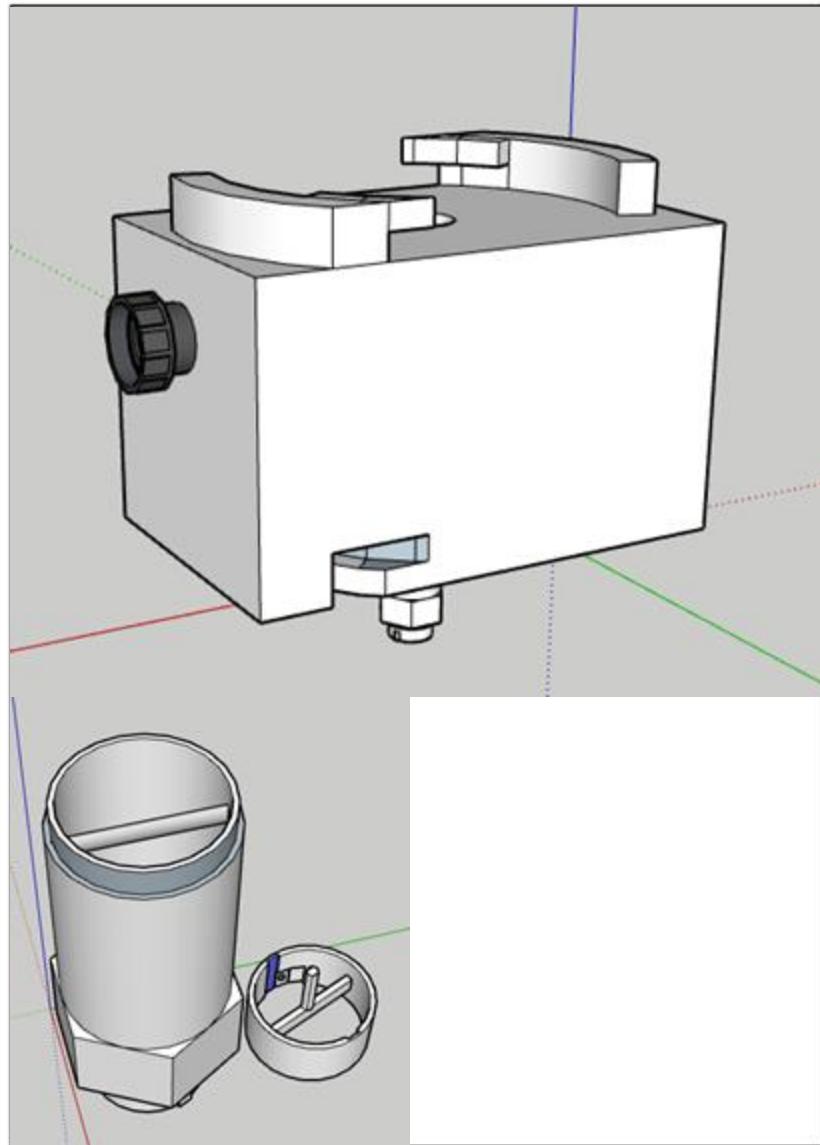




Summarise your idea using our 'fill in the blanks' template below and a visual which reflects your project.



**MY INNOVATION IS CALLED** KliK Tanks

**MY NAME / TEAM NAME IS** Geordan Giblett

**I / WE GO TO SCHOOL AT** Papamoa College

**MY / OUR BIG IDEA IS** Interlocking tanks that take can be removed and are portable for natural disasters.

**AND IT HELPS** Save the environment, reduces strain on water treatment plants, watering plants and people after a natural disaster.

**BY SOLVING THE PROBLEM OF** Water wastage in the Tauranga region, were water rates spike to an all time high during the summer months because people want to water their gardens/lawns to keep them green



Communicate the problem you are trying to solve, how big it is, who it affects and why it matters.

