UNIT 6 LESSON 5 CONDITIONAL PROBABILITY

Conditional Probability – probability of an event occurring given that another event has already occurred.

Multiplication   Rule:

> **General Multiplication Rule**
>
> For any two events A and,
>
> $$P(A \text{ and } B) = P(A) * P(B \mid A)$$
> $$\text{or } P(A \text{ and } B) = P(B) * P(A \mid B)$$
>
> where $P(B \mid A)$ and $P(A \mid B)$ are the conditional probabilities.

Ex 1) Select two cards from the standard deck of 52 cards without replacement. Find the probability of selecting two kings.

Probability of selecting the first king: $\frac{4}{52}$

Probability of selecting the second king: $\frac{3}{51}$

Based on the Multiplication Rule: $\frac{4}{52} * \frac{3}{51} = \frac{12}{2652} = 0.0045$

Ex 2) The probability that a particular knee surgery is successful is 0.85.
 Find the probability that three knee surgeries are successful.

Three successful surgeries = 0.85 * 0.85 * 0.85 = 0.614

Ex 3) A committee consists of four women and three men. The committee will randomly select two people to attend a conference in Hawaii. Find the probability that both are women.

Probability that the first is woman: $\frac{4}{7}$

Probability that the second is woman: $\frac{3}{6}$

Based on the Multiplication Rule: $\frac{4}{7} * \frac{3}{6} = \frac{12}{42} = 0.28$ = 28%