

They're both the same: two letters! But *fosh* is closer to *fish*.

$$\begin{array}{cccc} F & O & S & H \\ \downarrow & & \downarrow & \downarrow \\ F & I & S & H \end{array} = 3$$

$$\begin{array}{cccc} F & O & S & H \\ \downarrow & \downarrow & & \\ F & O & R & T \end{array} = 2$$

You're comparing the longest common *substring*, but you really need to compare the longest common *subsequence*: the number of letters in a sequence that the two words have in common. How do you calculate the longest common subsequence?

Here's the partial grid for *fish* and *fosh*.

	F	O	S	H
F	1	1		
I	1			
S			1	2
H				

Can you figure out the formula for this grid? The longest common subsequence is very similar to the longest common substring, and the formulas are pretty similar, too. Try to solve it yourself—I give the answer next.

Longest common subsequence—solution

Here's the final grid.

	F	O	S	H
F	1	1	1	1
O	1	2	2	2
R	1	2	2	2
T	1	2	2	2

LONGEST COMMON SUBSEQUENCE = 2

vs

	F	O	S	H
F	1	1	1	1
I	1	1	1	1
S	1	1	2	2
H	1	1	2	3

LONGEST COMMON SUBSEQUENCE = 3