The collision theory explains that gas-phase chemical reactions occur when molecules collide with sufficient kinetic energy. The collision theory is based on the kinetic theory of gases; therefore only dealing with gas-phase chemical reactions are dealt with. Ideal gas assumptions are applied. Furthermore, we also are assuming:

1. All molecules are traveling through space in a straight line.
2. All molecules are rigid spheres.
3. The reactions concerned are between only two molecules.
4. The molecules need to collide.

Ultimately, the collision theory of gases gives the rate constant for bimolecular gas-phase reactions; it is equal to the rate of successful collisions. The rate of successful collisions is proportional to the fraction of successful collisions multiplied by the overall collision frequency.