Beginnings of U.S. Commercial Airline Service

Session Time: One, 50-minute session

DESIRED RESULTS

ESSENTIAL UNDERSTANDINGS

Appreciate the rich, global history of aviation/aerospace and the historical factors that necessitated rapid industry development and expansion. (EU1)

Understand the operational differences between general, commercial, and military aviation as well as how these differences influence the modern aviation/aerospace industry. (EU2)

Appreciate the global nature of the modern aviation/aerospace industry and embrace the discovery and inclusion of cultures outside the learner's typical experience. (EU7)

ESSENTIAL QUESTIONS

1. What factors led to the establishment of the St. Petersburg-Tampa Airboat Line?
2. Was the St. Petersburg-Tampa Airboat Line a case of "necessity being the mother of invention"?

LEARNING GOALS

Students Will Know

- The factors that led to the establishment of the first commercial airline service
- The causes and effects of the creation of the first commercial airline service

Students Will Be Able To

- *Identify* and *summarize* the origins of commercial airline service (DOK-L2)
- *Summarize* how lessons learned from the first failed airline service pointed the way to modern commercial airline flight (DOK-L2)

ASSESSMENT EVIDENCE

Warm-up
Students will discuss with a partner what they would have expected in terms of comfort, safety, speed and amenities if they were passengers on the first commercial airline flight.

Formative Assessment
Students will complete a Think-Pair-Share exercise that asks them to compare modern airline service to the first commercial flights.

Summative Assessment

Students will answer two questions that demonstrate their understanding of how the failings of the first commercial service points the way to successful airlines today.

LESSON PREPARATION

MATERIALS/RESOURCES

- Beginnings of U.S. Commercial Airline Service Presentation
- Beginnings of U.S. Commercial Airline Service Student Activity

LESSON SUMMARY

Lesson 1 - Beginnings of U.S. Commercial Airline Service
Lesson 2 - Aviation and World War I
Lesson 3 - Airmail and the Transcontinental Airway System

This lesson focuses on the beginnings of commercial airline service. As a warm-up, students will examine the features of the first commercial airplane and describe what they might have expected if they were passengers on the first airline flight.

The teacher then will facilitate a classroom discussion on the features of the first commercial flight and how the first commercial airline was structured. Students will participate in a Think-Pair-Share activity that asks them to compare modern airline service to the first commercial flights.

Next, the teacher will lead an exercise discussing what the first commercial airlines lacked, yet needed, to become viable. A summative assessment will demonstrate their understanding of how the failings of the first commercial service points the way to successful airlines today.

BACKGROUND

The first commercial airline flight took place before World War I on January 1, 1914. The flight started in St. Petersburg, Florida, and went across the bay to Tampa, Florida. Before the flight, people often traveled across the bay by boat. The flight reduced the travel time from 2 hours to 23 minutes. The first seat on the flight was auctioned to the highest bidder for $400, which is the equivalent of thousands of dollars today.

DIFFERENTIATION

To promote reflective thinking and guided inquiry in the **ENGAGE** and **EXPLAIN** sections of the lesson plan, circulate around the classroom and assist students who might have trouble coming up with ideas for the small group discussion. Ask questions that provoke their own ideas for possible answers.

To support verbal reasoning in the student activity in the **EXTEND** section, organize the class into groups for Think-Pair-Share instead of a whole group discussion. This allows learners to think about the question, discuss their thoughts with a partner before sharing with the larger group. It encourages all students to participate and practice skills, including metacognition.

LEARNING PLAN

ENGAGE

Teacher Material: Beginnings of U.S. Commercial Airline Service Presentation

Slides 1-3: Introduce the topic and learning objectives for today's lesson.

Slides 4-5: Conduct the **Warm-up.**

For this warm-up activity, ask students to examine the features of the first commercial airplane, the Benoist Model XIV Airboat, and have them describe what they would have expected if they were passengers on the first commercial airline flight. Collect student papers for grading. Take no more than 5 minutes of class time to complete the warm-up.

[DOK-L3; formulate, hypothesize]

Student responses may include limited space for seating and luggage, a bumpy ride because the airplane flew so low over the water, noisy and breezy due to the open cockpit, no amenities expected given there was room for just one passenger, and a relatively short flight compared to today's standards because of the slow flying speed.

