

Aviation

with Cranfield University

Talking points

Knowledge

1. When was the first powered flight?

Comprehension

2. How do aviation students at Cranfield University benefit from the National Flying Laboratory Centre (NFLC)?
3. Why does the NFLC use a real plane for its flying classroom, rather than a flight simulator?

Application

4. What new skills do you think will be needed within aviation as the industry adapts to address challenges surrounding its sustainability?
5. Given that hydrogen gas is extremely flammable, what challenges do you think aeronautical engineers must overcome when designing hydrogen powered aircraft and the infrastructure needed to accommodate them?
6. The explosion of the Hindenburg, a hydrogen-filled airship, in 1937 led to fears over the safety of hydrogen as a fuel. How do you think today's public will react to hydrogen powered aircraft? How do you think the aviation industry could relieve any fears and mitigate any resistance to future hydrogen powered aircraft?

Analysis

7. In what ways does aviation 'connect the world'?
8. Why is sustainability such an important issue in the aviation industry?
9. Why is safety such an important issue in the aviation industry?
10. Why do you think Sarah monitors aviation incidents in other parts of the world?
11. How do you think composite materials can improve the environmental impacts of aviation?

Evaluation

12. Of the many careers in aviation, which most interests you, and why?
13. As travelling by plane is significantly safer than travelling by car, why do you think many people are afraid of flying?
14. What strategies do you think will be most effective for reducing the environmental impacts of the aviation industry, and why?
15. To what extent do you agree that carbon offsetting is a viable solution to the environmental impacts of flying? What arguments (relating to physical processes, technology, government regulations and human behaviour) can you think of, both for and against carbon offsetting?

Activities

1. Careers in aviation

Design a stall for a school careers fair to promote and educate your classmates about careers in aviation. Use information from the article and any additional information you find online to create an eye-catching stall that highlights the wide range of opportunities available in the aviation industry.

You could include:

- Posters summarising what different aviation careers involve
- Information about the education and training pathways to different aviation careers
- Profiles of people working in different areas of aviation
- Statistics about the aviation industry and jobs in the sector
- Interactive elements to engage people with the information you are providing

Ask fellow students to visit your stall and be prepared to answer any questions they have. Can you convince them to pursue a career in aviation?

Extension:

Choose a specific career in aviation and design a short presentation to encourage your classmates to consider this career path. Your presentation should:

- Explain the responsibilities and day-to-day activities of someone working in this role
- Outline the qualifications needed and any specific training requirements
- Highlight the rewards of working in this career

Deliver your presentation to your class. Can you convince them to pursue this career in aviation?



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2. Aircraft of the future

The aviation industry has declared it will reach net-zero by 2050, meaning it will not release more carbon dioxide than it removes from the atmosphere. This article explains more about the industry's sustainability ambitions:

www.weforum.org/agenda/2022/12/aviation-net-zero-emissions

Use the internet to explore the latest research and technology for making the aviation industry more sustainable. This could include:

- Zero-emissions fuels
- Fuel efficiency
- Aircraft design
- Flight paths and profiles
- Human behaviour

Use this research to design an 'aircraft of the future' that incorporates a range of these innovations. Draw an annotated illustration of your aircraft that explains its features and how they will contribute to improved aviation sustainability.

Compare your ideas with those of your classmates. Which ideas do you think have the most potential for feasibly helping aviation reach net-zero?

Extension:

Consider the logistical challenges and practical impacts of your innovations. For example, will

changes to aircraft also require changes to airports and other infrastructure? Will flights themselves (e.g., paths and profiles) change? Will the passenger experience change and what will people likely think about this? Will costs increase to manufacture or maintain aircraft? What will happen to the existing

fleet – can current planes be retrofitted, or do they need to be retired?

For each challenge you identify, can you think how it could be overcome?

More resources

- Visit the team's Futurum webpage to find an animation, podcast and PowerPoint about careers in aviation: www.futurumcareers.com/flying-high-with-careers-in-aviation
- This blog article from Thomas explains how zero-emissions air travel could become a reality within 20 years in the UK: www.blogs.cranfield.ac.uk/transport-systems/how-zero-emissions-air-travel-can-be-a-reality-in-the-uk-within-20-years
- This blog article from a student at Cranfield University describes their experience of flying in one of the NFLC's light aircraft as part of their studies: www.blogs.cranfield.ac.uk/aerospace/student-flight-experience-a-new-perspective-from-the-sky
- Learn more about how aeronautical engineers are improving aircraft efficiency by changing wing designs in this Futurum article: www.futurumcareers.com/how-can-wing-design-improve-aircraft-flight
- Green Sky Thinking is a YouTube channel that examines how aviation could improve its sustainability: www.youtube.com/@GreenSkyThinking/videos
- This article introduces an array of possible careers in the aviation sector, and their requirements: www.thebestschools.org/careers/career-guide/aviation-careers