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**Student** **Ges-**  
**tures about Complex Wave Functions for One-Dimensional Potentials**  
CATHERINE SCHIBER, HUNTER CLOSE, ELEANOR CLOSE, DAVID DONNELLY, Texas State University- San Marcos — A quantum wave function for a particle in a one-dimensional potential may be purely real at some instant, or there may be no such instant, depending on the potential. When the time dependence of the wave function is factored in, any function will surely have both real and imaginary parts. The complex nature of the wave function in these cases is perhaps best shown using three dimensions rather than with a two-dimensional drawing. We asked upper-division quantum mechanics students in an oral exam to show with their hands what the shape of wave functions for various potentials would look like, and how these functions would evolve in time. We analyze the students' gestures to understand their thinking; in particular, we investigate the difference between gestures that trace static structures and those that represent dynamic evolution, and how students extend mathematical knowledge from two-dimensional contexts into three.

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