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How Things Work: Teaching Physics in the Context of Everyday Objects

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How Things Work is an unconventional introduction to physics, a course that starts with whole objects and looks inside them to see what makes them work. Effectively "case-study physics," it is designed primarily for non-science students who are unsure of the role of physics in the world and are looking for relevance in their studies. How Things Work is essentially the generalization of context-based introductory courses (Physics of the Human Body, Physics of the Automobile, and Physics of Music) and demonstrates that when physics is taught in the context of ordinary objects, these students are enthusiastic about it, look forward to classes, ask insightful questions, experiment on their own, and find themselves explaining to friends and family how things in their world work. In this talk, I will discuss the concept and structure of a How Things Work course and look briefly at how to teach its objects and assess what students learn from it. Although this course focuses on concepts rather than on calculations, it is rich in physics and requires that students think hard about the world around them. It also teaches problem solving and logical thinking skills, and demands that students face their misconceptions and failures of intuition. Lastly, it is actually quantitative in many respects, though its results are usually more words than numbers: your weight, the battery's voltage, or the acceleration due to gravity.