So Much Fun!

The boat is also very fun to play with. It doesn't sink in any type of water because we tested it. The children can open up the egg carton to put the play people or cars or animals or anything they want inside. Then they can make it crash through waves or even fall over and it will not sink.

It can be a transport ship, an ocean liner, a houseboat, or a pleasure boat—wherever the children's imagination takes them. You can also order a sail that attaches to the top of the Wave Breaker. The boat is so light that even a slight breeze will catch the sail and have it racing across a pond in no time.

Fanta Sea Company

Brought to you by the
Fanta Sea Company

Makers of high quality children's toy boats

The Wave Breaker

The unsinkable toy boat.

Brought to you by the
Fanta Sea Company

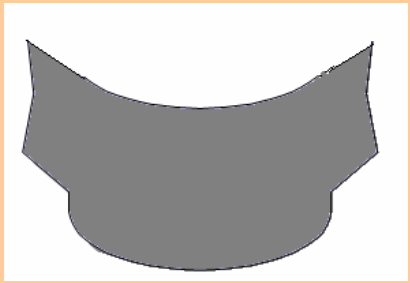
SHANE
ANTONIO
LAVONNE

The Wave Breaker

DESIGN PROCESS

We have conducted many experiments and tests to make sure that the Wave Breaker is buoyant, not very dense, and will float in pond, ocean, or bathtub water.

We wanted our boat to be buoyant and watertight. When we were making foil boats, we found that they tipped over if we weren't careful in our design. After many tests, we think the best design was one where most of the foil touched the water, but the sides were pretty tall so the water couldn't get in. Even this was tippy when we added the paper clips, so we had to make the bottom a little curvy so most of the paper clips stayed in the middle. It still sank when the water got in. The sketch shows our best foil boat design:



So we started thinking about what would be the best materials to use to keep our boat watertight. We knew from our experiments, that plastic bottles filled with air were the most buoyant material. They don't displace very much water and they are long so they float very well. Also, every time we pushed down on them they would pop right back up to the surface. So we knew we wanted to use plastic bottles in our boat design.

How could we make our boat stable? Plastic bottles are round and very tippy, so we knew we had to add other materials. We didn't want to add anything dense like rubber or metal that would weigh it down, and we had discovered that wood floats very well. So we thought we would make a wood platform out of popsicle sticks to connect the bottles together.

This design didn't work very well because the boat turned over and the popsicle sticks fell apart. The glue didn't hold it together. Plus, it was tippy because the wood was out of the water and only the bottles were touching the water.

FINAL BOAT

We decided to use a polystyrene egg carton to hold the bottles together and we used electrical tape instead of glue. This design worked very well because most of the surface of the boat is right on the water, and it uses two very buoyant materials. The two bottles act like pontoons and give the boat lots of stability. The tape is waterproof, so it won't fall apart. This is a picture of the Wave Breaker:

WHAT WE LEARNED

If we were to take the plastic in the bottles and scrunch it up, the plastic would sink. This is because the plastic would be more dense than the water. Because we've used the plastic in a long shape that we can fill with air, it is less dense than water, and it floats.

After we added the egg carton to our boat, we noticed it floated higher in the water—it displaced less water, than the wood one. We think this is because there is more area touching the water. The more water that pushes against the boat, the better it is able to float—the more buoyant it is. Our new boat has two bottles and the egg carton touching the surface of the water, so it is very buoyant.

When we filled our boat with weights, it floated lower in the water, but it didn't sink. It started taking on water, but the bottles still kept it afloat. This means that our bottles are more buoyant than the weight of the egg carton filled with water and that means it's a really good boat!

We had many hypotheses about what would make a good boat design. We tested our hypotheses out and kept changing them a little bit after every test. Now we know that the most important criteria for making a good boat are buoyancy, stability, and being watertight.