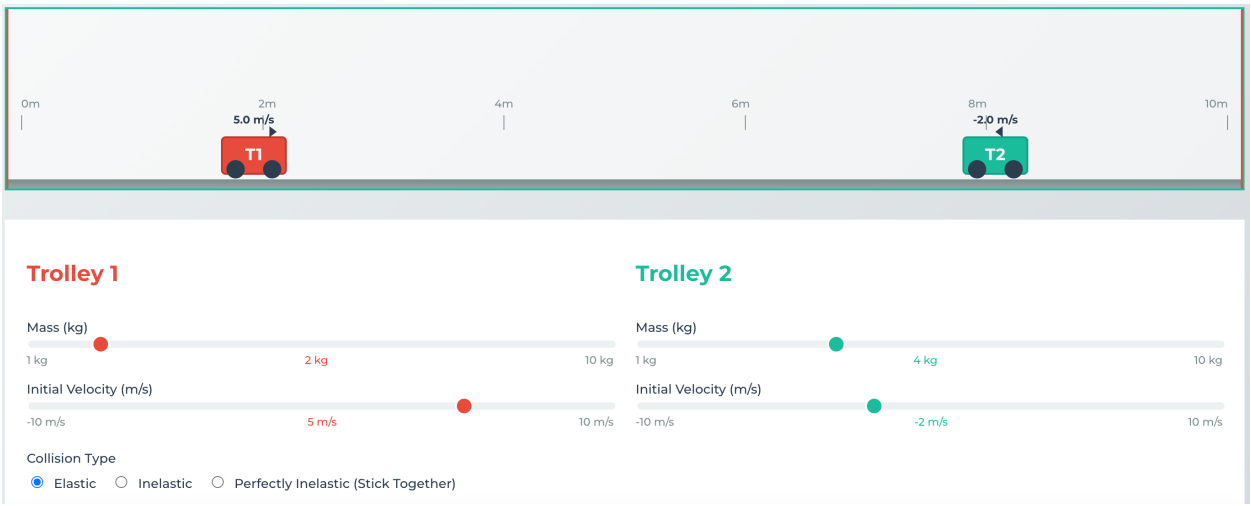
Investigating Momentum

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_1 (kg)**	**v_1 before (m/s)**	**p_1 before (kg·m/s)**	**v_2 before (m/s)**	**m_2 (kg)**	**p_2 before (kg·m/s)**	**p total before (kg·m/s)**

After Collision:

	Trolley 1			Trolley 2			
Collision Type	**m_1 (kg)**	**v_1 after (m/s)**	**p_1 after (kg·m/s)**	**v_2 after (m/s)**	**m_2 (kg)**	**p_2 after (kg·m/s)**	**p total after (kg·m/s)**