African Union | LEARN Leveraging Education Analysis for Results Network

ASSOCIATION FOR EDUCATIONAL ASSESSMENT IN AFRICA (AEAA)

Continental Assessment Framework for AFRICA

September 2025

Foreword

Education is the cornerstone of Africa's future. It is the key to unlocking the ambitions of Agenda 2063, the Continental Education Strategy for Africa (CESA), and the global commitment to Sustainable Development Goal 4. Yet, despite important progress, one major obstacle has persisted: the absence of reliable, comparable learning data across our continent. Many countries assess learning at the national level, and regional initiatives such as PASEC and SEACMEQ provide valuable insights. But taken together, these efforts are fragmented, leaving us without a unified picture of how well Africa's children are learning.

This gap is not simply technical—it strikes at the heart of our ability to ensure quality education for all. Without trustworthy and comparable data, policymakers cannot track learning effectively, education systems cannot be held accountable, and investments risk being made in the dark. Recognizing this urgent challenge, African Union Member States, at the 2023 meeting of the Specialized Technical Committee on Education, Science and Technology, called for a continental solution.

Through the AU Leveraging Education Analysis for Results Network (LEARN), the Association for Educational Assessment in Africa (AEAA), working with, the Global Education Monitoring Report, the UNESCO Institute for Statistics, and the Association for the Development of Education in Africa (ADEA), developed the Continental Assessment Framework for Africa (CAF-Africa). This framework, rooted in Africa's realities and shaped by the review of national curricula across diverse countries, represents a turning point. Its official launch at the 41st AEAA Conference in Addis Ababa in August 2025 is not just a milestone for education assessment—it is a statement of Africa's determination to lead with homegrown solutions.

CAF-Africa offers more than proficiency standards in mathematics and reading at Grades 3, 6, and 9. It provides countries with the tools to generate robust, comparable evidence; to strengthen assessment capacity; and to ensure that policy choices and investments are guided by facts, not assumptions. Most importantly, it reaffirms that every child in Africa deserves the chance to learn—and for their learning to be measured and valued.

As we enter the African Union's Decade of Education, CAF-Africa symbolizes our collective resolve to move beyond rhetoric to action. It will equip us to track progress, drive reforms, and hold ourselves accountable to Africa's children. Above all, it embodies our vision of an Africa where education empowers every learner to thrive, innovate, and contribute to building the Africa we want.

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The Continental Assessment Framework for Africa sets out a bold vision for education, developed in partnership under the African Union's Leveraging Education Analysis for Results Network (LEARN). We are grateful to the many individuals and organizations that came together to shape this vision.

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This work owes its success to the collective dedication of these experts and institutions, whose collaboration demonstrates the power of partnership in addressing Africa's most pressing educational challenges. Together, they have laid the foundation for a Continental Assessment Framework that reflects Africa's priorities, strengthens accountability, and ensures that every learner can thrive—reflecting the commitment that African children are born to learn.

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EXECUTIVE SUMMARY

1. Background

Relatively few African countries participate in cross-national assessments, including the two assessments based in Africa (PASEC and SEACMEQ). Where countries have national assessments, these are not comparable between countries. In total, data on reading proficiency *levels* at the end of primary school, as defined by the SDG global indicator 4.1.1, have been collected at least once since 2015 for only 1 in 3 African children, while trends are known for just 1 in 4 children. Data availability is even lower at the other two measurement points: early primary and end of lower secondary education.

Learning data gaps in Africa hinder effective education policy and progress tracking. Addressing this challenge is therefore critical for achieving the shared vision under Agenda 2063, the Continental Education Strategy for Africa (CESA) and Sustainable Development Goal (SDG) 4. In October 2023, at the African Union's (AU) Specialised Technical Committee on Education, Science and Technology (STC-EST), Zambia with support of The Gambia, Kenya, Rwanda and Senegal called for a continental initiative to address the learning data gap.

Led by the Association for Educational Assessment in Africa (AEAA), a Continental Assessment Framework (CAF) has been developed through an implementation partner agreement between the Global Education Monitoring (GEM) Report and Stellenbosch University, with technical guidance from the UNESCO Institute for Statistics (UIS).

