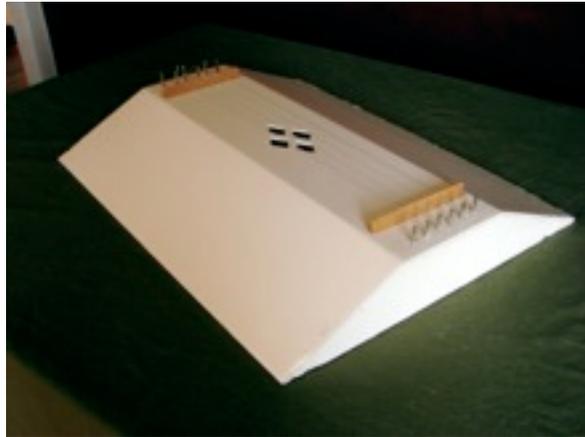


Materials:

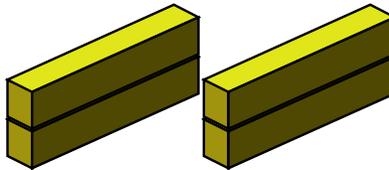
- 2 foam boards (30"x20")
- 12 zither pins (size 3/16")  
(Alternative: 6 zither pins and 6 decorative screws)
- 4 wood blocks (1 5/8" x 1 5/8" x 6")  
(Banister posts work great)
- 6 nylon "classical" guitar strings  
(Lower gauge strings work best for this size of harp. Higher gauge strings are available for harps, but you would need a longer harp to get a good response. Consider varying the gauges.)
- Two wooden bridges 5" long (This workshop uses 10" hognose psaltry bridges from Music Kit Makers, cut in half.)
- White glue
- Tuning key for 3/16" zither pins  
(pliers will be hard to use and will mar the pins' finish.)
- Optional: Wide clear tape (such as weathering tape)



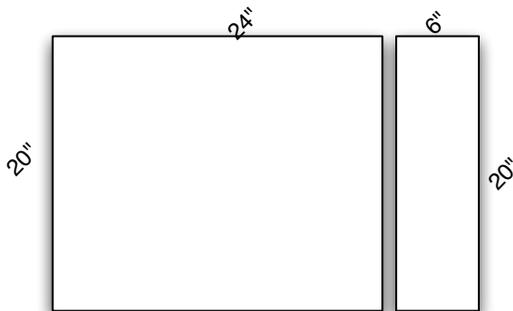
Equipment:

- Cutting surface
- Ruler (24 x 6 Omnigrid works great)
- "Exacto" or similar hobby knife
- 3/16" drill bit
- Drill

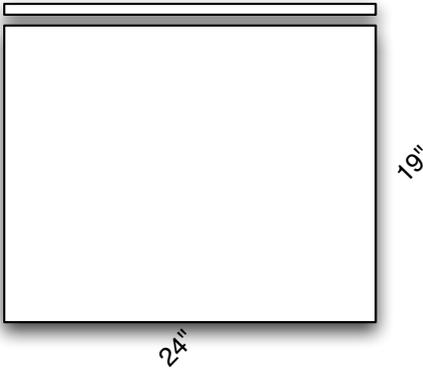
1. Glue two wooden blocks together. Glue the other two together. Set aside.



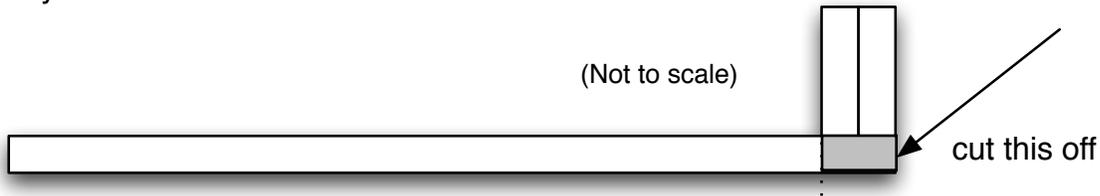
2. Cut **two** foam boards to 24 x 20. Be sure not to ruin the remaining (6" x 20") parts. You will need them later for the side panels.



3. Cut one inch off long end of **one** of the boards. This will be the **bottom board**.



4. Cut a .5 cm strip off **the bottom board**, making it a little over 23 5/8" long. (Essentially, you are trying to cut off 2 times the thickness of the foam board. The board's thickness measures best in metric. Unsure? Take the two 6" x 20" and put them together. Stand them up perpendicular to edge of the board you are going to cut and make your mark.) This will be your **bottom board**.

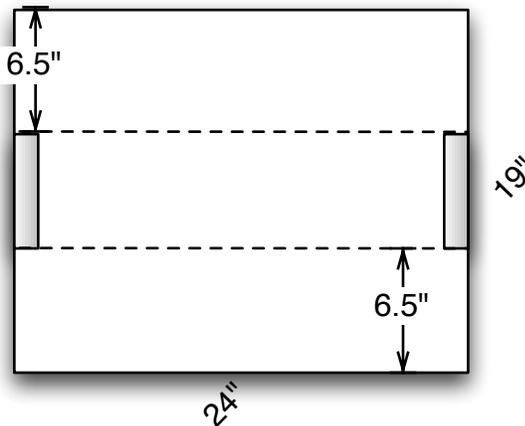


You now have two large boards.

