LESSON MAKER PRO

Chance Combos

Count outcomes to find compound probabilities.

GRADE 8 · 8.DS.C.6.b

8.DS.C.6.b "Determine the probability of a compound event as a fraction of outcomes in the sample space that result in the event."

NAME _____ DATE _____

COUNT THE OUTCOMES

A compound event combines two or more conditions. When all outcomes are equally likely, its probability is the number of outcomes that meet the conditions divided by the total number of possible outcomes.

WORKED EXAMPLE

Roll a fair eight-sided die numbered 1 through 8 and flip a fair coin. What is the probability of rolling greater than 6 and getting tails?

1. There are 8 × 2 = 16 possible outcomes.
2. The die can show 7 or 8, and the coin must show tails. That makes 2 favorable outcomes.
3. Divide favorable outcomes by total outcomes: 2/16 = 1/8.

Answer: 1/8

PRACTICE 6 problems

1 Flip a fair coin twice. What is the probability of getting exactly one head?

ANSWER _____

2 Roll a fair six-sided die numbered 1 through 6 and flip a fair coin. What is the probability of rolling a 5 or 6 and getting tails?

ANSWER _____

3 Pick one letter at random from A, B, and C. Then pick one number at random from 1, 2, 3, and 4. What is the probability of picking A or C and a number greater than 2?

ANSWER _____

4 Roll two fair four-sided dice, each numbered 1 through 4. What is the probability that the numbers add to 5?

ANSWER _____

5 A bag holds three tokens labeled R, S, and T. Pick one token at random, put it back, and pick again. What is the probability that the two tokens have different labels?

ANSWER _____

6 Roll two fair six-sided dice, each numbered 1 through 6. What is the probability that the sum is 9 and the first die shows an even number?

ANSWER _____

APPLY IT Show your work

1 At game night, an app randomly selects one of 3 maps and one of 5 team badges. Each map and badge is equally likely. Two of the maps are Jungle and Desert, and one badge is Lightning. What is the probability of getting Jungle or Desert with the Lightning badge?

WORK SPACE

ANSWER _____

2 A music app randomly picks one of 4 songs and one of 4 screen themes. Each song and theme is equally likely. You like 3 of the songs and 2 of the themes. What is the probability of getting a song and a theme you like?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Roll a fair six-sided die twice. What is the probability that the sum is at least 10 or the rolls match? Explain how you avoid counting any outcome twice.

WORK SPACE AND ANSWER

ANSWER KEY

Chance Combos

GRADE 8 · 8.DS.C.6.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Flip a fair coin twice. What is the probability of getting exactly one head?	**2/4 = 1/2**
2	Roll a fair six-sided die numbered 1 through 6 and flip a fair coin. What is the probability of rolling a 5 or 6 and getting tails?	**2/12 = 1/6**
3	Pick one letter at random from A, B, and C. Then pick one number at random from 1, 2, 3, and 4. What is the probability of picking A or C and a number greater than 2?	**4/12 = 1/3**
4	Roll two fair four-sided dice, each numbered 1 through 4. What is the probability that the numbers add to 5?	**4/16 = 1/4**
5	A bag holds three tokens labeled R, S, and T. Pick one token at random, put it back, and pick again. What is the probability that the two tokens have different labels?	**6/9 = 2/3**
6	Roll two fair six-sided dice, each numbered 1 through 6. What is the probability that the sum is 9 and the first die shows an even number?	**2/36 = 1/18**

PART 2 · APPLY IT

1. **2/15** There are 3 × 5 = 15 equally likely combinations. Two have Jungle or Desert with the Lightning badge, so the probability is 2/15.
2. **6/16 = 3/8** There are 4 × 4 = 16 equally likely combinations, and 3 × 2 = 6 have both a liked song and a liked theme. The probability is 6/16 = 3/8.

CHALLENGE

Six outcomes have a sum of at least 10, and six have matching rolls, but (5, 5) and (6, 6) are in both groups. That gives 6 + 6 - 2 = 10 favorable outcomes out of 36, so the probability is 10/36 = 5/18.

Accept equivalent fractions. Treat outcomes from repeated rolls or picks as ordered, so the first result and second result can make different outcomes.