

# Space Derby

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## Rules & Tips

### Constructing and Operating Rockets

The official space derby kit includes all necessary materials and instructions for building. Decorate the rocket with bright colors. Apply decals furnished in the kit.

### Space Derby Rules

All rockets must pass the following inspection to qualify for the race:

- Only basic materials supplied in the kit may be used.
- The rocket body may be no longer than 7 inches, not including the propeller and fins.
- There are no restrictions on the weight or design of the rocket.
- An auto winder will be used on race day. Each ROCKET will be wound the same amount of turns.



### Tips for rocket builders

- Reduce air friction or "drag" by making all surfaces as smooth as possible. A blunt, rounded nose causes less drag than a sharp nose. A good design has all leading edges rounded and trailing edges tapered to reduce the drag.
- Rubber bands should be lubricated before the race. They are the "motor" and must be strong and flexible.
- Use a sharp knife for cutting the grooves for the hanger fitting and fins. A dull knife will crush and splinter the balsa wood.
- When you start to carve, remember that the end with the small hole is the rocket nose.
- A potato peeler is good for carving the shape.
- To help increase the rocket's speed, reduce the wall thickness to a minimum of 1/8 inch. Do not weaken the area around the hanger (carrier) or carve away the nose button circle.
- Do not apply too much paint to the outside unless you sand between each coat.
- Be careful not to get glue on the plastic carrier, especially in the holes through which the monofilament line runs. Glue can interfere with smooth operation.
- Make the propeller shaft as short as possible by bending it close to the prop. Cut off the excess wire with wire cutters.
- Test the rocket's balance by hanging it from a string through the hole of the hanger fitting. If the rocket is nose-heavy, carve or sand a little wood off of the end. If it's tail-heavy, remove wood from the tail area.

### Tips for Preparing for Flight

- Lubricate the rubber bands before the derby. This prolongs the bands' life and power and will help reduce the possibility of breaking during the competition. They can be soaked overnight in castor oil. Or mix two parts green soap, one part glycerin, and one part water and rub the mixture on the rubber band about an hour before racing.
- Have extra boxes of rubber bands on hand. Remember, it takes three rubber bands to fly each ship properly.
- Experienced rocket racers "warm up" their space ships by gradually winding the rubber band motor to its full capacity—first 50 turns, then 100, then 200, etc. Release the propeller between each winding.
- A small hand drill is excellent for winding rubber bands. It also helps speed up the event. Check the ratio of the drill by making one revolution of the crank handle and count the number of times the chuck turns. Most drills average a one-to-four ratio; thus it would take 40 turns of the crank to give 160 winds on the rubber band motor. When using the hand drill winder, it's best for one person to hold the rocket and propeller while another stretches the bands about 12 to 15 inches beyond the rocket tail and turns the rubber bands, he gradually shortens the distance between him and the rocket.
- For a more evenly matched race, wind all rocket motors the same number of turns. For 100-foot launch lines, 150 to 170 winds should be sufficient.