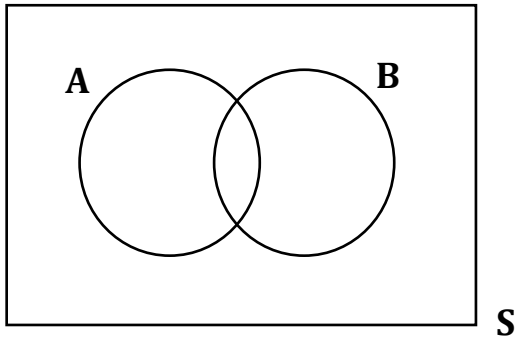
Conditional Probability

Consider A and B, two events in a sample space S. The conditional probability of A given B is defined as:

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

when P(B)>0.



Knowing that B has occurred, every outcome that is outside B should be discarded, so our sample space is reduced to the set B.

This way, A can only happen is when the outcome belongs to the set $A \cap B$.

We divide $P(A \cap B)$ by $P(B)$, so that the conditional probability of the new sample space becomes 1.