Reading benchmarks Xitsonga and Tshivenda languages

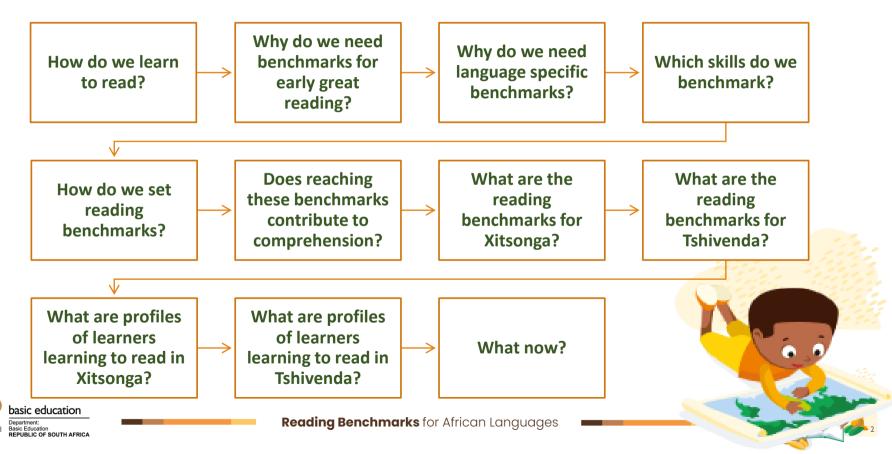
Presentation by: Lesang Mbali Sebaeng



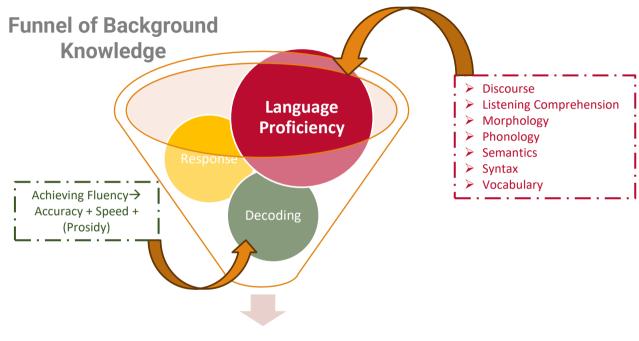




Reading Benchmarks for Tshivenda and Xitsonga



How do we learn how to read?









How do we learn how to read?

Our analytical approach aligns with the **decoding threshold hypothesis** (Wang et al. 2019)

- Until decoding occurs above a lower bound threshold level, reading comprehension is unlikely to develop/remain stagnant.
- There may also be an upper threshold, beyond which there are no additional gains in comprehension for increased decoding skills.
- Suggests that the relationship between fluency & comprehension will break down at low & high levels of fluency.



Why do we need early grade reading benchmarks?

Action Plan to 2024: Towards the Realisation of Schooling 2023

- Goal 1: Increase the number of learners in Grade 3 who, by the end of the year, have mastered the minimum language and numeracy competencies for Grade 3.
- Goal 2: Increase the number of learners in Grade 6 who, by the end of the year, have mastered the minimum language and mathematics competencies for Grade 6.
- Innovation indicators: early grade reading is one of the three cross-cutting innovation indicator

Medium Term Strategic Framework 2019-2024: Basic Education

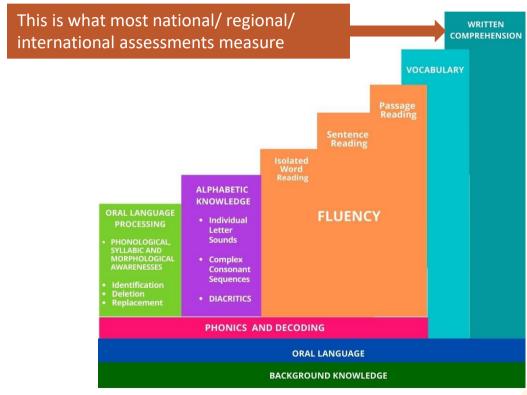
Outcome 2: 10-year-old learners enrolled in publicly funded schools read for meaning

State of the Nation (SONA) commitments

• If we are to ensure that within the next decade, every 10-year-old will be able to read for meaning, we will need to mobilise the entire nation behind a massive reading campaign.

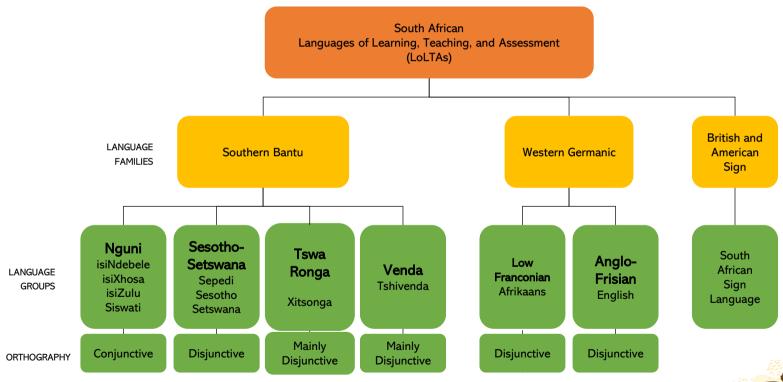


Why do we need early grade reading benchmarks?





Why do we need language specific benchmarks?