The importance of a Continental Assessment Framework rests on the following elements:

- It would enable standardised, comparable data across African countries, aligned with CESA indicator 4.5.1 and SDG indicator 4.1.1.
- It supports evidence-based decision-making and investment in education systems.
- It can address the paucity of national assessment frameworks and enhance the reliability of learning data through sample-based assessments.

The Global Proficiency Framework (GPF) served as the framework for the analytical work. The GPF is structured around a hierarchy of domains, sub-domains, constructs and sub constructs to clearly define what students should know and be able to do at different stages of learning. It defines four proficiency levels (Below, Partially Meets, Meets, Exceeds Minimum Proficiency levels). It provides a structured progression of skills in reading and mathematics from Grades 1 to 9 and serves as a benchmark for aligning national curricula and assessments. The UIS, as custodian of SDG indicator 4.1.1, has led global efforts to define and measure Minimum Proficiency Levels in reading and mathematics and locate them within the performance progression in each grade defined by the GPF. The GPF was field-tested in several African countries but not yet adapted continentally.

In brief, the CAF is a critical step toward closing Africa's learning data gap, enabling systematic monitoring, policy alignment, and educational improvement. It leverages global standards while tailoring them to the African educational landscape, ensuring that no child is left behind in the pursuit of quality education.

The analytical work was coordinated by a team of disciplinary specialists in reading, mathematics, assessment and evaluation at Stellenbosch University. The tasks included:

- Compiling curriculum and assessment frameworks from 10 African countries.
- Mapping these against the GPF.
- Drafting a CAF for mathematics and reading for Grades 3, 6 and 9.

At the continental level, the Leveraging Education Analysis for Results Network (LEARN), a collaboration between the AU, the GEM Report and the Association for the Development of Education in Africa (ADEA) engages three key CESA clusters – Curriculum, Teacher Development and Planning – to promote peer learning, collaboration and common action in support of national policies, which enhance primary education outcomes across Africa.

Under the Planning cluster and the LEARN initiative, AEAA has led efforts to address learning data gaps across Africa. The UIS, as custodian of SDG 4 indicators, has led global efforts to define and measure Minimum Proficiency Levels in reading and mathematics through the GPF.

At a technical validation workshop in July 2025, the CAF was reviewed and validated by the AEAA Technical Committee, along with assessment and curriculum experts from Cameroon, Kenya, Rwanda, Ghana, Lesotho, Malawi, Senegal, Uganda and Zambia as well as PASEC.

2. Countries

The curricula from 10 African countries (Cameroon, Chad, The Gambia, Ghana, Kenya, Lesotho, Morocco, Rwanda, Senegal, and Zambia) were analysed towards the development of the Continental Assessment Framework. In particular, information regarding the structural, curricular, and linguistic features relevant to education systems and assessment readiness were analysed for important contextual data against which the curriculum analysis could be interpreted. The following are the key comparative insights from the analysis:

a. Education system structures

- Most countries follow a 6-year primary education model, with variations occurring in pre-primary and secondary education structures.
- Free and compulsory basic education is common, though the extent and enforcement vary.
- Competency-based curricula are increasingly adopted (e.g., Kenya, Ghana, Rwanda, Zambia).

b. Language of instruction

- Multilingual contexts dominate: French, English, Arabic, and other official languages are used.
- Early grades often use local languages, transitioning to English or French at different grades.
- Language of instruction is a key factor in curriculum alignment and assessment comparability.

c. Curriculum and assessment

- Recent curriculum reforms emphasise literacy, numeracy, ICT, and life skills.
- Most countries have introduced national assessments at key stages (Grades 3, 6, 9).
- Curriculum implementation dates range from 2013 to 2024, reflecting varied reform timelines.
- It is difficult to access formal curriculum documents on public platforms prevails.

d. Governance and policy

- Ministries of education are the primary authorities, often supported by curriculum and assessment agencies.
- Education policies are aligned with national development plans and SDG 4.

