

STATENAME LADDERS

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Word ladders have featured many times in the past in Word Ways, where a word is changed into a related word one letter at a time. A simple example is to turn LEAD into GOLD – thus, LEAD-LOAD-GOAD-GOLD. Another easy example is COLD-CORD-CARD-WARD-WARM.

More difficult ladders between connected words can be achieved by changing one letter at a time and then transposing the resulting letters. Each step on such a word ladder is effectively a substitute-letter transposal. Here's how to go from RIGHT to WRONG: RIGHT-GRIOT-GROIN-WRONG. And here's how PILGRIM and FATHERS can be connected: PILGRIM-IMPERIL-LIMITER-MALTIER-ARMLETS-FALTERS-FATHERS.

It occurred to me that it would be interesting to determine if a set of word ladders could be constructed connecting US statenames of the same length. There are three 4-letter statenames (Iowa, Ohio and Utah), which means there are three potential ladders: Iowa-Ohio, Iowa-Utah, and Ohio-Utah. Similarly, there are three 5-letter statenames (Idaho, Maine and Texas), again leading to three potential ladders. And so on up to statenames with 13 letters. All told, there are 139 different potential ladders connecting statenames of the same length. Below are examples for 133 of these ladders. In the table below, for each of the 133 ladders, I show the number of words in the shortest theoretically possible ladder, the number of words in the actual ladder I have offered, and the potential reduction in the number of steps between the shortest theoretically possible ladder and the actual ladder presented. I'm sure there is plenty of scope for reducing the length of many of the chains. Any reductions that readers can find would be welcomed by the editors.

A word about the six ladders I haven't been able to build. Four of the six nonexistent ladders involve MISSISSIPPI at one end or the other. There just doesn't seem to be any way to change a letter of MISSISSIPPI to get a ladder started or finished. And the other two nonexistent ladders involve MASSACHUSETTS. While there is a trans-substitution of MASSACHUSETTS (to SETSUMATSUSHA), there doesn't seem to be a further trans-substitution allowing progress further along the ladder. If anyone can overcome these problems, please let us know via the editors.

Words in shortest possible ladder	Words in actual ladder	Possible reduction in steps
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4-letter states: Iowa, Ohio, Utah

3	3	0	Iowa	ohia	Ohio			
4	4	0	Iowa	ohia	huia	Utah		
4	4	0	Ohio	ohia	huia	Utah		

5-letter states: Idaho, Maine, Texas

4	4	0	Idaho	danio	amino	Maine		
5	6	1	Idaho	dhoti	hoist	oaths	heats	Texas
4	4	0	Maine	names	steam	Texas		

6-letter states: Alaska, Hawaii, Kansas, Nevada, Oregon

5	6	1	Alaska	kahals	halals	wallah	Halawi	Hawaii
3	3	0	Alaska	laksas	Kansas			
5	6	1	Alaska	akelas	ankles	knaves	davens	Nevada
7	8	1	Alaska	akelas	ankles	knarls	krangs	organs
				orange	Oregon			
5	6	1	Hawaii	Halawi	halwas	Khalsa	laksas	Kansas
5	7	2	Hawaii	Halawi	dahlia	Adelia	nailed	idaean
				Nevada				
7	9	2	Hawaii	Halawi	awhile	hameil	mailer	morale
				gaoler	orange	Oregon		
4	7	3	Kansas	laksas	Akelas	ankles	knaves	davens
				Nevada				
6	6	0	Kansas	kangas	krangs	organs	orange	Oregon
5	5	0	Nevada	agenda	danger	orange	Oregon	

7-letter states: Alabama, Arizona, Florida, Georgia, Indiana, Montana, New York, Vermont, Wyoming

6	6	0	Alabama	malabar	malaria	laminar	mazarin	Arizona
6	6	0	Alabama	malabar	malaria	mariola	aliform	Florida
7	7	0	Alabama	malabar	bimalar	Laramie	regalia	argoile
				Georgia				
6	6	0	Alabama	lambada	Lambadi	baladin	idalian	Indiana
5	5	0	Alabama	tambala	matalan	Matalon	Montana	
8	9	1	Alabama	tamable	lambert	brantle	latoner	elytron
				styrone	yonkers	New York		
7	7	0	Alabama	tambala	tamable	lambent	lomenta	montera
				Vermont				
7	9	2	Alabama	tambala	ambital	bimanal	blaming	mangily
				yawling	yowling	Wyoming		
4	4	0	Arizona	Adriano	ordinal	Florida		
4	4	0	Arizona	Argonia	origane	Georgia		
4	4	0	Arizona	Adriano	diarian	Indiana		
4	5	1	Arizona	Adriano	mandora	amorant	Montana	
5	6	1	Arizona	Adriano	aneroid	downier	wonkier	New York

