

WORLD SPACE WEEK 2026

Space Extempore Competition

SCHOOL-LEVEL COMPETITION

ORGANISED BY



COLLABORATION & AFFILIATIONS



OFFICIAL COMPETITION GUIDELINES

Technical Specifications, Rules & Regulations, and Judging Criteria

Document Type	Competition Guideline — Official Release
Category	School Level
Event Window	4th October 2026
Venue	Haldwani, Uttarakhand
Organized By	Astroverse Experience Pvt Ltd

1. PREAMBLE & PURPOSE

The **Space Extempore Competition 2026** is a senior-school-level speaking competition conducted as part of **World Space Week 2026**, designed to develop students' ability to think critically, communicate clearly and respond intelligently to emerging developments in rocket science and space exploration.

The overarching theme of the competition is:

ROCKET REVOLUTION

The theme represents the rapid transformation of rocket technology—from conventional expendable launch vehicles to **reusable rockets, autonomous landing, advanced propulsion, commercial launch systems, lunar exploration, human spaceflight and increasingly complex space missions**.

The competition is designed to test not simply a student's memory of space facts, but their ability to:

- Understand a contemporary aerospace issue.
- Form an opinion or argument.
- Think under time pressure.
- Connect science and technology with real-world consequences.
- Explain complex rocket-related topics in language appropriate for an audience.
- Respond intelligently to both **successful and unsuccessful rocket missions**.

Recent Indian missions provide particularly relevant real-world examples. ISRO's official records, for instance, document the **PSLV-C61/EOS-09 mission anomaly in May 2025**, while the 2025 Indian Space Situational Awareness Report records the mission as a third-stage anomaly resulting in a suborbital flight. ([ISRO](#))

The competition therefore treats **failure not as a taboo subject, but as an important part of engineering learning**.

2. OBJECTIVE

The primary objective of the Space Extempore Competition is to encourage senior-school students to develop:

- Scientific awareness
- Public speaking ability
- Critical thinking
- Spontaneous reasoning
- Argument-building skills
- Space-science literacy

- Awareness of current aerospace developments
- Ability to analyse technological successes and failures
- Confidence in presenting complex ideas clearly

The competition particularly encourages students to move beyond:

“What happened?”

towards:

“Why did it happen?”

“What can we learn from it?”

“What should engineers do differently?”

3. ELIGIBILITY

- **Competition Category:** Senior School
 - Recommended level: **Classes 6–12**
 - Each participant competes individually.
 - Participants must be officially registered for the competition.
 - Participants must comply with all instructions issued by the Organizing Committee and Judging Panel.
 - The speech must be delivered in the language specified by the Organizing Committee.
 - No participant may receive assistance from another person during preparation or delivery.
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4. THEME

ROCKET REVOLUTION

The competition will explore the transformation of rocket technology and the rapidly changing launch ecosystem.

The theme may include, but is not limited to:

Rocket Technology

- Reusable launch vehicles
- Multi-stage rockets
- Heavy-lift launch vehicles
- Small-lift launch vehicles

- Autonomous landing
- Precision landing
- Advanced propulsion
- Electric propulsion and its role in space transportation
- Cryogenic propulsion
- Methane-based propulsion
- Air-breathing propulsion concepts
- Nuclear propulsion concepts
- Green propulsion
- Additive manufacturing in rocket engineering

Launch Systems

- Commercial launch vehicles
- Private space companies
- Low-cost access to space
- Small satellite launchers
- Rapid launch capability
- Responsive launch systems
- Launch-site infrastructure
- Automated launch operations

Reusability

- Reusable boosters
- Reusable upper stages
- Rapid refurbishment
- Propellant economics
- Landing technology
- Reusability versus expendable launch vehicles
- Environmental and economic implications of frequent launches

Exploration

- Moon missions
- Mars missions
- Human spaceflight
- Lunar bases
- Space stations
- Deep-space transportation
- Commercial spaceflight
- Space tourism
- Interplanetary transportation

