1i1w Space Challenge

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🚀 Join the Space Challenge

How to Participate in the Challenges
Participants are invited to carefully review the challenge questions and choose the category that matches their level (Primary or Secondary).

- Primary Students: Submit creative entries including short stories and colorful drawings.
- Secondary Students: Submit a structured design or proposal, including clear explanations, simple diagrams, and innovative ideas.

All participants should:

- Answer both research and analysis questions
- Present their ideas clearly and creatively
- Include visuals such as drawings, diagrams, or tables (if needed)

Once your work is completed, send your submission to:
challenges@1i1w.com

Please include the following details in your email:

- Full Name
- Age / Grade
- Country
- Challenge Title

Timeline

- **Registration Deadline:** May 17
- **Final Submission Deadline:** June 14
- **Results Announcement:** June 21

1. Sustainable Settlement on the Moon (Artemis Moon Base Challenge)
Research Question:
Why has NASA chosen the Moon's south pole for building a permanent base?
What is the role of frozen water resources in permanently shadowed craters, solar energy on crater rims, and the idea of using small nuclear reactors there? How do NASA scientists plan to use these resources to provide water, oxygen, fuel, and protection for astronauts against radiation and dangerous lunar dust?

Analysis Question:
If you were to build a lunar habitat, would it be better to go beneath the Moon's surface or stay on the surface?

Analyze the advantages and disadvantages of underground habitats (inside natural caves or excavated tunnels) compared to surface habitats from these three aspects:

- Safety: Which option better protects against cosmic radiation, sharp lunar regolith, and extreme temperature fluctuations?
- Cost: Which is more expensive or cheaper in terms of transporting materials from Earth, excavation, and construction?
- Psychological impact on astronauts: What feelings might living in a dark and enclosed underground space create (loneliness, depression, lack of natural light)? What impact would a surface habitat with large windows have?

When combining these three factors, which option is more logical for long-term Artemis missions?

For Primary School Students (Drawing & Story Writing):
Imagine you are the first child astronaut in the world and you have moved to the Moon with your family!

Write a short and engaging story about a full day of your life on the Moon. When you wake up in the morning, what do you do? What strange and interesting things do you see around your home (large craters, the blue Earth in the sky, long jumps due to low gravity)? How do you feel?

Show everything with colorful and creative drawings in a way that feels like reading a real storybook about life on the Moon.

For Secondary School Students (Design & Proposal):
If you were a NASA engineer and wanted to build the first sustainable lunar habitat for 10 astronauts, what would you do?

Design a complete habitat that includes a general layout, an energy supply system (solar or nuclear), and food and oxygen production.

In your proposal, write:

- How do you identify and reduce the main risks (radiation, sharp lunar dust, temperature changes, and isolation)?
- What is your creative innovation that makes this habitat unique and smarter?
- Add your sketches, plans, and simple tables so that your proposal looks like a real NASA engineering report.

2. Mars Mission — Living in a Harsh Environment (Mars Habitation Challenge)

Research Question:
How are living conditions on Mars different from those on the Moon and Earth?
How do toxic dust and severe storms, gravity at only 38% of Earth, high cosmic radiation due to a thin atmosphere, and extremely cold temperatures create challenges compared to the Moon (which has no atmosphere) and Earth?
What important experiments has NASA conducted, such as MOXIE (producing oxygen from the Martian atmosphere) and simulation missions like CHAPEA and HI-SEAS, to prepare for real human life on Mars?

Analysis Question:
If you were on Mars and every message to Earth took 20 minutes to arrive, what impact would that have on your body and mind?
How does a 20-minute communication delay make decision-making in emergency situations more difficult, create feelings of loneliness and psychological stress, and affect astronauts' mental health?
Additionally, how do severe Martian dust storms that can last for weeks damage equipment, block solar energy, allow toxic dust into lungs, and threaten astronauts' physical health?
When these two problems (communication delay + dust storms) combine, what more serious challenges do they create for long-term missions?

