

# Rockets For Schools

## SECONDARY LAUNCH EVENT

### Frequently Asked Questions

#### 1. What is Rockets For Schools?

The Great Lakes Spaceport Education Foundation, Inc. was founded in 1992 to promote aerospace awareness through hands-on education with students, teachers and the general public.

Our objectives are:

- To stimulate knowledge about the benefits of aerospace.
- To increase public awareness of aerospace technologies and the importance of this technology for our environment and economic future.
- Promote aerospace education as an interdisciplinary framework for teaching math, science, and technology.
- Inform and motivate students, educators and the public.

Rockets For Schools is our unique educational program designed to meet our stated goals. The Rockets For Schools program allow the students to experience the excitement of building high power rockets, coordinating a rocket launch and working hands-on with industry professionals. This program is open to students of varied socio-economic backgrounds in grades 6 through 12 from the US.

#### 2. Where is Rockets For Schools?

All Rockets For Schools activities take place in Sheboygan. Sheboygan is located in Wisconsin about 50 miles north of Milwaukee along the shores of Lake Michigan.

#### 3. Who can participate in Rockets For Schools?

All U.S. middle and high School students in grades 6 through 12, can participate in the Secondary School Rocket Launches.

#### 4. When are the 2024 launches scheduled?

The Secondary School Launch is scheduled for Friday, May 10th and Saturday, May 11th.

#### 5. What does the Secondary Education Program consist of?

The Secondary School's Program is separated into three parts:

- Rockets For Schools Competition
- Rocket Launches and Support Activities
- Aerospace Educational Activities
- To meet an Astronaut or Industry Professional

#### 6. What is the Rocket for Schools Competition?

Middle and high school students from their own launch teams with a maximum of ten members. Each launch team must have an adult adviser to be responsible for the students' activities during the launch weekend. After submitting a completed application, they are sent a high-powered rocket kit. They also receive educational material to review and a worksheet to complete.

The launch teams are to complete the following tasks before arriving at Spaceport Sheboygan for the launch:

- Build and finish their rocket Class-1 or Class-2 kit
- Design and build a payload to be launched in their rocket
- Design a mission patch and informational display about their payload
- Complete the worksheet
- Have all the forms completed and returned to us by the due dates on the website

When the students arrive at Spaceport Sheboygan for the launch, they set up their informational display. During the day on Friday, they will give a ten-minute presentation about their rocket and

payload to a team of judges. Each launch team score is compiled based on the points earned in the following categories:

|          |                            |                   |
|----------|----------------------------|-------------------|
| <b>1</b> | <b>Rocket Construction</b> | <b>150 points</b> |
| <b>2</b> | <b>Rocketry Worksheet</b>  | <b>100 points</b> |
| <b>3</b> | <b>Payload Design</b>      | <b>150 points</b> |
| <b>4</b> | <b>Presentation</b>        | <b>100 points</b> |

## **7. Is there more information regarding the grading criteria?**

### **ROCKET CONSTRUCTION**

**See question #15 below for detailed criteria.** Student teams will be graded on their skill and attention to detail while building and finishing their rocket.

### **ROCKETRY WORKSHEET**

Each advisor is asked to go to our website at [www.rockets4schools.org](http://www.rockets4schools.org) and click on Education. Under Required Reading click on "Rocketry Basics" and download the required reading information. You will also need to either fill in online the Secondary Launch Worksheet and print it out or just print out the form and indicate your answers. If you are unable to download this information, please contact us and we will send it to you.

After reviewing the "Rocketry Basics" study guide and viewing the "Rocket Motor Tutorial" the team members must complete the Rocketry Worksheet. **One worksheet per team.**

### **PAYLOAD DESIGN**

Students must design, build and fly a payload on their rocket. The students are encouraged to be creative in designing a payload to explore the unique environment of sounds, sights, acceleration and pressures experienced during a launch.

