Energy

Answers

GCSE science knowledge recall

This topic online

Q	Answer	Remember
1	kinetic	Anything moving has a kinetic store; the faster it goes, the more it holds.
2	elastic	Stretched, squashed or bent: if it springs back, it was an elastic potential store.
3	chemical	The energy is released when chemical reactions take place.
4	gravitational potential	Higher up in a gravitational field means more energy in this store.
5	joule	Named after James Joule; 1 kJ is 1000 J.
6	kinetic energy = 0.5 × mass × speed^2	The speed is squared, so doubling the speed gives four times the kinetic energy.
7	9	0.5 × 2 × 3^2 = 0.5 × 2 × 9 = 9 J. Square the speed before multiplying.
8	4	2^2 = 4. That is why braking distances grow so quickly with speed.
9	GPE = mass × gravitational field strength × height	E_p = m g h. Height is the change in height, in metres.
10	9.8	Sometimes rounded to 10 N/kg for quick estimates.
11	100	5 × 10 × 2 = 100 J.
12	spring constant	A stiff spring has a big k; e is the extension in metres.
13	specific heat capacity	Water's is very high, about 4200 J/kg °C, so seas warm and cool slowly.
14	J/kg °C	Read it straight from the definition: joules, per kilogram, per degree.
15	84000	ΔE = m c Δθ = 2 × 4200 × 10 = 84 000 J.
16	power	Two kettles may boil the same water; the more powerful one does it faster.
17	watt	1 watt means 1 joule transferred every second.
18	30	P = E ÷ t = 600 ÷ 20 = 30 W.
19	created or destroyed	This is the law of conservation of energy: the total stays the same.
20	wasted	Wasted energy usually ends up heating the surroundings a little.
21	friction	Lubrication cuts friction, so less energy is wasted heating the parts.
22	decrease	Thicker walls with lower thermal conductivity both slow down the loss of energy.

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Q	Answer	Remember
23	efficiency = useful output energy transfer ÷ total input energy transfer	Multiply by 100 for a percentage; you can use power instead of energy too.
24	0.25	50 ÷ 200 = 0.25, which is 25%. No device can be more than 100% efficient.
25	Lubricate the moving parts to reduce friction (or use low-resistance wires so less energy heats the coils).	Find where energy is wasted, then cut that waste: friction, heating, sound.
26	non-renewable	Coal, oil, gas and nuclear fuel will run out; wind and solar will not.
27	tidal	Tides are caused by the Moon, so they are reliable, unlike waves.
28	geothermal	Only practical where hot rocks are close to the surface, as in Iceland.
29	carbon dioxide	Fossil fuels also release sulfur dioxide, which causes acid rain.
30	wind	Unreliable resources need back-up from power stations that can start quickly.

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