The diversity in education systems, languages, and curricular priorities across African countries underscores the need for a context-sensitive yet harmonised Continental Assessment Framework. This framework accommodates linguistic diversity, curriculum structures and national priorities, while enabling comparability and alignment with global proficiency standards in the interests of remaining locally relevant while ensuring global comparability.

3. Methodology

A comprehensive methodology was used to develop the CAF, focusing on sourcing, analysing, and mapping national curricula and assessment frameworks across African countries.

Data sources and collection

- Documents included national curricula, syllabi, assessment frameworks, policy and strategic documents, and international reports.

Analytical framework

- The GPF for reading and mathematics served as the primary analytical tool.
- Countries were selected to represent diverse regions and languages across Africa representing all AU regions.

Analytical process

- A five-step process was followed: data preparation, familiarisation, coding of intended curriculum competencies, mapping to GPF, and cross-country analysis. There were slight differences in the approach given the significant differences in the nature, format and contents of the curricula.
- **Mathematics**: A content analysis with deductive coding was used based on GPF descriptors.
- **Reading**: A content analysis was applied combining deductive and inductive coding to capture both GPF alignment and broader reading and overall language development competencies.

Challenges

- Curriculum structure, detail and terminology varied across countries.
- There was limited availability of detailed reading indicators (e.g., genres, text complexity).
- Non-language goals (e.g., civic education, life skills and numeracy) were integrated within language curricula.
- The quality of content presentation for analysis of reading-specific content was varied.

4. Mathematics

The analysis of mathematics curricula mapped against the GPF led to a CAF for mathematics proposal at Grades 3, 6, and 9, aligned with both global benchmarks and African educational contexts.

Curriculum alignment with GPF

- All countries cover the five GPF domains: Number and Operations, Measurement, Geometry, Statistics and Probability, and Algebra.
- Most countries show strong alignment with GPF expectations at the domain level, with variation increasing at the construct and subconstruct levels.
- Some countries exceed GPF expectations, introducing alternative (e.g., set theory) or advanced content (e.g., exponents) earlier than the minimum proficiency should be demonstrated.

Cross-country analysis

- In total, 823 Grade 3 and 878 Grade 6 competencies were analysed across 20 curricula in 10 countries.
- **Grade 3**: There is high alignment across countries in core subconstructs. Some countries include advanced topics not expected at this level.
- **Grade 6**: There are similar trends with broader coverage and more variation. Most countries meet and some exceed GPF expectations.
- These findings support the feasibility of a common assessment framework grounded in shared competencies.

Continental Assessment Framework for mathematics

The CAF for mathematics includes:

- Domains and constructs are aligned with the GPF for Grades 3, 6 and 9.
- Subconstructs are selected based on cross-country presence and relevance to learners.
- The framework emphasises contextualisation, language flexibility and representation of three levels of cognitive demand (recall, application, reasoning).

There is a robust evidence base for a CAF for mathematics. The framework demonstrates that African curricula are sufficiently aligned with global standards, to enable the development of a shared framework to monitor learning outcomes and support educational improvement across the continent.

5. Reading

The analysis of reading curricula mapped against the GPF led to a CAF for reading proposal at Grades 3 and aligned with both global benchmarks and African educational contexts.

Curriculum alignment with GPF

- All countries cover the three GPF reading domains: Comprehension of spoken/signed language, Decoding, and Reading comprehension.
- **Grade 3**: There is strong emphasis on oral comprehension and decoding; some countries include higher-order skills like reflection, not expected at this level. Reading comprehension receives minimal attention.
- **Grade 6**: There is increased focus on reading comprehension, but this is less than optimal; some foundational skills (e.g., decoding) persist, and higher-order comprehension skills (e.g., evaluating claims) are underrepresented.

Cross-country analysis

- In total, 511 Grade 3 and 553 Grade 6 competencies were analysed across 20 curricula in 10 countries.
- Significant variation exists at the construct, subconstruct, and skill/knowledge levels.
- Some countries exceed GPF expectations, while others omit key skills, highlighting the need for a harmonised framework.
- Reading comprehension development is generally not foregrounded as a fundamental educational skill; its development is subsumed in other language foci.