Why do we need language specific benchmarks?

- Language differences concerning linguistic typography necessitate distinct languagespecific benchmarks
 - Orthographic differences writing conventions, including spelling and grammar
 - Morphological differences internal structure of words and how relate to each other to make meaning
 - Differences in the relationship between language components, linguistic strategies employed for reading, and appropriate pacing when reading
- Nguni languages have a conjunctive orthography one word may be a whole sentence
- Sesotho-Setswana languages have a disjunctive orthography short word segments with prefixes and suffixes written separately
- Tshivenda and Xitsonga mostly disjunctive orthography but with compounding features



Why do we need language specific benchmarks?

Language	Text						
Sepedi	Go be go na le mosepedi yo a bego a na le tlala. O fihlile motseng wo mongwe a kgopela dijo. Go be go se na yo a bego a na le dijo						
Xitsonga	A ku ri ni mufambi loyi a ri na ndlala. U fikile emugangeni a kombela swakudya. A ku nga ri na loyi a ri na swakudya.						
isiZulu	Kunesihambi esasilambile kakhulu. Safika emizini omunye sacela ukudla. Abantu babengenakho ukudla.						
English	There was a stranger who was very hungry. He came to a village and asked for food. Nobody had any food.						
	Words in Sentence 1	Words in Sentence 2	Words in Sentence 3	Total words	Words per sentence	Letters per word	Total single syllable words: V/ CV
Sepedi	13	8	12	33	11	2.9	23
Xitsonga	10	6	10	26	8.7	3.4	17
isiZulu	3	5	3	10	3.3	8.5	0





Which skills do we benchmark?

Letter-sound knowledge which refers to alphabetic knowledge of the written code

Oral reading fluency (ORF) refers to the ability to read words in context with speed, accuracy and prosody.

Accuracy*

The percentage of words that are read correctly

Speed

The number of words that are attempted in a time period

Prosody

How natural reading sounds (how it conforms to speech rhythms & intonation patterns & reflects punctuation conventions





SETTING READING BENCHMARKS IN SOUTH AFRICA

October 2020



Contract Number 72067418D00001, Order Number: 72067419F00007
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3 Approaches:

Criteria Benchmarks:

Define competency. Measure performance against a criterion e.g. from CAPS

Expert consultation: Based on curriculum, performance statements, experience, data

Data Driven

Based on the relationship between competency and reference criterion e. g., fluency with comprehension





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Empirical analysis of large scale EGRA-type data

Theory:
Language and reading development

consultation:
Curriculum
requirements,
language
nuances, system
design

Expert

Three research components intersect to establish early grade reading thresholds and benchmarks



Data

Xitsonga Sample and Learner Characteristics

	Grade 2	Grade 3	Grade 4	Grade 6
Number of schools	120	120	120	120
Quintile range	1-3	1-3	1-3	1-3
Number of learners	1919	1719	1736	1727
Male	51%	52%	53%	54%
Female	49%	48%	47%	46%
Average age	7 years 8 months	8 years 9 months	9 years 11 months	12 years 1 month





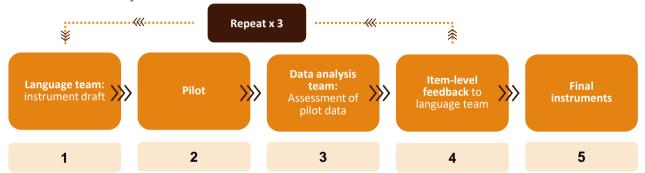
Data

Tshivenga Sample and Learner Characteristics

	Grade 3	Grade 4	Grade 7
Number of schools	60	60	60
Quintile range	1-3	1-3	1-3
Number of learners	1049	1060	1094
Female	49.5%	47.3%	47.4%
Male	50.5%	52.7%	52.6%
Mean age	8 years 5 months	9 years 5 months	12 years 7 months



Instrument Development



The key aims of the piloting /revisions

- 1. Developing instruments that are linguistically and culturally appropriate
- Ensuring assessments are set at the right level. No floor or ceiling effects
- 3. Appropriate language for the context with comprehension questions asked that are unambiguous
- 4. Appropriate length of the assessment (and specific reading passages)
 - assess the suitability of the length of the passages of connected text used to measure oral reading fluency (ORF) assess the difficulty level of comprehension questions



Instrument Development

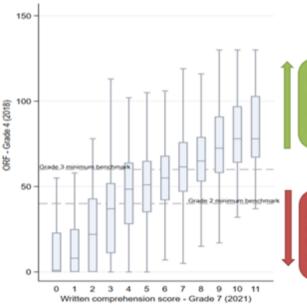
Skill/Task	Grade 2	Grade 3	Grade 4	Grade 6
Expressive Vocabulary	Х			
Rapid Object Naming	Х	Х		
Phonemic Awareness	Х			
Syllabic Awareness	Х			
Letter Sound Knowledge	Х	Х		
Complex Consonants and Diacritics	Х	Х	Х	
Syllable Reading	Х	Х	Х	
Word Reading	Х	Х	Х	
Oral Reading Fluency + Comprehension Questions	Х	Х	Х	Х



Does reaching these benchmarks contribute to comprehension?

