Example:
Flip a coin two times.

Let A be the event that the first flip is heads.
Let B be the event that the second flip is heads.

1. First write out the sample space.
   \[ S= \{HH, \ TH, \ HT, \ TT\} \]

2. Find probability of \( P(A) \) and \( P(B) \).
   \[ P(A) = \frac{2}{4} = \frac{1}{2} \]
   \[ \{HH, \ TH, \ HT, \ TT\} \text{ (Highlighted in yellow.)} \]
   \[ P(B) = \frac{2}{4} = \frac{1}{2} \]
   \[ S= \{HH, \ TH, \ HT, \ TT\} \text{ (Highlighted in yellow.)} \]

3. Find \( P(A \text{ and } B) \) using the sample space.
   \[ P(A \text{ and } B) = \frac{1}{4} \]
   \[ \{HH, \ TH, \ HT, \ TT\} \text{ (Highlighted in blue.)} \]

4. Find the \( P(A \text{ and } B) \) using the rule of Independence.
   \[ P(A \text{ and } B) = P(A) \cdot P(B) = \left(\frac{1}{2}\right) \cdot \left(\frac{1}{2}\right) = \frac{1}{4} \]