

DESCRIPTION	IPA	SAMPA	HTK	ISIZULU	ISIXHOSA	SISWATI	ISINDEBELE	SEPEDI	SETSWANA	SESOTHO	XITSONGA	TSHIVENDA	AFRIKAANS	ENGLISH	COMMENTS	
Affricates																
Voiceless alveo-labial affricate	tʰ	tp\	tp_b			intfutfu										
Ejective alveolar lateral affricate	tʰʰ	tK_>	tK_>		intlahla		ltlawana tthaga									
Voiceless aspirated alveolar lateral affricate	tʰʰ	tK_h	tK_h													
Voiced alveolar lateral affricate	dʰ	dK	dK								diala ndihazi					
Voiced aspirated alveolar lateral affricate	dʰʰ	dK\	dK_b													
Post-alveolar affricate	tʃ	tS	tS													
Ejective post-alveolar affricate	tʃʰ	tS_>	tS_>	tshe	intsha		utjani	tʃaka	ntʃa	tjô'tja					*In Afrikaans dictionary tS currently modelled as 't 5'	
Aspirated post-alveolar affricate	tʃʰ	tS_h	tS_h		tshisa		itjhatjha	tʃhaba	setʃhaba	tjhaba						
Ejective alveolar affricate	tsʰ	ts_>	ts_>	tsatsaza	intsimi		itsikiri	tsela	tsela	tsela						
Aspirated alveolar affricate	tsʰʰ	ts_h	ts_h			intsaba tsatsa	tshanya	tshadi	tshaba	tshéha						
Ejective velar affricate	kxʰ	kx_>	kx_>			ikrele										
Voiceless velar affricate	kx	kx	kx				kghupula*	kgama	kgama	kgama						
Voiceless velo-alveolar lateral affricate	kʃ	kK_>	kK_>	kleza		kleza									*isiNdebele kx typically aspirated. (Can be modelled as separate kx_h but no kʃ/kʃ_h minimal pairs.)	
Voiceless labio-alveolar ejective affricate	psʰ	ps_>	ps_>					psila								
Aspirated labio-alveolar affricate	psʰ	ps_h	ps_h					pshio								
Aspirated labio-palatal affricate	pʃʰ	pS_h	pS_h					pshatla								
Voiceless labio-palatal ejective affricate	pʃʰ	pS_>	pS_>					pjatla								
Voiced post-alveolar affricate	dʒ	d_0Z	d_0Z	inja*	inja	inja	jabula idzila	ja	ja	ja					* Depending on speaker, the isiZulu d_0Z can be realised as either d_0Z or Z	
Voiced alveolar affricate	dʒ	dʒ	dʒ	zalo		indzaba										
Voiced alveo-labial affricate	dʒβ	dʒ	dʒ			indvodza										
Voiced retroflex affricate	dʒ	dʒ'	dʒ_a													
Voiced aspirated retroflex affricate	dʒʰ	dʒ' h\	dʒ_a h_b								dzwi, dzaha ndzhaku njhani					
Voiced aspirated palatal affricate	dʒʰ	dʒh	dʒh													
Fricatives																
Voiceless labiodental fricative	f	f	f	fa	fa	fa	funa vula	fofa	fofa	fofa	famba vhilwa	fana vili	fel,vel wat	fin vim thin this		
Voiced labiodental fricative	v	v	v	vala	vala	vala										
Voiceless dental fricative	θ	T	T													
Voiced dental fricative	ð	D	D													
Voiceless alveolar fricative	s	s	s	sala	sala	sala	susa Zala	sesadi	sesadi	sesadi	sila muzumbi xava	sala zazamela shavha zhaka	sous zulu zing shin	sin zing shin		
Voiced alveolar fricative	z	z	z	zama	zama	liza shushu		ʃala	ʃapa	shapa			sjampoe genre	measure		
Voiceless post-alveolar fricative	ʃ	S	S	sha	sha	sha										
Voiced post-alveolar fricative	ʒ	Z	Z													
Voiceless velar fricative	x	x	x				rhonona ihongo		gana héma	gafa		xa	gat	loch		
Voiceless glottal fricative	h	h	h	ihhashi	huhuza	lihhashi		héma							*English h includes voiced and unvoiced variations	
Voiced glottal fricative	ɦ	ɦ	ɦ_b	hamba	hamba	hamba	hleodu hlaba	hama hlaba	hana hlaba	hama hlaba	huma hlamula	hana	hand	hit*		
Voiceless alveolar lateral fricative	ɬ	K	K	hlala	hlala	hlala	hlala dlala									
Voiced alveolar lateral fricative	ɮ	K\	K_b	dlala	dlala	dlala										
Voiced velar fricative	ɣ	G	G			igronya		gôga baba								
Voiced bilabial fricative	β	B	B													
Voiceless bilabial fricative	ɸ	p\	p_b								vona	vhavha fhala				
Voiceless retroflex fricative	ʂ	s'	s_a								sweka					
Voiceless labialised alveolar fricative	sw	sw	sw									swara				
Voiced retroflex fricative	ʐ	zw	zw										zwifha			
Bilabial alveolar fricative	ɸs	p\ s	p_b s					lefsifsi Bofsa bjala								
Voiceless bilabial postalveolar fricative	ɸʒ	p\ S	p_b S													
Voiced bilabial postalveolar fricative	βʒ	BZ	BZ													
Labiodantal-postalveolar fricative	ɸʒ	fS	fS													
Clicks																
Dental click	ǀ	\	_b	cinga	caca	cinga	cima gcina chacha									
Voiced dental click	ǀʱ	\g_0	_bg	gcina	cangci											
Aspirated dental click	ǀʰ	\h	_bh	chita	chachambo											
Alveolar lateral click	ǁ	\l\	_bl_b	xoxo	xoxa											
Voiced alveolar lateral click	ǁʱ	\lg_0	_bl_bg	gxumeke	gxabeka											
Aspirated alveolar lateral click	ǁʰ	\lh	_bl_bh	xhaka	isixhosa											
Palatal click	ǃ	\	_l_b	qumba	qala	qumba	qina			qaqa						
Voiced palatal click	ǃʱ	\g_0	_bg	qgiba	iwagqiba		umqgomu qhula									
Aspirated palatal click	ǃʰ	\h	_bh	qhuba	qhele											
Stops																
Voiceless bilabial plosive	p	p	p			impi							pap	pin*	*English p includes aspirated and un-aspirated versions	
Aspirated bilabial plosive	pʰ	p_h	p_h	pha	pha	pha	iphaphu iposo	phela pela	phela pela	phela pela	mpunga phanga	phala panda				
Ejective bilabial plosive	pʰʰ	p_>	p_>	impi	pasa											
Voiceless palatalised bilabial ejective	pjʰ	pj_>	pj_>													
Voiceless aspirated palatalised bilabial plosive	pjʰʰ	pj_h	pj_h													
Voiced bilabial plosive	b	b	b	imbuzi,ibhasi bona,ubaba	imbuzi, bhala bona	imbuti/bhala bona	khamba, bhala bona		baba	baba		bako	bas	bin*	* English b includes aspirated and un-aspirated versions	
Voiceless labial implosive	ɓ	b_<	b_<													
Voiced palatalised bilabial plosive	bj	bj	bj													
Voiceless alveolar plosive	t	t	t													
Aspirated alveolar plosive	tʰ	t_h	t_h	thata	theta	thandaza	thuta	thapo	thopa	thopa						
Ejective alveolar plosive	tʰʰ	t_>	t_>	taka	itakane	emanti	itafula	tôpa	tona	tôpa						
Voiceless palatalised alveolar plosive	tj	tj	tj													
Voiceless aspirated palatalised alveolar plosive	tjʰ	tj_h	tj_h													
Voiced alveolar plosive	d	d	d	indoda	indoda	indishi	idada		dira	duma						
Voiceless palatalised alveolar plosive	dj	dj	dj													
Voiced aspirated alveolar plosive	djʰ	dj_h	dj_h													
Ejective palatal plosive	cʰ	c_>	c_>			ukutya ityhefu										
Aspirated palatal plosive	cʰʰ	c_h	c_h			indyebo										
Voiced palatal plosive	ɟ	j\	j_b													
Voiceless velar plosive	k	k	k	ukuhamba		inkomo	kela khamba	khudu	khudu	sekhôna	kula	dyelo	kyk	kin		
Voiceless aspirated velar plosive	kʰ	k_h	k_h	khokha	khoka	khokha	khamba	Khudu	khudu	kula	khoma	khuhu kokodza				
Ejective velar plosive	kʰʰ	k_>	k_>			inkomo	inkomo									
Voiced velar plosive	g	g	g	ngena	ngena	ngena	igama						gholf	give		