Warm-Up

Explain the warm-up exercise using slide four and then allow students to view a photo of the Benoist Model XIV on slide five. Ask students to discuss with a partner what they would have expected in terms of comfort, safety, speed and amenities if they were passengers on the first commercial airline flight. Then have students write two to four complete sentences with their answers.

Facilitate a classroom discussion about the students' own experiences flying on the airlines. Ask if they remember their first flights and thoughts surrounding those flights. Additional discussion topics may include the length of the flights, reasons for the travel, their airport and flight experiences, destinations, and types of aircraft flown.

EXPLORE

Teacher Material: Beginnings of U.S. Commercial Airline Service Presentation

Slide 6: Use this slide to transition to talking about the Benoist Model XIV Airboat, the aircraft used in the first commercial flight.

Slide 7: Show students the following video as an introduction to the Benoist Model XIV Airboat.

- "Kermit Weeks re-creates first historical commercial flight across the bay - Fantasy of Flight" (Length 2:38) http://video.link/w/IvNd

The video summarizes the history of the first commercial flight, and introduces us to Kermit Weeks of Fantasy of Flight who recreated the Benoist Model XIV Airboat in 2013. While Weeks was unable to fly his recreation across the bay on January 1, 2014 to commemorate the 100 year anniversary of this flight, he was able to complete the remodel and get it running.

Slide 8: Review the statistics about the airplane with students. Emphasize that this was a "flying boat." Point out the size of the aircraft (very large) and its capabilities: relatively high speed for the time period, but very low altitude. Ask students how these factors might have affected the viability of this airplane for commercial air service. Point out that the low altitude was a very limiting factor. How many places in the U.S. could you fly at a height of 50′ without running into anything?

Slide 9: Point out that the Benoist Model XIV Airboat had one of the most powerful engines available in it's day. Ask students what advantages exist in an aircraft with more horsepower and what benefits and potential downsides come with more power?

It might seem obvious to students that an aircraft with more horsepower would be faster. That's not necessarily true, though. Sometimes more horsepower is needed simply because the aircraft is larger, thus more energy is required to move it and help it sustain flight. If an aircraft engine generates more horsepower, it stands to reason that the engine will also require more fuel to operate. Fuel has weight, which then increases the total aircraft weight that must be accelerated for flight. Simply speaking, more horsepower isn't necessarily equated to more speed, and other design considerations have to be taken into account as well.

EXPLAIN

Teacher Material: Beginnings of U.S. Commercial Airline Service Presentation
Student Material: Beginnings of U.S. Commercial Airline Service Student Activity

Slide 10: Present slide "The Flight" to students, providing details about where and when the first commercial flight took place. Ask students why this area would have been particularly hard to navigate. Point out the comparison between the flight time to Tampa versus the time to travel via other modes of transportation to the same destination. Note that well-maintained roads were not common in the U.S. at this time.

Ask students what a drawback to the destinations might have been. If they are unsure, focus on the fact that it only went to St. Petersburg and Tampa, Florida.

Slide 11: Cover additional details about the first commercial airline flight. Ask students what they think had happened in aviation since the Wright brothers' first flight that would have made this possible. Explain that the cost of the ticket ($5,000 in today's money) shows what a rare experience flying on an airplane was.

Slide 12: Review facts about the airline with students, placing it in the overall context of a viable business model. The St. Petersburg-Tampa Airboat Line only lasted four months. Because it could carry only one passenger at a time, it was not profitable and would have needed government help or much more regular use by tourists to be a viable business.

Nevertheless, it did transport more than 1,200 passengers within those four months! Explain that the service expanded to five cities, with two aircraft. Point out the lack of interest from some investors. Elicit ideas as to why investors in one area might have been less interested from those in another (more transportation options, more people with bad experiences, a larger metropolitan area leading to less need to travel).

Slide 13:Transition to the student activity by discussing limiting factors with students. Define business model (a plan for a business's operations, including revenue sources) and have students point out limitations to the viability of the first commercial airline business model (primarily, lack of scale, location, and destinations). Use the questions on the "Limiting Factors" slide to provoke student comment.

