Conservation of Momentum & Collision
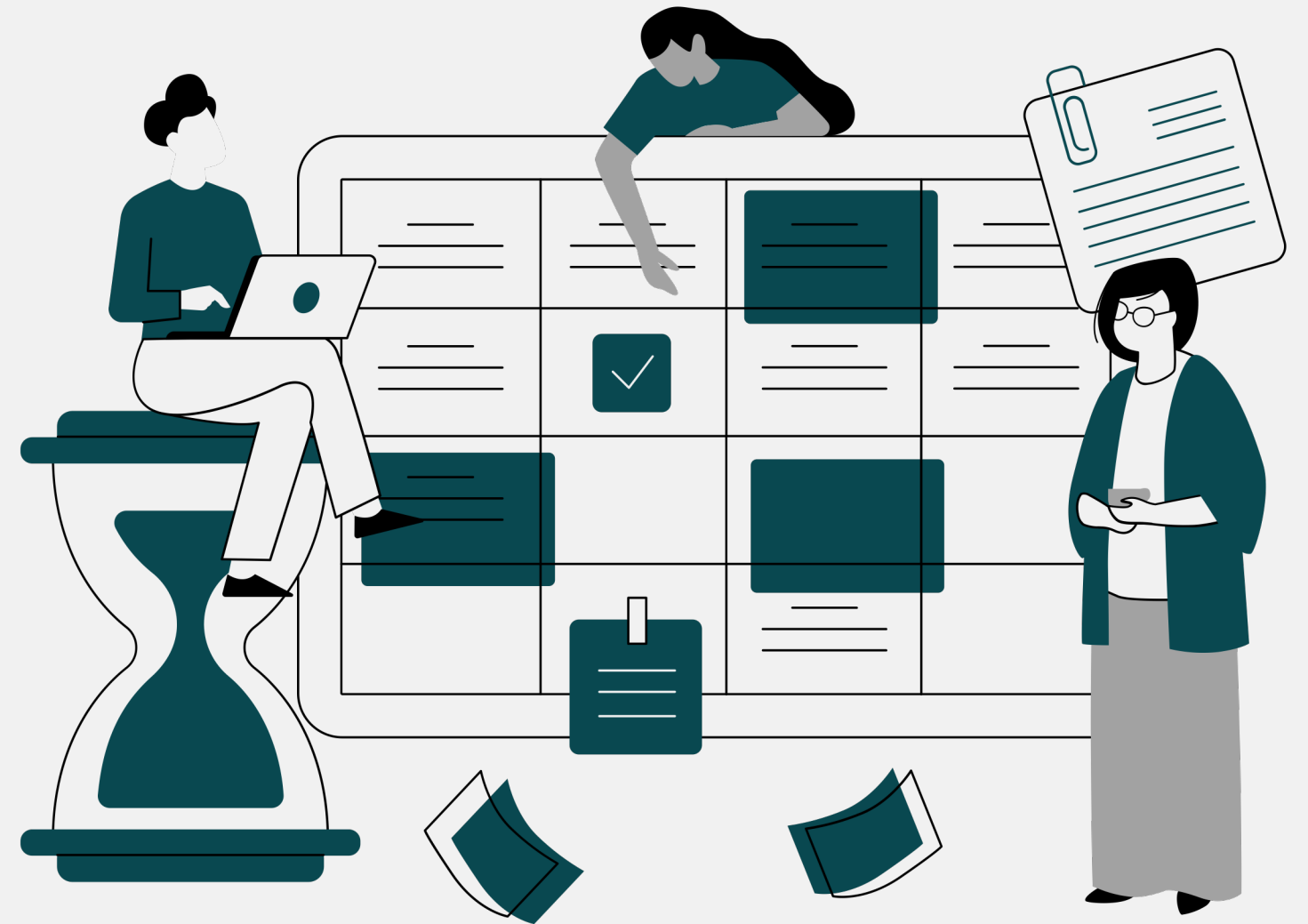
PhysiXplore Session 3
by Amanda Jiang

What is Momentum?