Continental Assessment Framework for reading

The CAF for reading proposes a structured, grade-specific framework including the domains of Oral Comprehension, Decoding and Reading Comprehension:

- **Grade 3**: There is a focus on foundational skills, including the foundations of reading comprehension, oral comprehension and decoding.
- **Grade 6**: There is greater emphasis on interpretation and reflection, with reduced focus on oral comprehension whilst maintaining literal comprehension fundamentals.
- **Grade 9**: Advanced comprehension, critical thinking and evaluation are prioritised.

The CAF for reading aims to provide a robust, context-sensitive framework to support African countries in monitoring learning outcomes and aligning with Sustainable Development Goal 4.1.1. It balances global standards with regional realities, ensuring relevance, comparability, and inclusivity.

6. Conclusions

The CAF aims to offer a harmonised yet flexible approach to monitor learning outcomes in mathematics and reading across Africa. It balances global standards with regional realities and provides a foundation for evidence-based decision-making, curriculum alignment and improved educational outcomes.

The mapping process of the 10 countries' curricula shows that:

- All countries essentially cover the spread of five **mathematics** domains and constructs of an expected global mathematics curriculum when compared to the GPF. This is important to bear in mind in the discussion of global, or more focused continental teaching, learning and assessment of mathematics.
- In contrast, the levels of **reading** comprehension needed to enhance the higher order thinking and reasoning for development across schooling subjects are not prominent. There is minimal alignment to GPF indicators. In some instances, especially at Grade 3 level, many of the comprehension skills and knowledge indicators addressed non-text-aligned vocabulary development/word meaning making.

The findings of the mapping should be considered with an awareness that the competencies outlined in the GPF are not meant to be exhaustive. All countries have contextual needs and priorities, that may require the addition of competencies not listed in the GPF. For each country, particularities are noted where these provided useful contextual insights for consideration in drafting the CAF.

The frameworks for mathematics and reading are presented in terms of their domains and constructs per grade. For each framework, the distribution of the domains and constructs is presented across grades 3, 6 and 9 in terms of the weighting (target percentage of testing score points).

Domains and constructs for mathematics with weightings, by grade

Domain	Construct	Grade 3	Grade 6	Grade 9
Grouped: N and A		**60**	**60**	**60**
N. Number and Operations	N.1 Whole numbers	60	25	0
	N.2 Fractions	15	25	0
	N.3 Decimals	0	15	0
	N.5 Exponents and roots	0	0	30
	N.6 Operations across number	0	0	20
A. Algebra	A.1 Patterns	20	20	0
	A.2 Expressions	0	0	15
	A.3 Relations and functions	5	15	35
Grouped: M and G		**35**	**30**	**20**
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter	20	30	35
	M.2 Time	20	15	5
	M.3 Currency	10	0	0
G. Geometry	G.1 Properties of shapes and figures	30	30	30
	G.2 Spatial visualizations	10	10	10
	G.3 Position and direction	10	15	20
Grouped: S		**5**	**10**	**20**
S. Statistics and Probability	S.1 Data management	100	90	70
	S.2 Chance and probability	0	10	30

The framework for **mathematics** includes 5 domains and 16 constructs; not all of the latter are included at all three grade levels (3, 6 and 9). The distribution of weighting (i.e. target percentage of testing score points) at each grade level across the five domains totals 100%. The recommended percentages for the associated constructs under the two grouped domains (Number and Operations and Algebra, and Measurement and Geometry), and Statistics and Probability also add to 100%. For example, for Grade 3, the grouped domains Number and Operations and Algebra comprise 60% of all the expected score points out of the domains targeted, whilst 'N.1 Whole numbers' comprises 60% of the expected score points when this pair of domains is assessed.

