SOFTWARE & TECH

How To Make A Parachute

Published: November 20, 2026 | Index ID: #-

Your Guide to Crafting a Safe and Functional Parachute

Building a parachute is a fascinating project that blends physics, engineering, and a touch of creativity. Whether you are looking for a fun weekend activity with children, a science fair project to demonstrate air resistance, or a serious endeavor into sport parachuting, understanding the fundamental principles is crucial. The phrase "how to make a parachute" can mean many things, from a simple toy dropping from a second-story window to a high-performance canopy designed for skydiving. This guide will walk you through the different levels of parachute construction, ensuring you have the knowledge to build something safe and effective for your specific needs.

Understanding the Basic Physics of Parachutes

Before diving into materials and assembly, it is essential to grasp why a parachute works. A parachute is designed to increase air resistance, or drag, to slow down a falling object. When you deploy a canopy, it captures a large volume of air, creating a high-pressure area underneath and a low-pressure area on top. This pressure differential pushes upward against the weight of the object, slowing its descent. The larger the surface area of the canopy, the more air it traps, and the slower the fall. For any project involving "how to make a parachute," keeping this principle in mind will guide your material and size choices.

Method One: The Simple DIY Toy Parachute

This is the easiest and most common entry point for learning how to make a parachute. It is perfect for children, classroom demonstrations, or simply for fun. The materials are inexpensive and usually found around the house.

Materials You Will Need

- A plastic bag (grocery bag or bin liner works well)
- Scissors
- A small weight (a toy figure, a small stone, or a metal washer)
- String or thin twine (four pieces, each about 12 inches long)
- Hole punch (or a sharp pencil)

Step-by-Step Assembly Instructions

1. Prepare the Canopy: Lay the plastic bag flat on a table. Cut a large square from the bag. A 12x12 inch square is a good starting point, but you can experiment with larger sizes.
2. Shape the Canopy: For better performance, trim the square into an octagon or a circle. This helps the parachute catch air more evenly. If using a square, round off the corners slightly.
3. Attach the Shroud Lines: Use the hole punch to make a small hole near each corner of the canopy. If you shaped it into an octagon or circle, space four holes evenly around the edge.
4. Tie the Strings: Cut four equal lengths of string. Thread one end of each string through a hole and tie a secure knot. Make sure the knot is larger than the hole so it cannot slip through.
5. Connect the Weight: Gather the free ends of all four strings. Tie them together with a strong knot. Then, tie your small weight to this gathered knot. Ensure the weight is securely attached.
6. Test Your Creation: Hold the parachute by the center of the canopy, lift it high, and release it. Watch as the canopy inflates and the weight descends slowly. If it drops too fast, try a larger canopy or a lighter weight.

Troubleshooting Your Toy Parachute

If your parachute does not open properly, the string lengths might be uneven. Check that all four strings are exactly the same length. Also, ensure the weight is not too heavy for the size of the canopy. Experimenting with different bag materials, such as a lightweight trash bag versus a thicker shopping bag, can also affect performance. This simple method is a fantastic way to teach the basics of drag and gravity.

Method Two: A More Durable Parachute for Model Rockets

Moving beyond toys, model rocketry requires a more robust parachute. These parachutes must withstand higher speeds and reliably deploy at altitude. Learning how to make a parachute for a model rocket introduces concepts like packing, shroud line attachment, and material strength.

Choosing the Right Materials

- Canopy Fabric: Use ripstop nylon or a lightweight polyester. These materials are strong, tear-resistant, and pack flat easily. Avoid plastic bags for rockets as they can melt or tear during high-speed ejection.
- Shroud Lines: Kevlar thread or braided fishing line works well. They are strong and resist fraying.
- Swivel: A small fishing swivel helps prevent the lines from twisting during descent.
- Reinforcement Tape: Nylon or fabric tape to reinforce the attachment points.