There are two restrictions placed on your payload:

1. Payloads must be less than 1.5 pounds in weight
2. No live animals are allowed in your payload

### **PRESENTATION**

Your team must develop a "science fair" type display. The display should contain a "Mission Patch" designed by the team members. Also, your display should contain information on your payload experiment. A 40" x 30" space on a display table will be set aside for your display. Your display will be available for public viewing during the entire weekend. Each team will be required to give a 5-to-10-minute presentation on Friday. Presentations will be given at your display.

This presentation must include:

- Introduction of team members
- Discussion of your mission patch
- Discussion of your payload
- What your team learned

## **8. What does the Rocket Launch and Support Activities consist of?**

Each launch team has the opportunity to be at the launch pad to help prepare the rocket for flight. One of the team members will also push the launch button to ignite their rocket's engine. When the launch team is not at the launch pad, they will be performing jobs in support of the launch day activities. Individual launch team members will be assigned to one of the following areas: (all weather permitting of course)

- Mission Control
- Rocket Tracking
- Recovery
- Balloon Launching
- Video Production

## 9. What aerospace education activities are planned for the secondary students?

The students will have an opportunity to view presentation given by a NASA Astronaut and other aerospace professionals. There is also an aerospace expo with many interesting displays for the students to explore. Some of the exhibits planned are: (Pending availability)

- A multi-media bus from NASA showing the work performed at the Glenn Research Center in Ohio
- A micro-gravity drop tower to demonstrate the effects of weightlessness
- Advanced High-power rockets from Tripoli Rocketry Association, Inc.
- Pictures of Earth taken from the Space Shuttle

## 10. What is the difference between the Class-1 and the Class-2 rockets?

There are two different rocket kits available to the Rockets For Schools launch teams. **First time teams** are required to build the Class-1 rocket. Our class-1 rocket is 4 inches in diameter and 6 feet high and will reach an altitude of 2500 feet.

Launch teams that have previously flown a Class-1 rocket can choose to build the Class-2 rocket. Our Class-2 rocket is 5.5 inches in diameter and about 8 feet high and will reach an altitude of 5000 feet.

## 11. The high-power rockets are very large. How safe is this activity?

We are very concerned with safety during our event and take every precaution to ensure the launches are conducted safely.

All rockets are inspected by members of the Tripoli Rocketry Association to ensure they can be flown safely. Any problems found with the rocket's construction are corrected before the rockets are taken to the launch pad.

Launch operations follow Tripoli's safety guidelines and are conducted by Tripoli personnel. The marine and air space are controlled by the Coast Guard and Civil Air Patrol respectively to ensure the launch can proceed safely.

All rocket launches are directed over Lake Michigan. If there is a rocket failure, they will splash down safely in the water.

## 12. What is the cost of the Secondary Launch Program?

Each launch team can contain up to 10 students and two Advisors. Our program fee is as follows:

**Class II Division:** Must have launched a Class I rocket before they can build a class II.

- Class I Rocket Jr. - \$498.00 (\$280.00 Team Entry Fee & \$218.00 Rocket Cost)
- Class I Rocket Sr. - \$498.00 (\$280.00 Team Entry Fee & \$218.00 Rocket Cost)
- Class I Rocket **with optional electronics bay** - \$528.00 (\$280.00 Team Entry Fee & \$248.00 Rocket Cost) **the Electronics bay is only for experiments only - not for parachute deployment electronics**
- Class II Rocket - \$676.00 (\$280.00 Team Entry Fee & \$396.00 Rocket Cost)
- Class II Rocket **with optional electronics bay** - \$710.00 (\$280.00 Team Entry Fee & \$430.00 Rocket Cost) **the Electronics bay is only for experiments only - not for parachute deployment electronics**

Please note that the launch team program fee includes the cost of the rocket kit. The rocket kit includes illustrated, step by step instructions and all parts necessary for construction (except epoxy, paint and payload). Motors are furnished on launch day.