**Top board:** 24" x 20"

**Bottom board:** 23 5/8" x 19"

5. Glue the blocks, upright, half-way along the each edge of the bottom board.



6. Cut the side panels according to the template, using the two 24" x 6" pieces. Try to make these as accurate to the template as possible.

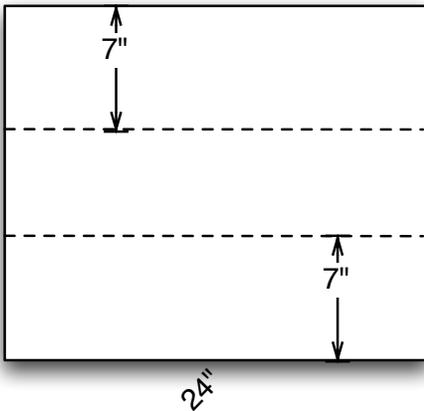
7. Glue the side panels to the edge of the bottom board and wood blocks.



(If the glue attaching the blocks to the bottom board has not dried. Go to next step and try later.)

Optional: after glue has dried, put tape along the inside corner to fill any gaps.

8. Draw lines seven inches from each side of the **top board**.

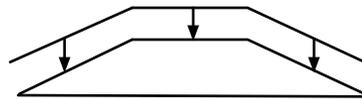


9. Using a hard edge, crease the **top board** along the lines.



10. Cut a sound hole in the **top board**.

11. Glue top to bottom and side panels.



12. Trim any excess from bottom board that sticks out.

13. Using template, mark for zither pins. Drill holes using 3/16 inch bit. Be sure to “reverse out” so that the hole is tight. (1 1/4” deep.)

14. Using tuning key, screw in zither pins.

15. String the harp.



## About tuning:

When you pluck a string, you hear the “fundamental.” Aeolian harps, however, play only “harmonic” notes. The harmonic is determined by the wind speed, the length of the string, and the string’s thickness. Consequently, you cannot know what notes will play until the wind is blowing.

Since the length of the string and the wind speed at a given time is static, differences in notes are determined by the string’s thickness. For this reason, aeolian harps have traditionally used strings with different gauges and lengths tuned to the same note (preferably, the natural frequency of the harp’s box). Theoretically, each string will then create a different note. (In actuality, not every string will respond to a particular wind speed. Some strings will fade in and out as the wind speed changes.)

Tuning to the harp’s natural frequency increases amplification. There are several ways to find the harp’s natural frequency. None are easy, so if you can’t do it, don’t worry about it.

- (1) Hold the harp by a pin and muffle the strings with your finger. With the other hand, tap the harp. That tap is actually a note. If you have a good ear, memorize the note.
- (2) Same as above, but use a software program that displays the pitch played by the tap. These programs are simple and usually free to download.
- (3) Put your mouth by the sound hole and hum a range of notes. When you hit the “right” note, the harp will vibrate. You will feel it in your hands. Memorize that note or catch it with a software program.

Hint: If the harp only reacts to high winds, loosen the strings. The strings can be much looser than they would be for a harp or guitar.

**Remember, there is no “rule” to tuning. Do what sounds best to you.**

### Materials:

Musicmaker's Kits  
14525 61st St. Ct. N  
PO Box 2117  
Stillwater, MN 55082  
800 432 KITS (5487)  
<http://www.harokit.com>  
(pins, strings, bridges and much more)

JustStrings.com  
20 Mont Vernon Street  
Milford, NH 03055  
603.673.1104  
<http://www.juststrings.com/>  
(single strings, bulk strings)

String This!  
3709 Severn Ave.  
Charlotte, NC 28210  
<http://www.stringthis.com>  
(single strings, bulk strings)

Experimental Musical Instruments  
PO Box 421, Point Reyes Station CA 94956  
(415) 663-9691  
<http://www.windworld.com/>  
(pins, tuning keys, and more)

### Aeolian and Kite Musical Instruments

Chris' Aeolian Journey  
[www.wingsonstrings.org/aeolian/](http://www.wingsonstrings.org/aeolian/)  
(My site.)

Ciel Libre (Free Sky)  
<http://w1.neuronnexion.com/~dferment/>  
(Didier Ferment's site for creative kites, aeolian instruments, and other designs. Most of the site is French, but some of the plans are in English.)

Uli Wahl's Kite and Musical Instrument's Site  
<http://members.aol.com/woinem1/index/index.htm>  
(This is the mega-site on aeolian instruments. Basically an encyclopedia of kite and aeolian instruments from around the world, their history, the science and musicology involved, sound clips, and lots of links to additional resources. The site is in German and English, but the links could be to sites in any variety of languages.)