Domains and constructs for reading with weightings, by grade

Domains	Constructs	Grade 3	Grade 6	Grade 9
Comprehension of Spoken or Signed Language		**20**	**10**	**0**
	C.1 Retrieve information at word level	20	10	0
	C.2 Retrieve information at sentence or text level	30	20	0
	C.3 Interpret information at sentence or text level	50	70	0
Decoding		**20**	**20**	**10**
	D.1 Precision	50	40	30
	D.2 Fluency	50	60	70
Reading Comprehension		**60**	**70**	**90**
	R.1 Retrieve information	50	25	20
	R.2 Interpret information	40	50	50

R.3. Reflect on information	10	25	30

The framework for **reading** includes 3 domains and 8 constructs; not all of the latter are included for all three grade levels (3, 6 and 9). The distribution of the weighting (i.e. target percentage of testing score points) at each grade level across the three domains totals 100%. Within each of the domains presented, the associated constructs add to 100%. For example (for Grade 3), the domain Comprehension of Spoken or Signed Language comprises 20% of all the expected score points out of the domains targeted whilst 'C.1 Retrieve information at word level' comprises 20% of the expected score points when Comprehension of Spoken or Signed Language is assessed.

Implementation

The Continental Assessment Framework (CAF) for Africa should not be viewed as the end goal but rather an essential first step toward a coordinated, African-led and sustainable approach to learning assessment. The following considerations have been identified to guide its implementation:

- Countries will need to review the CAF to become familiar with its contents and benchmark their own curricula (and, if any, assessment frameworks) against it for contextualisation.
- Given the absence of national assessment frameworks, the CAF should be used as an input to guide the development of a national assessment framework that takes national curricula, languages and resources into account.
- Countries may require specific training to develop their own assessment frameworks, using the CAF as a guidance and reference document. The strategic plan of the Association for Education Assessment in Africa (AEAA) is aimed at information sharing, training, and support activities required for country-level implementation.
- AEAA and the AU-IPED should accordingly develop and regularly review a plan for reporting back on the implementation of the CAF-Africa across countries and the related activities.
- More dialogue is needed with the two Africa-based regional assessments (PASEC and SEACMEQ) to support cross-country collaboration. This will also enable alignment in the design of current and future regional assessment frameworks with the CAF.
- In contextualising the CAF for **mathematics**, it is important to take note of the following:
  - Emphasise number sense in the early grades but do not exclude the other core mathematical domains.
  - Instructions should be translated into the local language if it is not assessed and bilingual assessments should be provided with answers accepted in any language.
- In contextualising the CAF for **reading** it is important to take note of the following:
  - Carefully address the development of reading in a primary language of instruction as well as a secondary language which may become the primary later.
  - Comprehension development for all languages is necessary for cementing and transferring skills from one language to another. Foregrounding comprehension levels in a framework is therefore crucial.
  - Reading comprehension strategy development may be particularly beneficial aligned to the country's reflection on its curriculum and assessment.
  - The oral language development tradition needs further explanation in relation to its role for the comprehension of spoken language.

Instrument design and item development

The Education Data and Statistics Commission / Global Alliance to Monitor Learning has specified a set of eligibility criteria for a country to use its assessment to report on SDG global indicator 4.1.1. The first of these criteria is alignment to the Minimum Proficiency Levels. In this sense, CAF is consistent with the eligibility criteria. In the case of national assessment instrument and item development, a range of internationally recognized and published technical standards must be met to comply with the eligibility criteria:

- Test construction, evaluation, and documentation: validity; reliability and measurement error; test development and revision; scales, norms, and score comparability; test administration; scoring and reporting; and supporting documentation.

- Fairness: fairness in testing and test use; rights and responsibilities of test takers; and inclusiveness (e.g., testing individuals from diverse linguistic backgrounds and those with disabilities).
- Testing applications: responsibilities of test users.

CHAPTER 1. BACKGROUND

The debates about the need for accurate and reliable information for the development of Africa have been made extensively over the past two decades in policy and research literature on regional and national levels (AU, 2025, PASEC 2019, SEACMEQ, 2019, Howie 2012, 2022, 2023, Greaney & Kellaghan, 2012 , Gustaffson, 2018, Mekonnen, 2025 amongst others). Lack of learning data is posing an ongoing challenge to policymakers, especially in countries that have not participated in international or regional learning assessments and whose national assessments are not comparable across countries due to different curriculum objectives, uneven coverage of constructs and sub-constructs, absence of or limited/insufficient assessment frameworks and insufficient quality items used for national assessments.

