

The Energy Ledger

More practice with squared speed, gravitational potential energy, conservation, and tracking every joule.

[squares] [PE = mgh] [conservation] [QUESTIONS ONLY] [PRINT-FRIENDLY]

NAME	PERIOD	DATE
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QUESTIONS ONLY - Practice independently or with a group. Use the class sheet as a model, but solve these numbers yourself.

PART A

The squared-speed clue

A ball rolls at 2 m/s, then at 4 m/s. Use a simple kinetic-energy pattern KE proportional to v^2 .

1 How many times larger is v^2 at 4 m/s than at 2 m/s?

2 If the first situation has 10 J of kinetic energy, estimate the second situation.

PART B

The shelf

A 3 kg beetle model rests on a shelf 2 m high. Use $g = 10 \text{ N/kg}$.

1 Find its gravitational potential energy using $PE = mgh$.

2 What height would give the same model 90 J of potential energy?

The Energy Ledger - continued

PART C

Close the ledger

A falling object starts with 120 J of potential energy. Air resistance turns 15 J into thermal energy before impact.

1 How much kinetic energy is left just before impact?

2 If 20 J then becomes sound and deformation, how much energy remains as motion?

PART D

The hill rule

A 2 kg cart has 80 J of energy at the top of a hill. At the bottom it has 55 J of kinetic energy.

1 How much energy became thermal, sound, or other forms?

2 If the cart loses 5 J more to friction, what kinetic energy reaches the bottom?
