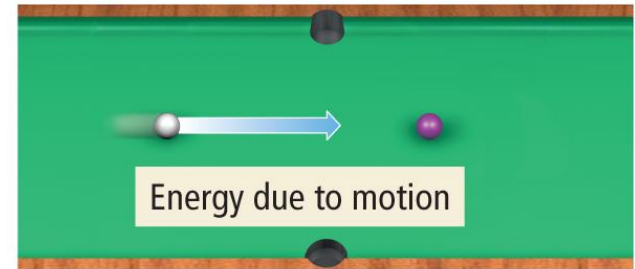


Chapter 6

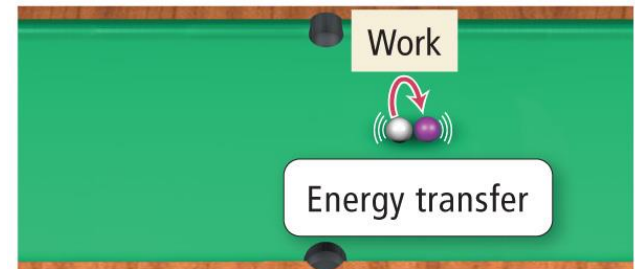
THERMOCHEMISTRY

Key Ways to transfer Energy

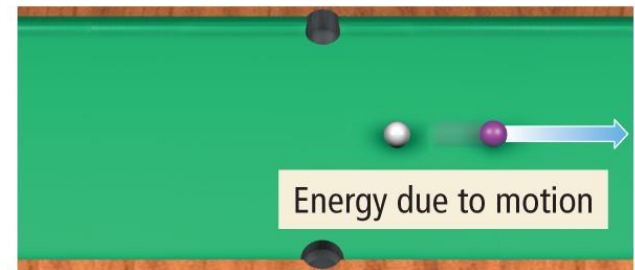
- **Energy:** the capacity to do work
- **Work:** force acting through a distance
- **Heat:** flow of energy due to temperature change



(a)



(b)



(c)

Types of energy* (some...)

Kinetic: energy of motion

- Thermal energy:
 - Associated with the Temperature of the object (Random motion of particles)

