

Exemplar Informational Texts: Science, Mathematics, and Technical Subjects – The Story of Science: Newton at the Center

Hakim, Joy. *The Story of Science: Newton at the Center*. Washington, D.C.: Smithsonian Books, 2005. (2005)

Probability, a branch of mathematics, began with gambling. Pierre de Fermat (of the famous Last Theorem), Blaise Pascal, and the Bernoullis wanted to know the mathematical odds of winning at the card table. Probability didn't tell them for certain that they would or wouldn't draw an ace; it just told them how likely it was. A deck of 52 cards has 4 aces, so the odds of the first drawn card being an ace are 4 in 52 (or 1 in 13).

If 20 cards have been played and not an ace among them, those odds improve to 4 in 32 (1 in 8). Always keep in mind that probability is about the likelihood of outcomes, not the certainty. If there are only 4 cards left in the deck, and no aces have been played, you can predict with certainty that the next card will be an ace—but you're not using probability; you're using fact. Probability is central to the physics that deals with the complex world inside atoms. We can't determine the action of an individual particle, but with a large number of atoms, predictions based on probability become very accurate.