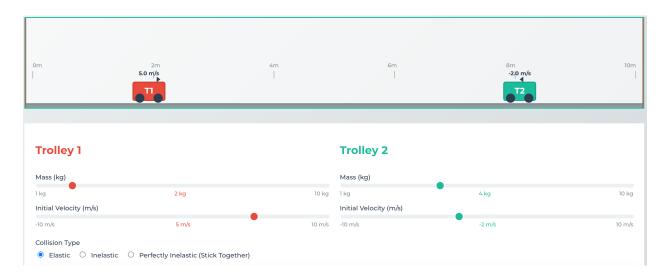
#### **Investigating Momentum**

Aim: The aim of this experiment is to investigate the law of conservation of momentum



#### Method:

- 1. Set the masses and intitial velocity of the trolleys
- 2. Keep the collision type as elastic for now
- 3. Press 'Start Simulation' and observe the collision
- 4. The 'Capture Results' button will record the mass and velocity of each trolley before and after the collision
- 5. Calculate the momentum of each trolley before and after the collision and enter into the table for checking
- 6. Is the total momentum the same before and after the collision?
- 7. Try a range of different scenarios e.g. both trolleys moving towards each other, one trolley initially not moving, both moving in the same direction

#### Extension:

- 1. Repeat the experiment but change the 'Collision Type' to 'Perfectly Inelastic'
- 2. What is different this time?
- 3. What sort of situation might this apply to?
- 4. For one 'Elastic' collision and one 'Perfectly Inelastic' collision with all the same other starting conditions calculate the **total kinetic energy** before and after the collision

# Results:

# **Before Collision:**

	Trolley 1			Trolley 2			
Collision Type	m <sub>1</sub> (kg)	V <sub>1</sub> before (m/s)	p₁ before (kg·m/s)	V <sub>2</sub> before (m/s)	m <sub>2</sub> (kg)	p₂ before (kg·m/s)	p total before (kg·m/s)

# After Collision:

	Trolley 1			Trolley 2			
Collision Type	mı (kg)	V <sub>1</sub> after (m/s)	p <sub>1</sub> after (kg·m/s)	V <sub>2</sub> after (m/s)	m <sub>2</sub> (kg)	p <sub>2</sub> after (kg·m/s)	p total after (kg·m/s)