162a Chemical Engineering as an "Eggs Act" Science

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I have never found a more versatile prop for teaching traditional Chemical Engineering courses than the common egg. The egg possesses many properties that make it the favorite tool in my bag of classroom tricks. The egg is nearly spherical. It comes in many sizes ranging from the minuscule hummingbird egg to the gargantuan ostrich egg. The egg is filled with non-Newtonian fluids. These fluids contain surfactant compounds central to much of kitchen chemistry. At relatively moderate temperatures, the egg undergoes chemical reactions that lead to transformation of the basic product, as well as several quality control issues.

I will present several examples, mostly based on those I have used teaching transport phenomena. These include flow pass solid objects, dimensional analysis, time-dependent transport, and colloid stability. I will also introduce possibilities of using the egg for discussions about optimization and product design.