## 13. Where can I get more information?

Additional information can be requested by contacting Rockets For Schools at:

Email Ken at [kenny@bergschultz.com](mailto:kenny@bergschultz.com)  
Phone: 920 918-3299

Email Carol at [clutz53@gmail.com](mailto:clutz53@gmail.com)  
Phone: (920) 458-6299 ext. 300

## 14. Can someone meet with my group to further explain your program?

Yes, we are available to make a presentation to your group. Please contact us to make arrangements.

## 15. What will the Judges be looking for in Rocket Construction

### Judging Fit and Finish Criteria for Rockets For Schools

**Artistic Design:** Theme, Logo, Decals, Pin striping. Paint Scheme.

**Consistent Paint Coverage:** Paint should be applied evenly throughout rocket. All painting and graphic designs must be performed by team student(s) only.

**Air Frame Cosmetics (spirals & touchup):** Are the spirals on airframe filled in and smooth. Dings and nicks filled in and finished smooth. The edge (or ends) of airframes (payload included) finished and smooth.

**Quality Paint Finish:** The finish paint should be smooth. Glossy enamels work the best. Finish paint should be free of dirt, bubbles, drips and cracks. Two-part paints are accepted and must be done by team participant(s). Clear coating is acceptable. If the rocket is finished in a flat enamel or satin, the recommended style should be accompanied with their artistic theme features.

**Complexity of Design (paint scheme):** Where two colors meet, is it even and sharp or does it fade transitionally into the other color. Unique overlays of colors on theme design. Is the design skillfully painted or drawn on by hand or air brush. All graphic designs must be performed by team student(s).

**Fin - Tapered consistently:** Fins should have even tapered ends all around the exposed edges.

**Over all Texture - Fin Finish:** Fins should have a smooth finish. No scratches, nicks, bubbles, dents or dulling of the finish paint.

**Nose Cone - Transitional and Smoothness:** The nose cone should be smooth – no sanding marks, seamless. The shoulder should be evenly transitional with the outside of the airframe with a flush and even mount.

**Attachment screws or Pins:** Nose cone should be secured to airframe with small screws or shear pins.

### *Payload Section*

**Rear Bulkhead Epoxy Fillets:** There should be a thick bead of epoxy smoothed out at the end of the payload bulk plate where the bulk plate meets the coupler. Coupler should be securely epoxied to payload airframe.

**Recovery System - Eye Bolts, Straps, Parachutes:** Eye bolts or U bolts should be securely fitted to bulk plates. Recovery straps should be free of contaminants and defects (cuts, glue, paint etc.) Parachutes should be slip knotted or swivel mounted to recovery strap. Parachutes should be in good condition with no weakness of shroud lines.

**Recovery Connections:** Recovery straps are to be securely tied to eye bolts or U bolts (do not use glues or epoxies to secure knots) and should be long enough to withstand possible catastrophic velocities.

**Smooth Fit to Payload Section:** Payload coupler should fit snug and smooth to booster section without binding. Payload airframe should be even with the booster airframe with minimal gapping around airframe when coupled together.

**Engine Mount Installation:** Motor tube and motor mount rings should have a liberal amount of epoxy applied all around connecting components. The inside of the motor tube should be free of epoxy or obstructions to allow the full length of the rocket motor. Motor mount distance should be installed in booster section as per instructions. Don't forget rocket motor retention clips.

**Alignment - Lugs, Rail Buttons:** Rail buttons should be secured to airframe and aligned straight with each other.

**Alignment & Straightness:** Fins should be straight and even.

**Epoxy Fillets at Root Edge:** Fins should be mounted solid to motor mount tube and airframe. Where the fin meets the airframe (through the wall mounting) there should be a thick bead of epoxy along the root of the fin. It should be smooth and conform to the airframe. Epoxy should be cured and hard.

## 16. What size motors do the rockets use?

Level 1 rockets use a CTI I285 and Level 2 rockets use a CTI K445.