5	5	0	Arizona	romania	moraine	montera	Vermont	
5	8	3	Arizona	romania	angioma	loaming	mangily	yawling
				yowling	Wyoming			
4	4	0	Florida	dariole	Loegria	Georgia		
5	5	0	Florida	ordinal	laniard	diarian	Indiana	
6	6	0	Florida	dilator	Rotalia	ailanto	amation	Montana
6	7	1	Florida	ordinal	aileron	loaners	Koreans	yonkers
				New York				
6	6	0	Florida	dilator	leotard	levator	venator	Vermont
6	6	0	Florida	ordinal	adoring	roaming	worming	Wyoming
6	6	0	Georgia	origane	Argonia	Arioian	diarian	Indiana
6	6	0	Georgia	origane	moraine	montera	amorant	Montana
5	5	0	Georgia	origane	wagoner	awroken	New York	
5	5	0	Georgia	origane	moraine	montera	Vermont	
5	5	0	Georgia	origane	roaming	worming	Wyoming	
4	4	0	Indiana	Adonian	Antonia	Montana		
7	7	0	Indiana	diarian	araneid	aneroid	downier	wonkier
				New York				
7	7	0	Indiana	diarian	araneid	aneroid	moraine	montera
				Vermont				
6	7	1	Indiana	Odinian	gonidia	adoring	roaming	worming
				Wyoming				
6	6	0	Montana	montane	montera	trowmen	network	New York
4	4	0	Montana	montane	montera	Vermont		
5	6	1	Montana	amation	moating	roaming	worming	Wyoming
4	6	2	New York	workmen	moniker	invoker	Trevino	Vermont
4	8	4	New York	yonkers	groynes	signory	yorking	working
				worming	Wyoming			
5	5	0	Vermont	morient	emoting	meowing	Wyoming	
8-letter states: Arkansas, Colorado, Delaware, Illinois, Kentucky, Maryland, Michigan, Missouri, Nebraska, Oklahoma, Virginia								
7	8	1	Arkansas	sardanas	sandarac	Calandra	cardanol	cartload
				doctoral	Colorado			
6	6	0	Arkansas	sardanas	Saarland	adrenals	Alanreed	Delaware
7	7	0	Arkansas	Alaskans	sisalana	Saillans	Allisons	allision
				Illinois				
7	8	1	Arkansas	ransacks	snackers	crankest	cronkest	unsocket
				Kentucks	Kentucky			
5	5	0	Arkansas	sardanas	mansards	Marsland	Maryland	
7	7	0	Arkansas	ransacks	Sarnacki	rackings	chagrins	chairing
				Michigan				
6	6	0	Arkansas	samskara	karaisms	komissar	ossarium	Missouri
3	5	2	Arkansas	Arkansaw	swanmark	Markesan	Nebraska	
6	6	0	Arkansas	Alaskans	Onalaska	oolakans	Koolhaas	Oklahoma
6	7	1	Arkansas	sardanas	Sardians	Sardinia	aniridia	viridian
				Virginia				

6	6	0	Colorado	doctoral	cartload	Calodera	acredale	Delaware
7	8	1	Colorado	doctoral allision	toroidal	dilators	ordinals	sinoidal
8	9	1	Colorado	doctoral unsocket	locators Kentucks	crotales Kentucky	ancestor	counters
5	6	1	Colorado	doctoral	cartload	cardanol	mandorla	Maryland
7	8	1	Colorado	doctoral matching	crotalid Michigan	cilantro	locating	latching
7	8	1	Colorado	doctoral ossarium	crotalid Missouri	calorist	acrotism	amorists
7	8	1	Colorado	doctoral ratsbane	ostracod Nebraska	redcoats	ancestor	baronets
5	10	5	Colorado	doctoral mochilas	toroidal chloasma	modiolar masoolah	homaloid Oklahoma	halidoms
7	8	1	Colorado	doctoral virginal	crotalid Virginia	cilantro	caroling	original
8	8	0	Delaware	airedale allision	reallied Illinois	arillode	arilloid	Rollinia
8	9	1	Delaware	Alanreed strucken	adrenals Kentucks	launders Kentucky	neutrals	centaurs
4	4	0	Delaware	Alanreed	alderman	Maryland		
8	8	0	Delaware	airedale charming	remedial Michigan	remained	dreaming	creaming
8	10	2	Delaware	awardees moralise	seawards solarium	madrases ossarium	misreads Missouri	dismaler
5	6	1	Delaware	awardees	seaboard	seerband	Redbanks	Nebraska
6	10	4	Delaware	acredale mochilas	declares chloasma	decrials masoolah	decimals Oklahoma	camisole
7	7	0	Delaware	laagered Virginia	enlarged	dragline	gainlier	virginal
8	9	1	Illinois	allision unsocket	stallion Kentucks	toenails Kentucky	aconites	conkiest
7	7	0	Illinois	allision Maryland	simonial	orinasal	manorial	mandorla
6	6	0	Illinois	allision	simonial	mailings	claiming	Michigan
5	6	1	Illinois	illusion	Limousin	lionisms	similors	Missouri
7	7	0	Illinois	allision Nebraska	lesional	aileron	baronies	bearskin
7	8	1	Illinois	allision masoolah	scallion Oklahoma	laconism	mochilas	chloasma
6	7	1	Illinois	allision Virginia	simonial	mailings	railings	virginal
7	10	3	Kentucky	Kentucks ransomed	unsocket mandoras	counters mandorla	ancestor Maryland	monstera
8	9	1	Kentucky	Kentucks coamings	unsocket chimango	counties Michigan	scouting	coasting

