**Conservation of momentum using video tracker**

Case 1 (cart move apart due to magnetic repulsion)-elastic

|  |  |  |
| --- | --- | --- |
| Same mass |  | Different mass |
| Before | After |  | Before | After |
| m1 = 1.0 kg | u1=**0.49** ms-1 | m1 =1.0 kg  | v1= 0.0 ms-1 |  | m1 = 3.0kg | u1=**0.36** ms-1 | m1 = 3.0 kg | v1= **0.18** ms-1  |
| m2= 1.0 kg | u2= 0.0 ms-1  | m2= 1.0 kg | v2= **0.49**ms-1 |  | m2= 1.0 kg | u2= 0.0 ms-1 | m2= 1.0 kg | v2= **0.54** ms-1 |
| What quantity is conserved? *pi*= **0.49***pf* =**0.49***Kei* = **0.12***Kef* = **0.12** |  | What quantity is conserved?*pi*= **1.08***pf* =**1.08***Kei* = **0.19***Kef* = **0.19** |
|  |
|  |
|  |
|  |
|  |

Case 2 (cart stick together due to velco)-inelastic

|  |  |  |
| --- | --- | --- |
| Same mass |  | Different mass |
| Before | After |  | Before | After |
| m1 = 1.0 kg | u1= **0.59** ms-1 | m1 =1.0 kg  | v1=**0.29** ms-1 |  | m1 = 2.0 kg | u1=**0.41** ms-1 | m1 = 2.0 kg | v1=**0.27** ms-1 |
| m2= 1.0 kg | u2=0.0 ms-1 | m2= 1.0 kg | v2=**0.29** ms-1 |  | m2= 1.0 kg | u2=0.0 ms-1 | m2= 1.0 kg | v2=**0.27** ms-1 |
| What quantity is conserved?*pi*=**0.59***pf*=**0.58***Kei*= **0.17***Kef*= **0.084**50% loss due to sound |  | What quantity is conserved?*pi*=**0.82** *pf*=**0.81***Kei*= **0.17** *Kef*= **0.11**35% loss due to sound |
|  |
|  |
|  |
|  |
|  |

Conservation of kinetic energy: 

Principle of conservation of momentum: *mA uA + mB uB = mA vA + mB vB*