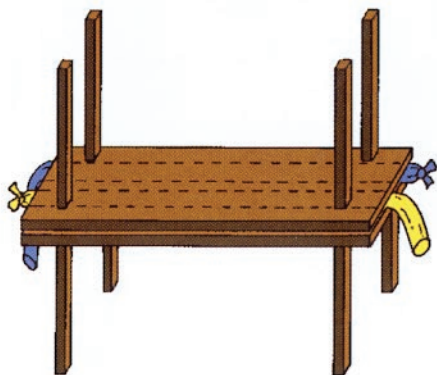


THE AMAZING TABLE LIFT

WINDBAGS are made out of thin tubes of plastic that will easily burst if too much pressure is applied. However, in this experiment you will be able to use two WINDBAGS to lift several hundred pounds of weight. You won't believe your eyes.



MATERIALS

Two WINDBAGS, two identical tables (2'x6'), and you must have adult supervision!

PRESENTATION

Prepare two WINDBAGS by tying a knot in one end of each bag. Spread the WINDBAGS out flat on one table with the open ends hanging over the edge. Ask for several people to help you position another identical table upside down on top of the first table. The two WINDBAGS should be *sandwiched* in between the tops of the two tables.

Ask each helper to kneel down by the ends of the table and begin blowing into the bags. Remind them to squeeze the WINDBAGS closed after each breath and not to let any air escape. The force of the air in the WINDBAGS will slowly cause the inverted table to rise. This compressed air is exerting pressure underneath the inverted table equally throughout the long WINDBAG. This same scientific principle is being applied when you pump up a bicycle tire or when an auto mechanic uses an air lift in a garage.

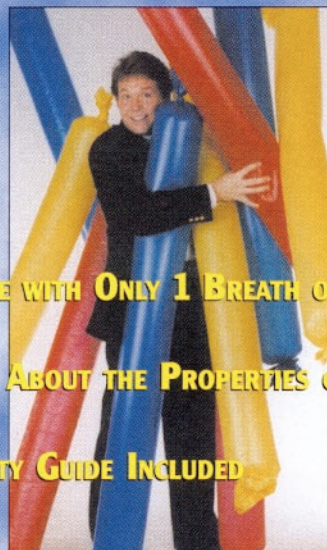
Invite more people to come up and sit on the inverted table. Roughly estimate the weight of the table and the people who are sitting on it. Warn the people not to get their fingers caught in between the tables. As the two people on the ends of the table blow into the WINDBAGS, the table and the people on the table will rise.

THE AMAZING...

WINDBAG™

INFLATE WITH ONLY 1 BREATH!

AMAZE YOUR FRIENDS!



- INFLATE WITH ONLY 1 BREATH OF AIR!
- LEARN ABOUT THE PROPERTIES OF AIR
- ACTIVITY GUIDE INCLUDED

Steve Spangler
SCIENCE

Steve Spangler Science
Toll Free (800) 223-9080
www.SteveSpanglerScience.com

Ages 10 to Adult

Warning: Keep these plastic bags away from babies and small children. To avoid danger of suffocation, do not use this bag in cribs, beds, carriages or play pens. This is not a flotation device.



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THE AMAZING...

WINDBAG™

INFLATE WITH ONLY 1 BREATH!

8 FEET LONG!

- EXPLORE THE PROPERTIES OF AIR
- GREAT SCIENCE FAIR PROJECT
- BUILD GIANT BALLOONS
STRUCTURES OUT OF AIR



**PACKAGE OF 4
WINDBAGS**

Steve Spangler
SCIENCE

WHAT IS A WINDBAG?

A WINDBAG™ is like a balloon without any elastic qualities. WINDBAGS do not stretch like ordinary balloons, making them easy to inflate. Best of all, these bags are big...8 feet long! There are many creative things that you can do with a WINDBAG. Here are some fun activities to get you started...

CHALLENGE

How many breaths would it take to blow up an 8 foot long bag? Depending on the size of the person, it may take anywhere from 10 to 50 breaths of air. However, with a little practice you will be able to inflate the bag using only one breath!

