

How to calculate the Shannon-Weaver diversity index

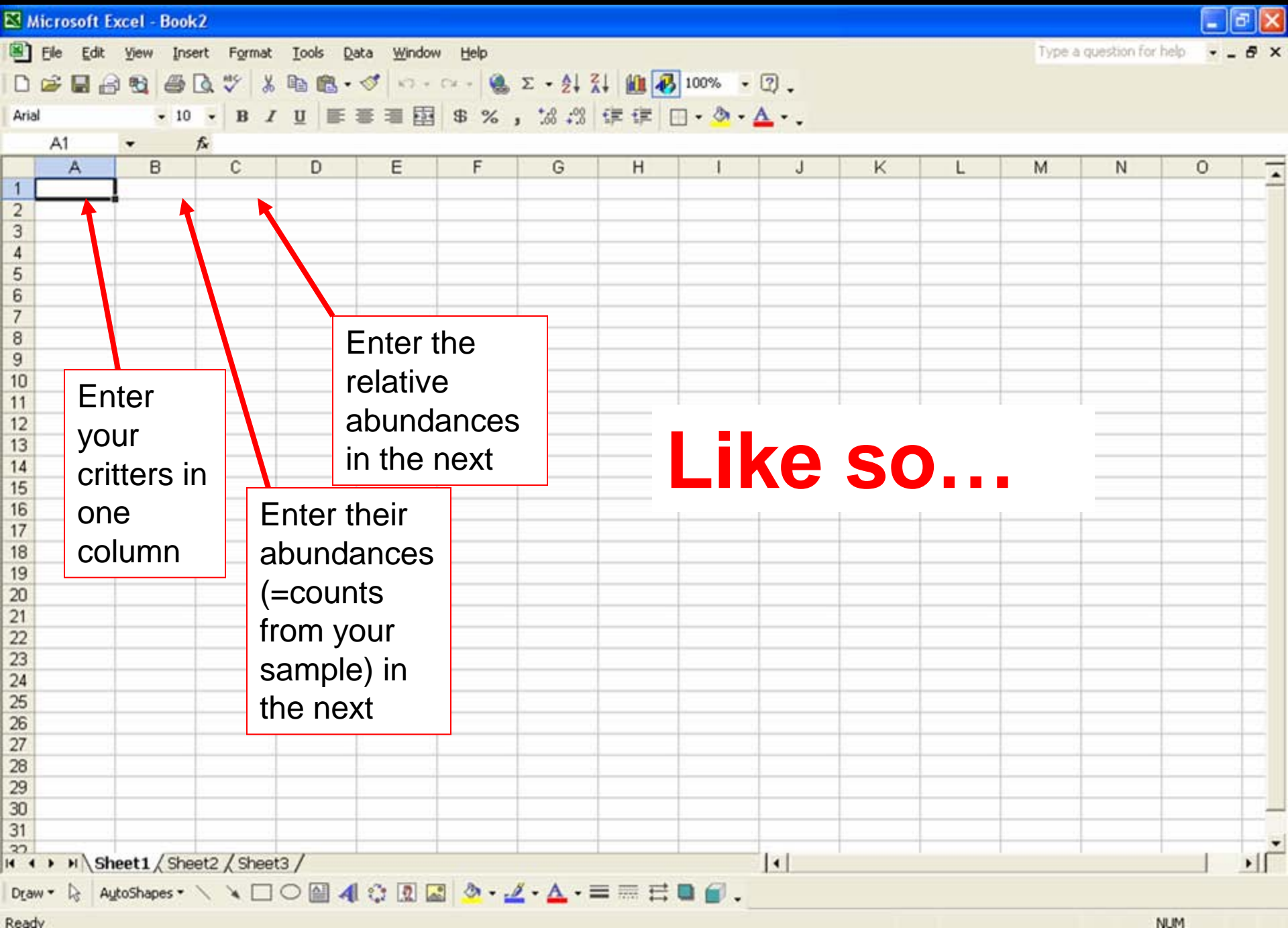
$$H' = -\sum p_i \ln(p_i)$$

H' = The Shannon-Weaver Diversity Index

p_i = the relative abundance of each group of organisms

But remember that the S-W index is usually expressed as $e^{H'}$

OR $H' = -\sum (N_i/N) \times \ln (N_i/N)$



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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32															

Enter your critters in one column

Enter the relative abundances in the next

Enter their abundances (=counts from your sample) in the next

Like so...