A short video that helps explain!

[What is momentum?](#)

Momentum
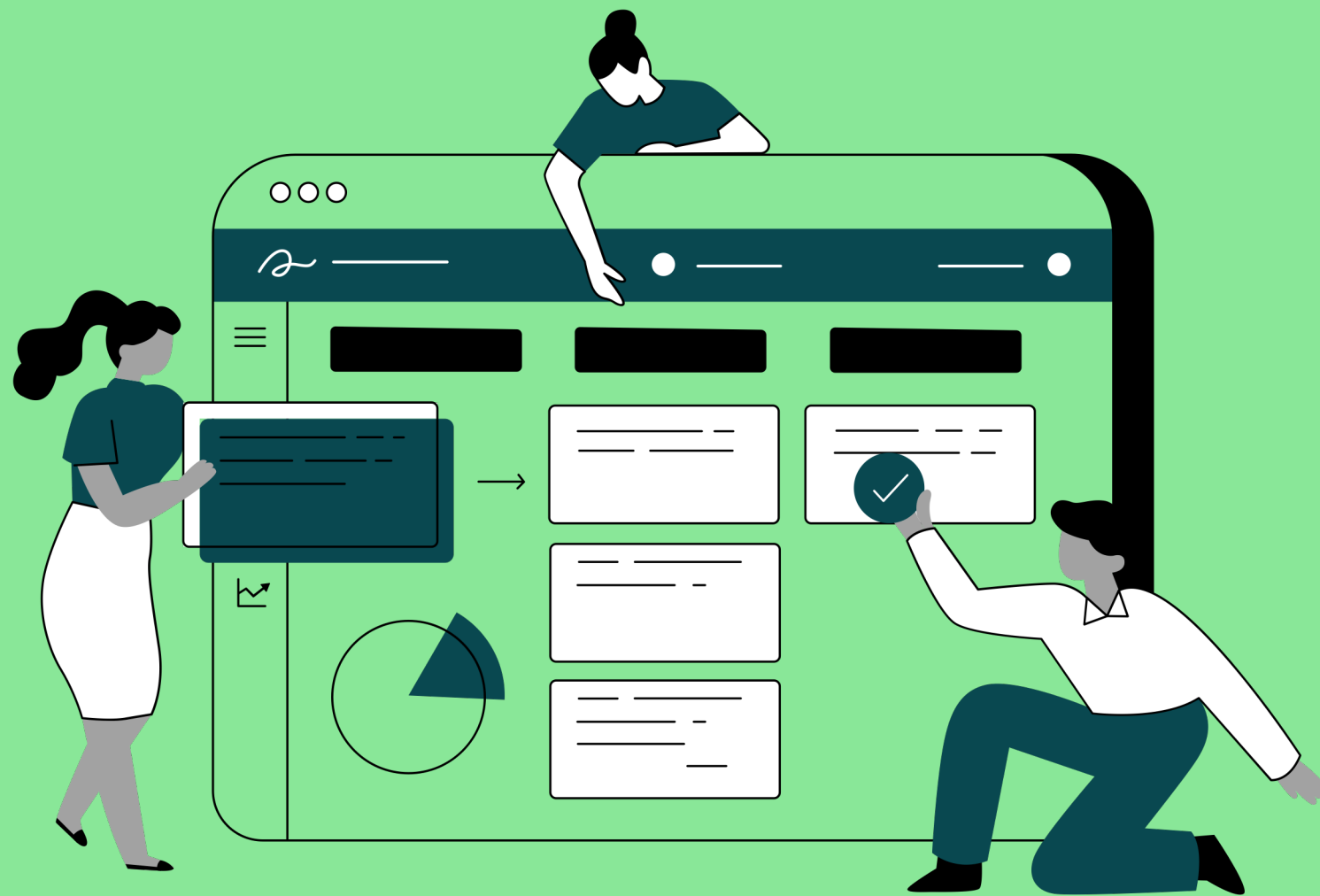
Momentum
- Measurement of mass in motion
- "Inertia in motion"
- $p = mv$

Conservation of Momentum
- Within a closed system, the total momentum in any direction is constant
- $m_1 v_1 + m_2 v_2 = m_1' v_1' + m_2' v_2'$

Collision

Something new for today!!

