### The Fundamental Principle of Counting

Fundamental Principle of Counting: If one thing can occur in $m$ ways and a second thing can occur in $n$ ways, and a third thing can occur in $p$ ways, and so on, then the sequence of things can occur in $m \times n \times p \times \ldots$ ways.

**Practice Exercises**

Find the number of possible outcomes for each scenario using the fundamental counting principle.

1. Boys and girls in a family with two children.
2. Choosing a cellphone that comes in black, white, or transparent that is 3G or 4G.
3. A choice of muffin or toast bread with coffee, milk, or juice.
4. Basketball uniform in white, red, blue, yellow, or green which comes in sizes small, medium, or large.
5. A die is rolled thrice.

**Problem Set**

Find the number of possible outcomes for each scenario using the fundamental counting principle.

1. Clocks come in 2 styles: wall or desk. They come in 5 colors: white, black, red, blue, or orange.
2. Elias has a choice of a queen or king with a choice of hearts, diamonds, clubs, or spades.
3. A coin is tossed five times.
4. A coin is tossed and a die is rolled.
5. Notebooks come in 4 colors: red, yellow, green, and blue. They come in 2 types: 5-subject and 7-subject.