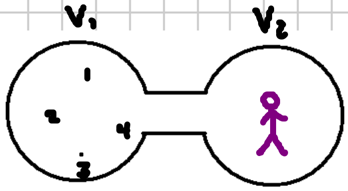
Note Title 3/18/2012

Lecture 17 4 Microstates Macrostates & more particles



macrostate V1 V2	V1 V2	V1 V2	V1 V2	V1 V2
✓ 4 0	✓ 3 1	2 2	1 3	0 4
1234	✓ 123 4	✓ 12 34	✓ 4 123	1234
	✓ 124 3	✓ 13 24	✓ 3 124	
	✓ 134 2	✓ 14 23	✓ 2 134	
	✓ 234 1	✓ 23 14	✓ 1 234	
		✓ 24 13		
		✓ 34 12		
W= 1	W= 4	• W= 6 greatest # microstates greatest entropy	W= 4	W= 1

• What is the probability of any of these macrostates occuring?

• Total ways to distribute 4 particles in two volumes:

1 + 4 + 6 + 4 + 1 = 16

16 diff ways to arrange 4 particles in two volumes

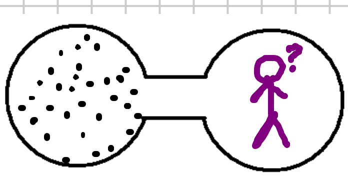
	Macrostate V1	V2	Probability
W=1	∴ (4)	(person)	1/16 100 = 6.25%
W=4	∴ (3)	•	4/16 · 100 = 25%
W=6	• •	• •	6/16 100 = 37.5%
W=4	•	∴ (3)	4/16 100 = 25%
W=1		∴ (4)	1/16 · 100 = 6.25%

← 6.25% of the time there will be No gas in Vol 2 to breath.

⇐ most probable to have gas particles evenly dist between the two Vol

most prob. ⇒ highest entropy

How does this change for more particles? 50!



0.000000000000009%

Very slim change that we'll have "0" molecules to breath.