Laminate devices have the potential to lower the cost and complexity of robots, increasing the practicality of their use in schools and in hazardous working environments. Taking advantage of laminate materials' inherent flexibility, a high-performance jumping platform is developed. The platform is designed by first gaining an understanding of the effects of varying the leg dimensions and motor gear ratios by using a simplified single-mass, variable-force model. Then, more complete multibody computer simulations and analytical models are developed, incorporating leg inertia, material flexibility, and a more robust motor model. From the simulation results, the leg design parameters are chosen to optimize jump height, and multiple physical platforms are built utilizing laminate construction. The platforms' jumping abilities are then tested and analyzed in comparison with the simulation results. Through these experiments, the electrical energy and mechanical energy into the system and the final potential energy of the system are monitored in order to identify and correct flaws or inaccuracies in the models.