For Primary School Students (Drawing & Story Writing):
Imagine you and your family boarded a spacecraft and are now the first family living on Mars! What does your home on Mars look like? (Dome-shaped, underground, or with large windows facing red mountains?)
Write a full day of your life in a short and exciting story: what do you do after waking up, what do you see outside the window, is there a dust storm or red sunlight, and how do you feel?
Show everything with colorful and creative drawings as if it were an adventurous storybook about life on the Red Planet.

For Secondary School Students (Design & Proposal):
If you were responsible for designing the first human habitat on Mars for 4 astronauts, what design would you propose?
Design a complete habitat that includes oxygen production from the Martian atmosphere, strong protection against toxic dust storms, and a practical plan for the first 30 days of life on Mars.
In your proposal, write:

- How do you manage the approximate cost of transporting equipment and construction?
- How do you reduce the main risks?
- What is your creative innovation that makes this habitat safer, smarter, or more sustainable?

Also add maps, simple designs, and a 30-day timeline so that your proposal looks like a real NASA engineering report.

3. Space Weather & Earth Protection (Space Weather Defense)
Research Question:
What happens to Earth and space during a solar storm?
How are solar storms (solar flares and coronal mass ejections) formed, how fast do they travel toward Earth, and what effects have they had on satellites, Earth's power grids, GPS systems, and even astronauts on the ISS? What real examples of these storms have NASA scientists recorded and studied so far?

Analysis Question:
Imagine that tomorrow morning the Sun produces a massive storm similar to the Carrington Event of 1859…

What dangers would it create for our modern life? The internet and communication networks might fail, GPS could stop working, city power could go out for days or weeks, airplanes and satellites could be at risk, and astronauts on the ISS could be exposed to intense radiation.

How can we prepare in advance? What roles do early warning systems, protective shields for satellites, emergency city plans, and public education play?

For Primary School Students (Drawing & Story Writing):
Imagine one morning the Sun suddenly becomes very angry and creates a huge storm!

You are the hero who saves Earth. Write a short and exciting story about how this solar storm threatens satellites, city electricity, and astronauts.

Explain what creative idea you use to save Earth and the satellites.

Show the whole story with large, colorful drawings as if it were a comic book about saving Earth.

For Secondary School Students (Design & Proposal):
If you were a NASA engineer responsible for protecting Earth from solar storms, what plan would you design?

Design a complete early warning system and protective shield for satellites or cities.

In your proposal, write:

- Analyze different emergency scenarios (such as global power outage, GPS and internet failure, or danger to ISS astronauts)
- Examine international solutions (cooperation between countries, new regulations, and division of responsibilities)
- What is your creative innovation that makes this system faster, cheaper, or more effective?

Also include diagrams, scenario tables, and a simple shield design so your proposal looks like a real space engineering report.

4. Space Agriculture — Future Food (Space Agriculture Challenge)

Research Question:
When NASA decided to grow plants in space, what interesting things happened?

How does the famous Veggie experiment on the ISS and plant growth experiments in simulated Martian soil work? What plants (such as lettuce, tomatoes, peppers, and vegetables) have been grown in space so far, and what important lessons have been learned for long-term missions to the Moon and Mars?

Analysis Question:
In a space greenhouse on the Moon or Mars, what major challenges do plants face?

Analyze limited light (weak sunlight or artificial light), very low gravity, and precise water management (where up to 95% must be recycled).

Beyond these technical challenges, how do plants improve astronauts' mental health? (The color green, the smell of soil, caring for plants, and the feeling of "life" in a harsh environment—how do these reduce stress and depression?)

For Primary School Students (Drawing & Story Writing):
Imagine you have a small magical greenhouse on the Moon or Mars!
What plants do you grow inside? (Lettuce, tomatoes, vegetables, colorful flowers, or even a small tree?)
Write a happy short story about the day you harvest your first crop: how do you feel when you see the first green leaf? What does the smell of soil and plants feel like? How do other astronauts react?
Show everything with colorful and detailed drawings as if it were a real storybook about farming in space.

For Secondary School Students (Design & Proposal):
If you were responsible for designing a space greenhouse to provide food for 10 astronauts on the Moon or Mars, what system would you build?