Prediction of written comprehension based on benchmark

Fig: Predictive validity of oral reading fluency for comprehension, Setswana language sample



Meeting a grade 3 minimum fluency benchmark (60 cwpm) by the end of grade 4 almost all successfully tackle a written comprehension task at the end of grade 7. → Learners are prepared for the transition into secondary school

Not meeting a grade 2 minimum fluency benchmark (40cwpm) by the end of grade 4 are unable to comprehend what they are reading by the end of primary school, typically scoring less than 40% in written comprehension

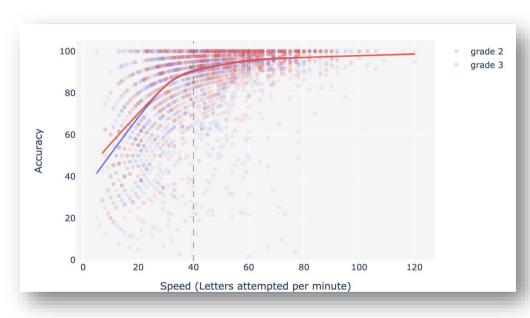
Notes: Own calculations. EGRS I waves 4-5. N = 1971



Letter Sound Knowledge: Speed and Accuracy Relationship

	Number of letters	Median letter sounds per minute (clspm)
Grade 2	60	38 (IQR, 23-53)
Grade 3	60	43 (IQR, 27-58)

- Letter-sound knowledge speed accuracy relationship for Grades 2 and 3 learners was nearly identical
- Learners with low speed tend to have low accuracy in sounding letters.
- Speed and accuracy increase together steeply until 30 letter sounds per minute (accuracy is 86%) after which the increase is gradual; both grades
- Beyond 40 letter sounds per minute (accuracy is 91% and 92% for grade 2 and grade 3 respectively)



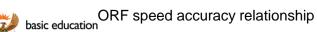
Letter-sound knowledge speed and accuracy relationship with trendlines



Oral Reading Fluency: Speed and Accuracy Relationship

	Task	Words in passage	Sample size	Median words attempted in one minute	Median correct words per minute (cwpm)
Grade 2	ORF 1	58	1303	34 (IQR, 21–45)	31 (IQR, 16–44)
	ORF 2	66	1307	32 (IQR, 19–44)	29 (IQR, 15–43)
Grade 3	ORF 1	93	1375	33 (IQR, 20–43)	31 (IQR, 17–42)
	ORF 2	93	1488	35 (IQR, 21–47)	32 (IQR, 15–45)
Grade 4	ORF 1	119	1383	37 (IQR, 26–54)	36 (IQR, 23–53)
	ORF 2	112	1396	41 (IQR, 29–51)	40 (IQR, 26–49)
Grade 6	ORF 1	234	1637	66 (IQR, 45–85)	64 (IQR, 42–84)
	ORF 2	158	1623	58 (IQR, 41–68)	57 (IQR, 39–66)

ORF 2
information text
- have been
found to be more
difficult than ORF
1 narrative text



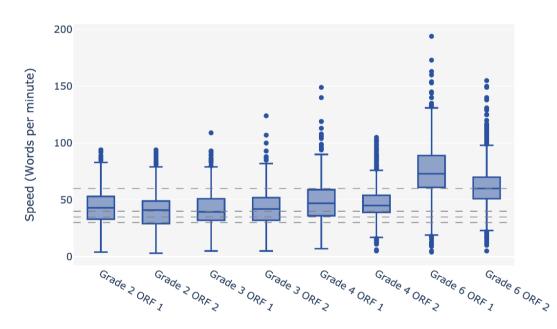
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Oral Reading Fluency: Speed and Accuracy Relationship (Fluency)

- Gr2 and Gr3 at the 50th percentile, reading speed tends to lie around or above 40 words attempted per minute.
- Gr4 at the 25th percentile, reading speed tends to lie around or above 40 words attempted per minute.
- Gr6 at the 25th percentile, reading speed tends to lie around or above 50 words attempted per minute. There are very few accurate readers who read slower than 40wpm.

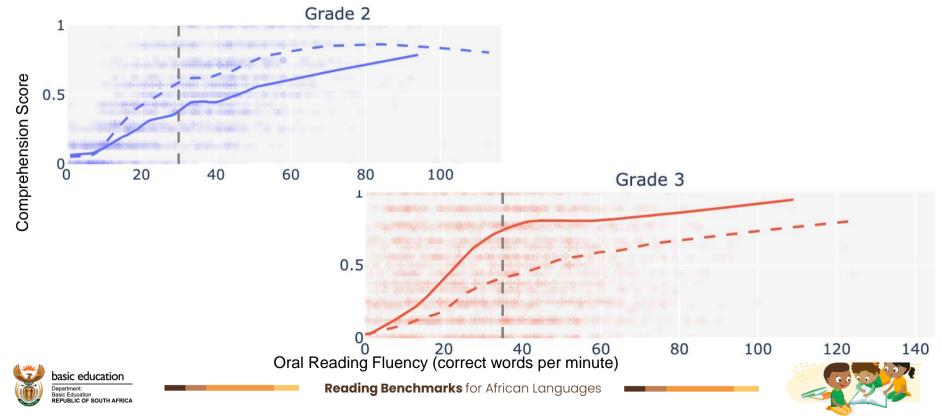
All grades, we see that majority of the readers who are making decoding errors tend to read very slowly.



