Suppose I have a block of matter with 8 two-state “Degrees of Freedom” (bins in which to place energy that can only hold 1 energy packet).

I have 2 packets of thermal energy. How many ways are there to distribute 2 packets? (i.e., How many microstates are there?)

1. 16  6. 32
2. 15  7. 28
3. 8  8. Something else
4. 64  9. It cannot be determined
5. 56
Suppose I have a block of matter with \( N \) two-state “Degrees of Freedom” (bins in which to place energy that can only hold 1 energy packet).

I have 2 packets of thermal energy. How many ways are there to distribute 2 packets?

1. \( 2N \)  
2. \( 2N-1 \)  
3. \( N^2 \)  
4. \( N(N-1) \)  
5. \( N^2/2 \)  
6. \( N(N-1)/2 \)  
7. Something else  
8. It cannot be determined

Try this! Count!
Suppose I have a block of matter with 4 two-state “Degrees of Freedom” (bins in which to place energy that can only hold 1 energy packet).

I have 2 packets of thermal energy. How many ways are there to distribute 2 packets? (i.e., How many microstates are there?)
Suppose I have two blocks of matter, each with 4 two-state “Degrees of Freedom” (bins in which to place energy that can only hold 1 energy packet).

I have 2 packets of thermal energy. How many ways are there to distribute 2 packets among both blocks compared to the number of ways to distribute 2 packets to one block?

1. Twice as high
2. Four times as high
3. Eight times as high
4. More than eight times as high
5. Not enough information