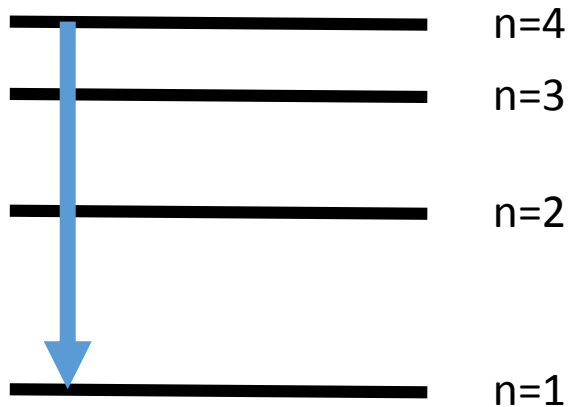
Potential: energy of position



- Chemical energy:
 - Energy associated with the positions of electrons

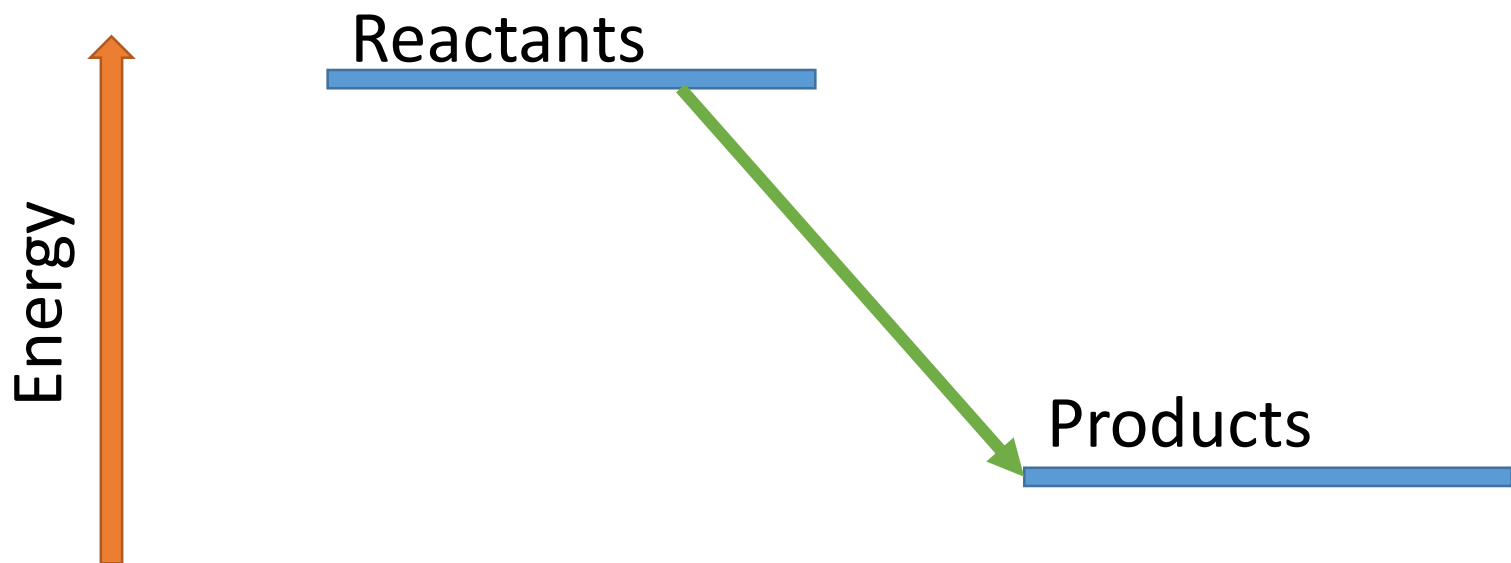
Electron Position as Potential Energy?

- Hydrogen atom:
 - Emission: Because of electron position, Energy was released as light.



Electron Position as Potential Energy

- Molecules: When electrons are involved in bonds, they also have potential energies. The more stable the bond, the lower potential energy of the electrons.



Breaking a Bond ALWAYS COSTS energy!

