

Entry, Descent, and Landing Aerothermodynamics at NASA Langley

Aerospace Engineering · Answer Key · 8 Questions

1. What is the primary focus of the research conducted at NASA Langley regarding EDL vehicle geometries?

- A) High lift-to-drag ratios
- B) Mid to low lift-to-drag ratios**
- C) Winged craft only
- D) Propulsion-only systems

2. Which of the following is NOT listed as a key area of the aerothermodynamic environment?

- A) Fluid mechanics
- B) High-temperature thermodynamics
- C) Astrophysics**
- D) Heat-transfer

3. According to the text, what has become the primary tool for the design and development of EDL missions due to its lower cost compared to flight-testing?

- A) Wind tunnel testing
- B) Computational Fluid Dynamics (CFD)**
- C) Scale modeling
- D) Manual calculations

4. Why is wind tunnel testing still considered critical despite the advancement of CFD?

- A) It is cheaper than CFD
- B) It provides data for complex phenomena that CFD cannot accurately model**
- C) CFD is no longer used by NASA
- D) Wind tunnels are required by international law

5. Which of these is a complex phenomenon that requires wind tunnel testing for accurate definition?

- A) Simple atmospheric density
- B) Boundary-layer transition**
- C) Constant velocity flight
- D) Standard orbital mechanics

6. NASA Langley provided aerothermodynamic support for which of these historical programs?

A) Gemini-Mercury-Apollo

B) The Wright Brothers' flights

C) Sputnik

D) The International Space Station interior design

7. Which recent programs are mentioned as having benefited from LaRC experimental capabilities?

A) Mars Science Laboratory and Orion

B) Voyager and Pioneer

C) Hubble Space Telescope

D) James Webb Space Telescope

8. What is a secondary role of wind tunnel testing mentioned in the text?

A) Replacing all human engineers

B) Producing high-fidelity data for computational model validation

C) Creating marketing materials for NASA

D) Replacing flight-testing entirely