

Physics In Sports

Overview

Each and every movement in each and every sport contains a great deal of physics. In some sports, such as swimming and cross-country, the winner of a competition is determined by who can move the fastest average speed. Other sports, such as basketball, figure skating, and ultimate Frisbee, the success depends on accuracy, technique and team work.

Objectives

- Students will design a poster analyzing the physics of a sport or physical activity.
- Students will research information related to the sport.

Analyze a Sport: Select a sport or physical activity that you would like to study.
Suggestions for sports are listed on the Google Classroom.

A. **Completing Research:** Please take notes and be prepared to hand in your notes. They maybe hand written or electronic. (see Google Classroom for a template)

Explain in detail the physics of specific actions or movements in your sport.

- Include pictures, diagrams, arrows and descriptions to clearly illustrate these actions.
- Include the physics terminology you have learned in class. You may include other related physics terminology that we have not yet addressed (but are directly related).
- You can include something that makes the physics in your sport unique compared to other related sports. You can include the history of the sport as well if you have time.

If you are not finding information, and you have checked all of the recommended resources on Google Classroom please ask for assistance! If you need help with your bibliography/citations, please ask!

B. **What Should Be Included on Your Poster**

For the sport of your choice, research the following information and include in your poster. Remember you are turning in your research notes for points!

1. Name of the Sport and your name.
2. Describe the objects in motion in your sport. Do people move around a lot? Do they move in straight lines or do they change directions? Is a ball, projectile, other equipment the focal point of the game?
3. Explain how speed is a part of your sport, such as the speed of a served tennis ball or speed of the runner. Describe how this speed is controlled by the athlete or is changed by their actions or movements. Think if acceleration is involved.
4. Find at least one example of the Laws of Motion (Newton's Laws) in your sport. Describe each example as clearly as possible. Use terminology learned in class. (Example: speed, velocity, acceleration, gravity, air resistance, projectile motion, forces, etc.
5. Include information for at least 3 or more of the following that relate to your sport:
 - What forces are involved in your sport? Use arrows to depict the forces acting upon the athletes in the sport.
 - How does weight or mass affect your sport? Does added weight or mass have an advantage or disadvantage? Are there weight classes to your sport?

- Consider the role friction plays in your sport. In what circumstances is friction desirable? Undesirable?
 - Consider how differences in the atmosphere and gravity between the Earth and on the moon would affect the play of your sport.
 - Describe the limitations (measurements) of the game or sport. Do these limitations affect the play of the sport. Do they limit the success of the winner?
6. Using your understanding of the physics involved, describe 2-3 specific things that an athlete could use to improve performance or improve the outcome of this sport.
7. Include Bibliography/Citation which has citations for the resources you used. You should aim to use information from 2 sources. These citations should be on your notes page.

C. Want Bonus Points?

- + Include some physics aspect that makes the motion (speed, velocity, acceleration, freefall, etc) in your sport unique compare to other related sports (use comparison/ statistics (numbers))
- + What is the history of your sport? When and by whom was it invented? How much has it changed since it was invented? Is there anyone that has made a great impact or contribution to the sport (explain)

RUBRIC on Google Classroom: read through so you know how it will be graded

100 points! POSTER & NOTES

DUE Thursday, Oct 25

Working on this assignment in class:

- **Monday, Oct 15 (today!)**
- **Friday, Oct 19**
- **½ block on Tuesday, Oct 23**
- **½ block on Thursday, Oct 25 (due date!)**

**You may work with one other person or by yourself.
You need to sign your name(s) on my list and put your sport of choice.**