Statistics and Probability

We use statistics and probability often in our daily lives. When we hear about the "average" price per gallon of gasoline or the "chance" of snowfall, we are dealing with statistics and probability. **Statistics** is the study of how data is collected, summarized, and presented. **Probability** is the likelihood that something will happen. Together, statistics and probability are used with data to draw conclusions, and/or make predictions.

Probability is expressed mathematically as a number between 0 and 1 (e.g., a chance of rainfall of $\frac{7}{10}$, or 0.7, or 70%). A probability near 0 means an event is unlikely, a probability of $\frac{1}{2}$ means the event is neither likely nor unlikely, and a probability near 1 means the event is likely to occur. Probabilities are useful for predicting what may happen in the long term, such as realizing trends in sales, human populations, and weather.

At this level, students build on their previous work with single data distributions and address differences between populations—that is, between two data sets. Students recognize that it is difficult to gather statistics on an entire population but that a random sample can be representative of the total population and will generate valid results.

Additionally, students develop probability models and use them to find probabilities of future events (such as finding the probability that a spinner will land on a certain spot or that a penny will be tossed as a "heads" or as a "tails"). Students also find probabilities of compound events. A **compound event** consists of two or more **simple events**. Tossing a die is a simple event. Tossing two dice is a compound event.

The Grade 7 Common Core State Standards for Statistics and Probability specify that students should-

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

The following hands-on activities will enable teachers to help students develop statistics and probability skills and concepts in a meaningful way. The activities will help students gain an appreciation for how mathematics can be used to model the real world.