

OPEN vs CLOSED vs ISOLATED

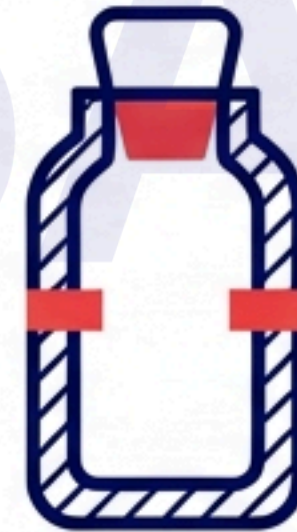
Just ask two questions: Can Matter Cross? Can Energy Cross?



OPEN SYSTEM



CLOSED SYSTEM



ISOLATED SYSTEM

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OPEN SYSTEM

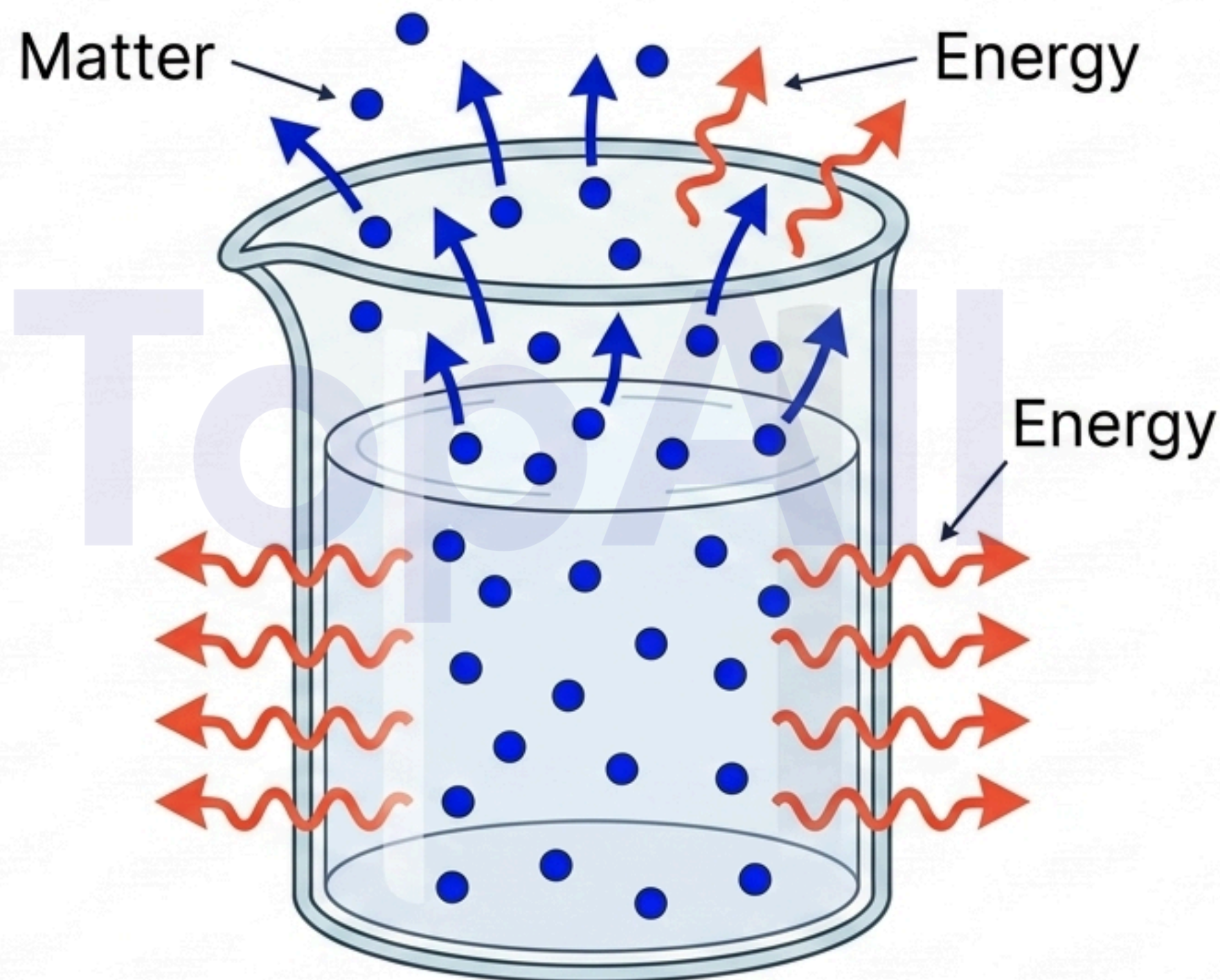
Matter ✓

Energy ✓

Example:

Reactants in an open beaker.

