INTRODUCTION
The Easel 5000 project is being done for an artist with cerebral palsy. The artist has a loss of fine motor ability, abnormal muscle tone, abnormal muscle movements, and vision problems. The goal of the project was to build an art easel that will allow the artist to paint from his wheelchair. This device is an easel that will attach to the artist's wheelchair tray. Once the easel is secured on the tray, it can be adjusted into various positions to ensure the easiest method of painting for the artist. The artist will ultimately be able to paint in whichever position they are most comfortable in.

SUMMARY OF IMPACT
Because cerebral palsy affects one’s strength, dexterity and range of motion, the easel will be built to compensate the artist in these areas. The artist is in need of an easel that can be easily adjusted. Since the artist has a limited range of motion, painting with a single position easel is incredibly difficult. The artist also cannot use a standard easel with tripod legs due to the fact that he is in a wheelchair. In addition, the artist is unable to paint unless the canvas projects out close to his wheelchair. The Easel 5000 will be able to allow the artist to paint from within the wheelchair and adjust the easel in whichever position is most beneficial for painting.

TECHNICAL DESCRIPTION
The overall structure of the Easel 5000 was made from aluminum extrusions, brackets, and screws obtained from the 80/20 Corporation. The use of these parts all attainable through 80/20 allows for
extremely easy assembly, maintenance, and parts replacement. With the aluminum extrusions used, adjustment for various pieces of the easel are extremely easy and can be accomplished with hex wrenches. Most extrusion pieces are attached with 90 degree angle brackets with screws and t-nuts that slide directly into the t-slot. Since the t-nuts can slide over the length of the extrusion, any additional position adjustments can be made if default positions are not to the user's liking. The easel is designed to slide directly onto the artist's wheelchair tray and then fastened onto the tray using knobbed screws on the underside of the easel.

The adjustments of the easel are made by dynamic pivot joints, also available through 80/20. There are a total of two pivoting joints on the easel allowing for a large range of motion for adjustments. These pivot joints allow the canvas face to be adjusted into numerous positions and then locked into place using l-brakes. Having pivots on symmetrical sides of the easel includes a built-in safety system. If one of the l-brakes is accidentally unlocked, one l-brake is still able to hold up the entire easel system. The use of the l-brake in the Easel 5000 is a large inclusion, and not only allows for positional adjustment, but it is also used to adjust the canvas clamp. Two l-brakes allow an extrusion to clamp down onto any canvas size as large as 20 inches tall, and then lock into place to ensure that the canvas does not move, even when facing downward.

Aside from the mechanical facets of the Easel 5000, the inclusion of a lighting system was included for the top of the canvas holder to illuminate the painting surface. The LED system consists of a PCB with all LED components soldered into it. These components are safely encased in a black plastic case. The LED system comes equipped with an easy on/off switch and a dimming system to allow for brightness adjustments. The light system can be adjusted to any angle through use of a friction hinge. Thus, the user can adjust the lighting system to a specific position and the light will stay put due to this hinge. Additionally, the lighting system is powered only by a battery, which is located in a white PVC battery case at the bottom of the canvas holder. On a full charge, the battery will be able to power the lighting system for a total of six painting hours. Once the battery is diminished it can be removed from the Easel 5000 and taken to a wall socket to be recharged. Recharging to full power can take up to 8.5 hours. The battery can then be replaced onto the easel using a quick Velcro attachment method.

The total cost of the parts and materials used to build the Easel 5000 was about $800.