

IA Intro/Background

Stuff I need:

- Title
- Research Question
- Why are you interested in this question?
- What is the relevance (to you and/or the community) of the RQ?
- What are some fundamental physics principles that will be relevant to understanding how the experiment is set up and what you're studying?
 - Definitions of key terms that aren't common knowledge; at least mention terms/ideas that are general knowledge (i.e. you don't need to define/re-explain Newton's laws, but if they're relevant, you'd mention them)
 - Any specific equations that you intend to use during your experimental analysis

Frisbees and Flight Distance

Research Question?

What is the effect of frisbee circumference on flight distance, assuming you throw a frisbee at the optimal 10-20 degree angle?

Why are you interested in this question?

I've always wondered how these frisbees with a hole in the middle of them fly so much farther than normal, conventional frisbees. I want to investigate whether it's the circumference of the frisbee (since these frisbees are usually bigger than the normal ones) or something else to do with lift.

What is the relevance of your RQ?

Finding an answer to the relationship between circumference of an object and the aerodynamic capabilities of said object could have hundreds of uses -- not just in aerospace fields, but also perhaps to protect offshore drilling plants from huge waves.

What are some of the fundamental physics principles you will use?

Some physics principles that I need to use are the kinematic equations, to calculate all the data about the frisbee in motion: how far it went, its initial and final horizontal/vertical velocities, etc. These equations are:

$$v = v_0 + at$$

$$\Delta x = \frac{v + v_0}{2}t$$

$$\Delta x = v_0t + \frac{1}{2}at^2$$

$$v^2 = v_0^2 + 2a\Delta x$$

Obviously, I will be using Newton's laws of motion as an assumption for my experiment, with a margin of error due to the fact that I do not have a proper way to measure air resistance.

• Hypothesis

The circumference of the frisbee will relate to the distance the frisbee travels parabolically, with an optimal circumference for maximum difference and the distance decreasing exponentially as the circumference becomes bigger and smaller than the optimal value.