

# ROCKETS: Lesson 3

This webpage found at:  
<http://pa4h.cas.psu.edu/Curricula/AerospaceSupp/Activities/Rockets/Overview/RocketsLesson3.htm>

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## Rocketry Rules:

Note: The [National Association of Rocketry](#) has a slightly different version of the rocketry rules than what is listed below. However, the version of rocketry rules listed in the Aerospace Adventures Stage 3: Reaching New Heights booklet on page 10 and 11 is more detailed than the one on the NAR webpage. Therefore, **IT IS HIGHLY RECOMMENDED YOU USE THE VERSION OF THE RULES PROVIDED IN YOUR BOOKLET!**

The version of the rules printed in your booklet is as follows:

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### *Model Rocket Safety Code*

- 1. Materials** - My model rocket will be made of light-weight materials such as paper, wood, rubber, and plastic suitable for the power used and the performance of my model rocket. I will not use any metal for the nose cone, body, or fins of a model rocket.
- 2. Motor/ Engines** - I will use only commercially-made NAR certified model rocket engines in the manner recommended by the manufacturer. I will not alter the model rocket engine, its parts, or its ingredients in any way.
- 3. Recover** - I will always use a recovery system in my model rocket that will return it safely to the ground so it may be flown again. I will use only flame-resistant recovery wadding if required.
- 4. Weight and Power Limits** - My model rocket will weigh no more than 1500 grams (53 oz.) at lift-off, and its rocket engines will produce no more than 320 Newton-seconds (4.45 Newtons equal 1.0 pound) of total impuls. My model rocket will weigh no more than the engine manufacturer's recommended maximum lift-off weight for the engines used, or I will use engines recommended by the manufacturer for my model rocket.

5. **Stability** - I will check the stability of my model rocket before its first flight, except when launching a model rocket of already proven stability.
6. **Payloads** - Except for insects, my model rocket will never carry live animals or a payload that is intended to be flammable, explosive or harmful.
7. **Launch Site** - I will launch my model rocket outdoors in a cleared area, free of tall trees, power lines, buildings, and dry brush and grass. My launch site will be at least as large as that recommended in the following table.

### LAUNCH SITE DIMENSIONS

Installed Total Impulse (Newtons-seconds)	Equivalent Engine Type	Minimum Site Dimensions (feet) (meters)	
0.00-1.25	1/4A & 1/2 A	50	15
1.26-2.50	A	100	30
2.51-5.00	B	200	60
5.01-10.00	C	400	120
10.01-20.00	D	500	150
20.01-40.00	E	1000	300
40.01-80.00	F	1000	300
80.01-160.00	G	1000	300
160.01-320.00	2Gs	1500	450

8. **Launcher** - I will launch my model rocket from a stable launch pad that provides rigid guidance until the model rocket has reached a speed adequate to ensure a safe flight path. To prevent accidental eye injury, I will always place the launcher so that the end of the rod is above eye level or I will cap the end of the launch rod when approaching it. I will cap or disassemble my launch rod when not in use and I will never store it in an upright position. My launcher will have a jet deflector device to prevent the engine exhaust from hitting the ground directly. I will always clear the area around my launch device of brown grass, dry weeds, and other easy-to-burn materials.
9. **Ignition System** - The system I use to launch my model rocket will be remotely controlled and electrically operated. It will contain a launching switch that will return to "off" when release. The system will contain a removable safety interlock in series with the launch switch. All persons will remain at least 15 feet (5 meters) from the model rocket when I am igniting model rocket engines totaling 30 Newton-seconds or less of total impulse and at least 30 feet (9 meters) from the model rocket when I am igniting model rocket engines totaling more than 30 Newton-seconds of

total impulse. I will use only electrical igniters recommended by the engine manufacturer that will ignite model rocket engine(s) within one second of actuation of the launching switch.

- 10. Launch Safety** - I will ensure that people in the launch area are aware of the pending model rocket launch and can see the model rocket's liftoff before I begin my audible five-second countdown. I will not launch a model rocket using it as a weapon. If my model rocket suffers a misfire, I will not allow anyone to approach it or the launcher until I have made certain that the safety interlock has been removed or that the battery has been disconnected from the ignition system. I will wait one minute after a misfire before allowing anyone to approach the launcher.
- 11. Flying Conditions** - I will launch my model rocket only when the wind is less than 20 miles (30 kilometers) an hour. I will not launch my model rocket so it flies into clouds, near aircraft in flight, or in a manner that is hazardous to people or property.
- 12. Pre-Launch Test** - When conducting research activities with unproven model rocket designs or methods I will, when possible, determine the reliability of my model rocket by pre-launch tests. I will conduct the launching of an unproven design in complete isolation from persons not participating in the actual launching.
- 13. Launch Angle** - My launch device will be pointed within 30 degrees of vertical. I will never use model rocket engines to propel any device horizontally.
- 14. Recovery Hazards** - If a model rocket becomes entangled in a power line or other dangerous place, I will not attempt to retrieve it.

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Web design: Victoria Kramer. This page was last updated on September 26, 2005.  
There are no plans for future updates.