

Chance Combo Lab

Find probabilities of events with two steps.

GRADE 7 • NY-7.SP.8

NY-7.SP.8 "Find probabilities of compound events using organized lists, sample space tables, tree diagrams, and simulation."

NAME _____

DATE _____

COUNT THE OUTCOMES

For a compound event, list every possible pair of results. If all pairs are equally likely, probability = favorable pairs / total pairs. A simulation estimate uses successful trials / total trials.

WORKED EXAMPLE

Flip a fair coin and spin a fair spinner labeled 1, 2, 3, and 4. Find $P(\text{tails and } 4)$.

	spinner result			
coin result				

1. List the pairs: H1, H2, H3, H4, T1, T2, T3, T4.
2. There are 8 equally likely pairs.
3. Only T4 is favorable.

Answer: $1/8$

PRACTICE 4 problems

- 1** Spin a fair 5-color spinner and roll a fair 6-sided number cube. Find $P(\text{blue and } 6)$.

ANSWER _____

- 2** Five fair coins are flipped. Find $P(\text{exactly 3 tails})$.

ANSWER _____

- 3** Cards numbered 1 through 7 are drawn without replacement. Find $P(\text{first card is 7 and second card is 1})$.

ANSWER _____

- 4** In 60 simulated rolls of two fair number cubes, 15 rolls had a sum of 8. Estimate $P(\text{sum of 8})$.

ANSWER _____

APPLY IT Show your work

- 1** You make an avatar by choosing one background and one icon at random. Use the table. Find $P(\text{black background or star icon})$.

AVATAR CHOICES

Background	Star icon	Bolt icon	Wave icon
Neon	Neon-Star	Neon-Bolt	Neon-Wave
Black	Black-Star	Black-Bolt	Black-Wave

ANSWER _____

- 2** For a school livestream, 8 volunteers are available. One host is chosen first, then one scorekeeper is chosen from the remaining volunteers. Find $P(\text{Maya is host and Luis is scorekeeper})$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game uses a spinner with 4 equal sections: red, red, blue, and green. Then you roll a fair 6-sided number cube. You win with red and an even number, or with green and a 6. Find the probability. Explain using the number of equally likely pairs.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Spin a fair 5-color spinner and roll a fair 6-sided number cube. Find $P(\text{blue and } 6)$.	1/30
2	Five fair coins are flipped. Find $P(\text{exactly 3 tails})$.	5/16
3	Cards numbered 1 through 7 are drawn without replacement. Find $P(\text{first card is 7 and second card is 1})$.	1/42
4	In 60 simulated rolls of two fair number cubes, 15 rolls had a sum of 8. Estimate $P(\text{sum of 8})$.	1/4

PART 2 • APPLY IT

1. **2/3** There are 6 equally likely choices. The 3 black choices and the Neon-Star choice are favorable, so $4/6 = 2/3$.
2. **1/56** $P(\text{Maya is host}) = 1/8$. Then 7 volunteers remain, so $P(\text{Luis is scorekeeper}) = 1/7$; multiply to get $1/56$.

CHALLENGE

7/24. There are 24 equally likely pairs. Six pairs have red and an even number, and one pair has green and 6.

Accept equivalent fractions. For the challenge, accept any organized list or tree that shows 7 favorable outcomes out of 24.