Emerging Rocket Concepts

- Fully reusable launch vehicles
- Point-to-point rocket transportation

- Autonomous flight termination and safety systems
 - Artificial intelligence in launch operations
 - Digital twins for rocket development
 - Advanced simulation and model-based systems engineering
 - Autonomous navigation
 - Smart propulsion systems
 - Rocket health monitoring
 - In-flight fault detection
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5. FAILURE, ANOMALY & LESSONS-LEARNED TOPICS

A defining feature of this competition is that **rocket failures and mission anomalies may also form the basis of the extempore topics.**

Students should understand that aerospace engineering advances not only through successful missions, but also through systematic investigation of failures.

For example, ISRO reported that **PSLV-C61/EOS-09 performed normally through the second stage but encountered an anomaly during the third-stage operation, resulting in the mission not being accomplished.** A national-level committee investigated the anomaly, after which a modified HPS3 motor was developed and successfully static-tested. ([ISRO](#))

Similarly, ISRO's records identify **GSLV-F10/EOS-03 (2021)** as an unsuccessful mission. ([ISRO](#))

Possible failure-oriented topics may therefore include:

- **What can a failed rocket teach us that a successful launch cannot?**
- **Should rocket failures be considered an essential part of innovation?**
- **Why do rocket engines fail?**
- **The importance of third-stage performance in a multi-stage launch vehicle**
- **How failure investigation improves future rockets**
- **Should a launch be delayed even when the probability of failure is low?**
- **Engineering risk versus mission ambition**
- **The role of redundancy in rocket systems**
- **Human error versus design error in aerospace failures**
- **What happens after a rocket fails? The importance of root-cause analysis**
- **Should governments publicly disclose detailed rocket failure investigations?**
- **Can AI predict rocket failures before launch?**

These topics should encourage **analysis rather than blame.**

6. COMPETITION FORMAT

The competition will follow an **extempore speaking format**.

Step 1 — Participant Registration

Participants report to the designated venue and complete verification.

Step 2 — Topic Selection

A participant will be provided with an official topic from the approved **Rocket Revolution** topic pool.

The Organizing Committee may use:

- Random topic selection
- Topic draw
- Digital randomisation
- Judge-assigned topic

The exact mechanism will be communicated before the competition begins.

Step 3 — Preparation

After receiving the topic, the participant will receive a **short preparation period**, as specified by the Organizing Committee.

During preparation, the participant may:

- Think through the issue.
- Structure arguments.
- Recall relevant scientific information.
- Prepare a logical sequence for the speech.

Step 4 — Extempore Speech

The participant delivers an individual speech before the judging panel.

The speech must address the assigned topic directly.

Step 5 — Evaluation

Judges evaluate the participant based on:

Content + Understanding + Reasoning + Relevance + Delivery + Spontaneity

7. NATURE OF THE TOPICS

Topics will be designed to require **thinking, not memorisation**.

They may take one of several forms.

A. OPINION-BASED

Example:

**“Reusable rockets are the biggest revolution in space transportation.”
Discuss.**

The participant must develop and defend a position.

B. PROBLEM-SOLVING

Example:

“A rocket repeatedly fails during upper-stage operation. What should engineers investigate first?”

The participant should demonstrate engineering reasoning.

C. DEBATE-STYLE

Example:

“Rocket reusability should be prioritised over maximum payload capacity.”

The participant may argue for or against the proposition.

D. FAILURE ANALYSIS

Example:

“A launch vehicle reaches the third stage but fails to inject its payload into orbit. What could have gone wrong?”

The participant should discuss possible causes and lessons.

E. FUTURE-LOOKING

Example:

“What will the rocket of 2047 look like?”

The participant should combine imagination with technological reasoning.

F. SCIENCE & SOCIETY

Example:

“Should access to space become as routine as air travel?”

The participant must consider technological, economic and societal dimensions.

