NASA TECHRISE STUDENT CHALLENGE

2025-26 Challenge Overview

https://www.futureengineers.org/nasatechrise

The Challenge

NASA is calling on middle and high school students to join the fifth NASA TechRise Student Challenge, which invites students teams to submit experiment ideas to fly on a suborbital-spaceship or high-altitude balloon. Students in sixth to 12th grades at a U.S. public, private, or charter school – including those in U.S. territories – are challenged to team up with their schoolmates to design an experiment under the guidance of an educator.

The suborbital-spaceship will offer approximately 3 minutes of microgravity

The high-altitude balloon will offer approximately 4-8 hours of flight time at approximately 70,000-95,000 feet and exposure to Earth's atmosphere, high-altitude radiation, and perspective views of our planet.

The NASA TechRise Student Challenge seeks to equip America's future workforce with the skills needed to advance the U.S. aerospace economy. The experience provides hands-on learning and opportunities to innovate, fostering practical skills, encouraging experimentation, and empowering individuals to build and make.

Note that no experience is necessary to participate in the NASA TechRise Student Challenge!

Prizes

A total of 60 winning teams (35 suborbital-spaceship, 25 high-altitude balloon) will be selected to build their proposed experiment. Each winning team will be awarded:

- $1,500 to build their experiment
- A starter kit, including a flight box in which to build their experiment
- An assigned spot to test the experiment on a NASA-sponsored flight
- Technical support during the experiment build phase from Future Engineers, who will help students learn the skills they need to turn their experiment idea into a reality

Watch the Challenge Video!

Challenge Timeline

Contest Opens	Student Virtual Field Trip	Entries Due	Winners Begin Build	Experiments Launch
Sep 4 2025	Sept 25 2025	Nov 3 2025	Jan 20 2026	Summer 2026

Regions

- Teams will compete within their state or territory
- Target of at least 1 winner per state or territory

Steps to Enter

- **STEP 1: FORM A TEAM**

Your team needs to have at least four students and one educator/teacher.

- **STEP 2: REVIEW PROPOSAL EXAMPLE & TEMPLATE, EDUCATOR GUIDE, AND RULES**

Your entry needs to be a written proposal that describes your experiment. It's especially important to review both the Proposal Example & Template and Rules to understand the requirements. Team leads (teacher/school employee) can submit an unlimited number of proposals, but each proposal must be unique and only one can be selected as a winner.

- **STEP 3: CHOOSE SUBORBITAL-SPACESHIP OR HIGH-ALTITUDE BALLOON**

Decide whether your team would like to submit a proposal for an experiment to fly on a suborbital-spaceship or high-altitude balloon vehicle by reviewing the Design Guidelines and slide decks on the NASA TechRise Student Challenge webpage. Teams are welcome to submit proposals for both vehicle types.

- **STEP 4: PLAN YOUR EXPERIMENT**

Use the suborbital-spaceship or high-altitude balloon brainstorming and components design resources to explore experiment ideas and write your team's proposal/s describing how your team would build their idea if selected as a winner.

- **STEP 5: SUBMIT YOUR PROPOSAL**

Once your team's proposal is done, save it as a PDF so that the team leader (educator/school employee) can submit it online.

Proposal Example & Template

Write up the experiment idea using the Proposal Example & Template.

NASA TechRise 2025-26

PROPOSAL EXAMPLE & TEMPLATE

Your team's entry must be a proposal submitted as a PDF (max 20 MB). Please review the example and template below to develop your proposal. DO NOT include personally identifiable information such as school names, team member first & last names, photos of people, or other identifiable information in your proposal. However, mentioning names of significant figures (e.g., an astronaut) is okay if it helps explain your entry. All other names will be redacted. Once written, the team lead (teacher or school employee) can submit the proposal on the challenge website. Per the NASA TechRise Student Challenge Rules, your team's proposal must be an original creation that has not been previously submitted for or selected as a winner in a promotion or competition of any type. Team leads can submit an unlimited number of proposals. All entries will be judged using the following criteria:

- 40 Points: Impact - To what extent does the submission demonstrate a positive impact on the team's education and community, providing an opportunity for the team to gain new STEM-related skills?
- 20 Points: Connection - How connected is the submission to NASA's mission to explore the unknown in air and space, innovate for the benefit of humanity, and inspire the world through discovery?
- 20 Points: Alignment - How well does the proposed design of the experiment support the team's hypothesis?
- 20 Points: Design - How well does the submission meet the design guidelines?

PROPOSAL TEMPLATE

To develop your NASA TechRise proposal, please use the template linked below and follow the proposal guidelines.

- Download the MSWord template HERE

Note - You are welcome to recreate the template so long as your proposal includes all of the required sections and meets the required font and margin guidelines listed below.

