MINIMAL WORD LADDERS

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A word ladder is a sequence of words of the same length in which each word is successively transformed into the next word by changing only one of its letters and not rearranging the other letters. For example, QUITE becomes SUITE by changing Q to S. The sequence could continue with SUITE to SPIKE, SPIKE to SPFNE, SPFNE to SPINS, SPINS to SPANS, and so on, theoretically continuing for hundreds of words. In the six words of this ladder from QUITE to SPANS, though, no letter-position is changed more than once (e.g., after Q has been changed to S in position 1, S remains in position 1 in each successive word). All the word ladders shown below follow this pattern of minimal changes, and they are thus known as minimal word ladders.

ANY SOAP ELATE BRAVER CANNONS THUMBING
AND SWAP PLATE BEAVER CANTONS THUMPING
AID SWAY PLACE BEATER CANTORS TRUMPING
KID AWAY PEACE BETTER CANTERS TRAMPING
AWRY PEACH SETTER CASTERS CRAPPING
PERCH SETTEE MASTERS CRAPPINS
SETTLE MASTERY CRAPPIES CRAPPOES

The first and last words in a minimal word ladder are called noncraging because neither word uses any letter in the same position as the other. While nonminimal word ladders in which the first and last words are noncraging are not particularly difficult to construct, minimal word ladders are quite difficult for words longer than eight letters. In fact, not even a nonminimal word ladder has been found for words longer than eight letters in which the first and last words are noncraging (though such is surely possible for nine-letter words).

Minimal word ladders are more interesting and difficult to construct when common words are used and when consonants are changed into vowels and vice versa. In the above examples, all words are common (sanctioned by the Merriam-Webster Pocket Dictionary) except a few of the eights (which are in Webster's Third Unabridged). The 3- and 4-letter ladders have consonant-vowel changes in every position, the 5- and 6-letter ladders have four consonant-vowel changes, and the 7- and 8-letter ladders have only one or two. More consonant-vowel changes are possible if less common words are used, of course.
Below are more examples of minimal word ladders using words longer than five letters. I've chosen a sampling of the most interesting from the dozens I've constructed. Most of the words are common, and all are sanctioned by Webster's Ninth New Collegiate Dictionary. The two eight-letter word ladders are one word short of being complete. No minimal eight-letter word ladders have been constructed without words from unabridged dictionaries.

ACORNS ANUSES BANTER CLUMPY PICKED
SCORNS ANISES BAITER CLUMPS PACKED
SCORES ARISES WAITER PLUMPS BACKED
SCARES CRINES WHITER PLUMES BALKED
SCARED CRIMES WHINER PLUSSES BALLED
SOARED CRIMPS WHINEY PAUSES BALLET
SOAKED CRIMPY WHINNY PASSSES BALLOT
BOOTIES BRUSHES CAREENS CHANTY CUTLERY
BOOTIES BLUSHES CAREERS CHANTEY CUTLERS
BOBBIES BLUSTER CAMPERS CHATTER PUTTERS
BOBBINS BLASTER TAMERS SHATTER PUTTEES
ROBBING PLANTER TEMPERA SWATTER PATTIES
RUBBING PLANTAR TEMPURA SWITHER PANTIES
DIVISOR METALED
DEVISOR METTLED
REVISOR SETTLED
REVISER SETTEES
REVILED SETTERS
RESILED SITTERS
RESOLED SISTERS
CREATIVE GESTATES
CREATINE GESTATED
CREATING RESTATED
CREAKING RESEATED
WREAKING RESEALED
WRECKING REVEALED
WRACKING REVELLED
WHACKING RAVELLED

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ERIC ALBERT
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Titles of Rock

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Titles of Dal

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