



Highly Commended

Models & Inventions

Year 7-8

Jemima Trott

Seymour College



The objective of my model is to demonstrate a more efficient water system set in Madagascar, Africa to provide clean water for the communities and enhancing the quality of farmlands. After doing a school project last year on the liveability of Madagascar, I wanted to further apply my knowledge to create a working model of my designed 'liveable' city.

I will do this through minimalizing erosion, providing man-made and natural filters and creating a reservoir to hold the healthy water to provide to the community.

I used two stacked pieces of polystyrene as the base of my model. I then carved and channel out for my river, wetlands and underground plumbing efficiently. I began by carving out the river, filtration plant, reservoir and wetlands. As the model was going to be in close contact with water, I needed it to be waterproof to prevent leakage. I used multiple layers of plaster, Plaster of Paris and water-based (so that it did not dissolve the Styrofoam) to ensure that the base was completely sealed. My mountain was made out of multiple recycled cardboard boxes, newspaper and plaster. I then painted it with the same coloured spray paint as the rest of the model. To create a constant water flow, I had to use a water pump. I had help from my dad to trim then connect an old portable shower to a 12-volt battery pack. I soldered the shower to the battery pack and covered it with a shrinker. I also had help from my dad with channelling the model.

Whilst constructing my model, I had to overcome some major issues. Some including types of spray paints, constructing the houses, 'Shade Balls' not floating, time management, the water pump and the size of my model.

One of the issues that I encountered was the size of my model. I proceeded to construct my model without properly measuring it. This meant that two days before the due date when I checked the Science Award rules, I noticed that my project did not fit the 1-meter guidelines (it was 1.2 meters). In order to fix this issue, I had to saw off 20cm of my model. This meant that I had to rearrange my plumbing underneath the model and the town (house, community centre, well etc.).



One of the more time-consuming issues that I encountered was the water pump. I first bought a 12 volt AC connected water pump with the intention to convert it into battery powered 12 volt. Once I attempted this, the batteries were not enough to power the pump. Although, after adding an extra 1.5 volts, I overloaded the circuit on the extra battery pack. Running out of options I found an old portable shower in the shed and connected this to the same battery pack. This is what I ended up using on my model.

More information on each of the parts and what they represent is on the model. Instructions for use is on the attached USB.

By Jemima Trott, Seymour College.