

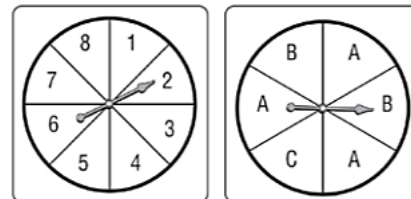
Name: _____ Date: _____

Independent and Dependent Events

Multiplication Rule for Independent Events

$$\bullet P(A \text{ and } B) = P(A \cap B) = P(A) \bullet P(B)$$

The two spinners at the right are spun. Find each probability.



1. $P(4 \text{ and } C)$
2. $P(\text{odd and } A)$
3. $P(\text{greater than } 3 \text{ and } B)$
4. $P(\text{less than } 5 \text{ and } B)$

There are 10 yellow, 6 green, 9 orange, and 5 red cards in a stack of cards turned facedown. Once a card is selected, it is not replaced. Find each probability.

5. $P(\text{two yellow cards})$
6. $P(\text{yellow and green})$
7. $P(\text{two cards that are not orange})$
8. $P(\text{two cards that are neither red nor green})$

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9. A coin is flipped, and a 6-sided die is rolled. What is the probability of landing on the tail side of the coin and rolling a 3 on the die?

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10. A jar contains 3 red, 5 green, 2 blue and 6 yellow marbles. A marble is chosen at random from the jar. After replacing it, a second marble is chosen. What is the probability of choosing a green and a yellow marble?
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11. A jar contains 3 red, 5 green, 2 blue and 6 yellow marbles. If you pull two marbles from the jar at the same time, what is the probability of choosing a green and a yellow marble?

12. An aquarium contains 6 male goldfish and 4 female goldfish. You randomly select a fish from the tank, do not replace it, and then randomly select a second fish. $P(\text{male and male})$?

13. A random sample of parts coming off a machine is done by an inspector. He found that 5 out of 100 parts are bad on average. If he were to do a new sample, what is the probability that he picks a bad part and then, picks another bad part if he doesn't replace the first?

How to Determine If 2 Events Are Independent:

- **Plug in what you know into $P(A \cap B) = P(A) \bullet P(B)$ and test it!**
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14. Let event M = taking a math class. Let event S = taking a science class. Then, M and S = taking a math class and a science class. Suppose $P(M) = 0.6$, $P(S) = 0.5$, and $P(M \text{ and } S) = 0.3$. Are M and S independent?

15. In a class, 60% of the students are female. 50% of all students in the class have long hair. 45% of the students are female and have long hair. Of the female students, 75% have long hair. Let F be the event that the student is female. Let L be the event that the student has long hair. One student is picked randomly. Are the events of being female and having long hair independent?
