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UNIT 7 LESSON 13

**AIM**: SWBAT determine the probability of compound events

**THINK ABOUT IT!**

Determine the type of probability that is being described in each situation below and explain how you were able to determine the type of probability on the lines provided using evidence from the situations.

Marcus is trying to determine the probability of flipping a coin to land on heads, picking a random number out of a hat and holding on to it, and then picking another number from the same hat.

Marcus is trying to determine the probability of rolling a number cube and picking a white marble out of a bag, putting it back and picking another white marble.

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Key Point:

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**Interaction with New Material**

Ex.1) Edwin has a bag that has colored pieces of paper in it. In the bag, there are 2 green, 3 yellow and 4 red pieces. Edwin wants to win a bet against his friend using the bag of colored paper pieces. Should he bet his friend that he can pull one of each color out of the hat with replacing the paper after each pull or without replacing?

**PARTNER PRACTICE**

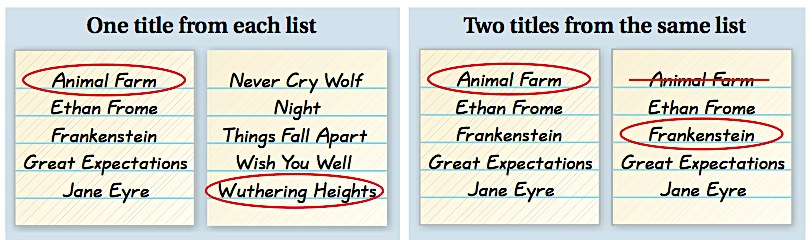
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| *Bachelor Level* |

1. Twenty cards are numbered 1 – 20. You draw a card. Without replacing it, you draw a second card. Find the probability that the first card will be an even number and the second card drawn will be an even number.
2. If the first card was replaced after initially being drawn, what would the probability be of the first card being an even number and the second card being an even number?
3. In these two experiments, explain which situation used independent and dependent probability. Which experiment resulted in a higher probability?

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| *Master Level* |

1. Your future high school teacher gives you two lists of titles and asks each student to choose two of them to read. You can choose one title from each list, or two titles from the same list.

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Which situation represents dependent probability and which represents independent probability? Justify your answer.

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1. Richard chose Animal Farm from the first list and Wuthering Heights from the second list. If his friend Khuvon is also choosing one book from each list, what is the probability Khuvon chose the exact same titles as Richard?

**INDEPENDENT PRACTICE**

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| *Bachelor Level* |

1. Reggie is baking cookies. He puts 10 cookies in a jar. There are 2 sugar cookies, 4 chocolate cookies, and 4 oatmeal cookies. Reggie selects a cookie from the jar without looking. Next, without replacing the first cookie, Reggie selects another cookie. What is the probability that Reggie will choose both sugar cookies?
2. A deck of cards has 5 yellow, 3 blue, and 5 green cards. You pick 3 cards from the deck. Cards are returned to the deck after they are picked. What is the probability of picking three blue cards in a row?
3. Which question (1 or 2) above represents independent probability? Explain your answer.

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| *Master Level* |

1. Which scenario(s) below represent dependent probability? Select all that apply.

a) Sarah spins a spinner with equal sections labeled A, B, C, and rolls a six-sided die. What is the probability that she will spin a “B” and roll an even number?

b) A bag of marbles is being used for a probability experiment. There are 3 red marbles and 7 green marbles. What is the probability of pulling a red marble followed by a green marble followed by another green marble if each marble is replaced after picking?

c) A bag of marbles is being used for a probability experiment. There are 3 red marbles and 7 green marbles. What is the probability of pulling a red marble followed by a green marble followed by another green marble if I put each marble in my pocket after I pick it?

d) Eight cards are numbered from 1 to 8 and placed in a box. One card is selected at

random and not replaced. Another card is randomly selected.

1. A deck of cards has 4 red, 5 purple, and 6 violet cards. You pick 4 cards from the deck. Cards are returned to the deck after they are picked.

Step A: What is the probability that four purple cards in a row are picked?

Step C: How could you change this experiment to make it a different type of probability? Explain.

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1. Kyle has a container that holds 60 paperclips. Half of the paperclips are metal. The other half are covered plastic: 10 red, 10 green, and 10 blue. If Kyle randomly takes a paperclip out of the container without putting it back, what is the probability that he will select a green plastic paperclip, followed by a blue plastic paperclip, followed by another green plastic paperclip?
2. Kyle puts all the paperclips back and tries again. Will it be more or less likely for him to pick three red paperclips in a row with replacement compared to the answer in question 6?
3. Which experiment that Kyle conducted represents dependent probability and why?

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| *PhD Level* |

1. Write two different probability experiments that meet the following criteria
   * + Both experiments must have the same initial sample space
     + One experiment must be independent probability and the other dependent probability
     + The experiment with dependent probability must have two separate events
     + The experiment with independent probability must have three separate events
     + The probability of the dependent experiment must be greater than the independent experiment

Experiment 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Experiment 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET**

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| Self-assessment | I mastered the learning objective today. | I am almost there. | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there. | You need more practice and feedback. |

1. A dealer deals a hand consisting of 3 spades, 4 diamonds, 6 clubs and 5 hearts.

Part A: If two cards are picked at random from that hand without replacement, what is the likelihood that one will be a heart and one will be a spade?

Part B: What type of probability is this (independent or dependent) and how do you know?

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1. A deck of cards has 5 yellow, 3 blue, and 5 green cards. You pick 3 cards from the deck. Cards are returned to the deck after they are picked.

Part A: What is the probability of picking three blue cards in a row?

Part B: What type of probability is this (independent or dependent) and how do you know?

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