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Group	Number in sample	Relative abundance										
2	Nematodes	8	0.5										
3	Copepods	4	0.25										
4	Polychaetes	2	0.125										
5	Gastrotrichs	2	0.125										
6	Total	16	1										
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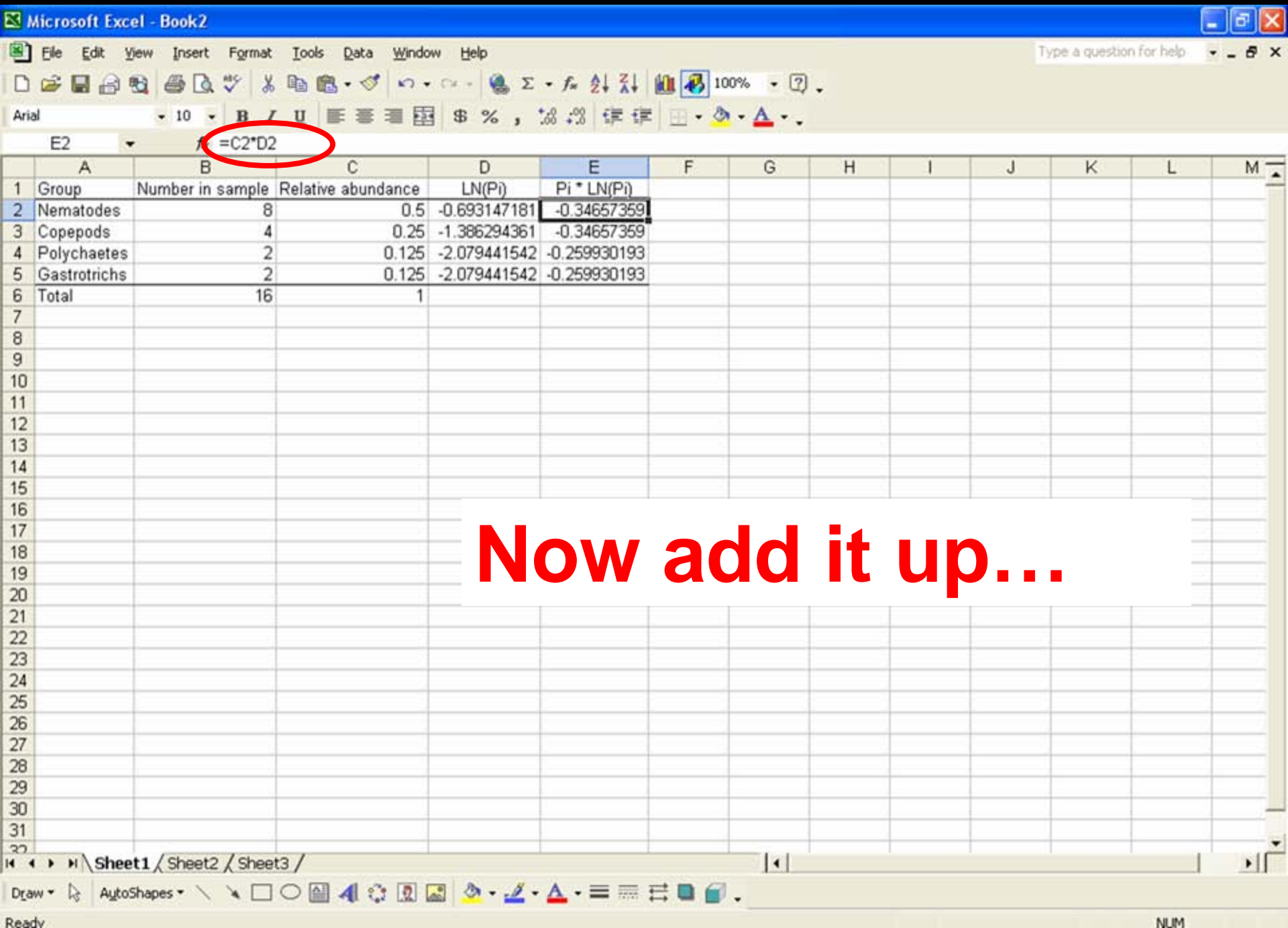
Remember:
relative
abundance is
simply the
abundance
divided by the
total. It should
always total to
1.