PROPOSAL GUIDELINES

Proposal Narrative: Pages 1-3
The proposal narrative should be written by STUDENTS. Generative AI is NOT allowed to create your proposal (spellcheck/grammar checks are allowed). The proposal may not exceed 3 pages (including in-text citations) and should be formatted using 11-point Times New Roman font, single-spaced, with 1-inch margins. The proposal narrative must include an experiment name and the three sections outlined in the Proposal Template, including the *what*, *how*, and *why* of your proposed experiment idea. DO NOT include hyperlinks to additional proposal information, files, or websites you have developed. This is beyond the 3-page limit. All links will be removed prior to judging.

PROPOSAL BASIC EXAMPLES

Suborbital-Spaceship Proposal Example (pages 2 – 4)
High-Altitude Balloon Proposal Example (pages 5 - 7)

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PROPOSAL EXAMPLE & TEMPLATE

Below, very basic example text for a suborbital-spaceship and high-altitude balloon proposal is provided for each proposal element to give teams a sense of the type of information the judges are seeking. This simple text is provided to help teams get started but should not constrain their thinking about the proposal topic or limit the level of detail in their responses.

SUBORBITAL-SPACESHIP EXPERIMENT: BASIC EXAMPLE

Experiment Name
Please provide a name for your proposed experiment.

Basic Example:

Proposed Experiment Name: Space Party

Section 1: WHAT is your team's experiment idea?

Note: Check out the NASA TechRise Suborbital-Spaceship Brainstorm Slide Deck for inspiration.

1a. What do you want to investigate?
- Explain what you plan to measure, monitor, or evaluate during the flight.

Basic Example:

We want to investigate how confetti moves in a reduced gravity environment.

1b. How does your investigation help to explore space and/or study our home planet?
- Summarize any background research you have done.

Basic Example:

Studying how small particles like confetti moves in space is important to NASA scientists because it can improve our ability to understand how the dust and dirt moves on the Moon or Mars so that we can help understand the best ways to keep our astronauts safe and healthy when they go there.

1c. What is your hypothesis (an educated guess) on what you think will happen during your investigation?
- Summarize what you think you will happen.

Basic Example:

Our hypothesis is that when the confetti is released, it will remain grouped together in the center of the experiment.

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PROPOSAL EXAMPLE & TEMPLATE

HIGH-ALTITUDE BALLOON EXPERIMENT: BASIC EXAMPLE

Experiment Name
Please provide a name for your proposed experiment.

Basic Example:

Proposed Experiment Name: Pollution Experiment Technology (PET)

Section 1: WHAT is your team's experiment idea?

Note: Check out the NASA TechRise Balloon Brainstorming Slide Deck for inspiration.

1a. What do you want to investigate?
- Explain what you plan to measure, monitor, or evaluate during the flight.

Basic Example:

We want to investigate how polluted the air is.

1b. How does your investigation help to explore space and/or study our home planet?
- Summarize any background research you have done.

Basic Example:

Air pollution is important to NASA Earth scientists because it can change our weather and hurt living things. We want to study pollution so that we can help understand the best ways to keep our planet safe and healthy for everyone.

1c. What is your hypothesis (an educated guess) on what you think will happen during your investigation?
- Summarize what you think you will happen.

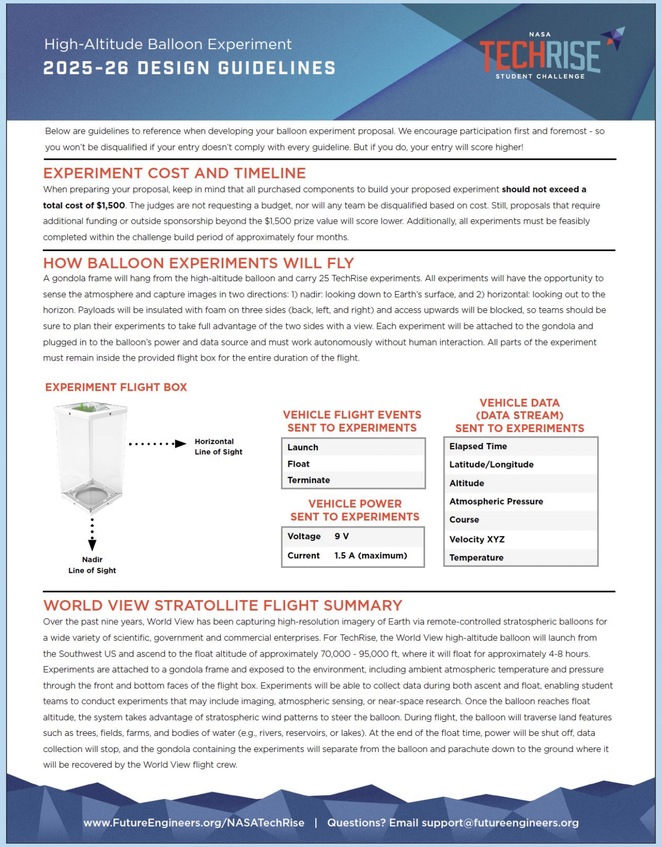
Basic Example:

Our hypothesis is that if we go higher in the atmosphere, then there will be less pollution since it is further away from human-made pollution sources.

