

# **Grade 12 Physics**

SPH4U

Qinghao Hu

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## Chapter 3

# Unit 2: Energy and Momentum

### 3.1 Types of Collisions

#### 3.1.1 Definitions

Collisions are typically classified based on the amount of **kinetic energy** the system has after the collision, in comparison to the amount of kinetic energy the system had before the collision. In other words, **how** does  $E'_k$  with  $E_k$ ?

#### 3.1.2 Elastic Collisions

In an elastic collision, the kinetic energy of the system after the collision is **equal** to the kinetic energy of the system before the collision. In mathematics, the equation can be represented by:

$$E'_k = E_k$$

*Remark.* This does not mean the kinetic energy of the system after the collision is **equal** to the kinetic energy of the system before the collision (Unlike momentum)

#### Steps of the collision

**Before the collision:** The mechanical energy is entirely in the form of kinetic energy