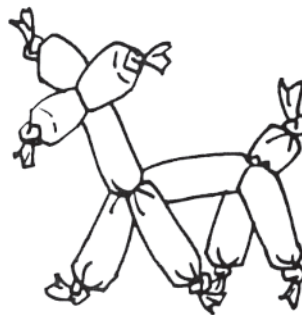


PRESENTATION

1. Tie a knot in one end of the bag. Invite a friend to blow up the bag keeping track of the number of breaths it takes. Then, let all of the air out of the bag. Explain to your friend that you can blow up the bag in one breath.
2. Have your friend assist you by holding onto the closed end of the bag. Hold the open end of the bag approximately 10 inches away from your mouth. Using only one breath, blow as hard as you can into the bag. Remember to stay about 10 inches away from the bag when you blow. Fig 1.
3. Quickly seal the bag with your hand so that none of the air escapes. Tie a slip knot in the end of the bag, or let the air out and try again.

HOW DOES IT WORK?

The WINDBAG quickly inflates because air from the atmosphere is drawn into the bag along with the stream of air from your lungs. Here's the technical explanation: In 1738, Daniel Bernoulli observed that a fast moving stream of air is surrounded by an area of low atmospheric pressure. In fact, the faster the stream of air moves, the more the air pressure around the moving air drops. When you blow into the bag, higher pressure air in the atmosphere forces its way into the area of low pressure created by the stream of air from your lungs. In other words, air in the atmosphere is drawn into the WINDBAG at the same time that you are blowing into the bag. Fire fighters use this principle to force smoke out of a building. Instead of placing the fans up against the doorway or window, a small space is left between the opening and the fan in order to force a greater amount of air into the building. Fire fighters call it "Positive Air Flow."



AIRWAVE

Tie a knot in one end of the bag. Hold open the other end and wave the WINDBAG up and down to scoop up some air. Run with it outside and allow the wind to inflate the tube. Fig 2.

WINDBAG SLIP KNOT

Trap the air inside the bag by squeezing it to one end and tie a loop-like slip knot. Simply loosen the slip knot to deflate. Fig 3.

AIR SAILING

Toss, play catch, or sail the WINDBAG outside for hours of fun. Small holes can be repaired with clear tape. Fig 4.

WIND DANCING

Inflate the WINDBAG and tie a slip knot. Attach a piece of string to the end of the bag. Tie the WINDBAG to a tree branch or a fence and watch the bag dance in the wind. Attach several WINDBAGS for a spectacular effect.

DECORATE YOUR BAG

You can decorate on the outside of the WINDBAG using markers. Use permanent marker so that the ink does not smear.

SEND A UNIQUE LETTER TO A FRIEND

Write a letter to a friend, but this letter won't require any paper. Roll the WINDBAG out on a table and write the letter to your friend directly on the outside of the WINDBAG! Use a permanent ink felt tip marker for best results. Explain to your friend how to inflate the bag using only one breath of air. What a great surprise! Fig 5.

BUILDING SHAPES & STRUCTURES

Build three-dimensional geometric shapes and giant balloon animals by joining several WINDBAGS together. You'll need to purchase a bag of #33 rubber bands. Hook two rubber bands together as shown in figure 6. Stretch the two rubber bands around two inflated WINDBAGS as shown in figure 7. Use the rubber bands to arrange the tubes in various shapes. Make giant cubes, triangles, pyramids, or any other shape imaginable. You can even build giant balloon animals!

ACKNOWLEDGMENTS

To the best of our knowledge, the originator of this idea is Doron Gazit, President of Air Dimensional Design, Inc. Mr. Gazit designs an array of large-scale airtube structures for conventions and events worldwide. Windtube™ is a trademark of ADD.

The presentation of the material contained in these instructions is the creation of Steve Spangler of Englewood, Colorado. Steve travels throughout the country as a science speaker and workshop presenter and is best known as the science host on **NEWS FOR KIDS**, a nationally syndicated children's television program.

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