(Boundary is an imaginary surface enclosing the beaker).



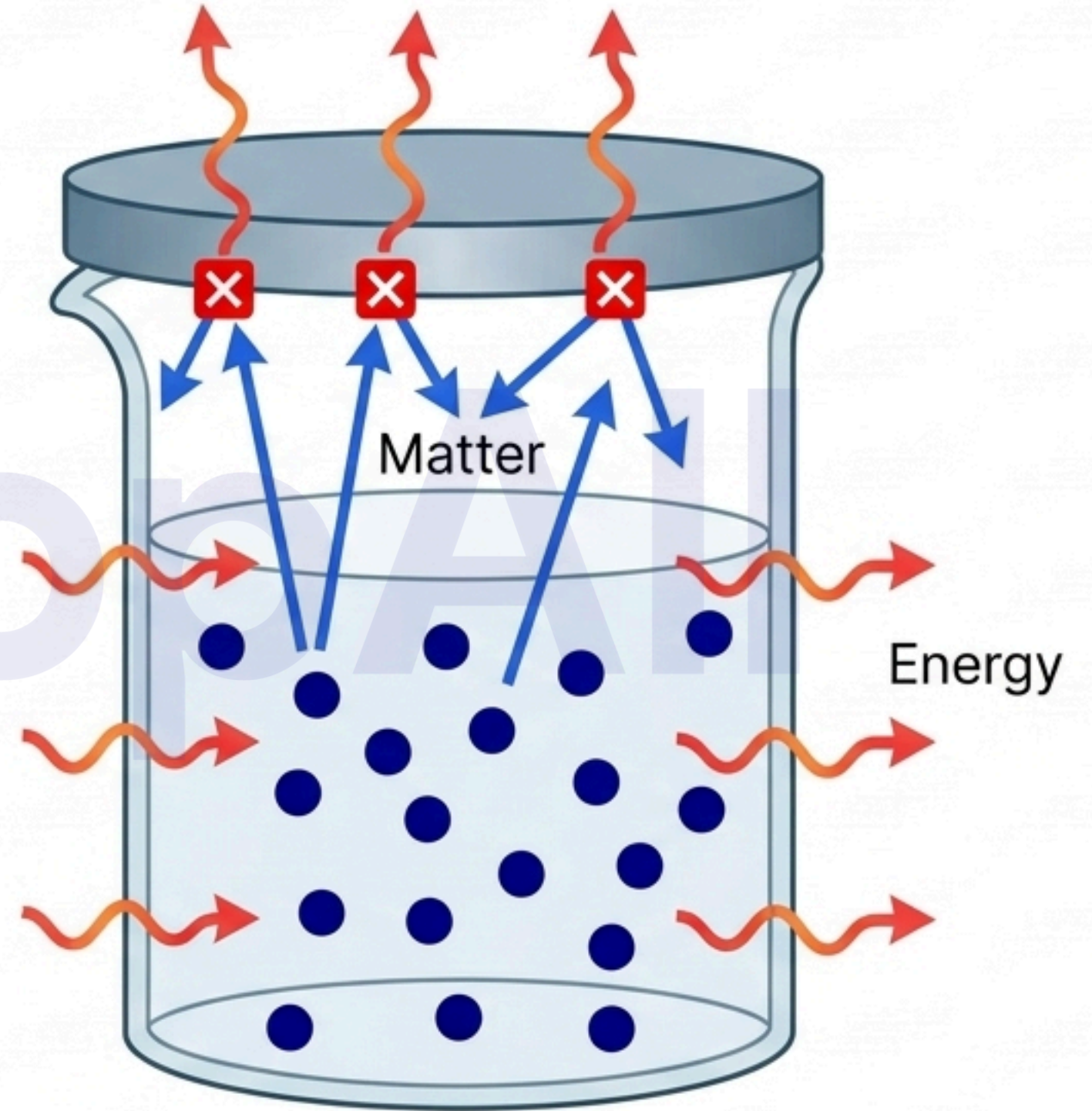
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CLOSED SYSTEM

Matter ❌

Energy ✅

Example: Closed conducting vessel (e.g., copper or steel).