8	8	0	Kentucky	Kentucks	unsocket	counters	outcries	moisture
7	7	0	Kentucky	Kentucks	unsocket	cronkest	Ackerson	brackens
8	10	2	Kentucky	Kentucks	unsocket	noctules	osculate	eschalot
8	10	2	Kentucky	Kentucks	unsocket	counters	routines	genitors
6	7	1	Maryland	dairyman	mridanga	admiring	maidling	claiming
7	7	0	Maryland	mandorla	manorial	roumania	mainours	ossarium
5	5	0	Maryland	malander	adrenals	larnakes	Nebraska	
5	7	2	Maryland	mandorla	mandolas	Asolando	oolakans	Koolhaas
6	6	0	Maryland	Grayland	daringly	drailing	virginal	Virginia
6	8	2	Michigan	chimango	coamings	isogamic	logicism	sciolism
7	7	0	Michigan	marching	crashing	creasing	bearings	bearskin
6	7	1	Michigan	mishnaic	shamanic	chamisal	chloasma	masoolah
4	5	1	Michigan	claiming	caviling	virginal	Virginia	
7	7	0	Missouri	ossarium	biramous	ambrosin	baronies	bearskin
7	7	0	Missouri	ossarium	mosasaur	amorosas	massoola	masoolah
6	9	3	Missouri	tourisms	amorists	agistors	organist	rigatoni
7	8	1	Nebraska	Markesan	shareman	marchesa	marschal	chloasma
6	6	0	Nebraska	bearskin	bearings	vinegars	vinaigre	Virginia
8	11	3	Oklahoma	masoolah	chloasma	chamisal	shamanic	mishnaic
				gaminish	graminis	migraine	vinaigre	Virginia

9-letter states: Louisiana, Minnesota, New Jersey, New Mexico, Tennessee, Wisconsin

5	6	1	Louisiana	Galoisian	magnolias	atonalism	anatomies
8	13	5	Louisiana	Galoisian	isolating	glutinosa	pulsation
				poulaines	phaseolin	anopheles	Halesowen
8	10	2	Louisiana	nosewheel	nose-jewel	Jo Sweeney	New Jersey
				lacinius	sulcation	coastline	encomiast
				centesimo	economies	economize	Niemczewo
8	15	7	Louisiana	Lusitania	lusatians	insulates	essential
				arsenites	arseniate	estuarian	saturnine