Design Guidelines

Review the Design Guidelines (Suborbital-Spaceship, High-Altitude Balloon) before submitting your proposal. A few examples include:

- Your experiment idea must be realistic so that it can be built within ~4 months.
- Your experiment must fit in a 4 inch x 4 inch x 8 inch box.
- Your experiment can weigh no more than 1 kilogram (2.2 pounds).



High-Altitude Balloon Experiment

2025-26 DESIGN GUIDELINES

Below are guidelines to reference when developing your balloon experiment proposal. We encourage participation first and foremost - so you won't be disqualified if your entry doesn't comply with every guideline. But if you do, your entry will score higher!

EXPERIMENT COST AND TIMELINE

When preparing your proposal, keep in mind that all purchased components to build your proposed experiment **should not exceed a total cost of $1,500**. The judges are not requesting a budget, nor will any team be disqualified based on cost. Still, proposals that require additional funding or outside sponsorship beyond the $1,500 prize value will score lower. Additionally, all experiments must be feasibly completed within the challenge build period of approximately four months.

HOW BALLOON EXPERIMENTS WILL FLY

A gondola frame will hang from the high-altitude balloon and carry 25 TechRise experiments. All experiments will have the opportunity to sense the atmosphere and capture images in two directions: 1) nadir: looking down to Earth's surface, and 2) horizontal: looking out to the horizon. Payloads will be insulated with foam on three sides (back, left, and right) and access upwards will be blocked, so teams should be sure to plan their experiments to take full advantage of the two sides with a view. Each experiment will be attached to the gondola and plugged in to the balloon's power and data source and must work autonomously without human interaction. All parts of the experiment must remain inside the provided flight box for the entire duration of the flight.

EXPERIMENT FLIGHT BOX

VEHICLE FLIGHT EVENTS SENT TO EXPERIMENTS

Launch
Float
Terminate

VEHICLE POWER SENT TO EXPERIMENTS

Voltage	9 V
Current	1.5 A (maximum)

VEHICLE DATA (DATA STREAM) SENT TO EXPERIMENTS

Elapsed Time
Latitude/Longitude
Altitude
Atmospheric Pressure
Course
Velocity XYZ
Temperature

WORLD VIEW STRATOLLITE FLIGHT SUMMARY

Over the past nine years, World View has been capturing high-resolution imagery of Earth via remote-controlled stratospheric balloons for a wide variety of scientific, government and commercial enterprises. For TechRise, the World View high-altitude balloon will launch from the Southwest US and ascend to the float altitude of approximately 70,000 - 95,000 ft, where it will float for approximately 4-8 hours. Experiments are attached to a gondola frame and exposed to the environment, including ambient atmospheric temperature and pressure through the front and bottom faces of the flight box. Experiments will be able to collect data during both ascent and float, enabling student teams to conduct experiments that may include imaging, atmospheric sensing, or near-space research. Once the balloon reaches float altitude, the system takes advantage of stratospheric wind patterns to steer the balloon. During flight, the balloon will traverse land features such as trees, fields, farms, and bodies of water (e.g., rivers, reservoirs, or lakes). At the end of the float time, power will be shut off, data collection will stop, and the gondola containing the experiments will separate from the balloon and parachute down to the ground where it will be recovered by the World View flight crew.

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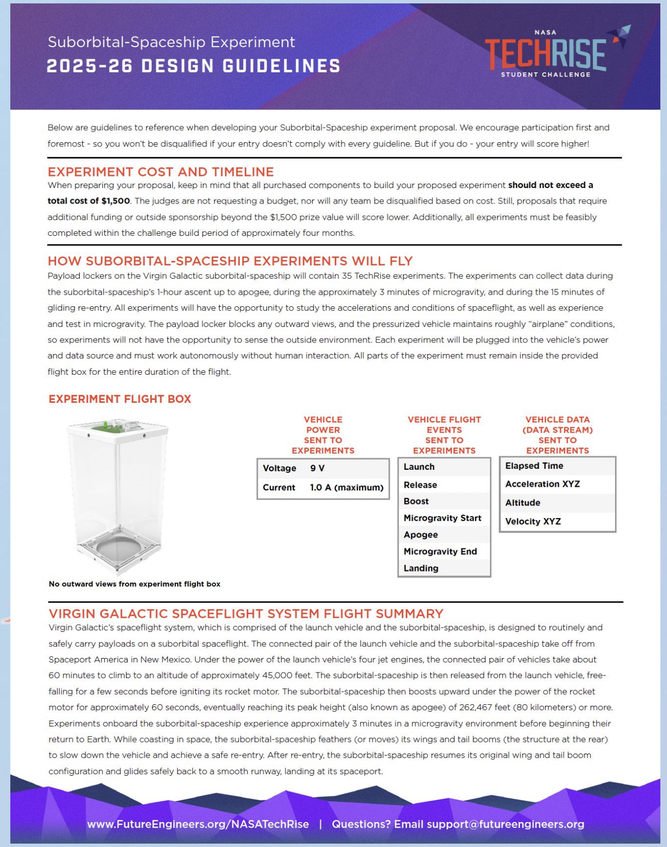