The UNESCO Institute for Statistics has the global mandate as a custodian agency responsible for defining and measuring globally comparable indicators of Sustainable Development Goal 4. In this context, the UNESCO Institute for Statistics maintains a methodological programme to enhance the measurement of Sustainable Development Goal 4 indicators, notably indicators on learning outcomes and in particular Sustainable Development Goal global indicator 4.1.1 on the proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex. As part of these efforts, the UIS established the Global Alliance to Monitor Learning, a platform to discuss technical approaches for indicator measurement. Through the work of the Global Alliance to Monitor Learning, the UNESCO Institute for Statistics has coordinated efforts to establish common reading and mathematics scales for all three points of Sustainable Development Goal global indicator 4.1.1. In 2018, international expert consensus defined the Minimum Proficiency Levels in each of the major cross-national assessments, based on the proficiency level descriptors in each of them, for each of the three points specified in the indicator: end of lower primary (4.1.1a), end of primary (4.1.1b) and end of lower secondary (4.1.1c). Since then, the Minimum Proficiency Level has been the focus of a long consultative process of refinement.

In Africa, several countries have reported the proportion of students achieving the Minimum Proficiency Levels by the end of early primary and the end of primary using the results of their participation in two rounds of the PASEC, a cross-national assessment. More recently, several countries have also been able to report based on the Assessment for Minimum Proficiency Level (AMPL), a tool focused on measuring the achievement of the Minimum Proficiency Levels developed by the UNESCO Institute for Statistics. Nonetheless, with as many as 2 out of 3 children unaccounted for and no learning trends for as many as 3 out of 4 children, many African countries are without the fundamental data needed to track their education system progress.

In 2023, highlighting the major gap in learning achievement data, Zambia requested a continental focus on closing it at the October 2023 meeting of the African Union Specialised Technical Committee on Education, Science, Technology and Innovation. In response, the Specialised Technical Committee decided to endorse the request. The Association for Educational Assessment in Africa (AEAA), the continent's main professional body in this field, under the LEARN initiative and the CESA Planning cluster, decided to pursue a plan to fill the learning data gaps in the continent.

Underpinning the AEAA initiative is the acknowledgement that monitoring progress in learning outcomes in educational systems is complex requiring a variety of data and the expertise to both design and implement. From a continental perspective, there is a need to include elements that enhance comparability across countries and over time. It has been argued that the information from universal, or censal, systems (e.g.: national examinations), which African countries have prioritised tends to be less reliable than information on learning proficiency from sample-based assessments, which permit more rigorous controls in the test administration process and facilitate the security of test items, or questions, which are repeated in later years. This partly explains the strong emphasis on sample-based systems in reporting against the Sustainable Development Goal 4.1.1 indicator. However, for national governments universal assessment systems, are important for various

reasons to include both types of assessment (Gustaffson, pp.42-43) to ascertain accurate and reliable data for monitoring progress for decision-making.

1.1. Purpose and scope

There are several reasons why the development of robust national assessment has been slow, including – but not limited to – scarcity of national expertise for carrying out complex technical tasks, limited resources to implement a sustainable assessment programme, and lack of coordination and coherence in delivering long-term technical support. This document is trying to tackle another reason that has held back institutional development for assessment, both at national and continental level: the lack of shared understanding on what are the learning outcomes that should be achieved by a certain point in students' educational trajectory.

The purpose of this document is to support the AEAA in:

- technical work towards the development of a continental assessment framework in mathematics and reading for Africa, and
- the introduction and rollout of a continental assessment framework and corresponding assessment tool for Africa.

The importance of a Continental Assessment Framework rests on the following elements:

- It would enable standardised, comparable data across African countries, aligned with CESA indicator 4.5.1 and SDG indicator 4.1.1.
- It supports evidence-based decision-making and investment in education systems.
- It can address the paucity of national assessment frameworks and enhance the reliability of learning data through sample-based assessments.
- It builds on the Global Proficiency Framework, addressing African contexts while maintaining global alignment.