**Now we need
natural logs (ln)...**

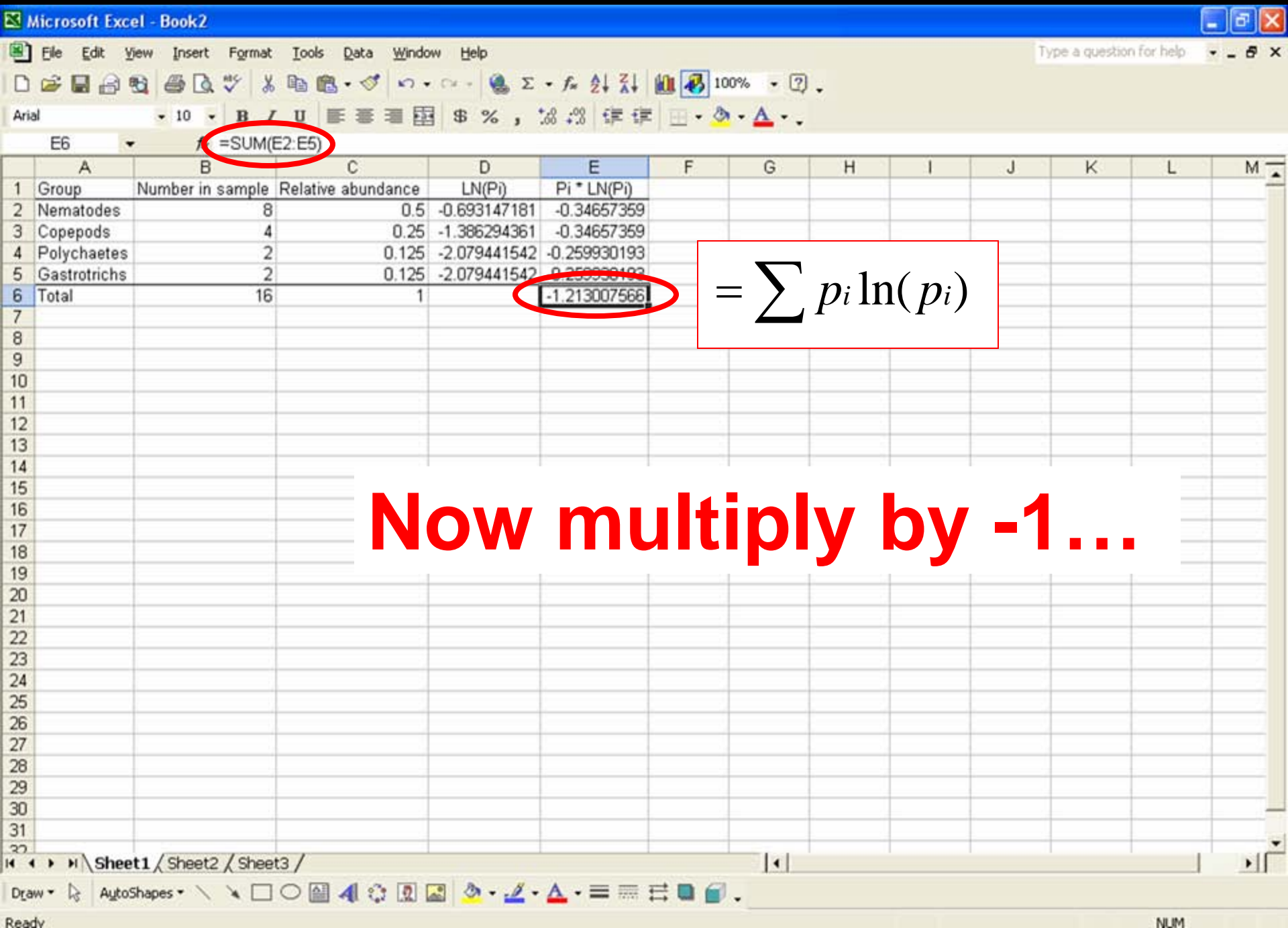
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Group	Number in sample	Relative abundance	LN(Pi)									
2	Nematodes	8	0.5	-0.693147181									
3	Copepods	4	0.25	-1.386294361									
4	Polychaetes	2	0.125	-2.079441542									
5	Gastrotrichs	2	0.125	-2.079441542									
6	Total	6	1										

LN is the formula
for natural log

**Next multiply
LN(Pi) by Pi...**



Now add it up...



=SUM(E2:E5)

$$= \sum p_i \ln(p_i)$$

Now multiply by -1...

-1.213007566



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Group	Number in sample	Relative abundance	LN(Pi)	Pi * LN(Pi)								
2	Nematodes	8	0.5	-0.693147181	-0.34657359								
3	Copepods	4	0.25	-1.386294361	-0.34657359								
4	Polychaetes	2	0.125	-2.079441542	-0.259930193								
5	Gastrotrichs	2	0.125	-2.079441542	-0.259930193								
6	Total	16	1		1.213007566								
7					1.213007566								
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$$= -\sum p_i \ln(p_i) = H'$$

Now raise e to H'...

