangers friends.

Hon. F. A. Tritle of Nevada offered the silver spike with the following sentiment : "To the iron of the east and gold of the west Nevada adds her link of silver to span the continent and wed the oceans."

Hon. A. P. K. Safford presented a spike of iron, silver and gold, an offering from Arizona,with the sentiment; "Ribbed with iron, clad in silver and crowned with gold, Arizona presents her offering to the enterprise that has banded the continent and made clear a pathway to commerce."

Mr. Harkness presented the golden spike from California, with a few sublime remarks. He said "The last rail needed to complete the greatest railroad enterprise of the world is about to be laid; the last spike needed to unite the Atlantic and Pacific by a new line of travel and commerce is about to be driven to its place. To perform these acts, you, the East and the West have come together. Never, since history commenced her record of human events, has she been called upon to note the completion of a work so magnificent in conception, so marvelous in execution. California is desirous to express her appreciation of the great enterprise. From her mines of gold she has forwarded a spike-from her laurel woods she has hewn a tie ; by the hands of her citizens she offers them to become a part of the great highway which is about to unite her in close fellowship with her sisters of the Atlantic."

Document 5

Stanford University has a website devoted to the Chinese railroad workers who were an essential part of the construction of the railroad. This is a modified excerpt of a tribute to Philip Choy. Read closely to see what his role was in 1969 and why he was "shocked and outraged." The full article can be found here:

<http://web.stanford.edu/group/chineserailroad/cgi-bin/wordpress/tribute-to-philip-choy/>

Tribute to Philip Choy

In 1969, as president of the Chinese Historical Society of America (CHSA), Choy joined others at the 100th anniversary of the Golden Spike ceremony commemorating the completion of the transcontinental railroad. The CHSA had prepared two commemorative plaques in English and Chinese to be placed in Sacramento and at the site of the Golden Spike ceremony to honor the Chinese, who constituted as much as 90 percent of the workforce of the Central Pacific Railroad.

At the ceremony, they heard Secretary of Transportation John Volpe declaim: "Who else but Americans could drill ten

tunnels in mountains 30 feet deep in snow? Who else but Americans could chisel through miles of solid granite? Who else but Americans could have laid ten miles of track in 12 hours?"

Choy and the members and officers of the CHSA, sat shocked and outraged. It was Chinese workers—men who were barred from becoming “Americans” at the time—who had actually done the drilling, chiseling and track laying across the Sierra Nevada of California and the deserts of Nevada and Utah. Yet Secretary Volpe, the official speaker of the day, had failed to even mention them. The deliberate snub was one more spark fueling the nascent (just beginning to grow) Asian American movement.

Document 6

A modified excerpt from an investment website about Theodore Judah, one of the financiers of the railroad. Here is the full article:

<https://www.investors.com/news/management/leaders-and-success/theodore-judah-planned-transcontinental-railroad-to-unite-america/>

Theodore Judah Planned Transcontinental Railroad to Unite America

Over the next six years, the 13,000 mostly Chinese CP workers laid 690 miles of track over the Sierra Nevada mountain range, which rose 7,000 feet. Over 1,500 died from avalanches, freezing weather and dynamite explosions while making tunnels.

The UP’s task was easier because it followed rivers through the Rockies. Its 3,000 mostly Irish employees built 1,085 miles of track to the meeting point in Promontory Point, Utah.

The final spike was driven in at a ceremony on May 10, 1869. Westward settlement and the national economy boomed, and the United States was finally truly united.

Document 7

A modified excerpt from a November 19, 1845 newspaper article from the Cadiz Sentinel of Cadiz, Ohio. Here is the link to the full article:

https://www.newspapers.com/clip/23262999/asa_whitney_makes_proposal_to_congress/

Railroad to the Pacific

At the close of the last session of Congress, Mr. Asa Whitney, a merchant from New York, presented the idea of getting public land grants for the purpose of constructing a railroad from Lake Michigan to the Pacific.

