

## LAB - BUMPER FOR CARTS

- Create a bumper that minimizes the force on the cart when colliding with force sensor.

• Whiteboard:

$$\bar{p} = m\bar{v}$$

- Data table → completed
- Sketch of shape of integral curve with and without bumper → time, maximum force

- From lab  $\rightarrow$  bumper reduces force by and increases time

$$\bar{p} = m\bar{v}$$

↓ momentum      ↓ mass      ↓ velocity

$$\Delta\bar{p} = m\Delta\bar{v}$$

↓ change in momentum      ↓ mass      ↓ change in velocity

$$\bar{F} = m\bar{a}$$

$$\bar{F} = m \frac{\Delta \bar{v}}{\Delta t}$$

$$\bar{F} \Delta t = m \Delta \bar{v}$$

$$\bar{F} \Delta t = \Delta \bar{p}$$

Impulse - Momentum Theorem