Design a fully closed greenhouse system including lighting (natural or artificial), water circulation, and CO_2 management.

In your proposal, write:

- How much space and energy does it require? (simple estimation)
- How do you recycle water and nutrients?
- What is your creative innovation? (for example, using algae, fungi, special plants, or smart automated systems)

Also include greenhouse diagrams, calculation tables, and explanation of the psychological benefits for astronauts so it looks like a professional NASA engineering report.

5. Space Debris — Orbital Threat (Space Debris Cleanup)

Research Question:
Thousands of dangerous pieces of debris are orbiting Earth at extremely high speeds!
How many types of space debris (from large old satellites to tiny bolts and screws) have been identified and tracked so far? At what speeds do they move, such that even a small object can act like a bullet and destroy satellites or the ISS? What statistics and data have NASA and other space agencies recorded?

Analysis Question:
If space debris destroys an important satellite, what would happen to our daily life on Earth? Analyze its impact on internet, global communication, weather forecasting, GPS, and the safety of the ISS.
Then explain why cleaning up space debris is very difficult internationally (legal issues, high costs, limited technology, and the fact that no single country can take full responsibility).

For Primary School Students (Drawing & Story Writing):
Imagine space debris are like small, fast monsters circling Earth and threatening satellites!

You are a space hero. Write an exciting story about how these debris attack an important satellite and how you save it with your creative idea.

What happens in your story? How do you feel when you save the satellite?

Show everything with large, colorful, detailed drawings like an adventure story about saving the sky.

For Secondary School Students (Design & Proposal):
If you were a NASA engineer and wanted to clean up dangerous space debris, what mission would you design?

Design a complete cleanup mission using methods such as space nets, lasers, or hunter satellites.

In your proposal, write:

- How do you detect, capture, and safely remove debris?
- What international laws are needed (country responsibility, agreements, legal challenges)?
- Evaluate cost vs benefit (construction, launch, operation vs protecting satellites and ISS safety)
- What is your creative innovation to make the mission safer or cheaper?

Also include a conceptual mission design, cost/benefit table, and operational steps so it looks like a real space engineering report.

6. Exoplanets & Search for Life (Exoplanet & Life Hunt)

Research Question:
How do we discover thousands of planets in distant galaxies without traveling to them?

How do exoplanet detection methods (transit method and radial velocity method) work? What amazing planets has the James Webb Space Telescope discovered, what has it revealed about their atmospheres, water presence, or possible signs of life, and what lessons have we learned?

Analysis Question:
What conditions must an exoplanet have for us to say “life might exist there”?

Analyze the habitable zone criteria (liquid water, suitable atmosphere, correct distance from its star).

Despite discovering thousands of exoplanets, why is finding clear signs of life (like oxygen, biological methane, or organic molecules) still very difficult? How do distance, weak signals, starlight interference, and current technology limit us?

For Primary School Students (Drawing & Story Writing):
Imagine you discover a new planet with life using your magical telescope!

What do the creatures look like? (green, tall, winged, transparent, or glowing?)

Write a happy short story about sending the first friendly message from Earth. What do you say? How do you feel thinking they might respond?

Show everything with colorful and detailed drawings like a real science-fiction storybook.

For Secondary School Students (Design & Proposal):
If you were a NASA scientist and wanted to study the nearest promising exoplanet, what mission would you design?

Design a complete mission using an advanced telescope or space probe to observe the planet and search for signs of life.

In your proposal, write:

- How do you detect signs of life (liquid water, suitable atmosphere, organic molecules, oxygen)?
- What message would you send to potential extraterrestrial life (friendly, scientific, or artistic)?
- What is your creative innovation that makes the mission smarter or more successful?

Also include mission trajectory, probe/telescope design, and a table of life indicators so it looks like a real NASA report.

Important Participation Rules

Please note the following guidelines before submitting your project:

- Each student is allowed to select and complete only one challenge.
- This section is designed for individual participation only.

❌ Team registrations are not allowed for this challenge section.

Awards & Recognition:

Outstanding participants will be selected by the jury and will receive an official certificate of achievement.