

Abstract Submitted  
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**Do Box Jumps Follow Newton's Laws?**<sup>1</sup> DIPTI SHARMA, KIMBERLY FARAH, Lasell College, Newton, MA — We found an interesting way of teaching Newton's 2nd law to health science major students using logger pro software and a video analysis method. Box jumps are a form of plyometric exercise used to strengthen the lower extremities of the body. An athlete would use box jumps as an exercise when they are trying to build up power and explosiveness where they lift their body weight. The problem that we studied in this project is how the quality of shoes affects the box jumps and how the results can be related with the Newton's law. To do this project we used three different types of shoes; 1) Nike Air Forces, 2) Nike basketball shoes, 3) and a pair of Nike running shoes. We recorded videos for several box jumps using a motion detector and logger pro software. Later, we analyzed the video recording to get the associated take off speed and acceleration of the various shoes and then found the force exerted on the various shoe types. We found that force varied with shoe type. Wearing lighter shoes during box jumping is the most convenient as it exerts less force and less effort. The type of shoe provides different support to the foot and ankle. For example, the Air Forces had thick laces and a strap that went around the lower aspect of the ankle whereas the basketball sneakers were a bit lighter but the shoes themselves went up past the ankle region, laced the entire way up, and had an ankle strap.

<sup>1</sup>The work was done by health major undergraduate students - N. Carroll and M. Michel

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