

Group Paper Topics:

(Estimation):

- i. Estimate the total distance run by all players (both teams) in an average NBA regular season game.
- ii. Estimate how many times the ball was hit over the net in the entire Wimbledon tournament last year.
- iii. Estimate how many baseballs are supplied by each time in an MLB season.
- iv. Estimate how many strides are utilized in a marathon?
- v. Estimate how many on-air words in the career of <Insert your favorite popular sports announcer here>.
- vi. How many people are employed because of the NFL? (Include coaches, medical staff, grounds crew, etc.)
- vii. How many soccer balls would it take to fill an Olympic Swimming pool?
- viii. How many checks are there in a typical NHL season?
- ix. How many times per year does the cleanup (number 4 hitter) strike out in the major and minor leagues (add the totals from all teams).
- x. How many half-court+ shots are made in the NBA each year?

(General Analysis):

- A. How much further would a home-run ball fly on the top of Mount Everest than at sea level?
- B. How much break is possible to achieve on a curveball? (Not how much *has* been achieved, but how much is humanly possible?)
- C. Would the speed of an NHL game be increased or decreased if it was played on “worn” ice? How much would it change things (Quantify it to any degree possible).
- D. Is it harder to steal a base on natural surfaces or on field turf? Why?
- E. What is the thickest piece of wood that someone could break with a heel kick?

- F. How many home runs would be hit each year in MLB if the fences were uniformly 400 feet to all fields in all stadiums?
- G. How far is it physically possible to kick a field goal under conditions of no wind at sea level elevation?
- H. How much more effort does a cyclist require to race if he/she is unable to draft behind another racer?
- I. If someone uses a heavier tennis racket than usual, will they hit the ball faster and harder because of the increased momentum or will it slow the ball down because of the added mass of the racket making the racket swing speed smaller?

(Open-ended sports debate (remember, you have to justify your points with a logical, quantitative argument).)

1. In the first quarter of a tie game of evenly matched opponents, the offense gains X yards ($X < 10$) on first down. The defense was offside on the play. What should the value of X be such that the offense is better off to decline the penalty?
2. Many people say that “you should never attempt a two-point conversion before the fourth quarter of a football game”. Quantitatively attempt to support or refute that argument.
3. Does “freezing the kicker” work in football?
4. What is the optimal fraction of teams to be included in a playoff for the championship of a sports league? What is the optimal playoff format (best of 3, best of 5, etc.)
5. What is the individual record in sports least likely to be broken? (remember, quantitative arguments!)
6. What is the most dominating professional sports team in the major 4 sports (MLB, NFL, NBA, NHL) in the last 100 years?
7. Does anchoring a putter convey a competitive advantage?