SUSTAINABLE CAPSTONE PROJECTS (SCAP)
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ELECTRIC TRAIN

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INTRODUCTION

The concept of this project is to design an electric train that works using an electric source .The electric train was invented to reduce the costs and use of coal. The main motivation was to make an innovated project out of scrap materials. The main benefit is that we will not use a lot of energy as it operates using batteries. We made a train with 3 compartments that loops non-stop on a circular railway.

MATERIALS USED IN CONSTRUCTION

We used cap bottles to make the wheels we got carton for the outer-cover, we got also plastic rods for the railway. We got wooden pieces as a base for the compartments. It is powered by a DC motor and a battery.

FINAL PRODUCT

We constructed the train using three compartments the first compartment is the motor and second compartment has the battery. The third one has a second motor with a battery. It works by putting the train on railway and turning the switch it starts moving and stops when we close it.

Figure 1. Team members

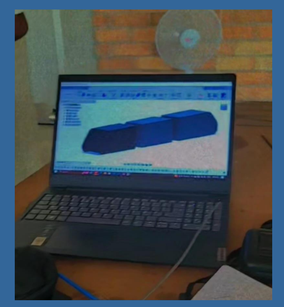

Figure 2. Initial design.

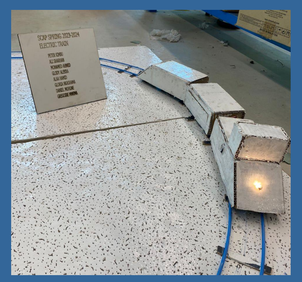

Figure 3. Electric train

RESULTS AND DISCUSSION

The electric train was constructed and after going through a lot of testing and modifications to the railway it worked. For future upgrades we can use copper railways rather than the plastic railways and power the battery through the copper. We can add long distance switch as well.

CONCLUSIONS

The project had its ups and down and we were faced by difficulties and issues with the railway and wheels friction. The problem was resolved by taping the wheels which reduced the friction. Another problem that arose was that the motor couldn't handle the three compartments but we increased the tension in the rubber band between the motor and wheels and added a second motor in the back compartment to increase the power. Theoretically, it seemed easy but in practical we were faced by difficulties but eventually we achieved good results.

REFERENCES

How to make a train of cardboard on the electric motor? – YouTube video