Speed distribution for learners reading with accuracy in Xitsonga (≥95% accuracy)



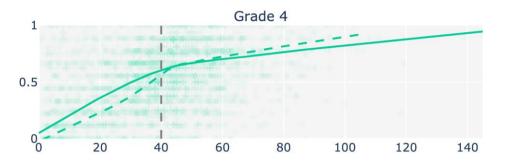
Oral Reading Fluency: Comprehension and Fluency Relationship

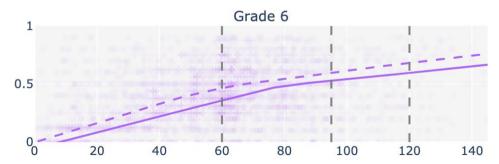


Somprehension Score

What are the reading benchmarks for Xitsonga?

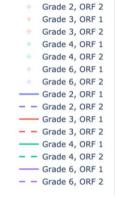
Oral Reading Fluency: Comprehension and Fluency Relationship





Oral Reading Fluency (correct words per minute)

Reading Benchmarks for African Languages



Grade 2, ORF 1





END OF GRADE 6

All learners should be able to read at least **85 CORRECT WORDS** per minute when reading a passage



END OF GRADE 4

All learners should be able to read at least **50 CORRECT WORDS** per minute when reading a passage



END OF GRADE 3

All learners should be able to read at least **40 WORDS** correct per minute when reading a passage



END OF GRADE 2

All learners should be able to read at least **30 WORDS** correct per minute when reading a passage



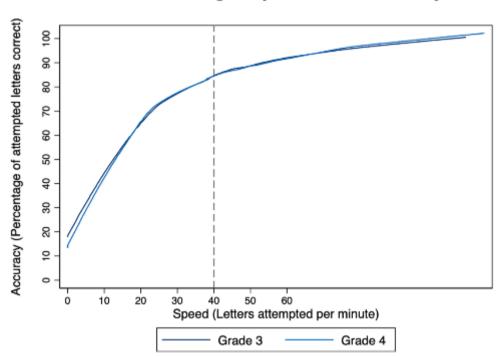
END OF GRADE 1

All learners should know their LETTER-SOUNDS well, sounding at least **40 LETTERS** correct per minute





Letter Sound Knowledge: Speed and Accuracy Relationship



- Half of the learners in both grades could sound 40 clspm.
- The same pattern (of 40clpm) was seen in other languages, such as the Nguni languages, Sesotho-Setswana languages, Afrikaans, and Xitsonga.
- Single letter-sounds much easier than complex consonants and diacritics
- Grade 3s could sound only 16.7 complex consonants and diacritics correctly on average, and Grade 4s only 16.0.

Observations: 1014 Grade 3, 1022 Grade 4



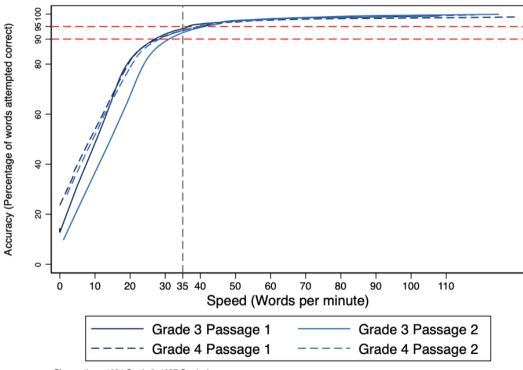


Oral Reading Fluency: Speed and Accuracy Relationship (Fluency)

Accuracy improves steeply with speed so that learners reading 30 words per minute are achieving an accuracy level of 90%.

After 40 words, we see little changes in accuracy with increasing speed, suggesting that an accuracy benchmark has been reached.

This provides preliminary evidence that **35 correct words per minute may be a** *minimum* Tshivenda reading benchmark that learners should achieve by the end of Grade 2



Observations: 1034 Grade 3, 1027 Grade 4

Relationship between speed and accuracy

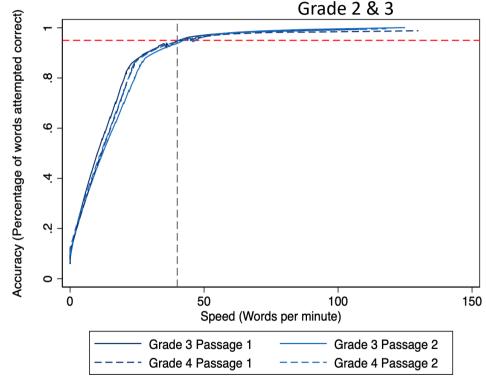






Oral Reading Fluency: Speed and Accuracy Relationship (Fluency)

- Accuracy improves steeply with speed so that learners reading 30 words per minute are achieving an accuracy level of 90%.
- Learners reading 20 words pm are getting every second word incorrect
- This provides preliminary evidence that **35** correct words per minute may be a *minimum* Tshivenda reading benchmark that learners should achieve by the end of Grade 2



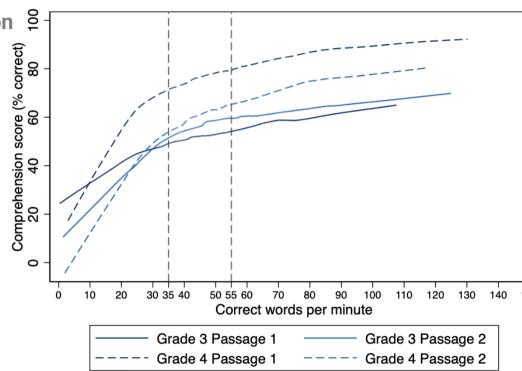
Relationship between speed and accuracy



Oral Reading Fluency: Comprehension and Fluency Relationship

- The fluency-comprehension relationship is similar for Grade 3 and 4 learners; flattening out at around 35 cwpm. learners reading 20 words per minute are getting every second word incorrect
- Below 35 cwpm, it seems that working memory is dedicated to effortful decoding, leaving little room for engaging with the meaning of the text.

