# CHAPTER 6--PROBABILITY

TREE DIAGRAMS AND CONSECUTIVE EVENTS

## Legend:

**N** = Notes—copy this in your notebook

**A** = Activity—I will be explaining and we will do an activity

**G** = Game—Time to play a Math Game!

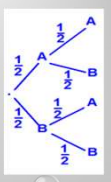
**C** = Classwork, grab a binder, start now and finish it for homework, look up the worksheet/assignment on MHS

## N Tree Diagrams and Consecutive Events

**New terms**

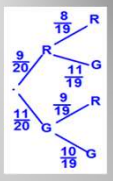
**Consecutive events**: are two or more events that happen one after another.

**With replacement**: the first event will have no effect on the next event. ex. Flipping a coin twice




## N

**Without replacement**: the first event will affect the probability of the next event. ex. Picking two marbles from a bag of red and green marbles (once we take a gum ball out of the machine, we do not put it back in for the next draw).




## A Gizmos Independent and Dependent Events

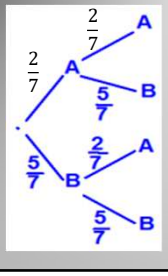
https://www.explorelearning.com/index.cfm?method=cResource.dspView&ResourceID=249

Explore:

1. Changing between with replacement and without replacement
2. Changing between 2, 3, and 4 draws

## N

**Example 1:** Given the tree diagram below, find $P_{AA}$. **(Must recognize: "with replacement" because denominator does not change.)**




$P(AA) = \frac{2}{7} \bullet \frac{2}{7} = \frac{4}{49}$

$P(AB) = \frac{2}{7} \bullet \frac{5}{7} = \frac{10}{49}$

$P(BA) = \frac{5}{7} \bullet \frac{2}{7} = \frac{10}{49}$

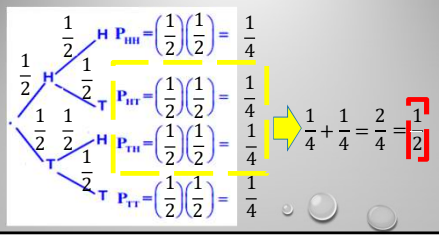
$P(BB) = \frac{5}{7} \bullet \frac{5}{7} = \frac{25}{49}$

**Vertical** (up and down the tree diagram) = adds up to 1

**Horizontal** (across the tree diagram) = multiply

**Example 2**: If a coin is flipped twice, what is the probability of getting a different result on each toss?

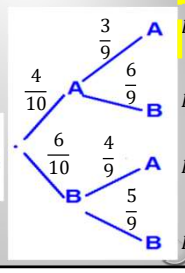
**(Must recognize: with replacement because H or T are both options each time you flip a coin)**




**Example 3:** In a bag of fruit, there are apples and bananas. If there are 4 apples and 6 bananas, what is the probability of picking an apple on two consecutive draws if there is no replacement?

**(Must recognize: "without replacement" because question says so.)**

$P(A) = \frac{\#\text{ of apples}}{\#\text{ of fruit}} = \frac{4}{10}$
$P(B) = \frac{\#\text{ of bananas}}{\#\text{ of fruit}} = \frac{6}{10}$
do not reduce

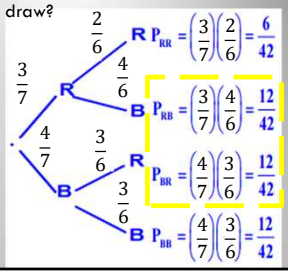



$P(AA) = \frac{4}{10} \cdot \frac{3}{9} = \frac{12}{90}$
$P(AB) = \frac{4}{10} \cdot \frac{6}{9} = \frac{24}{90}$
$P(BA) = \frac{6}{10} \cdot \frac{4}{9} = \frac{24}{90}$
$P(BB) = \frac{6}{10} \cdot \frac{5}{9} = \frac{30}{90}$

**Example 4**: A bag of marbles has 3 red marbles and 4 blue marbles. What is the probability of selecting different colored marbles on two consecutive draws if we do not replace the marble we drew on the first draw?

**(Must recognize: without replacement because the questions says so).**

$P(R) = \frac{\#\text{ of reds}}{\text{total }\#\text{ of marbles}} = \frac{3}{7}$
$P(B) = \frac{\#\text{ of blues}}{\text{total }\#\text{ of marbles}} = \frac{4}{7}$

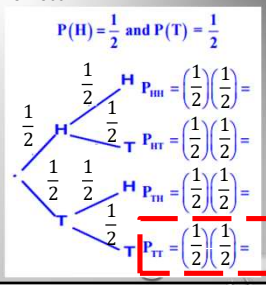



$\frac{12}{42} + \frac{12}{42} = \frac{24}{42} = \frac{4}{7}$

**Example 5: A coin is flipped twice. What is the probability of not getting a head on either toss?**

**(Must recognize: with replacement because it's a coin).**

$P(H) = \frac{1}{2}$ and $P(T) = \frac{1}{2}$




## Classwork/Homework

Green Binders
Chapter 6—Probability
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