Voiced aspirated velar plosive	gh	gh̥	gh_b					tla	tla	tla	nghena			
Voiceless alveolar lateral ejective	tʰ	tʰ_>	tʰ_>					tʰabó	tʰabó	tʰako	tianga			
Voiceless aspirated alveolar lateral plosive	tʰ̥	tʰ̥_h	tʰ̥_h								tlhari			
Nasals														
Bilabial nasal	m	m	m	mema	mema	mema	mina	éma	éma	éma	kuma	ima	man	mock
Alveolar nasal	n	n	n	nona	nona	nona	nina	nama	nama	nama	manana	nona/ nama	net	knock
Palatal nasal	ɲ	ɲ	ɲ	inyama, intsha	ntshe	inyama	inyama	nyaka	nyala	nyala	nyoka	nyamalala		
Velar nasal	ŋ	N	N	ingwe	inkomo	ingungu	nghala	ngwana	ngwana, nku	ngwana	ngulube	n'an'a	bang	thing
Retroflex nasal	ɳ	n'	n_a											
Voiced aspirated bilabial nasal	mʰ	m_h	m_h		mhumha									
Voiced aspirated alveolar nasal	nh	n_h	n_h		isinhanha									
Labiodental nasal	ɱ	m_j	m_j					myemyela						
Voiced aspirated palatal nasal	ɲʰ	ɲ_h	ɲ_h		inyholoba									
Vowels														
Unrounded high front vowel	i	i	i	vimba	vimba	vimba	lima	dira	dira	pitsa	ribye	lisa	sien	happy, into
Unrounded high front vowel with duration	i:	i:	i:											ease
Rounded high front vowel	y	y	y											
Rounded high back vowel	u	u	u	vula	vula	vula	thunga	Pula	pula	pula	huma	luma	nuwe	soek
Rounded high back vowel with duration	u:	u:	u:											lose
Unrounded near-high near-front vowel	ɪ	ɪ	ɪ					tsela	tsela	tsela				
Rounded mid-high front vowel with duration	ø:	2:	eu:											
Unrounded mid-low front vowel	ɛ	E	E:	senga	senga	senga	sela	rêma	rêma	rema	hela	rema	museum	pet*
Rounded mid-low central vowel with duration	ɜ:	3:	E:										pen	furs
Rounded mid-low back vowel	ɔ	O	O:	bola	bola	bola	bona	pôô	pôô	poho	songa	mboho	pol	cause
Rounded mid-low back vowel with duration	ɔ:	O:	O:											cut*
Unrounded low front vowel	a	a	a	thanda	thanda	tsandza	lala	rata	rata	rata	aka	rafha	pas	stars
Unrounded low back vowel with duration	ɑ:	A:	A:										maar	another
Central vowel (schwa)	ə	@	@										pit	pat
Unrounded mid-low front vowel	æ	{	{										hek	into, put
Rounded near-high near-back vowel	ɔ	U	U					motho	motho	motho				
Rounded mid-low front vowel	œ	9	u_										put	
Rounded low back vowel	ɒ	Q	Q											pot
Diphthongs														
	əi	@i	@i										peil/pyl	raise
	œy	9y	u_y										uit	
	ai	ai	ai											rise
	ɔi	Oi	Oi											noise
	au	@u	@u										oud	nose
	au	au	au											rouse
	iə	i@	i@										meet	fears
	uə	u@	u@										oor	stairs
	eə	e@	e@											cures
	uə	u@	u@											
Trills and Flaps														
Alveolar trill	r	r	r	uMarija	uMariya	uMariya	rara	rata	rata	rata	raha	ranga	raar	
Aspirated alveolar trill	rʰ	rʰ	rʰ_b								rhama			
Approximants														
Alveolar lateral approximant	l	l	l	lala	lala	lala	lila	lala	lala	lala	lomba	lifhata, lala	lol	long
Alveolar approximant	ɹ	r̥	r_b											wrong
Palatal approximant	j	j	j	ukuya	ukuya	leniyenta	yena	ya	ya	ya	yima	ya	jaar	yacht
Voiced labio-velar approximant	w	w	w	wa	wa	wa	wona	wa	wa	wa	wa	wa	twee	wasp
Retroflex lateral approximant	ɭ	l'	l_a					dira*						

