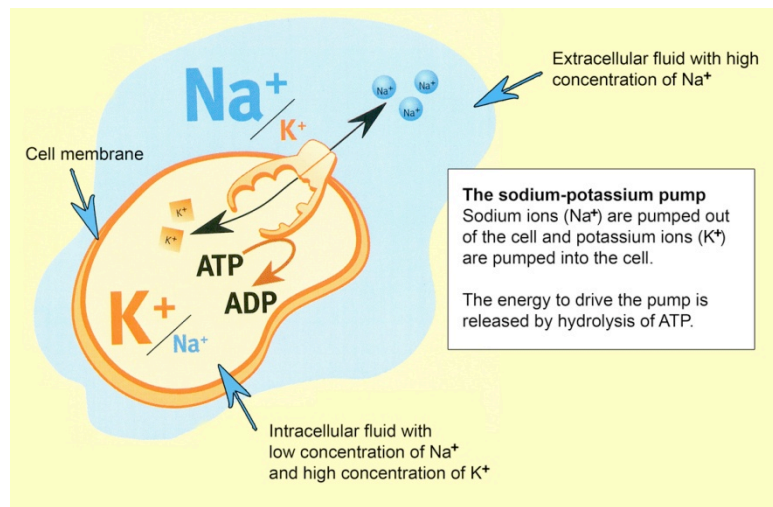


ENERGY UNIT CONVERSION TABLE

	J	kJ	cal	kcal	BTU	kWh
1 J =	1	0.001	0.2390	2.390×10^{-4}	1055	2.778×10^{-7}
1 kJ =	1000	1	239.0	0.2390	1.0557	2.778×10^{-4}
1 cal =	4.184	4.184×10^{-3}	1	0.001	252	1.162×10^{-6}
1 kcal =	4184	4.184	1000	1	0.252	1.162×10^{-3}
1 kWh =	3.6×10^6	3.6×10^3	8.604×10^5	860.4	2.93×10^4	1

**The Chocolate Chip Challenge:**

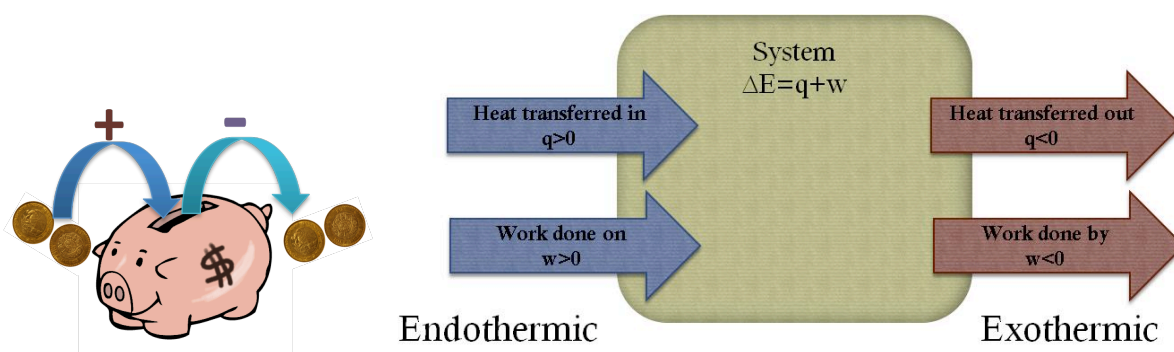
How many grams of salt would you need to give you the number of sodium ions that could be transported by the energy in one chocolate chip?

(1 chocolate chip has 3.5 Calories)

An **isolated system** _____ transfer _____ and _____ to its surroundings.

A **closed system** can transfer _____ but not _____ to its surroundings.

Chemists usually study _____ systems.



Specific Heat Capacity Values for Some Elements, Compounds, and Common Solids

Substance	Specific Heat Capacity (J/g · K)	Molar Heat Capacity (J/mol · K)
<i>Elements</i>		
Al, aluminum	0.897	24.2
C, graphite	0.685	8.23
Fe, iron	0.449	25.1
Cu, copper	0.385	24.5
Au, gold	0.129	25.4
<i>Compounds</i>		
NH ₃ (ℓ), ammonia	4.70	80.0
H ₂ O(ℓ), water (liquid)	4.184	75.4
C ₂ H ₅ OH(ℓ), ethanol	2.44	11.2
HOCH ₂ CH ₂ OH(ℓ), ethylene glycol (antifreeze)	2.39	14.8
H ₂ O(s), water (ice)	2.06	37.1
<i>Common Solids</i>		
wood	1.8	
cement	0.9	
glass	0.8	
granite	0.8	

Clicker Question

The instructions for baking brownies say to heat the oven to 350°F if using an aluminum pan, but to heat the oven to 325°F if using a glass pan. Why is this?

1. Glass heats up faster because it has a lower heat capacity.
2. Glass heats more slowly because it has a lower heat capacity.
3. Aluminum heats more slowly because it has a lower heat capacity.
4. Aluminum heats up faster because it has a higher heat capacity.