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Observations: 809 Grade 3, 830 Grade 4
Relationship between comprehension and accuracy

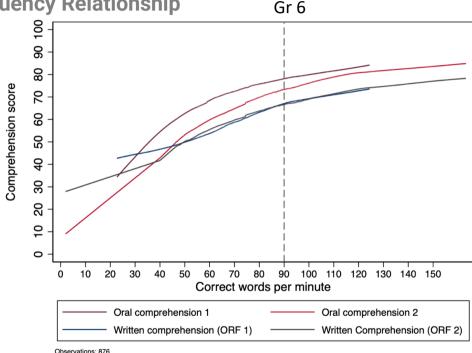




Oral Reading Fluency: Comprehension and Fluency Relationship

- The fluency-comprehension relationship is much flatter and more linear for the two Grade 7 passages.
- At a fluency level of 35 cwpm, Grade 7 learners cannot answer half of the attempted comprehension questions correctly
- At a fluency level of around 90 cwpm that Grade 7 learners are achieving oral comprehension scores above 60%.
- At 90 cwpm, Grade 7s achieve written comprehension scores of about 65%.
- •The Grade 7s' comprehension skills in both their oral and written comprehension tests increase with fluency.
- Whilst learners struggled more with some comprehension questions than others, there were similarities in the fluency-comprehension relationship across grades.

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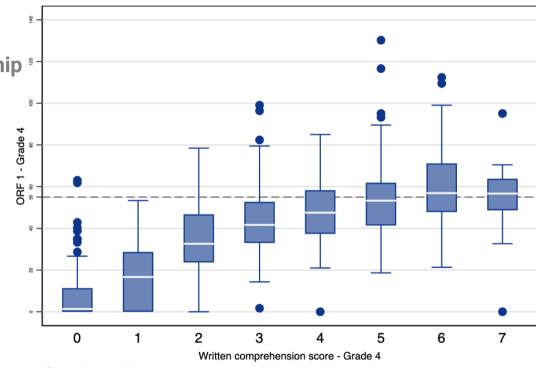


What are the reading benchmarks for

Tshivenda?

Oral Reading Fluency: Written
Comprehension and Fluency Relationship *

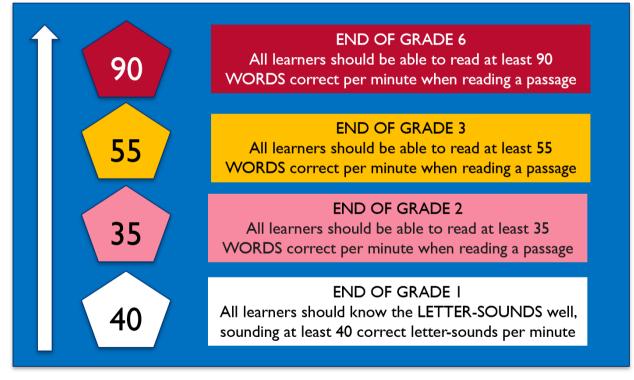
- Almost none of the Grade 4 learners who scored zero in their written comprehension had achieved 55 cwpm.
- As written comprehension results improve, the proportion of learners achieving 55 cwpm increases.
- Over half the Grade 4 learners who scored 6 out of 7 for their written comprehension achieved 55 cwpm.
- These results support the concurrent validity of the ORF benchmark for Grade 3.



Observations: 1027











What are the reading benchmarks for Xitsonga and Tshivenda?

Grade 1



End of Grade 1

All learners should know their LETTER SOUNDS well sounding at least 40 correct letters

- Beyond reading 40 correct letter-sounds per minute, there are few benefits of improving letter-sound knowledge and speed.
- Although the blending of sounds is integral to phonics instruction, once learners have met this letter-sound knowledge benchmark, decoding instruction should focus on assisting learners in applying word attack strategies and developing fluency.





What are the reading benchmarks for Xitsonga and Tshivenda?

Grade 2

Xitsonga

Tshivenda

XIISON



30

End of Grade 2

All learners should be able to read at least 40 correct WORDS per minute when reading a passage

35

End of Grade 2

All learners should be able to read at least 40 correct WORDS per minute when reading a passage

- This is a minimum threshold. Higher order reading skills are very unlikely to develop if learners do not reach this fluency level.
- Pre-pandemic, approximately 42% of non-repeating learners in the EGRS I/RSP schools had reached the fluency threshold of 40 cwpm by the end of grade 2.
- Below 40 words per minute, learners are reading too slowly and inaccurately to comprehend what they are reading.





What are the reading benchmarks for Xitsonga and Tshivenda?

