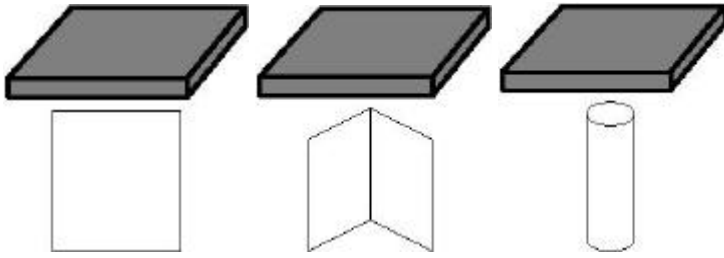


# The Secret Is Increasing

Expanding Your Horizons 27 April 2002

## How strong can you make it?

A single unfolded sheet of paper is not very strong. Try and balance your folder on an upright sheet of paper. Does this work? Now fold the paper in half and try again. What happens? Finally, roll the paper into a tube and place the folder on it. How many folders can you place on it now?



???

Changing the shape of the paper by folding or rolling thus makes it stronger and better able to support heavy objects. Can you make a bridge from a single sheet of paper, without scissors or glue, which can support a heavy load?

Paper packaging makes up the largest percentage (by weight and volume) of paper usage in the United States. Since paper boxes must be strong enough to hold heavy objects, corrugated cardboard is often used. Corrugated cardboard is made by sandwiching a piece of pleated paper between two others; it is this pleated sheet that gives it strength.

## How neat can you pack it?

Packing clothing in a suitcase becomes much easier if you fold them first instead of just shoving them in unfolded. You can put more clothing into a suitcase this way, and it's also easier to unpack.

Automobile airbags are designed to fit in a small space AND unfold at the right speed and in the right sequence. Can you figure out how to optimally fold an airbag to do this?

## How fast can you open it?

Ever wrestled with a map while hiking?

There are many ways of folding maps. How fast can you open a standard roadmap, find our location, and fold it back up neatly? We will show you other ways to fold this map.

There are other ways of folding maps and brochures that make it easier to open and close them. Can you follow the directions and fold your EYH map as a "Miura-Ori" or Z-fold map? Why do you suppose such maps are not more readily available?

Can you imagine a way to fold a map so that you can trace a path along it without opening it all the way up? There are ways of doing this that are military secrets. They allow jeep drivers to find where they are quickly without the map blowing away in the wind or providing a big visible white target for the enemy to shoot at.

More Information:

<b>Local Origami Group</b>	FlaP (Finger Lakes Paperfolders) <a href="http://www.geocities.com/fingerlakespaperfolders">www.geocities.com/fingerlakespaperfolders</a>
<b>Maps</b>	
Solar sails and Miura-Ori folds	<a href="http://www.u3p.net/fold/pliage_a.htm">www.u3p.net/fold/pliage_a.htm</a> <a href="http://www.worthhall.demon.co.uk/theory/miura.htm">http://www.worthhall.demon.co.uk/theory/miura.htm</a>
Z-CARD	<a href="http://www.zcard.com">www.zcard.com</a>
Alternative Map Folds	<a href="http://web.merrimack.edu/~thull/papers/MapFold.pdf">web.merrimack.edu/~thull/papers/MapFold.pdf</a>
<b>Buildings</b>	
Kwik-Kuvr Disaster Shelters	<a href="http://www.tsa.ac.za/dm/ntavares.htm">www.tsa.ac.za/dm/ntavares.htm</a> <a href="http://www.arch.nus.edu.sg/SOA/design_studio/rda/group5/Materials-Plastic.html">www.arch.nus.edu.sg/SOA/design_studio/rda/group5/Materials-Plastic.html</a>
thepod Icosahedral Shelters	<a href="http://www.icosavillage.net">www.icosavillage.net</a>
The Cardboard School	<a href="http://www.cardboardschool.co.uk">www.cardboardschool.co.uk</a>
Shigeru Ban	<a href="http://www.assemblylanguage.com/reviews/Ban.html">www.assemblylanguage.com/reviews/Ban.html</a> <a href="http://www.toto.co.jp/GALLERMA/hist/en/biogra/sakash.htm">www.toto.co.jp/GALLERMA/hist/en/biogra/sakash.htm</a> <a href="http://www.time.com/time/innovators/design/profile_ban.html">www.time.com/time/innovators/design/profile_ban.html</a> <a href="http://www.cnn.com/2000/STYLE/design/07/07/shigeru.ban/">www.cnn.com/2000/STYLE/design/07/07/shigeru.ban/</a>
Structural Engineer and Paper Architect	
<b>Paper Strength</b>	
Paper University	<a href="http://www.tappi.org/paperu/">www.tappi.org/paperu/</a>
Other Applications of Origami	<a href="http://www.siam.org/siamnews/10-01/origami.pdf">www.siam.org/siamnews/10-01/origami.pdf</a>
<b>Packing/Unpacking</b>	
Airbag Folding Software	<a href="http://www.easi.com/software/ecfold/?css_ok=1">www.easi.com/software/ecfold/?css_ok=1</a>
Parachute Folding	<a href="http://www.butlerparachutes.com/hxmanual.htm">www.butlerparachutes.com/hxmanual.htm</a>
Folding the United States Flag	<a href="http://www.legion.org/our_flag/of_folding_flag.htm">www.legion.org/our_flag/of_folding_flag.htm</a> <a href="http://www.learn2.com/09/0903/0903.asp">http://www.learn2.com/09/0903/0903.asp</a> <a href="http://usmilitary.about.com/library/milinfo/blflagfold.htm">http://usmilitary.about.com/library/milinfo/blflagfold.htm</a>

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**For:**

Weights, Paper

Rhodes 508

Sample Z-fold maps & brochures

Ithaca Maps

Miura-Ori map of Tokyo Transit System

Topographical Maps