Suborbital-Spaceship Experiment

2025-26 DESIGN GUIDELINES

Below are guidelines to reference when developing your Suborbital-Spaceship experiment proposal. We encourage participation first and foremost - so you won't be disqualified if your entry doesn't comply with every guideline. But if you do - your entry will score higher!

EXPERIMENT COST AND TIMELINE

When preparing your proposal, keep in mind that all purchased components to build your proposed experiment **should not exceed a total cost of $1,500**. The judges are not requesting a budget, nor will any team be disqualified based on cost. Still, proposals that require additional funding or outside sponsorship beyond the $1,500 prize value will score lower. Additionally, all experiments must be feasibly completed within the challenge build period of approximately four months.

HOW SUBORBITAL-SPACESHIP EXPERIMENTS WILL FLY

Payload lockers on the Virgin Galactic suborbital-spaceship will contain 35 TechRise experiments. The experiments can collect data during the suborbital-spaceship's 1-hour ascent up to apogee, during the approximately 3 minutes of microgravity, and during the 15 minutes of gliding re-entry. All experiments will have the opportunity to study the accelerations and conditions of spaceflight, as well as experience and test in microgravity. The payload locker blocks any outward views, and the pressurized vehicle maintains roughly "airplane" conditions, so experiments will not have the opportunity to sense the outside environment. Each experiment will be plugged into the vehicle's power and data source and must work autonomously without human interaction. All parts of the experiment must remain inside the provided flight box for the entire duration of the flight.

EXPERIMENT FLIGHT BOX

No outward views from experiment flight box

VEHICLE POWER SENT TO EXPERIMENTS

Voltage	9 V
Current	1.0 A (maximum)

VEHICLE FLIGHT EVENTS SENT TO EXPERIMENTS

Launch
Release
Boost
Microgravity Start
Apogee
Microgravity End
Landing

VEHICLE DATA (DATA STREAM) SENT TO EXPERIMENTS

Elapsed Time
Acceleration XYZ
Altitude
Velocity XYZ

VIRGIN GALACTIC SPACEFLIGHT SYSTEM FLIGHT SUMMARY

Virgin Galactic's spaceflight system, which is comprised of the launch vehicle and the suborbital-spaceship, is designed to routinely and safely carry payloads on a suborbital spaceflight. The connected pair of the launch vehicle and the suborbital-spaceship take off from Spaceport America in New Mexico. Under the power of the launch vehicle's four jet engines, the connected pair of vehicles take about 60 minutes to climb to an altitude of approximately 45,000 feet. The suborbital-spaceship is then released from the launch vehicle, free-falling for a few seconds before igniting its rocket motor. The suborbital-spaceship then boosts upward under the power of the rocket motor for approximately 60 seconds, eventually reaching its peak height (also known as apogee) of 262,467 feet (80 kilometers) or more. Experiments onboard the suborbital-spaceship experience approximately 3 minutes in a microgravity environment before beginning their return to Earth. While coasting in space, the suborbital-spaceship feathers (or moves) its wings and tail booms (the structure at the rear) to slow down the vehicle and achieve a safe re-entry. After re-entry, the suborbital-spaceship resumes its original wing and tail boom configuration and glides safely back to a smooth runway, landing at its spaceport.

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Entries Due by Nov. 3, 2025, 11:59 PM PT

A proposal needs to be written by students and submitted by a teacher/educator.
All proposals must include the following sections:

- **WHAT** is your team's experiment idea? What do you want to investigate? How does your investigation help to explore space and/or our home planet? What is your hypothesis on what you think will happen during your investigation?

- **HOW** do you imagine your experiment would work? Describe what your experiment is (how will you test your hypothesis?) and how it would work during flight using the suborbital-spaceship or high-altitude balloon experiment design resources. Provide a diagram of your experiment.

- **WHY** do you want to propose this experiment idea? Why is this investigation/experiment important to your team and your school? What new knowledge or skills would your team gain by doing this project? How is your experiment connected to one or more of the central parts of NASA's mission?

Have Questions?

- Review the NASA TechRise Student Challenge Resources
- Review the NASA TechRise Student Challenge FAQ
- Email Future Engineers at support@futureengineers.org