*English E also realised as e in SAE

*English a includes both a and V variants (found in SAE)

Note that the standard tense/lax distinction was not made for diphthongs in SAE

In audio phone set, small portion of @ accompanies approximants where necessary in order to make them clearly audible

*The Sepedi 'l' only occurs before an 'i' or 'u' (except in a few exceptional cases, specifically words of foreign origin and words containing 'll') and can therefore be seen as a contextual variant of l. Here modelled as a separate phoneme.

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Revision	Language	Changes
1.1	All	First version released
1.2	Afrikaans	changed e: to i@, moved to diphthongs
1.2	Afrikaans	changed h to h\
1.2	Afrikaans	changed o: to u@, moved to diphthongs
1.2	English	changed e to E (e removed)
1.2	English	changed h to h\
1.2	English	changed r to r\
1.2	English	changed u to U (put/into)
1.2	IsiNdebele	changed kx_h to kx
1.2	isiZulu	changed sample words for h and h\
1.2	isiZulu	removed r (words of foreign origin only)
1.2	Sepedi	changed kx_h to kx
1.2	Sepedi	changed o to U
1.2	Sepedi	replaced e with I (capital i)
1.2	Sesotho	changed h to h\
1.2	Sesotho	changed kx_h to kx
1.2	Sesotho	changed o to U
1.2	Sesotho	replaced e with I (capital i)
1.2	Setswana	changed kx_h to kx
1.2	Setswana	changed o to U
1.2	Setswana	replaced e with I (capital i)
1.2	Siswati	changed x to h
1.2	Siswati	changed sample words for h and h\
1.2	Siswati	removed tS_> (words of foreign origin only)
1.2	Xitsonga	changed dZh\ to dZh
1.2	Xitsonga	moved dK and dK\ to affricates