Have a Swingin' Time: Investigation into the Effects of Mass Distribution on a Pendulum's Motion to Model a Swing for Disabled Persons

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This project’s aim was to investigate how changing the distribution of mass around a central point of a pendulum affected its motion and to then use the data collected to model a method of swinging that does not require entire body movement for disabled persons. This was done by setting up an apparatus on a pendulum that allowed for weights to be moved along two wooden crossbars that could be adjusted to different angles. The period and velocity of the pendulum’s motion were recorded. It was found that when the masses were at their greatest distance apart this led to the greatest period for motion of the pendulum and velocity was unaffected by the distribution of the mass. The data collected was then used to model a method of swinging that disabled persons without the entire use of their body could use. This data was applied to a swing in which a steel pole with weights at either of its ends was rotated to try and attempt to see if by moving the steel pole a swinging motion could be sustained. This was successful and further development and refinement of the model created for the method of swinging can be recommended in order to design a swing that disabled persons could use with only the use of their arms.

Awards Won: