Suppose we have several possible events of interest, say A_1, A_2, $\ldots$, A_n. Suppose that they are disjoint and that their union is all of the sample space, i.e., $\bigcup_j A_j = S$. In other words, the A_j's form a partition of the sample space.

Now let's calculate $P(A_j \mid B)$.

$$
\begin{aligned}
P(A_j \mid B) &= \frac{P(A_j \cap B)}{P(B)} \\
&= \frac{P(A_j \cap B)}{P(A_1 \cap B) + P(A_2 \cap B) + \ldots + P(A_n \cap B)} \\
&= \frac{P(A_j)P(B \mid A_j)}{P(A_1)P(B \mid A_1) + P(A_2)P(B \mid A_2) + \ldots + P(A_n)P(B \mid A_n)}
\end{aligned}
$$