CONCEPT: INTRO TO MOMENTUM

- **Momentum** is a physical quantity that objects with mass (**m**) have when moving at some velocity (**$\vec{v}$**): **___ = _____**

  Units: **[_____]**

  - Conceptually, it is a measure of how *DIFFICULT* it is to stop moving objects.
  - Momentum is a **vector**, it *always* points in the same direction as the object's _____.
    - If moving in the direction of negative, velocity AND momentum will be negative.

EXAMPLE: A 4,000 kg truck moves to the right with 10 m/s. An 800 kg racecar moves to the left with 50 m/s. Calculate the momenta of the two vehicles.

PROBLEM: A 2-kg object moves with 10m/s at 37° above the horizontal. **a)** Calculate the object's momentum. **b)** Calculate the horizontal and vertical components of the object's velocity AND momentum.

MOMENTUM
$p = mv$

PROBLEM**:** How fast would you have to throw a 150-g rock for it to have the same momentum as a 10-g sniper rifle bullet travelling at 900 m/s?

MOMENTUM
$p = mv$