

Protect and Collect

STAT STEM CHALLENGE. How can we protect and collect shipping containers? Cooper Forward, Alfie Thompson, Devonport Christian School. Grade 6.

Why are shipping containers important?

Shipping containers are important for shipping goods including food, electronics, cars and more. It takes a long time for shipping containers to reach their destination so they need protection, here are some dot points about why shipping containers are important.

< It is much cheaper to move large containers around than to load and unload boxes of goods from trucks.

< Containers are much safer to transport goods. <https://www.ausmepa.org.au/ships-and-the-marine-environment/the-journey-of-a-container/why-containers/> this link is for the 3 dot points that are here.

< Containers are more difficult to steal the contents.

Shipping containers carry billions of tonnes of cargo every year and are full of food, textiles and bulk supplies of goods, including coal, oil and grain and they also carry automobiles and paper. Shipping containers are around 350 metres long and 40 metres wide. They usually take around 7 weeks to complete their journey.

The problems. Shipping containers fall off the ship and are almost impossible to spot and boats crash into them causing major damage. Some shipping containers aren't strapped down properly which cause them to fall off. When they fall off they bust open and all the contents fall into the ocean and kill sea life and the containers become a part of the ocean.

There might be a solution involving balancing all the shipping containers perfectly by a computer. A container ship needs to remain balanced in the water the weight of the containers need to be evenly spread from side to side. At times ships will be hit by large waves and strong winds.

If the heaviest load on the ship is at either end then there will be a lot of stress on the middle of the ship when it is hit by waves. Containers get lost after hitting rough seas, when other containers crash into each other, they collapse and get lost at sea. ABC News Sheet. (In real life paper sheet.)

My solution. Alfie and I's solution is every shipping container has four extremely strong magnets on all of the corners stacked up on each other and the containers have a long strap going up and if the containers fall off each container has a small waterproof tracker which can be track from a small boat a little bit bigger than a shipping container, we will make a Minecraft world to build our prototype. The magnets can be turned off by a little device.

Another part of our solution is to balance the shipping containers which makes the shipping containers less likely to fall off the ship and spill/makes debris in the water.

Aim. The problems of shipping containers are containers fall off the ship and the contents fill the ocean and the container becomes a part of the ocean. When they fall off the ship it is almost impossible to spot by boats, yachts and any type of boat. We are going to solve the problem of shipping containers falling off and not getting spotted by boats.

There is a solution but is not proven to be successful, you get a special computer that balances the shipping containers perfectly and it is less likely for the containers to fall off.

The materials we will need for our solution are, heavy duty magnets, sustainable straps to hold down the containers, a pick up boat to pick up the containers that fell off the ship and return them.

Background. The background is one, the first paragraph on the other page.

Relevance. I chose this project because it is a big problem and it needs to be solved, SO many shipping containers fall off ships and it is deadly to ships that crash into it, and fish and sea life eat the contents and it becomes an artificial reef.

Requirements. Our solution is to help stop shipping containers falling off and damaging objects and animals, all container ships need a solution to this crisis. We cannot keep letting containers destroy our ocean and ships.

The important role for the ships master is to make sure that the ships that ply our waters are operated safely and do not damage our marine environment. Some container spills have serious environmental impacts, some of the contents inside shipping containers are not biodegradable, and this means that animals will think that it is food and try to eat it but it might end up killing them which is not good. "Hundreds of containers are lost at sea every year due to worsening weather conditions and poor maintenance. Presenting a growing threat to marine life." ABC News Paper Sheet.

Strengths and Weaknesses. Strengths: It would harder for containers to fall off, it would make it less likely for ships to crash into the container.

Weaknesses: It would be expensive to buy all the materials for our solution.

References List

Britannica School

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ABC Education

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Ausmepa Why shipping containers.

<https://www.ausmepa.org.au/ships-and-the-marine-environment/the-journey-of-a-container/why-containers/>

Ausmepa Cargo plans

<https://www.ausmepa.org.au/ships-and-the-marine-environment/staying-afloat/cargo-plans/>

ABC News

<https://www.ship-technology.com/features/containers-lost-at-sea/>

Prototype (Minecraft World with cargo ship and containers)

Minecraft Photo's.

This is the magnet

Bigger crates are in the middle to balance the ship.



These are the crates.



This is where the magnet ship drive around.



This is the entire ship that carries the containers.

This is the control centre where you can turn off the magnets.



If we had to test our solution we would put our boat in water and see if it floats, then we would add shipping containers and add bigger containers in the middle to balance out the ship. We would see if the containers hold by tipping the ship a little to the side and see if it moves. Then we would go into rough seas and see if that effects the ship, then we would drop one of the containers in the ocean (we will get it back by the way.) and see if the magnet ship can pick it back up and onto the ship.



By Cooper and Alfie