



Name _____ Class _____ Date _____

AFTER THIS WORKSHEET YOU CAN

- ✓ Understand: Kinetic Energy (KE)
- ✓ Understand: Potential Energy (PE)
- ✓ Understand: Conservation of Energy
- ✓ Understand: Energy Transformations



Section A • Concept Check

• BEGINNER

4 × 1 = 4

- 1 Find KE of a 6 kg object at 8 m/s.

- 2 Find PE of a 10 kg object at height 15m (g=10).

- 3 A ball is dropped from 45m (g=10). Find its speed at the bottom.

- 4 A roller coaster car (500 kg) is at the top of a 20m hill (g=10) with zero initial speed. Find its speed at the bottom, ignoring friction.



Section B • Problem Solving

• INTERMEDIATE

4 × 3 = 12

- 5 Why doesn't the mass of the roller coaster car matter in the previous calculation?

- 6 A spring stores 50 J of potential energy. If all of it converts to kinetic energy, and the object has mass 4 kg, find its speed.

- 7 A 1 kg object has KE=18 J. Find its speed.

- 8 Why is total mechanical energy NOT conserved when friction is present?



Section C • Challenge

• CHALLENGE

2 × 2 = 4

- 9 Find PE of a 2 kg object at height 50m (g=10).

- 10 A pendulum swings from its highest point (all PE) to its lowest point (all KE, in an idealized frictionless case). What stays constant throughout the swing?

Reflection — the most useful thing I learned: _____

✂ ANSWER KEY – FOLD OR CUT BEFORE HANDING OUT

1 = 192 J 2 = 1500 J 3 = $v^2=2*10*45=900$, $v=30$ m/s 4 = $v^2=2*10*20=400$, $v=20$ m/s | 5 = Mass cancels out of the equation when converting PE to KE, since both depend on mass equally 6 = $50=0.5*4*v^2$, $v^2=25$, $v=5$ m/s 7 = $18=0.5*1*v^2$, $v^2=36$, $v=6$ m/s 8 = Friction converts some mechanical energy into heat (thermal energy), which isn't counted as mechanical energy | 9 = 1000 J
10 = Total mechanical energy (KE + PE)