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Executive Summary

An American, Leslie Irvin, made the first ever international free fall parachute jump near Dayton, Ohio in 1919. He has inspired our project .The purpose of our project is to find out what the latest time the parachute can be released and have the landing velocity below a specified safety threshold. We think that if we find this out it will help prevent future skydiving accidents.

Introduction

Our project is base on learning about speed, drag, timing, and air pressure. We plan on finding what elevation it would be necessary to initiating our

parachute. With a drag rating and the right air pressure, you could reach a speed too high and then when your parachute opens your harness could easily rip, or give you quite a jolt which might cause brain damage, lung or circulatory system problems, and could even inflict death. We want to mathematically know the safest elevation and speed for jumping and initiating your parachute and know what speed you should be down to when landing back on stable ground.

Project Description

Our project is very advanced for our grade level. Our math model involves high calculus. We had many problems in the beginning. We chose this problem because we wanted to do

something challenging. We figured that no one has done it before.

We did most of our research for this project on the Internet. Our math model is to help us understand how far from the ground will you have to open a parachute to have a safe landing. We have been working on our math model with our mentor and teacher, Ms. Arzu to understand the calculus part of our math model.

Results

In our results we will be explaining the variables involved in our math model.
Like we said in our project description, our math model involves calculus and considering we are only in algebra 1 it was very confusing, but now with the help of some mentors (which will be listed in our acknowledgements area) we have enough knowledge to be able to explain to the judges (which is obliviously you).

Anything falling in a gravitational field with an atmosphere has an
Acceleration that is approximately described as:

A=g -kv
A= acceleration
G= the acceleration due to gravity (which varies as we move)
K= the drag co-efficient (which varies with air density)
V= velocity

Dv/dt = g-kv
D= delta
Dv= change in velocity
Dt= change in time

Conclusion

After looking at our excel data (which made our problem even more confusing), with the help of our teacher, we can tell you what our conclusion is and what we like and don't like about our results.

We have done an excel program to help us see what the speed or velocity of the person parachuting would be with and without drag.

Looking at our excel spreadsheet we can understand our math model to a point but not all the way through .Why, you ask. We're in 8th grade doing Algebra with a problem that is dealing with calculus so it's confusing to a point for us.

Well , when we look at the spreadsheet at 4.2 minutes into the jump without drag your at 40.2 feet down from your jump which we're saying that is 1400 feet in the air.

Recommendations

If we would have had more time to work on this project for the ais challenge we would have been able to create a more advanced computer program to compete with. That would able us to do further research with.

Acknowledgements

We’d like to thank Nick Bennett for all of his wonderful help with this project. He’s done a lot for us including helping us understand our math model. We’d also like to thank ms. Arzu for her generous help in this great but confusing project.

THANKS!

Falling Through the Sky

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