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# Building a Heart: The Function and Mechanics

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The heart is an inconceivably beautiful organ combining form and function. In high school physics classes it is rare to get an opportunity to spend time on an extended project. It is my intention to begin the year with my second-year AP Physics B students with the challenge of designing and constructing an artificial heart. The initial process will rely on their previous year's knowledge of Mechanics. This will serve two purposes. The project will reinforce their prior knowledge while developing or reinforcing the students' hands-on construction knowledge. We will begin by determining the necessary parameters of the heart, through research and guided reading. My students will then incorporate their acquired knowledge of the heart as a system with their knowledge of Mechanics to produce a simplified heart pump. Their prototype will simulate the left heart that pumps oxygenated blood to the body. As my students work on their artificial hearts, I intend to provide them with opportunities to explore the background fluid dynamical properties of blood flow through the circulatory system of the body. This will enable my students to transition from the study of Mechanics to that of fluid dynamics.

(Developed for AP Physics II B, grade 12; Physics I Gifted and Physics I Scholars, grades 11-12; recommended for AP Physics II B, grade 12, and Physics I Gifted and Scholars, grades 11-12)