8. WHAT YOU NEED TO DO

8.1 Understand the Topic

The first responsibility of the participant is to identify exactly what the topic is asking.

For example:

“Are reusable rockets the future?”

is different from:

“Are reusable rockets economically sustainable?”

A strong speaker should address the **specific question**, not simply speak about rockets generally.

8.2 BUILD A CLEAR ARGUMENT

Participants should ideally structure their speech around:

Opening → Explanation → Argument → Evidence → Analysis → Conclusion

A simple framework could be:

WHAT?

What is the issue?

WHY?

Why does it matter?

HOW?

How does the technology or system work?

SO WHAT?

What are its implications?

WHAT NEXT?

What should happen in the future?

8.3 USE SCIENTIFIC REASONING

Participants are encouraged to use relevant:

- Scientific principles
- Rocket-engineering concepts
- Mission examples
- Real-world evidence
- Historical context
- Current developments

However, **accuracy is more important than the number of facts used.**

8.4 DISCUSS FAILURE INTELLIGENTLY

When the topic concerns a failed mission, participants should avoid simply stating:

“The rocket failed.”

Instead, discuss:

Failure → Cause/possible cause → Investigation → Lesson → Corrective action → Future implication

This mirrors the engineering approach to failure analysis.

For example, ISRO's response to the PSLV-C61 anomaly involved a national-level investigation followed by redesign and static testing of a modified third-stage motor. ([ISRO](#))

8.5 CONNECT TECHNOLOGY TO HUMANITY

Strong participants should be able to connect rocket technology with broader questions:

- What does cheaper access to space mean?
 - Can reusable rockets reduce launch costs?
 - What does frequent launch activity mean for space sustainability?
 - Can rockets support lunar infrastructure?
 - How could rockets contribute to India's long-term space ambitions?
 - Can emerging launch technologies make humanity a multi-planetary civilisation?
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9. REFERENCE TOPIC BANK

The following topic bank is provided to help participants **prepare**, but the actual competition topic may be different.

A. REUSABLE ROCKETS

1. Are reusable rockets the biggest revolution in launch technology?
 2. Is reusability more important than maximum payload capacity?
 3. Can fully reusable rockets make space travel routine?
 4. Is rocket refurbishment the real challenge of reusability?
 5. Will reusable upper stages become necessary for future deep-space missions?
 6. Reusable rockets: engineering breakthrough or economic necessity?
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B. ROCKET PROPULSION

7. Is methane the fuel of the next generation of rockets?
8. Can green propulsion make spaceflight more sustainable?
9. Are cryogenic engines still the best solution for heavy-lift rockets?
10. What could replace conventional chemical propulsion?
11. Could nuclear propulsion revolutionise Mars missions?
12. Why is rocket propulsion one of the hardest engineering problems?
13. Electric propulsion is efficient—but can it replace chemical rockets?
14. The future of air-breathing rocket propulsion.

C. AUTONOMOUS ROCKETS

- 15. Should rockets be capable of diagnosing their own failures?
 - 16. Can artificial intelligence make rocket launches safer?
 - 17. Should AI be allowed to make critical launch decisions?
 - 18. Autonomous landing: the next major step after rocket reusability.
 - 19. Can a rocket learn from its previous flight?
 - 20. Digital twins: can we test a rocket without launching it?
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D. MULTI-STAGE ROCKETS

- 21. Why do rockets need multiple stages?
 - 22. Could a single-stage-to-orbit rocket become practical?
 - 23. Is staging an engineering compromise or an engineering necessity?
 - 24. What makes stage separation one of the most critical moments of a launch?
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E. COMMERCIAL SPACEFLIGHT

- 25. Will private companies dominate the future of rocket launches?
 - 26. Should space transportation become commercially competitive?
 - 27. Can commercial rockets reduce the cost of scientific exploration?
 - 28. Space tourism: rocket revolution or luxury industry?
 - 29. Should governments depend on private launch providers for strategic missions?
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10. FAILURE & MISSION ANOMALY TOPIC BANK

These topics may be especially useful for preparation.