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Let's Test Them Now.**

$$E=mc^2$$



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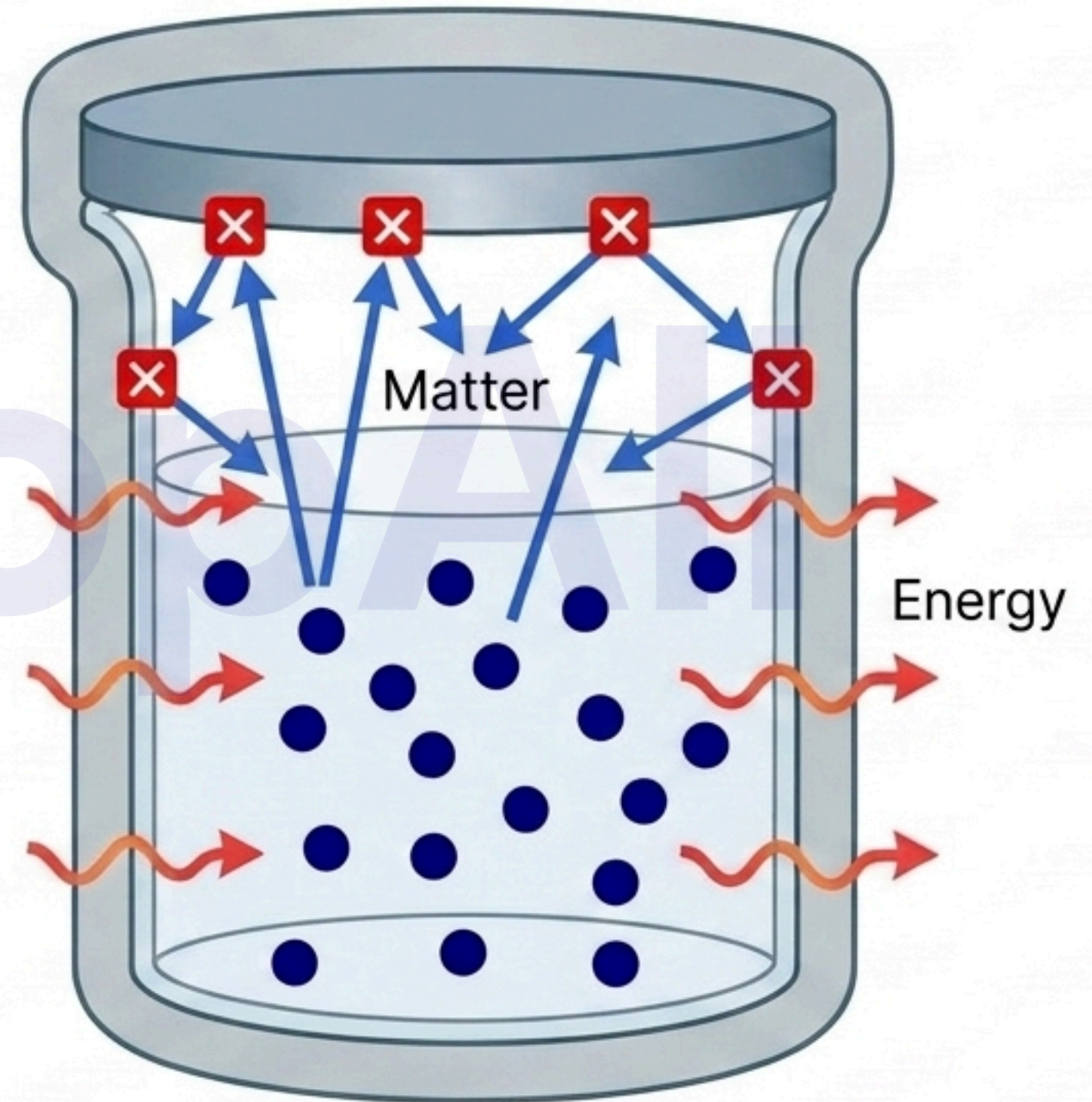
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ISOLATED SYSTEM

Matter ❌

Energy ❌

Example: Thermos flask /
closed insulated vessel.



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System	Matter	Energy
Open	✓	✓
Closed	✗	✓
Isolated	✗	✗

! JEE Trap: Closed $\neq$ Isolated

- **Closed box:** Blocks mass, but heat can still enter/leave (conducting walls).
- **Isolated box:** Blocks mass AND heat (insulated walls). Don't mix them up!

Revision Mnemonic:

OPEN → M  E 

CLOSED → M  E 

ISOLATED → M  E 

(Where M = Matter, E = Energy)

The entire universe = The System + The Surroundings.



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