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A biotic video game smart phone kit for formal and informal biophysics education HONESTY KIM, SEUNG AH LEE, INGMAR RIEDEL-KRUSE, Stanford University, Bioengineering — Novel ways for formal and informal biophysics education are important. We present a low-cost biotic game design kit that incorporates microbial organisms into an interactive gaming experience: A 3D-printable microscope containing four LEDs controlled by a joystick enable human players to provide directional light stimuli to the motile single-celled organism *Euglena gracilis*. These cellular behaviors are displayed on the integrated smart phone. Real time cell-tracking couples these cells into interactive biotic video game play, i.e., the human player steers *Euglena* to play soccer with virtual balls and goals. The player's learning curve in mastering this fun game is intrinsically coupled to develop a deeper knowledge about *Euglena's* cell morphology and the biophysics of its phototactic behavior. This kit is dual educational - via construction and via play – and it provides an engaging theme for a formal biophysics devices class as well as to be presented in informal outreach activities; its low cost and open soft- and hardware should enable wide adoption.

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