Question #309

This question deals with the "sweet spot" of the baseball bat seen in the photograph at the left below. The bat hangs by a short loop of string at the handle end, and the sweet spot, or center of percussion is marked on the side of the bat with a piece of yellow Dymo tape, as seen in the photograph at the right below.

Suppose that with the bat suspended by the string, I strike the sweet spot briskly with a rubber mallet, as seen in an mpeg video by clicking your mouse on the photograph at the left above. Lamentably, you cannot see what actually happens because the video stops just before the mallet hits the bat.

The question this week is what happens to the bat when it is suspended as seen and struck with the mallet. The three points, above, below, and at the center of percussion, at which the bat will be struck are shown in the three photographs below. Click your mouse on the photographs to see how the bat will be struck in each case.

Part 1, Q1: When the bat is struck *above* the sweet spot, the bat:

- (a) rotates clockwise about the center of percussion and swings to the left.
- (b) rotates clockwise about the center of percussion and swings to the right.
- (c) rotates counterclockwise about the center of percussion and swings to the left.
- (d) rotates counterclockwise about the center of percussion and swings to the right.
- (e) rotates clockwise about the center of percussion but does not swing in either direction.
- (f) rotates counterclockwise about the center of percussion but does not swing in either direction.
- (g) swings to the left without rotating about the center of percussion.
- (h) swings to the right without rotating about the center of percussion.

Part 1, Q2: When the bat is struck *below* the sweet spot, the bat:

- (a) rotates clockwise about the center of percussion and swings to the left.
- (b) rotates clockwise about the center of percussion and swings to the right.
- (c) rotates counterclockwise about the center of percussion and swings to the left.
- (d) rotates counterclockwise about the center of percussion and swings to the right.
- (e) rotates clockwise about the center of percussion but does not swing in either direction.
- (f) rotates counterclockwise about the center of percussion but does not swing in either direction.
- (g) swings to the left without rotating about the center of percussion.
- (h) swings to the right without rotating about the center of percussion.

Part 1, Q3: When the bat is struck *at* the sweet spot, the bat:

- (a) rotates clockwise about the center of percussion and swings to the left.
- (b) rotates clockwise about the center of percussion and swings to the right.
- (c) rotates counterclockwise about the center of percussion and swings to the left.
- (d) rotates counterclockwise about the center of percussion and swings to the right.
- (e) rotates clockwise about the center of percussion but does not swing in either direction.
- (f) rotates counterclockwise about the center of percussion but does not swing in either direction.
- (g) swings to the left without rotating about the center of percussion.
- (h) swings to the right without rotating about the center of percussion.

Part 2: When the bat is positioned on Dan's finger at the center of percussion, as seen in the photograph above, and released:

- (a) it will fall off with the thick end of the bat moving down.
- (b) it will fall off with the thin end of the bat moving down.
- (c) it will remain balanced.

Click here for [Answer #309](#) after March 10, 2008.

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For questions and comments regarding the *Question of the Week* contact
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