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This presentation will analyze the real life example of target shooting, model it mathematically, and derive a beautiful theorem characterizing normal distribution.

This talk is very valuable for all college instructors and textbook writers of probability theory.

Binomial distribution, Poisson distribution, and normal distribution are most important and fundamental distributions in probability theory and statistics. Many textbooks do wonderful jobs in introducing binomial and Poisson distributions by (a) Describing real life examples in everyday life leading to these distributions, (b) modeling these examples mathematically, and (3) deriving the probability distribution functions rigorously from the mathematical models. However, almost no book introduce normal distribution from real life examples with rigorous mathematical reasoning. We hope that our presentation provides valuable example and understandable mathematical reasoning, which should be adopted by all calculus-based probability textbooks. (Received September 19, 2011)