Module 5: Analyzing Populations, Probabilities, and Potential

TOPIC 1: INTRODUCTION TO PROBABILITY

In this topic, students use familiar objects, such as number cubes and spinners, to learn the terminology of probability, including outcome, experiment, sample space, event, simple event, probability, complementary events, and equally likely. Students calculate probabilities rolling number cubes, using spinners, and drawing marbles from a bag. For real-world situations or probabilistic situations that require a large number of trials, students use simulation techniques, including random number tables, to simulate the results of experiments.

Where have we been?

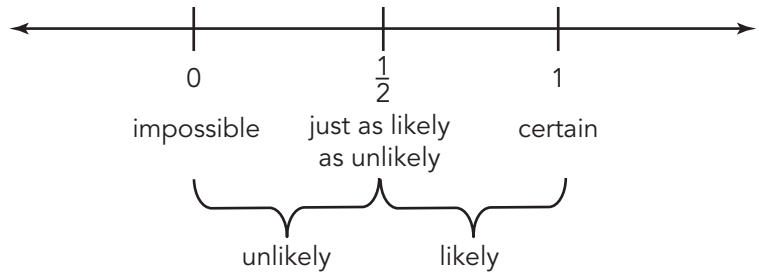
This topic is students' formal introduction to probability, but they have encountered probabilistic situations throughout their lives and in previous school years. The topic opens with asking students to interpret the meaning of a meteorologist's forecast. They use their intuition of the meaning of "chance of rain" and rewrite the percent as a fraction.

Where are we going?

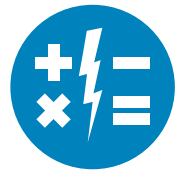
Students will use probability and ideas about randomness to explore sampling and drawing inferences about data, which is the start of the formal study of statistical inference. The basic ideas developed in this topic will be used in the next topic on compound probability.

Using a Number Line to Interpret Probabilities

The probability of an event is a value from 0 to 1, with 0 meaning that the event is impossible, and 1 meaning that the event is certain.



Myth: Memory is like an audio or video recording.



Let's play a game. Memorize the following list of words: strawberry, grape, watermelon, banana, orange, peach, cherry, blueberry, raspberry. Got it? Good. Some believe that the brain stores memories in pristine form. Memories last for a long time and do not change—like a recording. Without looking back at the original list, was apple on it?

If you answered "yes," then go back and look at the list. You'll see that apple does not appear, even though it seems like it should. In other words, memory is an active, reconstructive process that takes additional information, like the category of words (e.g., fruit), and makes assumptions about the stored information.

This simple demonstration suggests memory is not like a recording. Instead, it is infl uenced by prior knowledge and decays over time. Therefore, students need to see and engage with the same information multiple times to minimize forgetting (and distortions).

#mathmythbusted

Talking Points

You can further support your student's learning by resisting the urge, as long as possible, to get to the answer in a problem that your student is working on. Probability is a tricky concept. Students will need time and space to struggle with all the implications of thinking about events in terms of their probabilities. Practice asking good questions when your student is stuck.

Questions to Ask

- Let's think about this. What are all the things you know?
- What do you need to find out?
- How can you model this problem?

Key Terms

sample space

A list of all possible outcomes of an experiment is called a sample space. A sample space is typically enclosed in brackets, { }, with commas between the outcomes.

event

An event is one or a group of possible outcomes for a given situation.

complementary event

Given an event *A*, a complementary event to *A* is the event *not A*, which contains all of the outcomes not in event *A*.

experimental probability

Experimental probability is the ratio of the number of times an event occurs to the total number of trials performed.