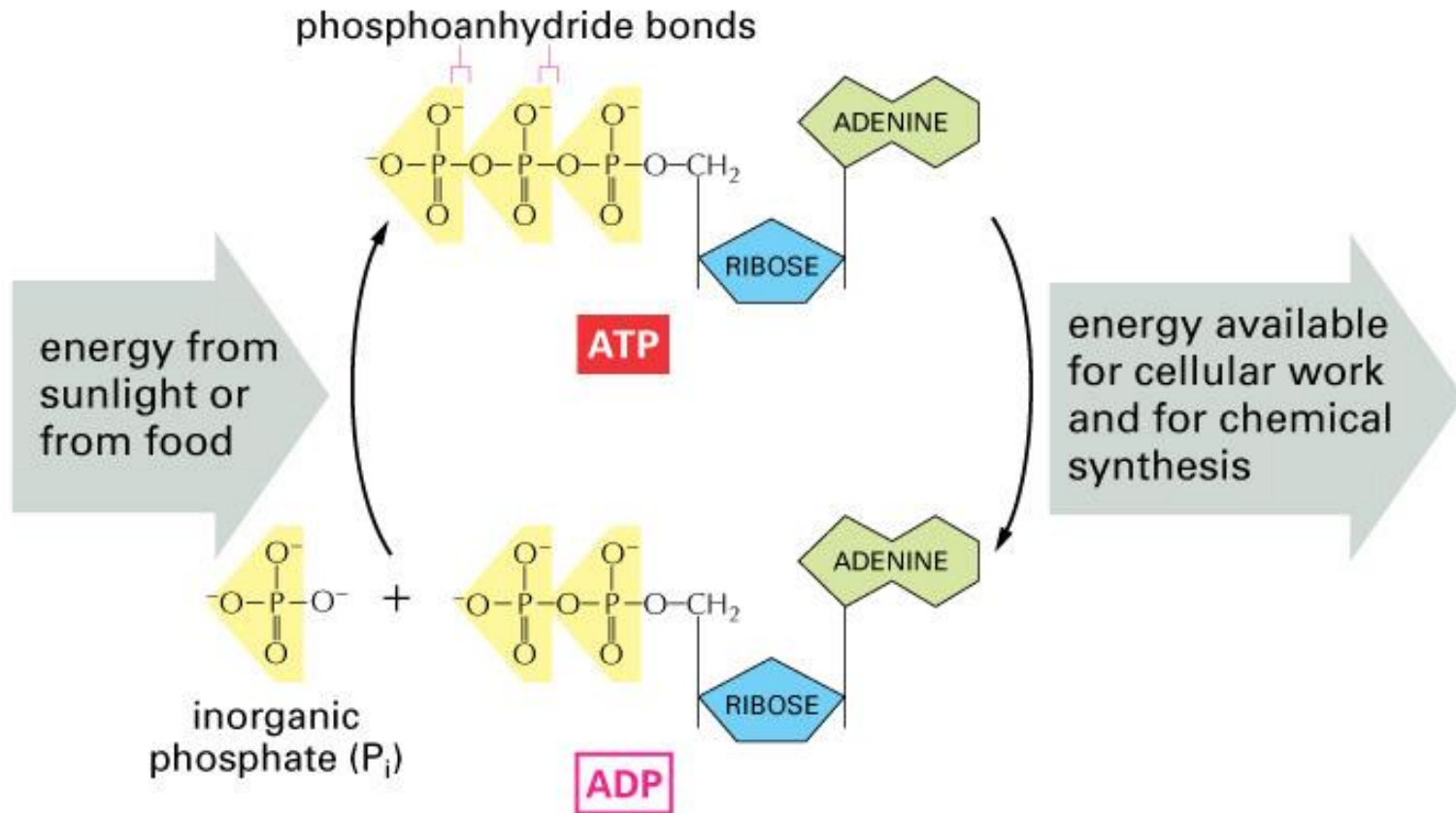


Figure 3-32 Essential Cell Biology, 2/e. (© 2004 Garland Science)



Which is easier to sell

1 Calorie Pepsi One

or

1000 calorie Pepsi One Thousand

DESROCHERS'
JOKE!