Grade 3

Xitsonga

Tshivenda



End of Grade 2

All learners should be able to read at least 40 correct WORDS per minute when reading a passage

55

End of Grade 2

All learners should be able to read at least 40 correct WORDS per minute when reading a passage

- This is a minimum threshold. Higher order reading skills are very unlikely to develop if learners do not reach this fluency level.
- When learners reach this level of fluency, working memory is no longer engaged in effortful decoding and is freed up to engage with the meaning of the text.
- Below this, learners are reading too slowly and inaccurately to comprehend what they are reading.
- Learners should be exposed to both narrative and information texts to develop their fluency in reading





What are the reading benchmarks for Xitsonga and Tshivenda?

Grade 6

Xitsonga

Tshivenda

End of Grade 2

85

All learners should be able to read at least 40 correct WORDS per minute when reading a passage

90

End of Grade 2

All learners should be able to read at least 40 correct WORDS per minute when reading a passage

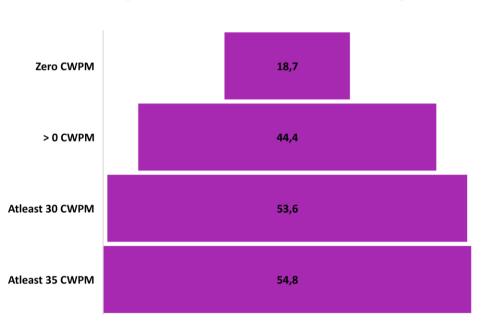
- This fluency benchmark is indicative of the point at which reading comprehension becomes increasingly possible when learners read on their own.
- This point signals when teachers' focus should hone in on teaching learners skills and strategies needed to tackle written comprehension while encouraging vocabulary and language development.
- At this fluency rate, underdeveloped comprehension skills become the main constraint to further literacy development.





What are profiles of learners learning to read in Xitsonga?

Average Correct Letter Sounds per minute (Grade 2)



- Grade 2 learners that cannot read at least one word correctly in a minute can correctly sound 19 letters per minute.
- Grade 2 learners reading at least 35 cwpm can read a much higher number of correct letter sounds per minute (55 clspm)

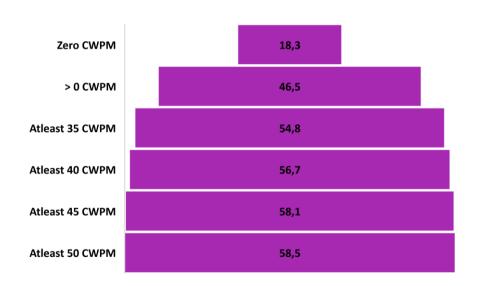




BENCHMARKING EARLY GRADE READING SKILLS

What are profiles of learners learning to read in Xitsonga?

Average Correct Letter Sounds per minute (Grade 3)

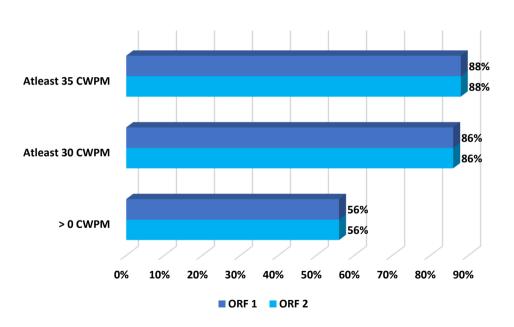


- Grade 3 learners that cannot read at least one word correctly in a minute can correctly sound 18 letters per minute.
- Grade 3 learners reading at least 35 cwpm can read a much higher number of correct letter sounds per minute (55 clspm)





% of learners with at least 95% accuracy in word reading (Grade 2)



56% of Grade 2 learners reading at least 1 wcpm reach 95% accuracy.

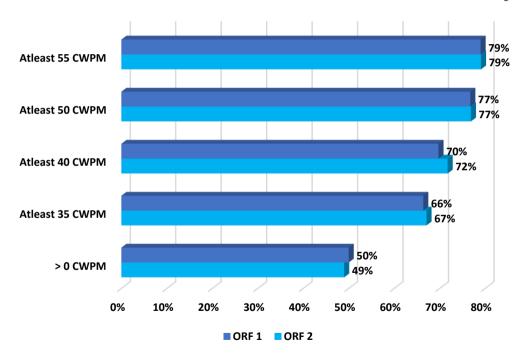
• Percentage of accurate readers greatly improved to 86% amongst learners reading at least 35 cwpm.





Xitsonga Learner Profiles by threshold level

% of learners with at least 95% accuracy in word reading (Grade 3)



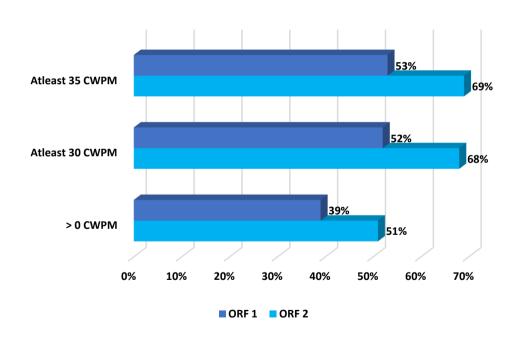
• 50% of Grade 3 learners reading at least 1 wcpm reach 95% accuracy in ORF 1.

• Percentage of accurate readers greatly improved to 92% amongst learners reading at least 40 cwpm in ORF 1.