Collision

- Conservation of momentum: always true in every type of collision!!
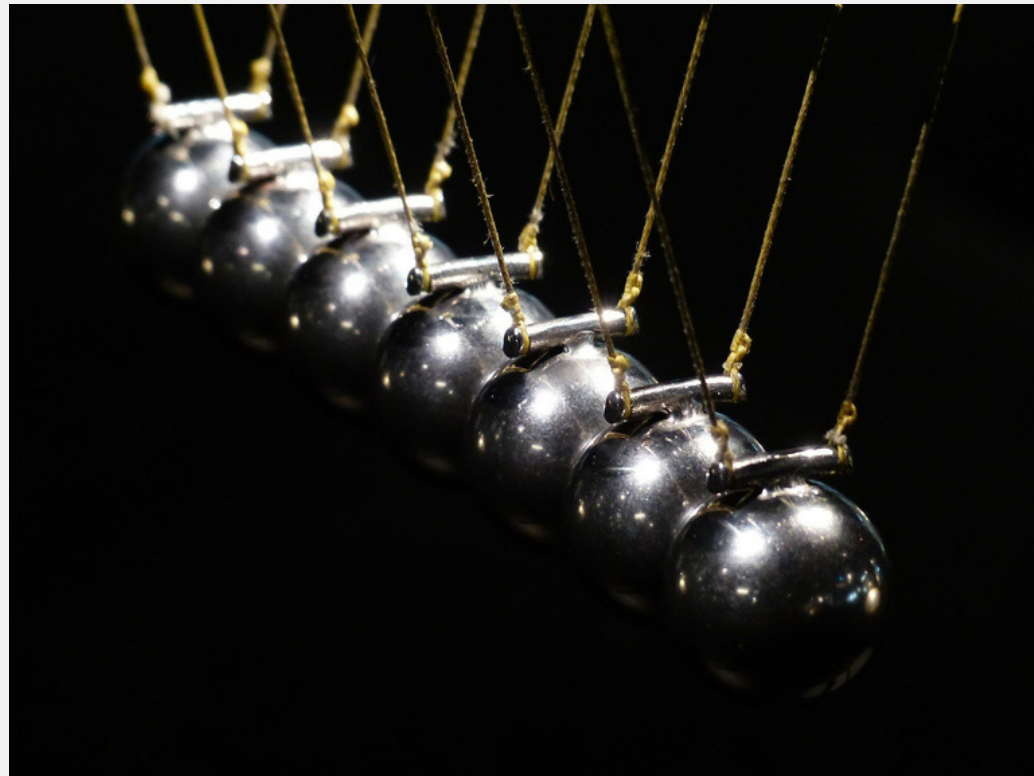- The difference is kinetic energy
- $K = \frac{1}{2}mv^2$

Elastic Collision

- Kinetic energy is conserved

Inelastic Collision

- Kinetic energy if not conserved (some is lost)
- "Missing" energy: internal energy (e.g: potential energy, thermal energy, sound, light...)
- **Perfectly inelastic collision**: objects stick together

Real Life Examples

Pendulum

Rocket

Skating

involves angular

Magnets will help you create different
types of collisions (elastic/inelastic)

**Experiment set-up!
Focusing on
COLLISIONS**

Calculation

Momentum

- Before & after collision
- p=mv
- compare the momentum

Kinetic Energy

- Before & after collision
- compare the kinetic energy
- compare elastic and inelastic collision in terms of kinetic energy

Difference?

- What do you notice?
- Does the result confirm the definition of elastic/inelastic collision?