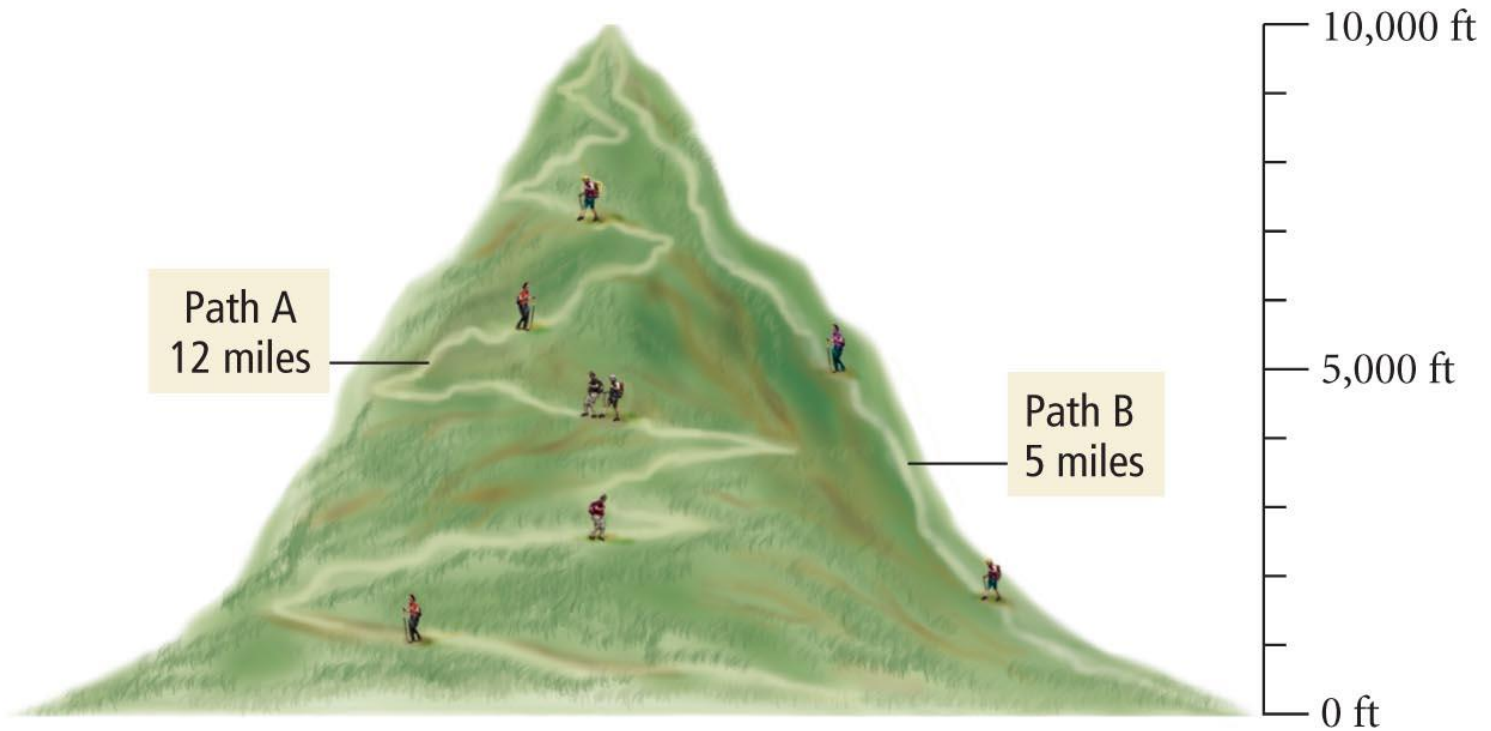


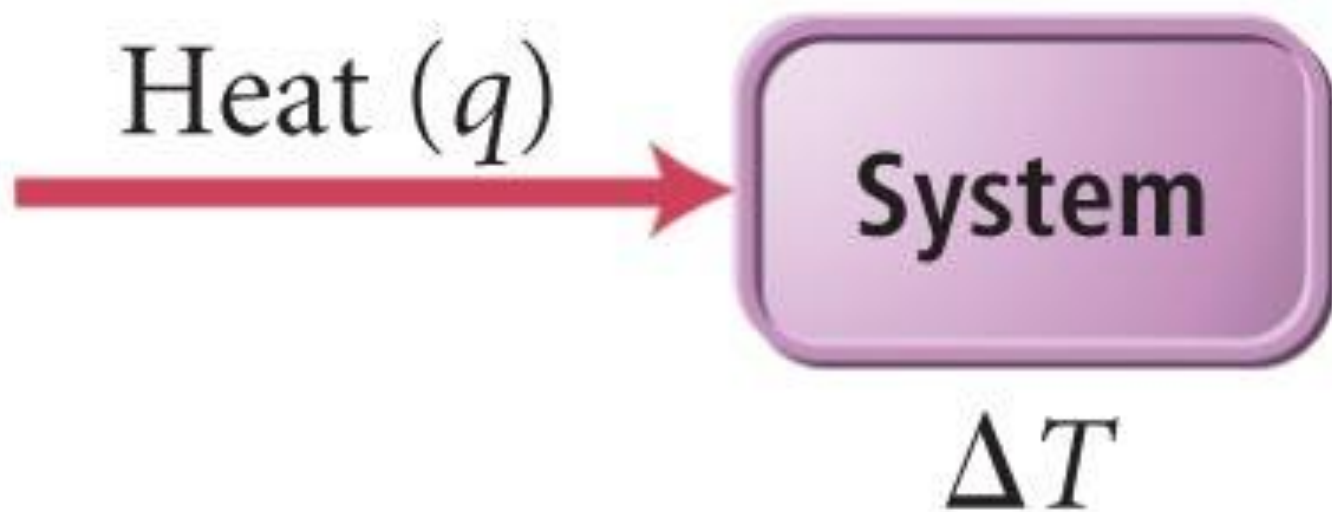
1 calorie = 4.184 joule

How many joules are in one can of Pepsi one?

A State Function

Change in altitude depends only on the difference between the initial and final values, not on the path taken.





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TABLE 6.4 Specific Heat Capacities of Some Common Substances

Substance	Specific Heat Capacity, C_s (J/g · °C)*
Elements	
Lead	0.128
Gold	0.128
Silver	0.235
Copper	0.385
Iron	0.449
Aluminum	0.903
Compounds	
Ethanol	2.42
Water	4.18
Materials	
Glass (Pyrex)	0.75
Granite	0.79
Sand	0.84

*At 298 K.

