**Physics and Biomechanics in American Football**

Name

Institution Affiliation

Course

Instructor

Date

Title

**Physics and Biomechanics in American Football**

**Introduction**

The domain of American football is not only an athletic expertise demonstration but also a physics and biomechanics principles exhibition. The presentation focuses on the link between the activities on the football field and the scientific concepts that make such a show happen. My experience in the sport has made me eager to explore the 'backstage' of what we players go through physiologically during the game. This exploration is more than just a scholarly exercise; it is a personal journey to discover the subtleties of a sport, which I have given a considerable part of my life.

**Outline**

1. **Introduction**

An overview of how these scientific principles apply to American football.

1. **The Role of Momentum in Football**

Analyzing player collisions and the transfer of momentum.

1. **Biomechanics of a Football Player**

Understanding the mechanics behind player movements, tackles, and throws.

1. **Energy and Work in Football Plays**

Examining how energy is used and transformed during gameplay.

1. **The Impact of External Forces**

The impact of friction, air resistance, and forces on the ball and players.

1. **Injury Prevention and Performance Enhancement**

Understanding physics and biomechanics can lead to safer and more effective playing strategies.

1. **Conclusion**

Summary of findings and implications for players, coaches, and fans.

**References**

Freudenrich, C. (2024). *How the Physics of Football Works*. Retrieved from Howstuffworks: https://entertainment.howstuffworks.com/physics-of-football.htm

Hawkins, J. (2023, April 10). *The Science of American Football: Analyzing the Physics and Biomechanics of the Game*. Retrieved from American Football Today: https://www.americanfootballtoday.com/post/the-science-of-american-football-analyzing-the-physics-and-biomechanics-of-the-game

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Orzel, C. (2015, October 11). *Football Physics: The Forces Behind Those Big Hits*. Retrieved from Forbes: https://www.forbes.com/sites/chadorzel/2015/10/11/football-physics-big-hits-newtons-laws-and-einsteins-relativity/?sh=4d7f60ae6365

**Why did you choose this topic?**

My interest in this topic is a result of my love for the football game, which has developed through my years of playing and enjoying its competitiveness, strategies, and challenges of a physical and mental nature. This knowledge motivated me to figure out the physics and biomechanics aspects involved in the background processes. Playing football is not just a sport for me; it is a transparent mix of motion, force, and energy. I intend to strip the game down to its bare bones and then look at it from the outside through theoretical lenses. I want to connect my hands-on experience with theoretical aspects to appreciate better and comprehend this contrivance.

### How are you planning to relate your topic to physics and biomechanics?

The connection of physics, biomechanics, and football concepts creates a fascinating area for exploration with subjects like momentum, player movements, energy dynamics, and equipment design. Examining momentum discloses the feature that makes the player collisions more critical in revealing how mass and velocity are vital factors in the game dynamics and tackle handling.