

LESSON
10.1**Challenge Practice***For use with the lesson "Analyze Surveys and Samples"***In Exercises 1–3, use the following information.**

Sometimes the job of a survey statistician is made more difficult by the nature of the question being asked. For example, suppose a survey is conducted to estimate the number of people who sleep with a stuffed animal. Many people surveyed may feel uncomfortable to admit to this event. It has been suggested that one way to overcome this difficulty is to have the person being asked the question flip a coin without revealing the outcome. If the coin results in heads, then they should respond yes to the question, even if they don't sleep with a stuffed animal. If the coin results in tails, then they should tell the truth.

1. Suppose 1000 people are surveyed and 605 respond yes. What is your estimate of the probability of a person sleeping with a stuffed animal?
2. Suppose n (a large number) people are surveyed and r respond yes. What is your estimate of the probability of a person sleeping with a stuffed animal?
3. Suppose n (a large number) people are surveyed and less than $\frac{n}{2}$ say yes. What can you conclude about the question being asked?

In Exercises 4–6, use the following information.

Suppose the question being asked in Exercises 1–3 is embarrassing for some to respond yes and for others to respond no. Have the respondent flip the coin twice. If two heads result, then respond yes always. If two tails result, then respond no always. If one head and one tail result, then reply with the truth.

4. Suppose 1000 people are surveyed and 300 respond yes. What is your estimate of the probability of a person sleeping with a stuffed animal?
5. Suppose n (a large number) people are surveyed and r respond yes. What is your estimate of the probability of a person sleeping with a stuffed animal?
6. Suppose 1000 people are surveyed and 100 respond yes. What can you conclude about the question being asked?