Flight in Greek Mythology

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)

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 are the earliest recorded inspirations of flight for humans?
2. What about flight spurs human imagination?

LEARNING GOALS

Students Will Know

- The Daedalus myth and its significance for human flight
- Myths about flight from other cultures
- How Greek myths extend into early attempts for human flight

Students Will Be Able To

- *Infer* what motivated people to want to fly before the invention of airplanes. (DOK-L2)
- *Describe* and *summarize* the earliest attempts of human flight based on the images of animals in flight (DOK- L2)

ASSESSMENT EVIDENCE

Warm-up
Ask students to describe how myths may have inspired human flight.

Formative Assessment
Students work in small groups to design a flying device that would enable a human to experience flight long before airplanes were invented.

Summative Assessment
Students answer questions about the earliest thoughts of human flight and what motivated people to fly.

LESSON PREPARATION

MATERIALS/RESOURCES

- Flight in Greek Mythology Presentation
- Flight in Greek Mythology Student Activity
- Flight in Greek Mythology Teaching Aid

LESSON SUMMARY

Session 1: Flight in Greek Mythology

Session 2: Da Vinci and His Flying Machines

This lesson will begin with students asked to describe the purpose of myths and how myths may have inspired human flight. Students will then be introduced to one of the earliest tales of flying, the Greek myth about Daedalus and his son, Icarus. After viewing a video about Daedalus and Icarus, students will be presented with the emphasis placed on STEM concepts throughout the history of Greece as well as some of the major figures in Greek history and the contributions they made to science, mathematics, and engineering. Students are then asked to design a device that would allow human flight in ancient times.

Finally, students complete an exercise in which they summarize what they have learned throughout the lesson, speculate about the motivations that existed for people in ancient times to fly, and how early attempts at flight that were based on images of animals.

BACKGROUND

This story has woven a common theme throughout the history of flight. Daedalus and Icarus tried to escape the island of Crete after being put into prison by King Minos. They flew to freedom using wings made of feathers and held together by wax. Icarus ignored his father's warning not to fly too close to the sun. The wax in his wings melted, and he fell into the sea and drowned.

DIFFERENTIATION

To support verbal reasoning in the **ENGAGE** 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.

To support student motivation in the **EXTEND** section, allow students to perform a gallery walk of the flying devices. Allowing learners to contribute ideas and interact with others fosters motivation for learning and builds confidence. It also promotes positive interaction through visual and auditory exchange of ideas.

LEARNING PLAN

ENGAGE

Teacher Material: Flight in Greek Mythology Presentation

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

Slide 4: Conduct the **Warm-up.**

Warm-Up

Ask students about the purpose of myths and how myths may have inspired human flight. Take no more than five minutes of class time for this warm-up. Possible answers to this warm-up include:

Myths taught life lessons or morals to be learned or studied. Myths may have encouraged people to think big and attempt feats that may have seemed impossible - like flying must have long before the airplane was invented. [DOK 1, infer]

EXPLORE

Teacher Material: Flight in Greek Mythology Presentation, Flight in Greek Mythology Teaching Aid

Slide 5: Introduce the main characters of the "Icarus and Daedalus" myth by Josephine Preston Peabody. The myth is reproduced in the Teaching Aid if you choose to have students read the text.

Slide 6: Students will watch a video that introduces band the myth.

- "The Flight of Icarus (Daedalus and Icarus) Greek Mythology" (Length: 5:08) https://video.link/w/00Fkc
- For teachers unable to access VideoLink links, the video is also available here: https://www.youtube.com/watch?v=3s2QPQnuaGk

Teaching Tips

It is recommended that the teacher preview the video prior to showing students.

Note that the first three minutes of the video give background information about Daedalus. The portion related to flight begins at about 3:05.

Slides 7-8: Review the main points of the myth of Icarus and Daedalus. Students should leave this discussion thinking that this myth started curiosity and wonder about flight and thinking about how to overcome the laws of nature to achieve it.

EXPLAIN

Teacher Material: Flight in Greek Mythology Presentation

Slide 9: Review what a myth is with students. After reviewing this information, ask students what other myths, or characters from myths, they can remember. They may mention Hercules, Mulan, Pegasus, Zeus, Apollo, King Midas, Cyclops, the Iliad, etc.

Point out to students that myths are not always positive, they often include a lesson or serve as a warning. Roman myths often borrow characters from Greek mythology, which came 1000 years after the Greeks.

Slides 10-11: Present the slides regarding Greece as the home to deep thinking about STEM concepts like mathematics and various areas of science and engineering. While first thoughts of flight originate in various primitive cultures, flight innovations started in Greece.

Plato was a student to Socrates, opened an Academy. Aristotle was a student to Plato for 20 years and the tutor of Alexander the Great. Aristotle was interested in mathematics, physics, biology, study of logic.

Pythagoras is first credited for writing mathematical formulas and the Pythagorean Theorem, "The square of the longest side on any right triangle is equal to the sum of the squares of the other two sides." Euclid was known for his work in mathematics and geometry, was the author of *The Elements,* the most widely used mathematics and geometry textbook in history.

Archimedes was a mathematician and engineer, and the son of an astronomer. Archimedes developed a relationship between the ratio of a circle to its circumference that is a very close approximation to what we know as "pi" today. It was Archimedes who first developed the "Law of the Lever and Balance."

EXTEND

Teacher Material: Flight in Greek Mythology Presentation

Slide 12: Conduct the **Formative Assessment.**

Before collecting each group's designs, ask volunteers to share their work with the class. This activity should take no more than 10 minutes to complete and is worth up to 10 points. [DOK 3; construct, hypothesize, DOK 4; design]

Formative Assessment

Working in groups of two or three, ask groups to imagine living centuries ago, before man officially took flight. Ask students to create some kind of device that would enable a human to experience flight, even if the flight time is brief. Have students design a flying device and how they would safely test it. Groups can draw and label their design or write their design in words.

EVALUATE

Teacher Material: Flight in Greek Mythology Presentation
Student Material: Flight in Greek Mythology Student Activity

Slide 13: Conduct the **Summative Assessment.**

Collect the assessment from the students at the end of class. Use the *Summative Assessment Rubric below* for scoring. [DOK 1; recall, DOK 2; draw conclusions]

Summative Assessment

Provide each student a copy of **Flight in Greek Mythology Student Activity**. Ask students to answers the questions using one to three sentences. Have students complete the assessment individually. Allow them to use their own notes to complete the assessment.

Summative Assessment Scoring Rubric

- Follows assignment instructions
- Answers show evidence of one or more of the following:
    - The roots of STEM in Greek history
    - Knowledge of the myth of Icarus and Daedalus

- Ability to infer people's motivation for flight

- Shows understanding of concepts covered in the lesson.

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

GOING FURTHER

Show a video that helps students see that other primitive cultures, not just the Greeks, had their own flying myths and were interested in understanding flight.

- "Toni Morrison on Myth and Flying Africans." (Length 1:47) http://video.link/w/AIJd

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.9-10.1** - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- **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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