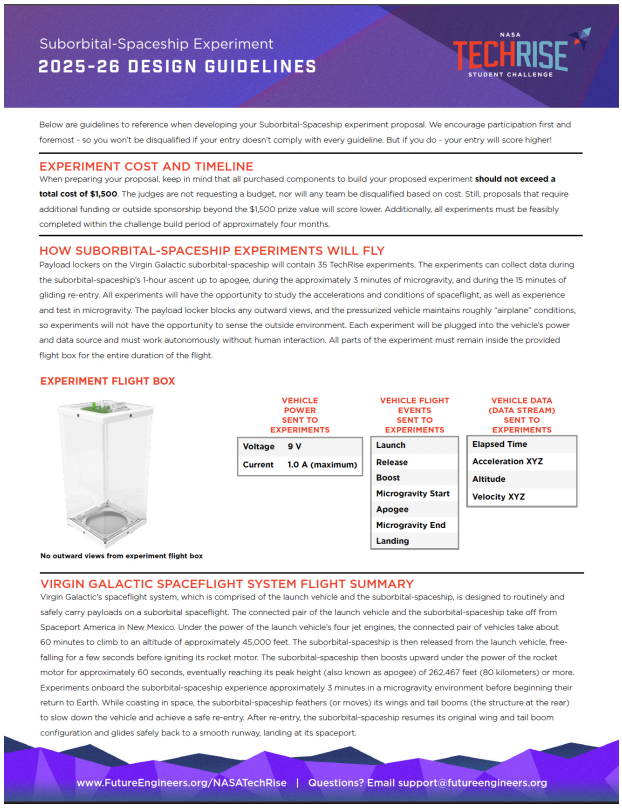
DESIGN GUIDELINES

The 2025-26 NASA TechRise Student Challenge invites student teams to develop experiment ideas for either a suborbital-spaceship or a high-altitude balloon. Due to the uniqueness of this challenge, there are suborbital-spaceship guidelines and high-altitude balloon guidelines. Please select the vehicle type to below to view the guidelines applicable to your entry type.

Please click to view the

NASA TechRise Suborbital-Spaceship Guidelines



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

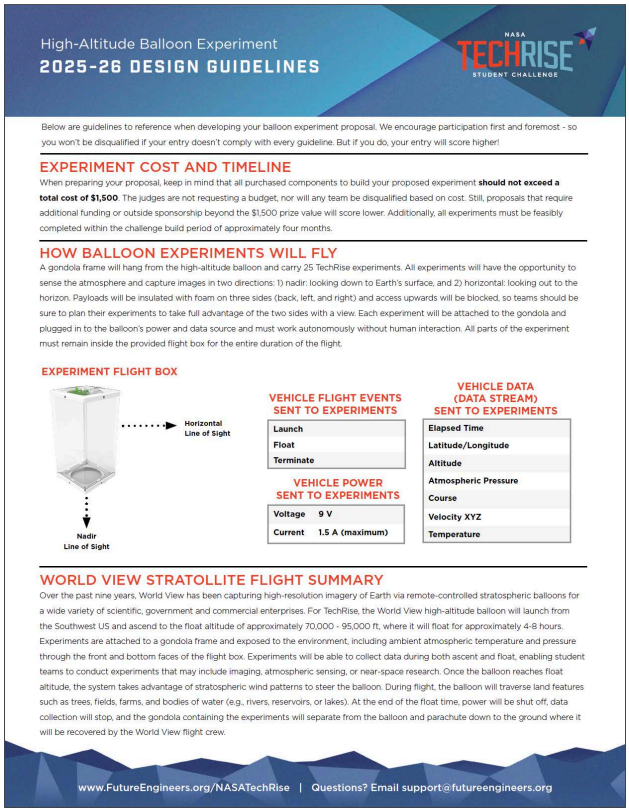
VIRGIN GALACTIC SPACEFLIGHT SYSTEM FLIGHT SUMMARY

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.

www.FutureEngineers.org/NASATechRise | Questions? Email support@futureengineers.org

Please click to view the

NASA TechRise High-Altitude Balloon Guidelines



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

Horizontal Line of Sight

Nadir Line of Sight

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.

www.FutureEngineers.org/NASATechRise | Questions? Email support@futureengineers.org