In modern classrooms and lecture halls at most schools and Universities, whiteboards are the preferred visual aid utilized. Despite their advantages over other visual aids, valuable time is wasted erasing large areas of whiteboard space that span up to 4’ by 9’ or larger. In addition, fifty minute to one hour classes do not allow enough time for lecture material let alone time to erase past information. Our design allows the user to quickly and effortlessly erase an entire whiteboard with one pull.

Using Solidworks, finite element analysis was conducted on the base frame of the erasing surface to ensure that the design can withstand significant loads applied by the user (see Figure 4). The tests show that the frame can indeed withstand loads of large magnitude with little frame deflection. The minor deflection of the frame ensures that no permanent deformation will occur to interfere with the erasing motion. Also the limited deflection ensures product longevity.

The work needed to erase a standard 4’ by 9’ whiteboard was determined by attaching an accelerometer to a dry eraser while in use. With the mass of the eraser known, the output from the accelerometer was easily integrated over the x and y distances of the whiteboard to yield work in Joules. This quantity was compared to the work needed to pull the Quick-Erase the horizontal span of a similar whiteboard with equivalent dimensions. The results show (see Figure 5) that the Quick-Erase only requires approximately twice the work to erase the same whiteboard. In addition time tests show that the Quick-Erase on average took 8.1 seconds to erase while conventional methods took on average 78.5 seconds.

The Quick-Erase erasing system will significantly decrease the time spent removing markings from whiteboards with a minimal and insignificant increase in work required. As a result, more time can be spent teaching students new material. This will enable more interaction between teacher and student which will improve the educational experience.