The project was a startling one and so vast and apparently impossible, that few seemed willing to grapple with it, or to entertain it as feasible. But the committee listened and were convinced it was practicable, and made a report in its favor. The report came at the end of the session, and further action was not had upon the matter. But the plan was not forgotten, and the only feasible mode of binding Oregon to us is the one proposed by Mr. Whitney.

Document 8

Modified excerpts of a timeline of significant events in the construction of the railroad, from the Stanford University Chinese Railroad Workers in North America Project. For the full timeline, visit :

<https://web.stanford.edu/group/chineserailroad/cgi-bin/website/timeline/>

Timeline

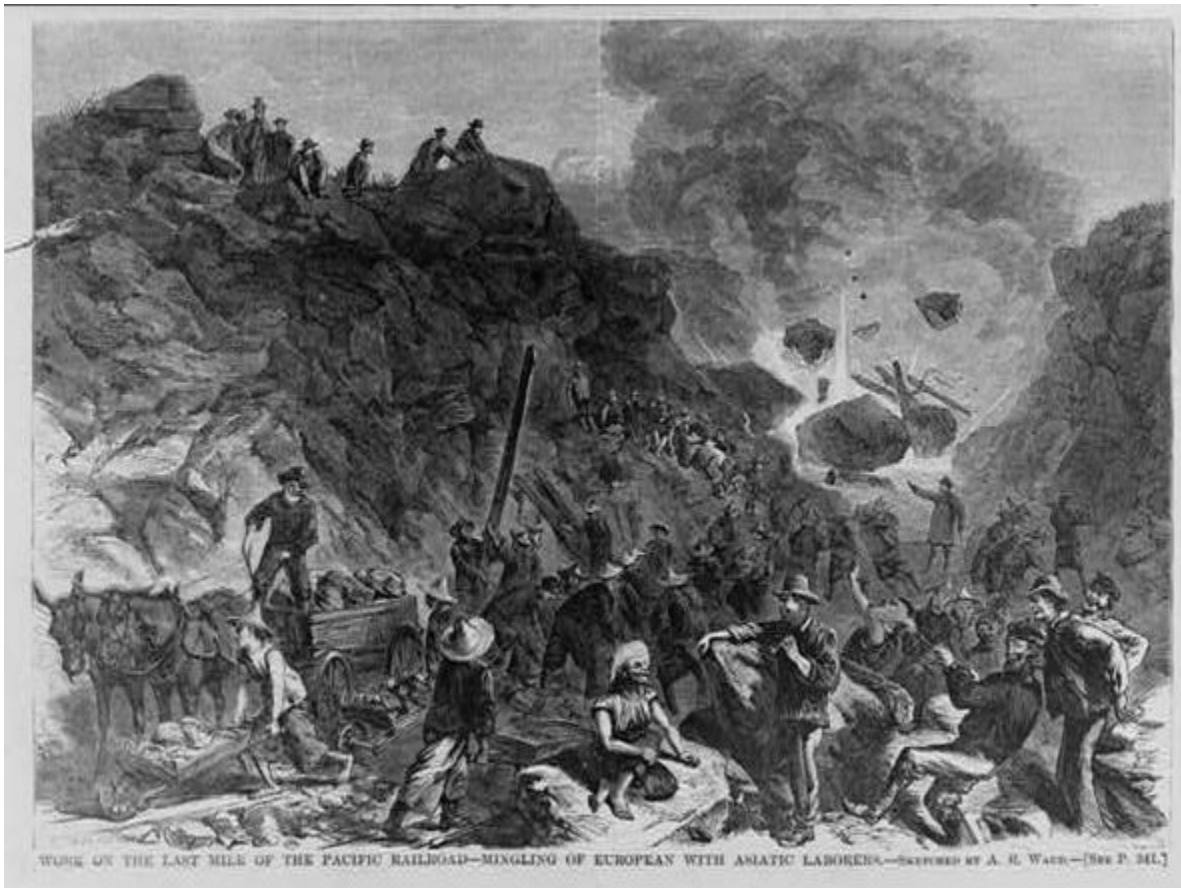
January 1864: The first known Chinese workers for the Central Pacific Railroad Company arrive. Foreman Ah Toy and headman Hung Wah lead a crew of 21 men to work on clearing the Dutch Flat-Donner Lake Wagon Road.

