

## Silence of the Slam

### What is this about?

In “Vibrating Bats” you learned about the way bats vibrate because of the collision with the ball. In this activity you will learn how to find the vibrational node for an actual baseball bat. The vibrational node will turn out to also have something to say about the “sweet spot.”

### What do I need?

You’ll need a baseball bat (hopefully the one you used in the “Quick Reactions” activity), a piece of notebook paper, a bit of tape, and a hammer.

### What will I be doing?

You will be listening to the amplified vibrations of the bat that are created when it is struck with a hammer. These vibrations are the same as the ones created when the ball hits the bat.

### What to do and notice

1. Create a megaphone out of the notebook paper and tape. Make sure the small side is just big enough to fit over the end of the handle end bat. Attach it to the bat with some tape.
2. Hold the bat gently by the handle and let it hang vertically.
3. Gently tap the hammer on the bat starting near the handle while listening to the sound from the megaphone.
4. Move the hammer down the bat slowly and continue tapping.

Write a description of your results. Did you find a spot toward the barrel end where the sound was nearly gone? This spot is the vibrational node or VN.

### What did I learn?

You can now find the vibrational node of a real baseball bat, not just a thin wooden dowel. Remember, a well-designed bat should have the VN near the CP to reduce the energy absorbed by the bat when it hits the ball. This is called the “sweet spot” of the bat.

### What else should I think about?

Go back and look over the “Quick Reactions” activity. Compare the location of the CP and the VN you just measured. Are they close to each other? Next time you’re at bat, what part of the bat do you want to hit the ball? At silent spot you might smack a grand slam!

### Catch it in the Web!



Vibrational Modes of a Baseball Bat

(<http://paws.kettering.edu/~drussell/Demos/batvibes.html>)

The animations on this page illustrate the vibrational behavior of a baseball bat.



YouTube Time Warp - Baseball bat

(<http://www.youtube.com/watch?v=QFIEIybc7rU>)

The Discovery Channel program uses high speed photography to watch the vibrations of baseball bats.

