Model Rocket Safety Code

The National Rocketry Association

With additional comments from Rocket League

Model Rocketry is SAFE

- It's one of the safest things you can do outdoors, *if* you follow the safety code
  - Safer than playing on a playground
  - Safer than Little League
  - Way safer than skateboarding
  - Way, *way* safer than sky diving. . .
- If you follow the safety code, it's really hard to get hurt
- But if you don't follow the safety code, you could poke your eye out--or worse.
- That's why the slides that follow are so important.

1. Materials

I will use only lightweight, nonmetal parts for the nose, body, and fins of my rocket.

- Balsa, plastic, cardboard, paper are all good materials.
- Small metal parts such as fasteners, eye screws, motor clips, snap swivels, and electronic payloads are OK.
- If nose weight is needed, use clay. If a LOT of nose weight is needed, think about using larger fins!

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2. Motors

I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

- Only use the solid model rocket engines you buy in stores. They are relatively inexpensive and have been designed for your model rockets with safety in mind.
- Check the engines before using them, just to make sure that they are undamaged.
- Never try to re-use or re-pack a spent solid rocket engine. Don't brew your own fuel. It is extremely dangerous--students are hurt every year trying to do this.
- Don't attempt to modify the nozzle or the casing of the solid rocket engine, or take it apart, unless you're using a robot that's inside an explosion proof bunker, and you've passed the robot qualification test.

3. Ignition System

I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

- Never use fuses or other non-electrical means of ignition.
- Make sure that no one plays with the launcher. Take the key is out of the launcher when you are at the pad (you don't want the rocket launching while you're hooking it up!)

4. Misfires

If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

- Sometimes the motor doesn't light when the button is pushed, and sometimes the launch is delayed a few seconds. You need to be sure the motor isn't going to light before you go back to the pad!

5. Launch Safety

- I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance
  - at least 15 feet away when I launch rockets with D motors or smaller,
  - 30 feet when I launch larger rockets.
- If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance.

- If something goes wrong, you want everyone to be watching at a safe distance.
- If the rocket isn't stable, you want to find out about it before it has a burning motor in it!

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6. Launcher

- I will launch my rocket from a launch rod, tower, or rail
  - That is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up,
  - I will use a blast deflector to prevent the motor's exhaust from hitting the ground.
- To prevent accidental eye injury,
  - I will place launchers so that the end of the launch rod is above eye level or
  - I will cap the end of the rod when it is not in use.

- Make sure the pad is secured, so it can't blow over with your rocket on it!
- Don't work at the pad with the end of the launch rod unguarded. You can poke your eye out!

7. Size

- My model rocket
  - will not weigh more than 1,500 grams (53 ounces) at liftoff and
  - will not contain more than 125 grams (4.4 ounces) of propellant, and
  - will not exceed 320 N-sec (71.9 pound-seconds) of total impulse.
  - If my model rocket weighs more than one pound (453 grams) at liftoff or has more than four ounces (113 grams) of propellant, I will check and comply with Federal Aviation Administration regulations before flying.

- If your rocket exceeds any of the limits above, you need to comply with the High Power Rocketry Safety Code, or maybe work for NASA!

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8. Flight Safety

I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.

- Model rockets can't hurt airplanes, but pilots may not know that. You don't want them to think you're aiming at them, or to interfere with the airplane's flight!
- If the rocket goes into clouds, you will lose sight of it, and won't be able to move out of the way if it comes down without its parachute.
- It is both unsafe and illegal to use model rockets to launch fireworks or anything else that is flammable!

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9. Launch Site

- I will launch my rocket
  - outdoors, in an open area at least as large as shown in the attached table, and
  - in safe weather conditions with wind speeds no greater than 20 miles per hour.
- I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

- You need a big enough area to keep your rocket away from trees, houses, streets, power lines, and any other place where you can't safely recover it.
- Too much wind will send your rocket out of the recovery area!
- Make sure the fire danger is low enough to fly safely.

Launch Site Dimensions

Total Impulse (N-sec)	Motor Type	Minimum Site Dimension (ft)
0.00--1.25	Less than A	50
1.26--2.50	A	100
2.51--5.00	B	200
5.01--10.00	C	400
10.01--20.00	D	500
20.01--160.00	E through G	1000
160.01--320.00	Two Gs	1500

10. Recovery System

- I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and
- I will use only flame-resistant or fireproof recovery system wadding in my rocket.

- Make sure the parachute is big enough to lower the rocket safely to the ground.
- Make sure the recovery system is in good shape before each flight.
- Don't use tissue or other materials that can drift down and start a fire.

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11. Recovery Safety

I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

- Never, ever try to get a rocket down from a dangerous place!
- Never fly near trees. If your rocket ends up in a tree, you're going to need a new rocket.
- Never fly near a highway. You can be hurt chasing your rocket across the highway and people driving by are often distracted by model rockets.
- Never fly near houses. Your rocket can do damage to the windows, sidings and roof of a house. If your rocket ends up on the roof, you're going to need a new rocket.
- And never, ever fly near high tension wires. That's a sure way to lose a rocket.

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