

Water Bottle Rocket

Project Description

A water bottle rocket is a type of rocket that is powered by water and compressed air or gas. It is usually made by modifying an empty plastic water bottle to create a pressurized container, which is then launched into the air by releasing the pressure through a valve or nozzle.

To create a water bottle rocket, water is added to the bottle, and then the bottle is partially filled with air or gas, typically using a pump or compressor. The pressure inside the bottle builds up until it is high enough to force the water out through a nozzle or opening in the bottom of the bottle, propelling the rocket upwards. The fins or stabilizers on the outside of the bottle help to keep the rocket stable during its flight.

Structure Description

A water bottle rocket is a type of rocket that uses pressurized water and air to propel it into the air. It typically consists of a plastic bottle, a launcher, and a nozzle.

The plastic bottle serves as the body of the rocket and is partially filled with water. The launcher is used to pressurize the bottle by injecting air into it using a bicycle pump or an air compressor. This creates pressure inside the bottle, which forces the water out of the nozzle at the bottom of the bottle, creating a jet of water that propels the rocket into the air.

Water bottle rockets also include fins, which are attached to the sides of the bottle to stabilize the rocket in flight. The fins help keep the rocket pointed in the right direction and reduce wobbling or spinning that could cause it to lose stability or crash.

Overall, the design of a water bottle rocket is relatively simple, making it a popular activity for science experiments, educational programs, and outdoor recreation.

Main Equipment/parts used

Water Bottle of 2l capacity
PVC Pipes - 20/25 mm diameter and connectors
Nozzles
Insulation tape, M-seal, Hot Glue gun and Super Glue
Spray paint
Zip-Ties
Corrugated sheets
Sandpaper
Air pump

Experience in making the project

We have learned about the aerodynamics principle of a rocket, how different constraints like temperature and wind along with air density can affect the trajectory of a rocket. In our project fins played a major role in achieving a proper trajectory and maximum range with a constant pressure of 50 psi. We tried and failed many times and in the process, we came across different shapes of the rocket and made multiple of them.

Overall, our experience working on a Water Bottle Rocket provided us with a valuable learning opportunity that developed both technical and soft skills. We believe that the knowledge and experience gained from this project will serve us well in future endeavors.

Experience from the visit of IIT BHU

Visiting IIT BHU with our Water Bottle project for a tech fest was an unforgettable experience. IIT BHU is a world-renowned institution for science, engineering, and technology, and being able to showcase our project there was a great achievement.

When we arrived at the tech fest, we were amazed by the various teams from across the country who were showcasing their projects. We had the opportunity to meet and interact with teams who were working on diverse projects, ranging from machine learning to robotics to augmented reality.

We also had the chance to explore the IIT BHU campus and attend various activities related to technology and innovation. We attended talks by renowned researchers, participated in workshops on cutting-edge technologies, and explored the many innovation labs on campus.

One of the highlights of the trip was meeting and learning from industry leaders and experts in various fields. We attended the talk session of Shri Haribabu Srivastava, Director General of DRDO. Shankar K. Pal, Computer Scientist, President, Indian Statistical Institute, etc. We had the opportunity to hear their insights and experiences, ask questions, and network with them.

Overall, the trip was an incredible learning experience that exposed us to new ideas, technologies, and people. We returned to our college campus with a renewed sense of inspiration and motivation to continue working on innovative projects.

Our participation in the competition

We participated in a tech fest competition and successfully cleared the qualification round and the first round, earning a spot in the final round. Out of many teams, only 10 were selected for the final round, and we were excited to be one of them.

During the final round, we competed with the other teams, and while we did not win, we were proud of our performance. We had put a lot of effort and hard work into our Water Bottle rocket project, and we received positive feedback from the judges and other attendees.

Even though we did not win the competition, we took the experience as a learning opportunity. We identified areas where we could improve our project and skills and came up with new ideas for future projects. We also congratulated the winners and celebrated their success, recognizing that they had put in just as much effort and hard work as we had.

Overall, participating in the tech fest competition and making it to the final round was a valuable experience that taught us a lot about innovation, teamwork, and perseverance.

How college helped us in our project

Our college played a crucial role in helping us make our project a success. The college provided us with the resources, infrastructure, and guidance we needed to design, develop, and test our project.

In addition, the college also provided us with funding to purchase the necessary equipment and materials for the project. This allowed us to focus on the technical aspects of the project without worrying about financial constraints.

Overall, the support and resources provided by our college were instrumental in making our project a success. We are grateful for the assistance and guidance we received and hope to continue to utilize the resources and expertise of the college for future projects.

Members

1. Saurav Kumar (B210062EC)
2. Harsh Srivastava (B210048EC)
3. Tejas Khillare (B210095EC)
4. Ashutosh Kumar (B210043EC)
5. Puru Jindal (B210084EE)
6. Vishwajeet Kumar (B210096EE)

Team Description of Maze Solving Robot Project

1. Puru Jindal (B210084EE)
2. Vishwajeet Kumar (B210096EE)
3. Ashutosh Kumar (B210043EC)

Some Photos of our trip and competition









