LESSON MAKER PRO

Outcome Combo Quest

Count compound outcomes, then turn the count into a probability.

GRADE 7 · 7.SP.C.8a

CCSS.Math.Content.7.SP.C.8a "Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs."

NAME _____ DATE _____

THE BIG IDEA

For a compound event, first find the total number of equally likely outcomes. Then count the outcomes that meet both conditions and write favorable outcomes/total outcomes.

WORKED EXAMPLE

A design app randomly pairs 11 avatar bases with 13 badge symbols. What is the probability of getting the neon base and the comet badge?

1. There are 11 x 13 = 143 possible avatar-and-badge pairs.
2. Only 1 pair has both the neon base and the comet badge.
3. Probability = 1/143.

Answer: 1/143

PRACTICE 6 problems

1 A fair coin is flipped and a fair spinner with 8 equal sections numbered 1 through 8 is spun. What is P(tails and a 7)?

ANSWER _____

2 Two fair number cubes are rolled. What is P(the first cube is even and the second cube is greater than 4)?

ANSWER _____

3 A spinner has 9 equal sections, 2 purple and 7 orange. One card is chosen from 10 cards, 4 with stars and 6 with circles. What is P(purple and star)?

ANSWER _____

4 Two fair number cubes are rolled. What is P(the sum is 8)?

ANSWER _____

5 Three fair coins are flipped. What is P(exactly two heads)?

ANSWER _____

6 A badge is made by choosing 1 of 4 shapes and 1 of 3 patterns. Each pair is equally likely. What is P(triangle and striped)?

ANSWER _____

APPLY IT Show your work

1 At an esports club, a game setup is made by randomly choosing 1 of 8 maps and 1 of 3 team colors. What is the probability that the setup uses the Harbor map and the green team color?

WORK SPACE

ANSWER _____

2 A profile maker randomly combines 1 of 6 avatar styles with 1 of 5 backgrounds. Two avatar styles are animals, and 3 backgrounds are space scenes. What is the probability of an animal avatar with a space background?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two fair spinners are each labeled 1 through 8. What is the probability that one spinner lands on a multiple of 3 and the other spinner lands on a prime number? Explain how you avoid counting any outcome twice.

WORK SPACE AND ANSWER

ANSWER KEY

Outcome Combo Quest

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A fair coin is flipped and a fair spinner with 8 equal sections numbered 1 through 8 is spun. What is P(tails and a 7)?	**1/16**
2	Two fair number cubes are rolled. What is P(the first cube is even and the second cube is greater than 4)?	**1/6**
3	A spinner has 9 equal sections, 2 purple and 7 orange. One card is chosen from 10 cards, 4 with stars and 6 with circles. What is P(purple and star)?	**4/45**
4	Two fair number cubes are rolled. What is P(the sum is 8)?	**5/36**
5	Three fair coins are flipped. What is P(exactly two heads)?	**3/8**
6	A badge is made by choosing 1 of 4 shapes and 1 of 3 patterns. Each pair is equally likely. What is P(triangle and striped)?	**1/12**

PART 2 · APPLY IT

1. **1/24** There are 8 x 3 = 24 equally likely map-and-color setups. Only one setup is Harbor and green, so the probability is 1/24.
2. **1/5** There are 6 x 5 = 30 possible profiles, and 2 x 3 = 6 have an animal avatar and a space background. The probability is 6/30, or 1/5.

CHALLENGE

15/64. There are 8 outcomes where the first spinner is a multiple of 3 and the second is prime, plus 8 reversed outcomes. The outcome (3,3) is in both groups, so subtract it once: 8 + 8 - 1 = 15 favorable outcomes out of 64.

Accept equivalent fractions, including unsimplified forms such as 6/36 for problem 2 and 8/90 for problem 3. For the challenge, students should identify that (3,3) is counted in both groups before subtracting it once.