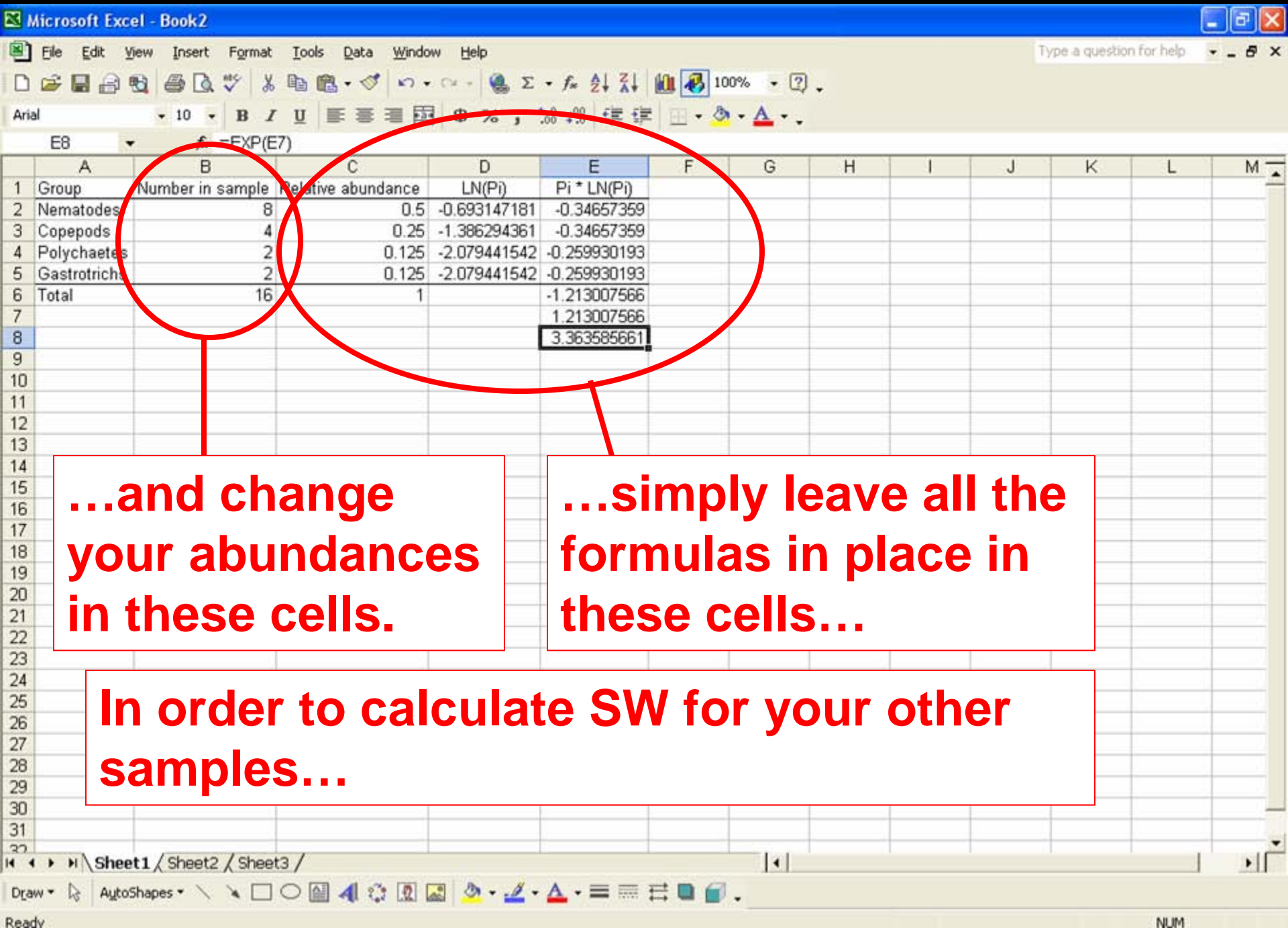


	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Group	Number in sample	Relative abundance	LN(Pi)	Pi * LN(Pi)								
2	Nematodes	8	0.5	-0.693147181	-0.34657359								
3	Copepods	4	0.25	-1.386294361	-0.34657359								
4	Polychaetes	2	0.125	-2.079441542	-0.259930193								
5	Gastrotrichs	2	0.125	-2.079441542	-0.259930193								
6	Total	6	1		-1.213007566								
7					1.213007566								
8					3.363585661								
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EXP is the formula for raising e to a power

$$= e^{H'}$$

Ta Da!



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Group	Number in sample	Relative abundance	LN(Pi)	Pi * LN(Pi)								
2	Nematodes	8	0.5	-0.693147181	-0.34657359								
3	Copepods	4	0.25	-1.386294361	-0.34657359								
4	Polychaetes	2	0.125	-2.079441542	-0.259930193								
5	Gastrotrichs	2	0.125	-2.079441542	-0.259930193								
6	Total	16	1		-1.213007566								
7					1.213007566								
8					3.363585661								

...and change your abundances in these cells.

...simply leave all the formulas in place in these cells...

In order to calculate SW for your other samples...