

## Idaho Going Up The Idaho Near Space Exploration Program

STEM or science, technology, engineering, and mathematics education is a critical part of pre-college education. Even for students not planning to enter STEM related fields after graduation, a strong STEM background increases the ability to thrive in growing technological world. There are many ways schools strengthen STEM education. Activities like robotics and bridge building are popular examples that go back decades.

There is however, a newer activity called near space exploration. Near space is located between the altitudes of 60,000 and 328,000 feet. Because of its altitude, the near space environment simulates most of the important aspects of outer space. Weather balloons are the inexpensive near space vehicles and they typically reach altitudes between 80,000 and 110,000 feet. A weather balloon's climb rate is approximately 1,000 feet per minute and a typical flight takes 90 minutes to complete (after a 30 minute balloon fill). Near space flights are tracked using amateur radio and students without a radio license can track their experiment over the internet using an internet connected PC or handheld smart device.

Students desiring a flight into near space must meet the following requirements. These requirements will ensure that their experiment does not violate weight and safety requirements while placing the least imposition on the rest of the experiments going up.

1. Experiments must be contained within a BalloonSat airframe.
2. Experiments cannot exceed a one-foot cube in size.
3. Students must test their experiments after construction to ensure they function as desired.
4. The experiment and airframe cannot exceed six pounds in weight.
5. The airframe cannot exceed one than one ounce per square inch in surface density.
6. Experiments that release deployable structures during the flight require approval in order to ensure they don't interfere with other experiments going up.
7. Experiments cannot carry hazardous or dangerous items.
8. Experiments cannot release items other than lightweight (safe) objects during the flight.
9. Experiments cannot carry living organisms above the insect level.
10. Experiments are encouraged to use some type of switch to signal the experiment to begin recording data.
11. Experiments should be prepped and ready for flight prior to filling the balloon for launch. Only 30 minutes of time is available for preparing a launch, so experiments are encouraged to be ready and self-starting.
12. If students cannot be present at the launch, then the instructions for starting the experiment must be clearly written and easy to follow.
13. Any experiments shipped for flight cannot have batteries connected in circuit.
14. Any batteries shipped with the experiment must be disconnected and their terminals covered in a non-conducting cap.
15. The experimenter must accept any risk for the lost of the experiment or its inability to record data.

If you would like to launch an experiment into near space, please do the following.

1. View the What is Near Space Power Point
2. View the Factors Affecting a Near Space Flight Power Point
3. View the HabHub Predicting Near Space Flights Power Point
4. View the BalloonSat Construction Power Point
5. View the BalloonSat Testing Power Point
6. Contact the NearSys flight director at [nearsys@gmail.com](mailto:nearsys@gmail.com)

NearSys can provide some mentoring help and will attempt to launch at your site. If weather or terrain does not permit a launch from your site, then you can travel to the Treasure Valley for a launch or mail your experiment to NearSys for flight. NearSys will give you information on tracking the flight live.