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How it started -

Last year my journey started when I was offered the opportunity to join a project-based learning classroom in which I would have to find a problem from around my community. After being notified about how water usage is extremely high during the summer months in Tauranga and how water restrictions affect my family. I decided to research a little deeper into water usage and water wastage in the Tauranga region. After interviewing members from the city council I found out that the second biggest water use in and around the house after sanitary use is outdoor discretionary use. From this new information, I choose to focus my project on how can I minimise the strain on the two water treatment plants in Tauranga? After going about my classroom project for a term and a bit, one of my teachers recommended that joining Young Innovators Awards would be worth a shot and that I should enter.

Who it affects -

Wastage of water is currently affecting millions of people around the world as there are an equal amount of people that do not have access to water in which they can use for Bathing, cleaning, watering plants and most importantly drinking. Imagine if all the clean water that you personally use for things like showering and flushing the toilet was given to the people who didn't have access to clean drinkable water, even if this idea was scaled back, the amount of clean water that could be saved and the amount of strain on the two current water treatment facility would be amazing. You personally contribute to the wastage of water even if it is just leaving the tap running while brushing your teeth as all this adds up.

How big is the problem -

70% of earth's surface is composed of water of this 2.5% is fresh water, most of which is trapped in ice. Humans only have access to 0.3% of the whole world's water supply to hydrate 7.5 billion people. With the increase of population and more cities drawing their day zero closer such as Mexico city or cape town. The water wastage problem in Tauranga is increasing. The Tauranga city council have realised this is an issue and have begun to build there third water treatment facility in Waiari but this will not be completed until 2021 to try and keep up the demand. To put less strain on the Joyce and Oropi treatment facilities during the summer months water restrictions have been put in place, this is is only a temporary solution to a growing problem as the population of Tauranga has increased massively in the past decade. As climate change affecting more areas around the world, drought and long periods without rain are becoming more common.

Why it matters

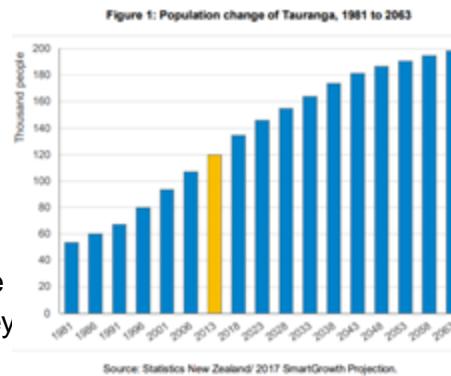
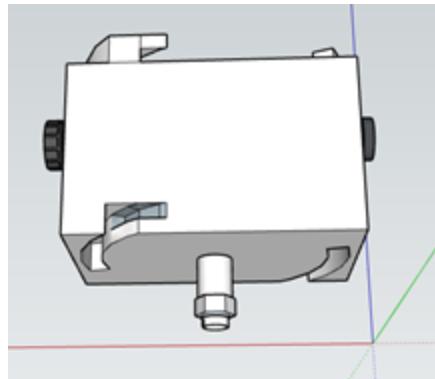
The Earth is dying, there is no simple way to put it. Humans are using too many resources of Earth. If we want to keep up the pace of destroying our planet then we would need another Earth but unfortunately, there is no Earth two. To reduce the amount of resource we use while also saving humans we need to start using the logistical amount you need on a daily. The whole Human race, myself included has "eyes bigger than our stomach". Every living thing in the world needs water to live. Humans can only go a few days without water, humans also need food but to grow food you need water. People need to start DOING sustainably and ingenuity now. KilK tanks can solve this as conventional tanks are to large for most propertys sizes in suburb areas but my tanks are small enough to fit flush up against a wall. My tanks can help solve this problem.



## YOUR RESEARCH

Communicate who your innovation is for, what they need, who you spoke to when carrying out your research and what technology or science you might use to make your innovation work.