Construction Steps for a Rocket Parachute

1. Cut the Canopy: Cut a circle or hexagon from your ripstop nylon. For a typical model rocket, a 12 to 18-inch diameter works well. Use a hot knife or a soldering iron to cut the fabric, melting the edges to prevent fraying.
2. Reinforce the Edges: Fold over the edge of the canopy by about half an inch and sew or glue it down. This creates a hem that strengthens the edge and provides a place to attach shroud lines.
3. Attach Shroud Lines: Cut four to six pieces of Kevlar thread, each about one and a half times the diameter of the canopy. Space them evenly around the hem. Sew or tie them securely. Alternatively, use small adhesive patches designed for nylon.
4. Connect to the Swivel: Gather all shroud lines and tie them to one end of the swivel. Ensure the knot is tight and secure.
5. Attach to the Rocket: Tie the other end of the swivel to the shock cord of your model rocket. The shock cord is the elastic or rubber cord inside the rocket body that ejects the parachute.
6. Pack for Flight: Carefully fold the parachute along its seams and place it inside the rocket body. Tuck the shroud lines in neatly to prevent tangles.

Testing and Adjusting for Model Rockets

Always test your parachute with a simulated ejection charge or simply by throwing it from a high place. Adjust the size of the canopy based on the weight of your rocket. A heavier rocket needs a larger parachute. If your rocket descends too slowly and drifts far in the wind, consider a smaller parachute or a spill hole—a small hole in the center of the canopy that stabilizes descent.

Method Three: Skydiving Canopies – A Serious Engineering Feat

This section addresses the most high-stakes interpretation of "how to make a parachute." Building a skydiving parachute is not a weekend DIY project. It requires professional training, specialized equipment, and a deep understanding of aerodynamics. Attempting to build and use a skydiving parachute without proper knowledge is extremely dangerous and potentially fatal.

The Complexity of a Modern Skydiving Canopy

Modern skydiving parachutes are advanced pieces of engineering. They are constructed from zero-porosity fabric, which is coated to prevent air from passing through. The canopy is composed of multiple cells that inflate to form an aerodynamic wing. This wing shape allows the skydiver to steer, flare, and control their descent with precision. The shroud lines are made of high-strength materials like Vectran or Spectra, and they must be precisely measured and attached at specific points on the canopy.

Why You Cannot Safely Build a Skydiving Parachute at Home

- Material Sourcing: Professional-grade fabric and line sets are not available to the general public. They must meet strict safety standards.
- Precision Manufacturing: The shape and size of each cell must be exact. Even a small deviation can cause instability or a malfunction.
- Rigging and Inspection: Parachutes must be packed and inspected by a certified rigger. They have the training to identify potential failures.
- Legal and Liability Issues: Using a homemade parachute for skydiving is illegal in most jurisdictions and would void any insurance.

If You Want to Skydive

Instead of building a parachute yourself, invest in proper training at a skydiving school. You will learn to use professionally manufactured equipment. Once you are licensed, you can work with a certified rigger to assemble a parachute system from approved components. This is the only safe path for anyone serious about sport parachuting.

Safety Considerations for Any Parachute Project

Regardless of the type of parachute you are making, safety should be your top priority. For toy parachutes, always supervise children during construction and testing. Avoid using heavy weights that could cause injury if dropped on someone. When testing, choose an open area away from trees, power lines, and people. For model rockets, follow the safety code of the National Association of Rocketry (NAR). Never launch a rocket near people or buildings. For skydiving, seek professional training. Never attempt a jump without proper instruction and equipment.

Creative Ways to Use Your Homemade Parachute

Once you have mastered the basics, you can expand your parachute-making skills into other areas. Consider these fun and educational projects:

Egg Drop Challenge: Build a parachute to protect an egg from breaking when dropped from a height. This is a classic engineering challenge that tests your understanding of drag and shock absorption.

Parachute for a Camera: Create a larger, more stable parachute to safely lower a small action camera from a drone or a high point. This requires careful weight distribution and a reliable deployment mechanism.

Parachute for a Toy Soldier: Make tiny parachutes for action figures and have them battle in the sky. It is a great way to practice your skills on a small scale.

Conclusion

Learning how to make a parachute is a rewarding journey that spans simple crafts and complex engineering. From a basic plastic bag and string to a high-performance skydiving canopy, each project teaches valuable lessons about physics, materials, and safety. Start with the simple toy parachute to understand the fundamentals, progress to a

model rocket parachute for more durability and precision, and save the advanced canopy building for professional training. The key is to respect the forces involved and always prioritize safety. With the right knowledge and approach, you can successfully build a parachute that opens, descends smoothly, and brings your object safely back to earth. So gather your materials, find a good drop zone, and enjoy the process of creating something that defies gravity.

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