Slide 14: Conduct the **Formative Assessment.**

Collect student papers when they are completed for grading. Take no more than 5 minutes of class time to complete the assessment. [DOK-2; *estimate*; *predict*]

Questions

Possible answers include:

Benefits of modern airline service that the first airline did not have:

Speed, ability to travel long distances, cargo capacity, passenger capacity, affordability, ease of booking, quiet, ability to connect to the internet in flight, in-flight entertainment

Ability to take advantage of these benefits:

In almost all cases, these benefits are included in the standard level of service with all airlines today. It's never been easier to book flights, stay connected in the air, and airlines are flying the most modern aircraft available.

Formative Assessment

Provide students with **Beginnings of U.S. Commercial Airline Service Student Activity**. Lead students in a Think-Pair-Share activity which asks students to list and describe three benefits of modern airline service that the first airline did not have. As a follow-up, ask how easy or difficult it is for passengers to take advantage of these benefits today? Pair students up with one another and have them discuss their answers with their partners before sharing with the class.

Teaching Tips

Optional Approach: You may conduct this activity as one large class discussion instead if a Think-Pair-Share exercise.

EXTEND

Teacher Material: Beginnings of U.S. Commercial Airline Service Presentation

Slides 15-16: To begin the discussion, ensure students have an understanding of why the first airline failed. Further the discussion on slide 16 by discussing major factors involved in airline profitability.

EVALUATE

Teacher Material: Beginnings of U.S. Commercial Airline Service Presentation

Slide 17: Conduct the **Summative Assessment.**

Take no more than 10 minutes of class time to complete the assessment. [DOK-3; *explain phenomena in terms of concepts*]

Questions

Possible answers include:

Why did the first commercial airline fail?

The business model was unsustainable. Very difficult to make a profit (the first flight was in a flying boat and carried only one passenger); needed ability to mass produce aircraft; needed the ability for aircraft to carry more passengers; and needed the development of an airport system across the United States.

What makes a modern airline successful?

Stable population to serve (and permanency of residents), access to numerous aircraft (need for mass production of aircraft in the United States), ability for aircraft to carry numerous passengers and carry large quantities of cargo, must ensure passenger safety, operate at a positive margin, must have destinations and a network of airports.

Summative Assessment Scoring Rubric

- Follows assignment instructions
- Writing indicates
    - Understanding of the causes of the failure of the first commercial airline.
    - Understanding of the factors that make modern airlines successful

Points	Performance Levels
9-10	Consistently demonstrates criteria
7-8	Usually demonstrates criteria
5-6	Sometimes demonstrates criteria
0-4	Rarely to never demonstrates criteria

Summative Assessment

Working individually, ask students to write at least one paragraph for each of the following questions:

- Why did the first commercial airline fail?
- What makes a modern airline successful?

GOING FURTHER

Research the training and experiences of the first commercial pilot, Tony Jannus, and compare and contrast his background with the requirements for becoming a pilot today.

Learn about the first commercial flights in other countries and how these flights compared with the flight in the U.S..

STANDARDS ALIGNMENT

NGSS STANDARDS

Three-dimensional Learning

- **HS-ETS1-1** - Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
    - Science and Engineering Practices
        - Asking Questions and Defining Problems
        - Constructing Explanations and Designing Solutions
    - Disciplinary Core Ideas

        - ETS1.A: Defining and Delimiting Engineering Problems
    - Crosscutting Concepts
        - Systems and System Models
        - Influence of Science, Engineering, and Technology on Society and the Natural World
- **HS-ETS1-2** - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
    - Science and Engineering Practices
        - Constructing Explanations and Designing Solutions
    - Disciplinary Core Ideas
        - ETS1.C: Optimizing the Design Solution
    - Crosscutting Concepts
        - none
- **HS-ETS1-3** - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
    - Science and Engineering Practices
        - Constructing Explanations and Designing Solutions
    - Disciplinary Core Ideas
        - ETS1.B: Developing Possible Solutions
    - Crosscutting Concepts
        - Influence of Science, Engineering, and Technology on Society and the Natural World

COMMON CORE STATE STANDARDS

- **RST.9-10.2** - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
- **RST.9-10.4** - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- **RST.9-10.7** - Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- **WHST.9-10.2** - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
- **WHST.9-10.4** - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- **WHST.9-10.6** - Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

- **WHST.9-10.7** - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

- **WHST.9-10.8** - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

- **WHST.9-10.9** - Draw evidence from informational texts to support analysis, reflection, and research.

REFERENCES

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