Throughout my journey, I have had multiple designs and ideas on how to minimise the strain on the two current water treatment facilities. Some of the earliest ideas were a greywater system, grass seeds that does not require heaps of water and better sprinklers. Later on when I finally came up with the idea for interlocking, customizable water tanks that could be taken off and moved around with water still inside. I also decided that I needed to have a catchment system other than grey water or rainwater off a roof, this lead me to design a road that used permeable concrete and a series of pipes to catch water but this turned out to be a fail as I struggled to now create two products as well as trying to fix massive problems with the road system. In the end the road system didn't work as the negatives heavily outweigh the positives, thus I scraped that idea and focused in on my KliK tanks. Some of my first designs had multiple problems that my peers helped point out to me such as in one of my first designs there was a problem with water possibly becoming stagnant and unuseable. Another problem that I face was trying to get water from one downpipe to multiple tanks, how I solved this was by meeting experts from Fieldays in which they recommended that I use a PVC union piece between the top tanks so that the tank closest to the downpipe fills up and then the one next to it fills up and so forth. One big issue I faced was trying to find out how many little I should make them, at first my own idea was to make them 15 litres to make them as easy to carry and remove as possible but after talking to others they brought up the fact that 15 litres is not a lot of water and that most people could carry one 10 little buckets in each hand. After that conversation, I decided to go home and fill up two 10 litre buckets and tried walking around my backyard with them, with success. The next day I brought this up to my peers in which they still recommended that 20 litres was not enough still. After a lifting a 15 litre bucket and a 10 litre bucket, I decided that 25 litres would be the perfect balance between enough water storage and not being too heavy that you couldn't lift them.



Who have I talked to during this Journey

City council members - early on in my journey I decided that talking to an expert on the current water wastage problem in Tauranga would be the best for me. After interviewing two members of the Tauranga city council who both had great ideas like greywater system, grass seeds that doesn't require heaps of water and better sprinklers I decided to think of my own idea in which I thought Interlocking and customizable water tanks would be the best as they are multi function.

Fieldays exhibitors - When Fieldays was on my family drove over to Hamilton to help with my project. There I meet two very important exhibitors, first Marius from Hydroflow who helped me fix the downpipe issue by suggesting that instead of using multiple downpipes I use a PVC union piece at the side of each top tank as well as explain what one-way valves would work best for my tanks and other situations. The second person was a woman from Mokee plastics who recommended that rotational moulding my tanks with recycled plastic that are food grade is possible as well as lowering the price of each individual tank.

Teacher/students - I constantly had teacher and students giving constructive criticism to help improve my project by pointing out problems in my water tank design before they could become bigger issues later on as well as when my projects where still in the early stages of the product life cycle they all helped to create a product that I was happy with and that others have been excited for.

Who is my product for -

After researching into property sizes and the expected growth of Tauranga and other factors such as the average person water use inside a household or how many people on average live in one house. I decided that marketing to the middle class, family members that have a garden or other form of plant life that they like to look after and people who mostly own their house as renters have more restrictions on what they are allowed to do with the house would be best suited as you could market towards how much money a family could save. Through extensive research, I could not find any product that offers the same versatility that my KliK tanks provide, the closest was a tank that you could stack onto of each other but that could not be removed and is not portable.



Explain your final idea, how it works and how it solves a problem.

How does my idea solve the need/problem?

Since Tauranga second biggest water usage is outdoor discretionary use by collecting water from the roof water usage would drop even if just by a few 1000 litres compared to the 50,000 litres of water Tauranga uses during summer peaks.

How your idea is better than what currently exists?

