

## Titanic Essay

During her maiden voyage, the luxurious liner RMS *Titanic* sideswiped an iceberg and sank early on April 15, 1912, off the coast of Newfoundland in the North Atlantic. More than 1,500 people died in the catastrophe out of the 2,240 passengers and personnel on board. Less than three hours passed before the *Titanic* sank, defying the architects' assertions that she would remain unsinkable even in the worst conceivable sea conditions. From an engineers perspective, the sinking of the *Titanic* was caused by incautious, careless technique to the hull, stern, and propel which led to massive failure & the death of thousands.

White Star Maritime specifically designed and built the *Titanic* to be the flagship of their fleet of commercial ships in order to accommodate the demand for travel between Europe and the United States. Already, several ships offered frequent transatlantic service. Even so, white star built the most opulent liner possible in an effort to win over travelers' hearts, minds, and money. In 1907, Lord Pirrie, senior partner and chairman of the shipyard Harland and Wolff, and Bruce Ismay, managing director of White Star Line, hatched a plan to construct a ship that would be bigger and better than competition. Following dinner, the two devised plans to build the Olympic, Titanic, and Britannic, three of the most opulent ships ever built, which would be completed in 1911, 1912, and 1913, respectively (Casey, 2012).

On the Titanic, the first-class passengers enjoyed the height of luxury. The *Titanic* was on her first journey while carrying some of the wealthiest individuals in the world. This featured well-known aristocrats including legislators, businesspeople, bankers, professional sportsmen, industrialists, and senior military officers. The majority of passengers flying first class had an

Figure 1.1: Photo of the *Titanic*

Figure 1.2: Buoyancy of a boat

Figure 1.3: Equation to solve force

entourage, which may have included any or all of the following: a maid, valet, cook, and chauffeur. A first class ticket might cost as much as 870 pounds.

Third class was a lot different, with only two places to eat as a third class member, it was an extremely packed space. Although third-class passengers were given the least amount of room on board and the fewest amenities, third class on board *Titanic* was notably more pleasant than what was provided on many of her rivals. Third class, which was turning into an increasingly lucrative portion of the transatlantic passenger service, was where the White Star Line had established a reputation for offering very exceptional service. The third-class passengers on the *Titanic* were all housed in individual cabins with a capacity of no more than ten people, thus technically the term "steerage," which refers to low-paying immigrant passengers living in open-plan dormitories, does not apply to them.

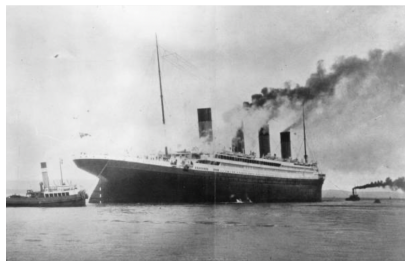


Figure 1.1

On April 15, 1912, the *Titanic*, a British luxury passenger liner, sank while on its maiden trip from Southampton, England to New York. The double-bottomed hull of the *Titanic*, which was the biggest and most opulent ship ever to sail the seas, was divided into 16 watertight compartments. It was thought to be unsinkable since four of these could be submerged without compromising its buoyancy. The ship struck an iceberg on April 14 just before midnight,

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southeast of Cape Race, Newfoundland; five compartments burst, and the ship sank. Of the 2,200 passengers, about 1,500 perished. (E.)

The damage to the hull was the initial impact that drowned the ship, when the 30,000 tonne stern section obliterated the ship for good. (Hoare, C.) As an “unsinkable,” ship, it went down pretty easily. The iron rivets that propelled the ship forward completely collapsed due to it being too fractured and unstable to keep the boat completely buoyant. You need to enter more water into the boat, and take it out.

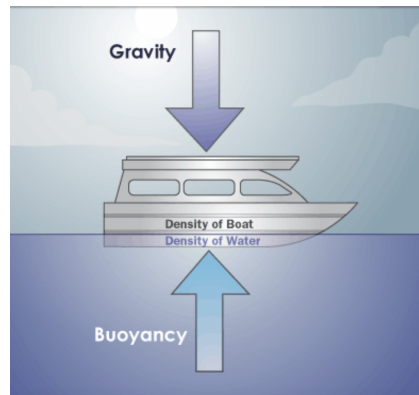


Figure 1.2

Without the iron rivets stable, it made it extremely hard to keep the boat up while sinking with damage to its hull.

Six of the sixteen compartments on the boat's exterior bottom were ripped when the iceberg struck. The watertight compartments, sixteen feet above the sea, were divided by fifteen transverse bulkheads. They had them just horizontally rather than vertically, which made them insufficiently powerful on their own. Additionally, they were easily pierced and unable to contain

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all the water. Six of the compartments on the boat filled with water when the iceberg struck it, progressively lowering the bow to the ocean and causing the boat to sink. (Hoare, C.)

Scientists found a piece of metal that had formerly been a piece of the Titanic's hull steel while on an excursion to study the *Titanic* catastrophe. The experts observed that some of the boat's hull steel fragments were sharp and resembled shards of broken glass. When struck by an iceberg, the majority of steel would typically bend without shattering. The cataclysmic impact was at a force unmeasurable and completely obliterated the flimsy steel.

$$\mathbf{F} = \frac{d}{dt}(m\mathbf{v})$$

Figure 1.3

A more consistent double *hull* could have completely changed the trajectory of the ship's collision. Their only dilemma was the time constraint it would take to import from Sweden and create, so they vested for the cheaper option. They felt a double *bottom* would've been the most adequate way of completion considering all the options. This turned out to be a mistake.

As previously mentioned, the riveting & steel plates were one of the main causes of the sink. The overlapping plates, hand-hammered, made them ridiculously unstable. Mainly steel and Wrought Iron, it was a disaster waiting to happen. When the ship dragged over the iceberg, the berg broke or popped the rivets along the hull, allowing water to seep in between the hull plates. This is what actually caused the ship to sink. Although this is disputed, it is claimed that the hull plates themselves exhibited signs of stress fracture and were therefore insufficiently strong.

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Overall, the *Titanic* was rushed to completion by the Star Maritime to be the best, and first, boat to cross the Atlantic of that caliber. The building, materials used, and time needed all created one huge mishap.

Tragedy like the *Titanic* is absolutely unacceptable for engineers. The flaws were so vibrant, but in the end only money mattered. Designs should be constantly double-checked and looked over to keep the most important aspect of your creation alive: people.

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