				uneastern	unwestern	unsweeten	unevenest
5	8	3	Louisiana	seventeen	Tennessee		
				Aitolians	satiation	situation	sinuation
				nicotians	socinians	Wisconsin	
7	9	2	Minnesota	tensional	hailstone	anetholes	
				Halesowen	nosewheel	nose-jewel	Jo Sweeney
				New Jersey			
5	6	1	Minnesota	encomiast	emication	Ecionemia	Ciemniewo
				New Mexico			
5	6	1	Minnesota	cantonise	tenancies	sentience	sentences
				Tennessee			
5	5	0	Minnesota	sensation	sanctions	socinians	Wisconsin
6	12	6	New Jersey	Jo Sweeney	nose-jewel	nosewheel	whensoe'er
				overweens	Reedson, WV	ironweeds	Serwoniec
				Czerniewo	Niemczewo	New Mexico	
5	8	3	New Jersey	Jo Sweeney	Joy Senese	eyestones	yestreens
				terseness	tenseness	Tennessee	
7	12	5	New Jersey	Jo Sweeney	nose-jewel	nosewheel	wholeness
				wenchless	chewiness	Schwieson	Sosnowiec
				cooniness	incession	Wisconsin	
7	12	5	New Mexico	Niemczewo	economize	economies	centesimo
				monetizes	sonnetize	sonnetise	inertness
				sternness	tenseness	Tennessee	
5	8	3	New Mexico	Ciemniewo	Mianowice	Amnicon, WI	insomniac
				inactions	socinians	Wisconsin	
6	8	2	Tennessee	tenseness	sternness	inertness	sonnetise
				conessine	incession	Wisconsin	
				10-letter states: California, Washington			
7	9	2	California	fractional	falcations	agnostical	glasnostic
				agonistics	incognitas	nowcasting	Washington
				11-letter states: Connecticut, Mississippi, North Dakota, Rhode Island, South Dakota			
12			Connecticut				Mississippi
8	11	3	Connecticut	noctilucant	noctilucine	nautilicone	reclination
				interaction	contorniate	entocarotid	dehortation
				adhortation	North Dakota		
8	10	2	Connecticut	noctilucant	noctilucine	nautilicone	declination
				directional	chlorinated	achondrites	disanchored
				Rhode Island			
12	14	2	Connecticut	noctilucant	noctilucine	nautilicone	reclination
				interaction	contorniate	entocarotid	dehortation
				adhortation	North Dakota	Andrakottos	Natsuko Toda
				South Dakota			
12			Mississippi				North Dakota
10			Mississippi				Rhode Island
11			Mississippi				South Dakota
7	9	2	North Dakota	adhortation	dehortation	orthodiaene	lionhearted

				chlorinated	achondrites	disanchored	Rhode Island
3	4	1	North Dakota	Andrakottos	Natsuko Toda	South Dakota	
8	12	4	Rhode Island	disanchored	achondrites	chlorinated	lionhearted
				orthodiaene	dehortation	adhortation	North Dakota
				Andrakottos	Natsuko Toda	South Dakota	
12-letter states: New Hampshire, Pennsylvania, West Virginia							
7	10	3	New Hampshire	Prince Mahesh	Marchenspiel	Charles Maine	aldermancies
				encarnalised	Carney Island	Canvey Island	pensylvanica
			Pennsylvania				
6	12	6	New Hampshire	Prince Mahesh	Marchenspiel	Charles Maine	aldermancies
				encarnalised	Centre Island	internalised	eternalising
				trianglewise	Living Waters	West Virginia	
7	10	3	Pennsylvania	Pennsylvania's	vena spinalis	palestinians	internasalis
				sanitariness	Nissan Verita	Saint-Gervais	East Virginia
			West Virginia				
13-letter states: Massachusetts, North Carolina, South Carolina							
10			Massachusetts				North Carolina
7			Massachusetts				South Carolina
3	3	0	North Carolina	Carrauntoohil	South Carolina		

154 = the potential reduction in the total number of steps!

Sources for all the words and names above are summarised in the table below:

Collins English Dictionary (2018)

amorant; amorosas; baladin; cantonise; chewiness; conkiest; Halesowen; laksas; masoolah; nosewheel; Saarland; snackers; sonnetise; Trevino; whensoe'er; wonkier

Collins Official Scrabble Words (2019)

cronkest; encarnalised; eternalising; internalised; lomenta

Dorland's Illustrated Medical Dictionary, 28th edition

internasalis - see 'sutura internasalis'

en.wiktionary.org

East Virginia

encyclopedia2.thefreedictionary.com

Andrakottos

Facebook

Jo Sweeney; Schwieson

Oxford English Dictionary

acredale- hyphenated, except solid in 1831 quote; Aitolians - see 'Aetolian'; amation; argoile - see 'argol'; awroken - see 'awreak'; glasnostic; halwas - see 'halva'; komissar - see 'commissar'; lambada; malander - see 'mallender'; marschal - see 'marshal'; moralise - see 'moralize'; morient; nose-jewel; nowcasting; Pennsylvania's - see 'butcherbird', 1792 quote - possessive or plural form; pensylvanica - see 'yellow jacket', 1939 quote; reallied – see 're-ally', 1596 quote; sanitariness; Sardinia - see 'sardine'

Ordnance Survey Gazetteer of Great Britain, 3rd edition

Canvey Island

Times Index Gazetteer of the World

Ackerson; Alanreed; Amnicon, WI; Argonia; Arkansaw; Centre Island; Grayland; Markesan; Marsland;

