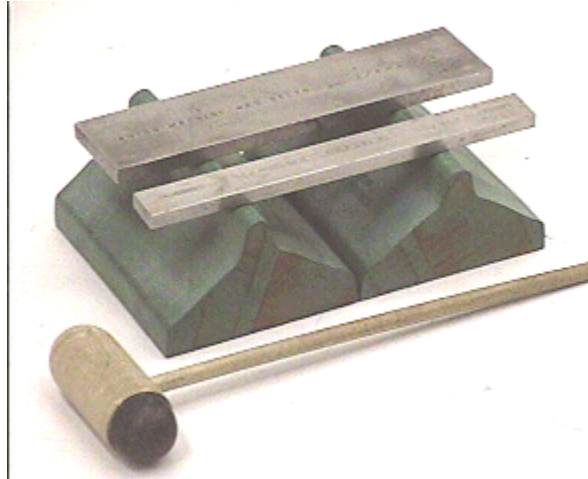


Answer #48

The answer is (c): the frequency of the wider bar will be exactly the same as that of the narrower bar, as can be heard on an mpeg video by clicking your mouse on the photograph below.



The transverse standing waves excited in these two bars by striking them as seen in the video are the same. Each has an antinode in the center, nodes approximately at the points where they rest on the rubber supports, and antinodes approximately at the ends (although not quite, because of the rigidity of the bars). The fact the width of the two bars is different has no bearing (to a good approximation) on the rate at which they vibrate in this transverse mode. The relevant physical quantities are the mass per unit length of the bar *relative to its ability to bend*, which is the same for both bars; both quantities increase in the same manner as the bar becomes wider.

On the other hand, changing the thickness of the bar will modify the frequency, but how?

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