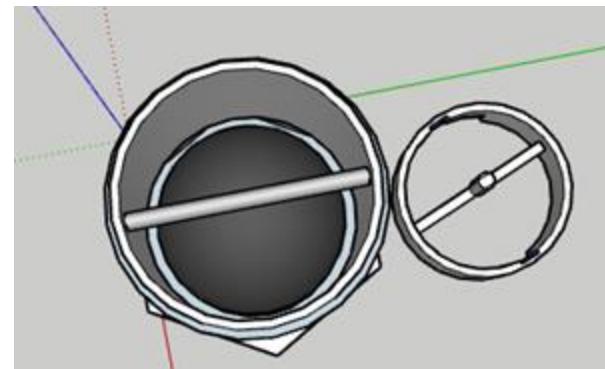
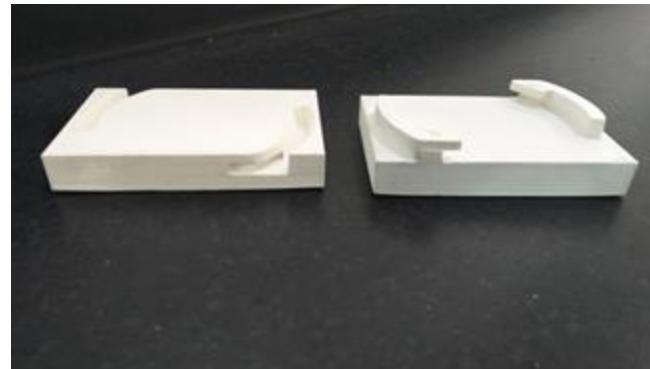
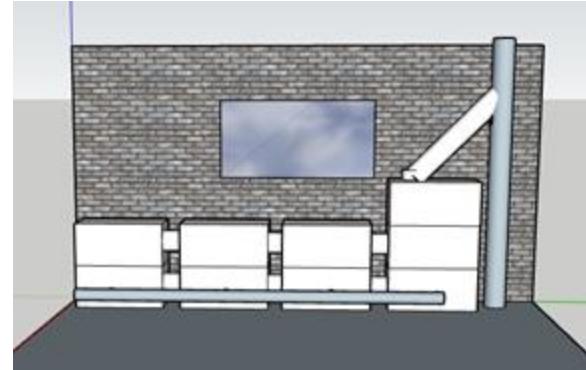
My idea is one of a kind as through extensive research the closest product I could find was a Tank that you could stack to be as tall as you wanted. My product is far superior than this product my tanks can be removable meaning that as soon as you twist the top tank out of the bottom tank the the pin holding the ball ( in the one way valve) closes, this stops flow between a top and bottom tank making them completely removable. This feature can be used in lots of extreme situation such as if water from the council was cut off or there was a nature disaster you could you they water for cleaning, watering or drinking if boiled. Customizable, since my design can be stacked and interlock on top of each other they can be stacked as high as liked. As you can see in this image you only need one downpipe to fill multiple tanks.

How my idea would work?

Water from the roof would fall into the gutter from then the water travels down the downpipe and about half in caught by the pipe leading to the first tank. After this water fills each tank equally through each one way valve. After this a small pipe extruding from the bottom tank would connect up to other tanks at the end there could be a hose extension for water gardens or lawns.

What Technologies would be needed to work -

First, my tanks would be made out of recycled PET plastics which are food grade. From that, the plastic would be rotationally moulded to form a strong thick layer that would make it cheaper than blow moulding or another form of plastic moulding. Also the using of one way valves would be the biggest technology as tanks with too many moving parts cause malfunction and erosion but proper valves can last up to fifty years without breaking.



Other info -

Environmentally conscious -

My product is environmentally conscious as it has been designed to impact the ecosystem as little as possible by using recycled plastics as well as reducing strain onto the two streams in which the two treatment plants draw water from while reducing the amount of flow( they also pump polluted water back into the stream, which flows into the ocean impacting onto life in the stream and ocean and wildlife that drinks from the stream.

I have made and 3D printed three different models of how my product would twist together (photo left) and lock. I have also made a wooden model of the top and bottom of the tanks at life size to show others how they click together and don't pull apart due to the male and female parts interlocking. I have also created five different sketchup models showing the evolution of the project design process and one showing a possible setting in which the tanks could sit (top left photo). I have also created a DIY one way valve to show how it would work( photo right).