Average Comprehnsion Score (% correct from attempted) (Grade 2)

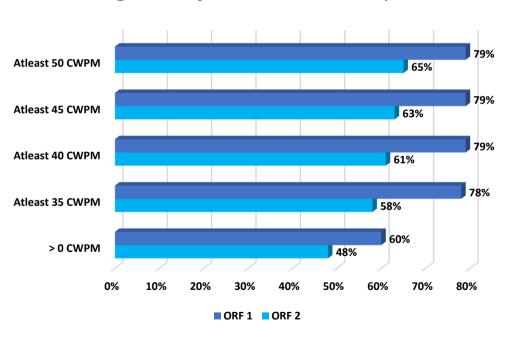


- Learners reading at least 1 cwpm comprehend very little of what they read.
- Comprehension is above average for learners reading at least 30 cwpm.





Average Comprehnsion Score (% correct from attempted) (Grade 3)



- Learners reading at least 1 cwpm comprehend very little of what they read.
- Comprehension is above average for learners reading at least 40 cwpm.

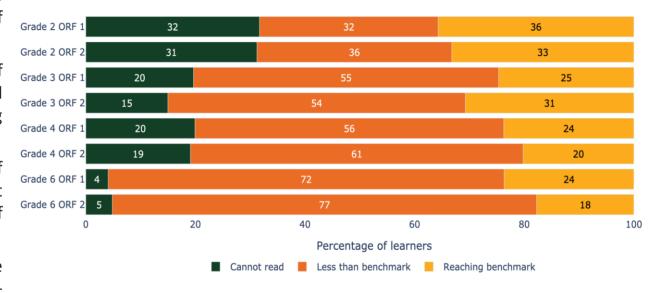




- Only 36% of Grade 2 learners are meeting the benchmark of 30 wcpm.
- For Grade 3, about 15–20% of learners are unable to read while 25%–31% are meeting the benchmark.
- For Grade 4, the percentage of non-readers remains high at 19%–20%. Only 20%–24% of learners meet the benchmark.
- For Grade 6 ORF 1 (narrative text), there are very few nonreaders (4%) and 24% of the learners are reaching the benchmark of 85 cwpm.

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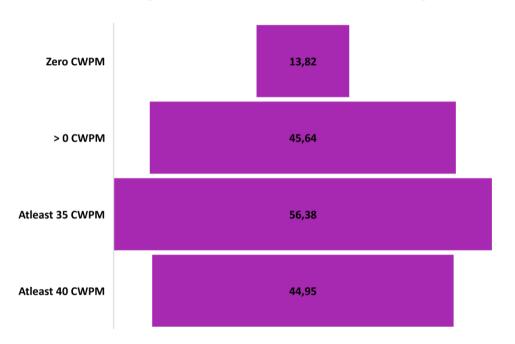






What are profiles of learners learning to read in READING BENCHMARKS FOR TSHIVENDA AND XITSONGA TShivenda?

Average Correct Letter Sounds per minute (Grade 2)

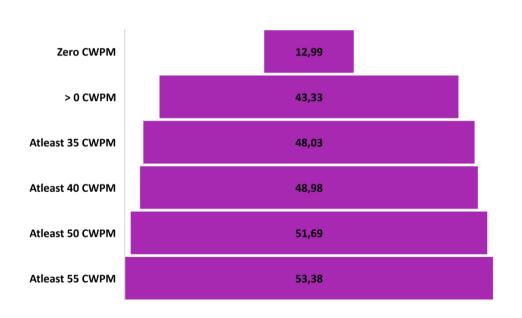


- Grade 2 learners that cannot read at least one word correctly in a minute can correctly sound 14 letters per minute.
- Grade 2 learners reading at least 35 cwpm can read a much higher number of correct letter sounds per minute (56 clspm)





Average Correct Letter Sounds per minute (Grade 3)

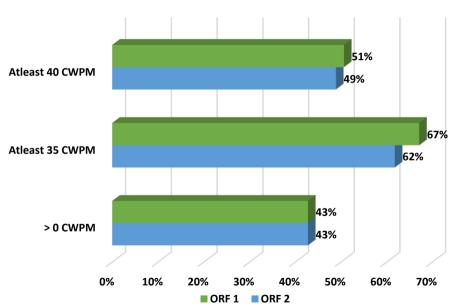


- Grade 3 learners that cannot read at least one word correctly in a minute can correctly sound 13 letters per minute.
- Grade 3 learners reading at least 35 cwpm can read a much higher number of correct letter sounds per minute (53 clspm)





% of learners with at least 95% accuracy in ORF (Grade 2)

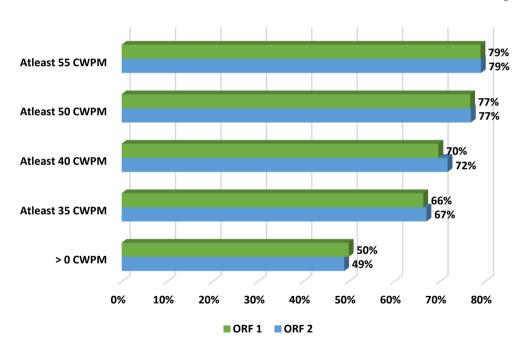


- 43% of Grade 2 learners reading at least 1 wcpm reach 95% accuracy.
- Percentage of accurate readers greatly improved to 67% & 62% in ORF 1 and 2 amongst learners reading at least 35 cwpm.





