



# BSA SAFETY MOMENT

## WATER BOTTLE ROCKETS

### SUMMARY

**So you want to launch a water bottle rocket. These pressurized rockets use pressurized air and water and can fly at 100 mph. Unfortunately, used improperly or carelessly, they have been known to burst, strike spectators, or launch into the face of a participant. And yes, this has really happened. The rockets have also sometimes damaged property by landing hundreds of feet away. Adequate and knowledgeable adult supervision is critical to a safe, successful launch.**

### GENERAL INFORMATION

Leaders and participants should be aware of local and state laws related to the launching of rockets, including water bottle rockets. Here are a few essential tips to have a safe and fun event:

- Rockets should be remotely launched from a stable launch device and not hand held. The launch device should be pointed within 30 degrees of vertical to ensure that the rocket flies nearly straight up.
- If more than 30 degrees of tilt is needed, either remove the rocket from service or the wind is likely too strong.
- Operators and spectators should stand back at least 50 feet, or 15 meters. High-pressure air can cause a water bottle rocket to rupture and explode, causing severe injury.
- The plastic bottles commonly used for soft drinks or water are generally used to construct the body of the rocket. Flying components—such as fins, a nose cone, or decorations—need to be lightweight and non-metallic (such as Styrofoam, tape, etc.).
- “Payload” items such as GoPro cameras and flight computers are not recommended due to their added weight.
- Air pressures should be appropriate: Most websites recommend a maximum range between 50 and 90 pounds per square inch (psi). Do not use any other gases, such as propane, CO<sub>2</sub>, or nitrogen—only atmospheric air.
- The use of friction-type launchers where the rocket is not held by a latch reduces the chance of overpressure.
- Use a working and accurate pressure gauge, visible at a distance from the launch site, to verify the pressure being used.
- Compressed air tanks may speed up a launch, but we recommend a manual tire pump set up away from the launch site. High pressure tanks or pumps are not recommended.
- If a rocket does not launch successfully, DO NOT allow anyone to approach the rocket until it has been depressurized through a remote “bleed down” of pressure.