Indian Missions

- 30. What can India learn from the PSLV-C61/EOS-09 mission anomaly? ([ISRO](#))
- 31. Why should rocket failure investigations be treated as a part of engineering success?
- 32. How can a third-stage failure affect an otherwise successful multi-stage launch?
- 33. What does the GSLV-F10/EOS-03 failure teach us about launch reliability? ([ISRO](#))

34. Should India's future launch vehicles prioritise reliability over rapid development?
35. Can a failed mission accelerate technological development?

International Mission Challenges

36. What can repeated launch attempts teach us about rocket development?
 37. Should experimental rockets be judged differently from operational rockets?
 38. Is failure inevitable when developing revolutionary launch technology?
 39. How should engineers balance innovation and mission reliability?
 40. What is more important: first-flight success or rapid learning?
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11. EMERGING ROCKET TECHNOLOGY TOPIC BANK

Participants should also prepare for emerging technologies such as:

Reusability

- Rapid turnaround
- Autonomous booster landing
- Reusable upper stages
- Fully reusable launch vehicles

Propulsion

- Methane engines
- Full-flow staged combustion
- Advanced cryogenic engines
- Nuclear thermal propulsion
- Nuclear electric propulsion
- Air-breathing propulsion

Manufacturing

- 3D-printed rocket engines
- Advanced composites
- Automated manufacturing
- Digital manufacturing

Intelligence

- AI-assisted guidance
- Autonomous flight control
- Predictive maintenance
- Fault detection

- Digital twins

Operations

- Automated launch operations
- Rapid launch
- Responsive space access
- Multi-launch architectures

Sustainability

- Upper-stage disposal
 - Controlled re-entry
 - Launch debris
 - Space traffic management
 - Environmentally responsible propulsion
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12. INDIA'S ROCKET REVOLUTION

Participants should be particularly aware of India's evolving launch ecosystem.

Relevant areas include:

- PSLV
- GSLV
- LVM3
- SSLV
- Reusable Launch Vehicle technology
- RLV autonomous landing experiments
- Human-rated launch vehicles
- Gaganyaan
- Chandrayaan missions
- NISAR
- SPADEX
- Commercial Indian launch services
- Private Indian launch companies
- Small launch vehicles
- Future heavy-lift systems

ISRO's recent launch record includes **NISAR on GSLV-F16, CMS-03 and BlueBird Block-2 on LVM3 missions, and the PSLV-C62/EOS-N1 mission in January 2026**; its official mission list also records PSLV-C61/EOS-09 as not accomplished. ([ISRO](#))

India's RLV programme is another important example of the rocket revolution: ISRO's timeline records the **RLV-LEX-03 autonomous landing mission in June 2024**. ([ISRO](#))

13. HOW YOU WILL BE EVALUATED

The judging panel will evaluate participants across **five core parameters**.

1. SUBJECT KNOWLEDGE & SCIENTIFIC UNDERSTANDING — 25%
2. CONTENT & ARGUMENT — 25%
3. SPONTANEITY & CRITICAL THINKING — 20%
4. COMMUNICATION & DELIVERY — 20%
5. ORIGINALITY & INSIGHT — 10%

14. GENERAL RULES

- Participants must speak independently.
 - No participant may receive assistance during preparation or delivery.
 - Participants may not use mobile phones, internet-enabled devices or external reference material during the preparation or speaking period unless specifically permitted by the Organizing Committee.
 - Participants must address the assigned topic.
 - Deliberately changing the topic to avoid the assigned question may reduce the score.
 - Offensive, discriminatory or inappropriate language is prohibited.
 - Scientific misinformation presented knowingly may negatively affect the evaluation.
 - Participants must follow instructions from the Organizing Committee and Judging Panel.
 - The decision of the Judging Panel shall be final and binding.
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