% of learners with at least 95% accuracy in ORF (Grade 3)



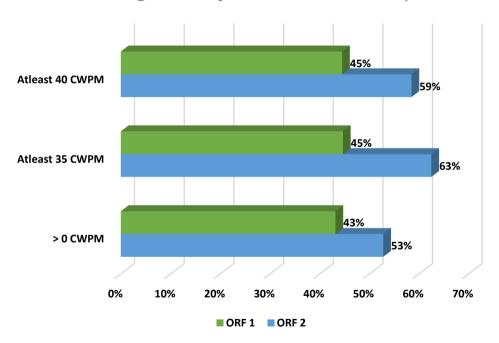
• 50% of Grade 3 learners reading at least 1 wcpm reach 95% accuracy in ORF 1.

• Percentage of accurate readers greatly improved to 79% amongst learners reading at least 55 cwpm in ORF 1.





Average Comprehnsion Score (% correct from attempted) (Grade 2)

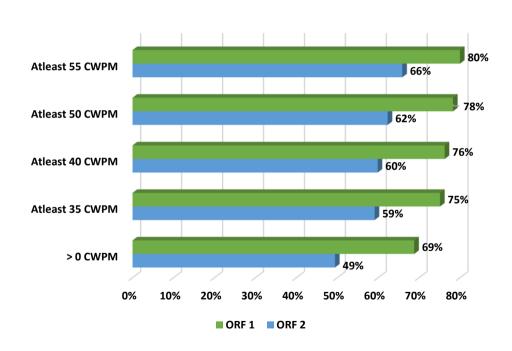


- Learners reading at least 1 cwpm comprehend very little of what they read.
- Comprehension is above average in ORF 2 for learners reading at least 30 cwpm.





Average Comprehnsion Score (% correct from attempted) (Grade 3)



- Learners reading at least 1 cwpm comprehended very little of what they read in ORF 2.
- Comprehension is a lot higher for learners reading at least 55 cwpm for both ORF 1 and 2.





	Grade 3	Grade 4	Grade 7	
Cannot read (0 cwpm)				
Mean correct letter-sounds per minute	13.55	13.23		
Letter-sounds scoring zero (%)	7.0%	15.5%		
Complex consonant sounds per minute	1.02	1.22		
Complex consonants scoring zero	76.6%	74.5%		
Vocabulary (%)			17.1%	
Observations	128	110	24	
Reading below the Grade 2 benchmark				
Mean correct letter-sounds per minute	32.23	32.05		
Complex consonant sounds per minute	7.31	8.74		
Complex consonants scoring zero	43.8%	32.9%		
% with at least 95% accuracy in word reading	13.6%	17.1%		
Comprehension (% of total correct)	21.1%	26.3%	6.2%	
Comprehension (% of attempted correct)	34.8%	32.0%	20.3%	
Written comprehension score (%)		26.1%	26.9%	
Vocabulary (%)			26.4%	
Observations	331	340	120	

7% of Grade 3 and 16% of Grade 4 learners are unable to correctly sound one single letter

The results are very similar across Grades 3 and 4- only get 32% to 35% in the comprehension questions they attempt correct

Performance improves markedly amongst learners who achieve the Grade 2 benchmark





Tshivenda?

Grade 4s that achieve the Grade 3 benchmark score 66% for questions attempted and Grade 7s score 63%

(2% of all Grade 7s sampled cannot read

Across all three grades, learners that achieved the Grade 6 benchmark scored between 71% and 77% of their oral comprehension.

Grade 4s and 7s in this group also did very well in their written comprehension, scoring 79% on average

	Grade 3	Grade 4	Grade 7	
Reaching the Grade 2 benchmark				
Mean correct letter-sounds per minute	44.49	41.68		
Complex consonant sounds per minute	21.66	19.07		
Complex consonants scoring zero	9.8%	16.6%		
% with at least 95% accuracy in word reading	51.4%	59.8%		
Comprehension (% of total correct)	62.1%	53.6%	36.4%	
Comprehension (% of attempted correct)	62.3%	54.9%	49.5%	
Written comprehension score (%)		53.9%	49.8%	
Vocabulary (%)			53.4%	
Observations	315	361	202	
Reaching the Grade 3 benchmark				
Mean correct letter-sounds per minute	50.56	48.35		
Complex consonant sounds per minute	30.16	28.37		
Complex consonants scoring zero	5.2%	12.3%		
% with at least 95% accuracy in word reading	69.6%	78.6%		
Comprehension (% of total correct)	63.3%	65.1%	59.9%	
Comprehension (% of attempted correct)	63.6%	65.7%	62.7%	
Written comprehension score (%)		68.0%	66.3%	
Vocabulary (%)			67.8%	
Observations	250	220	414	

BENCHMARKING EARLY GRADE READING SKILLS



Performance of different categories of readers on other reading assessment tasks

Reading Benchmarks for African Languages

What now?

- Collaboration has supported innovation and excellence in the benchmarking process while promoting capacity building.
- These benchmarks are set to note the minimum fluency learners should attain- we are not quite there yet!
- Need future research and investment into what are the most effective ways to teach these early skills for each of those languages to achieve mastery in these early skills
- True value of the benchmarks will be in their use classrooms, national survey and in teacher development.





Inkomu!

Ri khou livhuha!





EDUCATION