November 21, 1865: The *Sacramento Union* reports that approximately 4,000 men, “mostly Chinese,” are at work on the Central Pacific Railroad.

April 28, 1869: The Central Pacific with teams of Irish and mostly Chinese workers set a record for laying 10 miles and 56 feet of track in 12 hours at Rozel, Utah. The effort sparked from a competitive bet with the Union Pacific, whose men had once laid 7 miles of track in one stretch (but they had reportedly worked from four in the morning until midnight, beyond a regular day’s work). The *San Francisco Bulletin* called the feat “the greatest work in tracklaying ever accomplished or conceived by railroad men.” A top-ranking Army commander, who was watching the workers’ progress with his soldiers, said, “Mr. Crocker, I never saw such organization as that. It was just like an army marching over the ground and leaving the track built behind them.”

Document 9

A lithograph entitled :
Work on the Last Mile of the Pacific Railroad – Mingling of European with Asiatic Laborers



Document 10

A modified excerpt from <https://railroad.lindahall.org/essays/innovations.html/>

The Use of Black Powder and Nitroglycerine on the Transcontinental Railroad

The crate had been shipped by steamer from New York City to Panama, across the isthmus via railroad, and then to San Francisco by steamship. It measured two-and-a-half feet square, weighed a little over 300 pounds, and was indistinguishable from thousands of others, except that it leaked an oily substance. The question was not about what was leaking from the crate, but who was at fault for the leak. To settle the dispute, representatives from the steamship company and the consignor, Wells Fargo, met at the latter's office on Montgomery Street. A Wells Fargo employee grabbed a hammer and chisel and began to open the leaking crate. The resulting explosion a little after noon on Monday, April 16, 1866, instantly killed the workers, leveled the Wells Fargo building, and rattled buildings more than a quarter mile away.

Nitroglycerine was a new product in 1866. Discovered in 1847 and perfected as a blasting agent in the 1860's, it was not widely known. In its pure, liquid form, the chemical was extremely volatile. Two days after the Wells Fargo explosion, six workers were killed along the Central Pacific railroad line in the Sierra Nevadas while transporting nitroglycerine.

The 15 tunnels along the Central Pacific line required massive amounts of explosives to blast through solid granite. In addition to nitroglycerine, crews used as many as 500 kegs of black powder a day.

Document 11

A modified excerpt of the Pacific Railway Act that was signed into law by President Abraham Lincoln on July 1, 1862. This act provided Federal government support for the building of the railroad. The full text of the act can be found here: <https://memory.loc.gov/cgi-bin/ampage?collId=llsl&fileName=012/llsl012.db&recNum=520>

Pacific Railway Act

Hereby created is "The Union Pacific Railroad Company" and the said corporation is hereby authorized to lay out, locate, construct, furnish, maintain, and enjoy a continuous railroad and telegraph from a point on the one hundredth meridian of longitude west in the Territory of Nebraska to the western boundary of Nevada Territory. The capital stock of said company shall consist of one hundred thousand shares of one thousand dollars each with not more than two hundred shares held by any one person.

Writing Your Letter

Now it's time to use your evidence as you build your case for the "moonshot" you propose.

Use this to organize your thoughts before you write your own letter or other product.

Dear _____,

I am writing today because I think__ (describe the issue or idea you have)_____

You may think this would be impossible, but we have done great things in the past that seemed impossible. For example, when we went to the moon, people thought _____

Even one hundred years before the moonshot, we did something a lot of people thought was impossible. We built

It required a lot of the same things as going to the moon. For example, _____

My teacher says we can learn from history, and I think that history teaches us _____

I hope you will consider my idea for the next moonshot!

Sincerely,





Lesson plans on the Transcontinental Railroad created with the support of Spike150, the Utah Division of State History, and Utah Council for the Social Studies.

