Energy Scramble

For each of the challenges, calculate the energy represented. There will only be 4 unique answers across all 15 problems.

For all problems that have the same number answer, unscramble the letters to form a word and record it below

What do these words have in common?

A

Energy Produced

A wind turbine sweeping an area of 50 m^2 collects power at 40% efficiency for 10 seconds with an air density of 1.3 kg/m^3 and wind speed of 5 m/s. What is the energy produced?

A

Electrical Energy

A 19-watt lightbulb is on for 1.1 minutes. What is the electrical energy dissipated?

B

Kinetic Energy

A 654-kg baby elephant is charging toward you at 6 m/s. What is the kinetic energy?

D

Kinetic Energy

A 3-kg rocket accelerates from rest at 2.5 m/s^2 for 167.2 meters. What is its final kinetic energy?

E

Electrical Energy

The electrical energy dissipated when a 4 Ω light bulb is connected to a 1.5 V battery for 400 seconds.

E

Work-Energy

Energy gained when a warehouse worker pushes a 550-kg cart with 220 N of horizontal force for a displacement of 5.7 meters

G

Work-Energy

A paperboy pulls a wagon with 50 Newtons of force at an angle of 60° with the sidewalk. How much energy is gained after traveling 9 meters?

J

Heat

What is the thermal energy required to heat a 50-gram dixie cup of water from 21.5°C to 27.5°C?

Specific Heat of Water
4180 J kg^{-1} K^{-1}

L

Energy Produced

If the average solar intensity is about 500 W/m^2, how much energy is produced in 26 s by 5 m^2 worth of solar panels at 25% efficiency?

M

Kinetic Energy

A 15.625-kg cannon ball is launched upwards at 15 m/s. How much kinetic energy does it have 10 meters above its launch height?

0

Heat

The heat energy required to boil off 8 grams of a liquid substance with the properties shown below

Specific Heat of Solid	2520 J kg^{-1} K^{-1}
Specific Heat of Liquid	4315 J kg^{-1} K^{-1}
Latent Heat of Fusion	392,400 J kg^{-1}
Latent Heat of Vaporization	2,031,250 J kg^{-1}

P

Work-Energy

A car smashes into a crash barrier and imparts a constant force of 40,625 N while it compresses from 4.7 m to 4.3 m. How much energy was dissipated?

R

Gravitational Potential Energy

A 75-kg cliff diver is 16 meters above the surface of the water. What is the gravitational potential energy relative to the water's surface?

U

Heat

The heat energy needed to melt 30 grams of a solid substance with the properties shown below

Specific Heat of Solid	2520 J kg^{-1} K^{-1}
Specific Heat of Liquid	4315 J kg^{-1} K^{-1}
Latent Heat of Fusion	392,400 J kg^{-1}
Latent Heat of Vaporization	2,031,250 J kg^{-1}

Y

Elastic Potential Energy

What is the elastic potential energy stored in a giant slingshot ride with a spring constant of 163.5 N/m when stretched back from its resting length of 5 m to a stretched length of 17 m?