10.2 Compound Probability

Practice

Tell whether the events are INDEPENDENT or DEPENDENT. **(circle one)**

1. You spin a spinner. Then you flip a coin. **INDEPENDENT or DEPENDENT**

2. You randomly choose 1 of 10 marbles. Then you randomly choose one of the REMAINING 9 marbles. **INDEPENDENT or DEPENDENT**

3. You toss a coin twice. **INDEPENDENT or DEPENDENT**

4. You spin a penny and a nickel on a table. The penny lands on heads and the nickel lands on tails. **INDEPENDENT or DEPENDENT**

5. A container has 7 green buttons, 3 yellow buttons and 4 blue buttons. You reach in and randomly draw out a blue button. You KEEP the blue button and reach in again to draw out a second blue button.

INDEPENDENT or DEPENDENT

A container holds 3 red pens, 6 black pens, 4 purple pens, and 2 blue pens. → TOTAL = 15 pens

Use the above information to answer the following WITH replacement.

8. Find P (red pen, purple pen)

$= \left(\frac{3}{15}\right)\left(\frac{4}{15}\right) = \frac{12}{225} = \frac{4}{75}$

9. Find P (blue and then red)

$\left(\frac{2}{15}\right)\left(\frac{3}{15}\right) = \frac{6}{225} = \frac{2}{75}$

10. Find P (black, black)

$\left(\frac{6}{15}\right)\left(\frac{6}{15}\right) = \frac{36}{225} = \frac{4}{25}$

Use the above information to answer the following WITHOUT replacement.

11. Find P (red pen, purple pen)

$= \left(\frac{3}{15}\right)\left(\frac{4}{14}\right) = \frac{12}{210} = \frac{2}{35}$

12. Find P (blue and then red)

$\left(\frac{2}{15}\right)\left(\frac{3}{14}\right) = \frac{6}{210} = \frac{1}{35}$

13. Find P (black, black)

$\left(\frac{6}{15}\right)\left(\frac{5}{14}\right) = \frac{30}{210} = \frac{1}{7}$

Find each probability.
Each item is NOT REPLACED.

14. A box contains 6 red and 5 blue pencils. Choose a red one, keep it, and choose another red one.

There will be one less red.

$\left(\frac{6}{11}\right)\left(\frac{5}{10}\right) = \frac{30}{110}$

There will be one less marble

$= \frac{3}{11}$

Find each probability.
Each item IS REPLACED.

15. A box contains 6 red and 5 blue pencils Choose a red one and choose another red one.

$\left(\frac{6}{11}\right)\left(\frac{6}{11}\right) = \frac{36}{121}$

The colors of M&Ms in a large bag are given in the table.

M&M Distribution				
Red	Yellow	Blue	Green	Brown
2	5	7	6	10

30 total

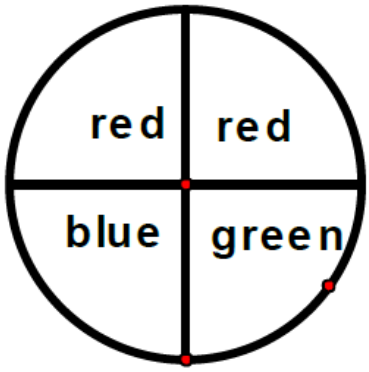
16. You draw 2 M&M's without replacement. Find P(2 Greens).

$\left(\frac{6}{30}\right)\left(\frac{5}{29}\right) = \frac{30}{870} = \frac{1}{29}$

17. You draw 2 M&M's with replacement. Find P(2 Greens).

$\left(\frac{6}{30}\right)\left(\frac{6}{30}\right) = \frac{36}{900} = \frac{1}{25}$

Use the spinner shown below for questions 18-21



18. Find P(spin Blue).

OUTCOMES: R, B, G

$\frac{1}{4}$

19. Find P(spin Red).

$\frac{2}{4} = \frac{1}{2}$

20. Find P(spin Green and then Blue)

$\left(\frac{1}{4}\right)\left(\frac{1}{4}\right) = \frac{1}{16}$

21. What is the sample space of 2 spins? Hint: There are 9 outcomes!

R,R	B,R	G R
R,B	B,B	G,B
R,G	B,G	G,G

SPIN 1 / SPIN 2 / OUTCOMES

- RED → RED: R,R; BLUE: R,B; GREEN: R,G
- BLUE → RED: B,R; BLUE: B,B; GREEN: B,G
- GREEN → RED: G R; BLUE: G,B; GREEN: G,G

Bob has 5 books about cats, 6 books about dogs, and 2 books about fish. Use this to answer 22-24.

22. How many different ways can Bob ~~make~~ select one book on cats, one on dogs, and one of fish?

$(5C)(6D)(2F) = 60$ ways!

23. Bob randomly grabs one of his books. Find p(fish book).

$\frac{2}{13}$ — 2 fish / 13 total

24. Bob randomly grabs two of his books. Find p(2 cat books).

"WITHOUT REPLACEMENT" $\left(\frac{2}{13}\right)\left(\frac{1}{12}\right) = \frac{2}{132} = \frac{1}{66}$