

Tuning Helmholtz Resonators

Gourds are the standard resonator for African xylophones (including marimbas). You can see them by doing a word search on "African marimba". Here is an example of one that makes room for the gourds by mounting the bars in a cuve:

<https://www.lookandlearn.com/history-images/M468592/Man-playing-a-marimba-in-Africa>

To tune this type of resonator (called a Helmholtz resonator), first cut the top off a gourd that has a neck and one globe--cave-man club, kettle, dipper, etc. A gentle expansion of the neck into the globe is preferable to the abrupt expansion of the dipper. Clean out the inside and blow across the top to hear the note produced. If you now cut a small amount off the neck, the gourd will give you a higher note. Play the bar you want to resonate. What pitch are you aiming for? What pitch do you have? Cut the neck down a little bit at a time until you get to the note you need.

The resonator will have the most effect if the size of its opening is close to the width of the bar. It might be hard to test the pitch by blowing when the opening gets this large, so you can tap the gourd instead or hold it under the bar while tapping the bar to see whether it's amplifying the pitch. If you're not sure, hold it under surrounding bars to see which one it amplifies best.

A great reference for marimbas is *Making Marimbas and Other Bar Percussion Instruments* by Bart Hopkin and Carl Dean.