

25. XSORT Gender Selection MicroSort's XSORT gender-selection technique is designed to increase the likelihood that a baby will be a girl. In updated results (as of this writing) of the XSORT gender-selection technique, 945 births consisted of 879 baby girls and 66 baby boys (based on data from the Genetics & IVF Institute). Based on these results, what is the probability of a girl born to a couple using MicroSort's XSORT method? Does it appear that the technique is effective in increasing the likelihood that a baby will be a girl?

26. YSORT Gender Selection MicroSort's YSORT gender-selection technique is designed to increase the likelihood that a baby will be a boy. In updated results (as of this writing) from a test of MicroSort's YSORT gender-selection technique, 291 births consisted of 239 baby boys and 52 baby girls (based on data from the Genetics & IVF Institute). Based on these results, what is the probability of a boy born to a couple using MicroSort's YSORT method? Does it appear that the technique is effective in increasing the likelihood that a baby will be a boy?

27. Struck by Lightning In a recent year, 304 of the approximately 300,000,000 people in the United States were struck by lightning. Estimate the probability that a randomly selected person in the United States will be struck by lightning this year. Is a golfer reasoning correctly if he or she is caught out in a thunderstorm and does not seek shelter from lightning because the probability of being struck is so small?

28. Mendelian Genetics When Mendel conducted his famous genetics experiments with peas, one sample of offspring consisted of 428 green peas and 152 yellow peas. Based on those results, estimate the probability of getting an offspring pea that is green. Is the result reasonably close to the expected value of $3/4$, as claimed by Mendel?

Using Probability to Identify Unlikely Events. *In Exercises 29–36, consider an event to be “unlikely” if its probability is less than or equal to 0.05. (This is equivalent to the same criterion commonly used in inferential statistics, but the value of 0.05 is not absolutely rigid, and other values such as 0.01 are sometimes used instead.)*

29. Guessing Birthdays On their first date, Kelly asks Mike to guess the date of her birth, not including the year.

- What is the probability that Mike will guess correctly? (Ignore leap years.)
- Would it be unlikely for him to guess correctly on his first try?
- If you were Kelly, and Mike did guess correctly on his first try, would you believe his claim that he made a lucky guess, or would you be convinced that he already knew when you were born?
- If Kelly asks Mike to guess her age, and Mike's guess is too high by 15 years, what is the probability that Mike and Kelly will have a second date?

30. Credit Card Purchases In a survey, 169 respondents say that they never use a credit card, 1227 say that they use it sometimes, and 2834 say that they use it frequently. What is the probability that a randomly selected person uses a credit card frequently? Is it unlikely for someone to use a credit card frequently? How are all of these results affected by the fact that the responses were obtained by those who decided to respond to the survey posted on the Internet by America OnLine?

31. Car Crashes In a recent year, among 135,933,000 registered passenger cars in the United States, there were 10,427,000 crashes. Find the probability that a randomly selected passenger car in the United States will crash this year. Is it unlikely for a car to crash in a given year? What does this suggest about driving?

32. Air Travel Fatalities One measure of air travel safety is this: There are 117 fatalities per billion passenger flights. Express that measure as a probability. Is it unlikely for an air passenger to be a fatality? How does air travel compare to the car fatality rate of 40 fatalities per billion trips? Is this comparison fair?