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

UNIT 7 LESSON 11

**AIM**: SWBAT represent the sample space with tree diagrams and determine the probability of a dependent compound events

**THINK ABOUT IT!**

In a sack, there are 3 red marbles and 7 green marbles for a total of 10 marbles. The tree diagram below shows the outcomes and the **individual probabilities** of randomly picking a marble out of a bag, replacing it, and picking out another marble.

 Red Green

 P(red) = $\frac{3}{10} $P(green) = $\frac{7}{10}$

 Red Green Red Green

 P(red) = $\frac{3}{10} $ P(green) = $\frac{7}{10}$ P(red) = $\frac{3}{10} $ P(green) = $\frac{7}{10}$

Step A: Fill in the probabilities for the tree diagram below if you pick out a marble on the first try and ***do not*** replace it before picking out a second marble.

 Red Green

 P(red) = \_\_\_\_\_\_\_\_\_\_ P(green) = \_\_\_\_\_\_\_\_\_\_

 Red Green Red Green

 P(red) = \_\_\_\_\_\_\_ P(green) = \_\_\_\_\_\_\_\_ P(red) = \_\_\_\_\_\_\_\_ P(green) = \_\_\_\_\_\_\_\_

Step B: Use your tree diagram to determine the probability of pulling out a red, **not replacing it**, and then pulling out a green marble.

Key Point:

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**Interaction with New Material**

Ex.1) Margo is working on a school project and has to randomly select two more partners. The teacher puts 4 boy names and 3 girl names in a hat for her to randomly pick two names without replacing the names. Create a tree diagram and an organized list that shows the sample space of the outcomes with the corresponding probabilities. What is the probability that she will work with at least one other girl?

**PARTNER PRACTICE**

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| *Bachelor Level* |

1. A bag has 5 marbles total in it; 2 red and 3 blue.

Step A: Create a tree diagram showing the different possibilities with their corresponding individual probabilities.

Step B: Make an organized list of the sample space and include the probability of each outcome.

Step C: What’s the probability of picking a red marble, and then another red marble?

Step D: What’s the probability of picking two blue marbles?

**INDEPENDENT PRACTICE**

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| *Bachelor Level* |

1. Your drawer contains 10 red socks and 10 blue socks. It’s too dark to see which are which, but you grab two anyway.

Step A: Create a tree diagram to represent this situation and list the individual probabilities.

Step B: Create an organized list of the sample space and the corresponding probabilities.

Step C: What is the probabilitiy that you will pull out two red socks?

Step D: What is the probability that you will pull out mismatched socks?

Step E: What was different about your approach in part C and D?

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| *Master Level* |

1. Explain which situation represents dependent probability and why.
* Situation A: In a jar, there are 5 pennies, 5 nickels, and 5 dimes. Shartese is going to pick out one coin, record the type, and replace it in the jar. She’ll do this 50 times.
* Situation B: Kyle is going to conduct a different experiment involving quarters and dimes. He’ll randomly pull one coin out of the jar, record its type, and place it on the table. Then he’ll choose a coin from those that remain in the jar.

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1. Chris has a bag in his car that has 8 quarters, 4 dimes and 3 nickels in it. Create a tree diagram and an organized list to determine what the probability of randomly picking out three coins and the sum of the coins being less than 40 cents.
2. There are 8 prizes left in a prize bag: 5 rings and 3 necklaces. Dina gets to pick 2 prizes and really hopes that both of them are rings – she wants to give them to her little twin sisters. When Dina reaches into the grab bag and blindly pulls two prizes out.

Step A: Create a tree diagram to determine all the possible outcomes and the probability of each. Annotate the diagram with the probability of each individual outcome for each event in the experiment and represent the sample space in an organized list with corresponding probabilities.

Step B: What is the probability of Dina pulling out two rings?

Step C: What is the probability of Dina pulling out one of each (ring and necklace)?

Step D: Explain why your sample space changed after each event.

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| *PhD Level* |

1. A shuffled deck of cards is placed face-down on the table. It contains 4 hearts, 3 diamonds, 7 clubs and 6 spades. What is the probability that the top two cards are one of the diamonds followed by one of the spades?
2. A bowl of fruit is on the table and has 5 apples, 2 oranges, and 6 bananas. William and Ted come home from school and randomly grab one fruit each. What is the probability that both grab a banana?

**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 bag contains 5 apples. 3 are red apples and 2 are green apples. 2 apples are picked from the bin, without replacing the first after it’s picked.

Step A: Create a tree diagram to show all the possible outcomes of this event.

Step B: Write an organized list to show all the possible outcomes. Include the probability of each outcome, as a simplified fraction, next to each item on the list.

Step C: What is the probability of at least one apple being green? Explain your answer.

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