

Additional Vocabulary Support

Experimental and Theoretical Probability

Complete the vocabulary chart by filling in the missing information.

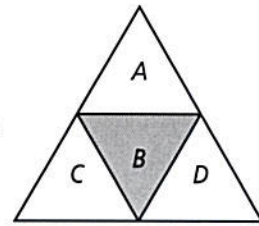
Word or Word Phrase	Definition	Picture or Example
probability	1.	Actuaries use <i>probability</i> to assess risk and make tables for insurance companies.
experimental probability	2.	A team won 6 of their 10 games. The experimental probability of the team winning is $\frac{6}{10}$.
theoretical probability	Theoretical probability of an event is a measure of the likelihood that the event occurs based on mathematical reasoning.	3.
outcome	4.	One <i>outcome</i> of rolling a number cube is rolling a 5.
event	5.	A possible <i>event</i> of choosing two cards from a deck is a king of diamonds and a 2 of clubs.
sample space	The sample space is all possible outcomes.	6.
complement of an event	7.	The complement of rolling an even number on a number cube is {1, 3, 5}.

Practice (continued)

Form G

Experimental and Theoretical Probability

16. A game is played where students throw beanbags at the target shown to the right. Each region of the target is the same size and every beanbag hits the target. For one game, section A was hit 6 times, section B 3 times, section C 8 times, and section D 5 times.



- a. What is the experimental probability of hitting section D? $\frac{5}{22}$
- b. What is the theoretical probability of hitting section D? $\frac{1}{4}$

17. **Reasoning** How are the probability of an event and the probability of its complement related mathematically? Their sum is equal to 1.

Two standard number cubes are rolled. Find each probability.

18. $P(\text{a sum equal to } 2) = \frac{1}{36}$
19. $P(\text{sum not equal to } 2) = \frac{35}{36}$
20. $P(\text{a product equal to } 15) = \frac{1}{18}$
21. $P(\text{a sum greater than } 6) = \frac{7}{12}$
22. $P(\text{a product less than or equal to } 2) = \frac{1}{9}$
23. $P(\text{a sum equal to } 12) = \frac{1}{36}$
24. **Open-Ended** Is it possible for an event to have a probability of 1? Explain your answer. Yes; Answers may vary. Sample: The probability of rolling a number cube and rolling a number between 1 and 6, inclusive, is 1.
25. **Error Analysis** Out of 20 coin flips, your classmate gets heads 14 times. She determines that the experimental probability of getting heads is $\frac{1}{2}$. What error did your classmate make? What is the correct value for experimental probability? Explain. Your classmate confused theoretical probability with experimental probability. The experimental probability of getting heads is the number of number of heads divided by the total number of flips, or $\frac{14}{20} = \frac{7}{10}$.