Onalaska; Saillans; Saint Gervais

Webster's New International Dictionary, Second edition

acrotism; adhortation; Adonian; agonistics; aldermancies; ambital; amorists; Antonia; Arioian; arseniate; bimalar; brantle; chimango; diarian; emication; entocarotid; estuarian; eyestones; falcations; Galoisian; gaminish; gaoler; Halawi; homaloid; kangas; lacinious; Lambadi; Laramie; latoner; lesional; Loegria; Lusitania; maidling; massoola; matalan; Odinian; oolakans; orthodiaene; ossarium; seerband; similors; simonial; sinoidal; stricken; styrene; sulcation; trianglewise; venator; vinaigre; wenchless

Webster's Third New International Dictionary

achondrites; aconites; Adelia; admiring; adoring; adrenals; agenda; agistors; agnostical; ailanto; aileron; ailerons; Airedale; Akelas; Alaskans; alderman; aliform; allusion; ambrosin; amino; anatomies; ancestor; aneroid; anetholes; angioma; angriest; aniridia; ankles; anopheles; araneid; arillode; arilloid; armllets; arsenates; atonalism; averting; awardees; awhile; baronets; baronies; bearings; bearskin; bimanal; biramous; blaming; brackens; Calandra; calathos; calorist; camisole; card; cardanol; carolling; cartload; cavilling; centaurs; centesimo; chagrins; chairing; chamisal; charming; chloasma; chlorinated; cilantro; claiming; coamings; coasting; coastline; cold; conessine; contorniate; cord; counters; counties; crankest; crashing; creaming; creasing; crotales; crotalid; dahlia; dairyman; danger; danio; daringly; dariole; davens; decimals; declares; declination; decrials; dehortation; dhoti; dilator; dilators; directional; disanchored; dismaler; doctoral; downier; dragline; drailing; dreaming; economies; economize; elytron; emoting; encomiast; enlarged; eschalot; essential; falters; fathers; fractional; gainlier; genitors; goad; gold; gonidia; graminis (see 'radix graminis'); griot; groin; groynes; hailstone; halals; halidoms; hameil; heats; hoist; huia; idaeen; idalian; illusion; imperil; inactions; incession; incognitas; inertness; insomniac; insulates; interaction; invoker; ironweeds; isogamic; isolating; kahals; karaisms; Kentucks; Khalsa; knarls; knaves; Koreans; krangs; laagered; laconism; lambent; lambert; laminar; lanyard; larnakes; latching; launders; lead; leotard; levator; limiter; Limousin; lionhearted; lionisms; load; loaming; loaners; locating; locators; logicism; lusatians; madrases; magnolias; mailer; mailings; mainours; malabar; malaria; maltier; mandolas; mandora; mandoras; mandorla; mangily; manorial; mansards; marchesa; marching; mariola; matching; mazarin; meowing; mishnaic; misreads; moating; mochilas; modiolar; moisture; monetizes; moniker; monstera; montane; montera; moraine; morale; mosasaur; mridanga; nailed; names; nautilicone; network; neutrals; nicotians; noctiluculent; noctilucine; noctules; oaths; ohia; orange; ordinal; ordinals; organist; organs; origane; original; orinasal; osculate; ostracod; outcries; overweens; palestinians; phaseolin; pilgrim; poulaines; pulsation; rackings; railings; ransacks; ransomed; ratsbane; reclination; redcoats; regalia; remained; remedial; rigatoni; right; roaming; Rollinia; romania; Rotalia; roumania; routines; samskara; sanctions; sandarac; sardanas; Sardians; satiation; scallion; sciolism; scouting; seabeard; seawards; sensation; sentences; sentience; shamanic; shareman; signory; sinuation; sisalana; situation; socinians; solarium; sonnetize; stallion; steam; sternness; swanmark; tamable; tambala; tenancies; tenseness; tentional; terseness; toenails; toroidal; tourisms; trailing; trowmen; unsocket; vinegars; virginal; viridian; wagoner; wallah; ward; warm; wholeness; working; workmen; worming; wrong; yawling; yestreens; yonkers; yorking; yowling

Webster's Biographical Dictionary

Adriano

Wikipedia

Allisons; Asolando; Calodera; Carney Island; Carrauntoohil; Charles Maine; Ciemniewo; Ecionemia; glutinosa; Joy Senese; Koolhaas; Living Waters; Matalon; Mianowice; Natsuko Toda; Niemczewo; Nissan Verita; Redbanks; Reedson WV; Sarnacki; Setsumatsusha

www.amazon.com

Marchenspiel

www.princemahesh.com

Prince Mahesh

www.vocabulary.com

vena spinalis