In brief, the Continental Assessment Framework is a critical step toward closing Africa's learning data gap, enabling systematic monitoring, policy alignment, and educational improvement. It leverages global standards while tailoring them to the African educational landscape, ensuring that no child is left behind in the pursuit of quality education.

The analytical work was coordinated by a working team of Stellenbosch University consisting of disciplinary specialists in reading, mathematics, assessment and evaluation. The tasks included:

- Compiling and analysing curriculum and assessment frameworks from at least 10 African countries.
- Mapping these against the Global Proficiency Framework.
- Drafting a Continental Assessment Framework with specific frameworks for mathematics and reading for Grades 3, 6 and 9.

1.2. Global Proficiency Framework

The Global Proficiency Framework (GPF) represents a global consensus of what learners must know and be able to do to be proficient in reading and mathematics as they progress through the grade levels, regardless of where they live in the world.

The GPF for reading and for mathematics describes learner performance at four proficiency levels (one of which is the Minimum Proficiency Framework) by grade (1 to 9). It refers to learning areas, domains, constructs and descriptors that serve as a guide to the sequencing of skill acquisition and the progression by grade. It offers a lens to evaluate the alignment of curricula and assessments. Draft versions of the GPF were field tested in African countries including Djibouti, The Gambia, Ghana, Madagascar, Malawi, Nigeria and Senegal in 2019/20,

but this global framework has not been debated and adapted at the continental level, including with cross-national initiatives (PASEC and SACMEQ).

The GPF for **mathematics** was built on the Global Content Framework for Mathematics (UIS, 2018) developed by the UNESCO Institute for Statistics and the International Bureau of Education (IBE). It was based on a comprehensive analysis of 53 national mathematics curricula, and 115 regional/national mathematics assessment frameworks. It was also discussed by a team of representatives from several countries prior to its finalisation in 2020.

The development process for the GPF for **reading** started in October 2018 with the development of the Global Content Framework of Reference for Reading (GCFRR) by the UNESCO IBE. The Global Content Framework of Reference for Reading synthesised content and assessment framework information from more than 50 countries from around the globe, providing a picture of the common expectations countries have for learners' performance in reading. In 2019, reading educators, curriculum specialists, and psychometricians from around the world met in Washington, D.C. to outline a research-based progression of the minimum knowledge and skills learners in grade two (or primary two) to grade six (or primary six) should be able to demonstrate with respect to the key domains of reading, based on the Global Content Framework of Reference for Reading and other national and regional curriculum and assessment frameworks developed for reading.

The GPF (mathematics and reading) was used as the analytical basis for the development of the Continental Assessment Framework. In particular, it was applied to map the sample country curricula and other curriculum support material selected for the purposes of generating data for the development of the Framework for Africa. However, it must be recognised and noted that the competencies outlined in the GPF are not, and are not meant to be, exhaustive - countries all have contextual needs and priorities, that may require the addition of competencies not listed in the GPF.

An official curriculum outlines formally the content for teaching and learning at the classroom level. It supports teachers to carry out the daily activity of teaching in order to equip learners with the competencies (skills and knowledge) they should acquire as they progress through school. It communicates a government's vision of what learners are expected to learn, how they are learning it, and the amount of time they are to spend learning it. Ideally, the curriculum sets measurable learning outcomes at each grade level and against which teachers and the system at large can measure progress. Alongside an official country curriculum, for the purposes of assessment, an assessment framework is required to enable systemic testing of the achievement of the learning outcomes across the schools in a country.

The sample countries selected for the purposes of the creation of data for discussion of the Continental Assessment Framework for Africa all had curriculum documents that could be mapped using the analytical tool. Curriculum or syllabus documents generally adopt a similar structure which facilitated this process. Only one country in the sample had an assessment framework, evidence of the need for this particular discussion on the development of a Continental Assessment Framework for Africa, supported by the GPF. Detail on the country data and cross-country analyses used in the discussion and development of the draft framework are presented progressively in this document.

The GPF provides minimum proficiency levels which were used to create for the analyses of the mathematics curricula of the sample countries. Table 1 and Table 2 provide an overview of the GPF level descriptors which are given in relation to mathematics and reading domains and constructs.

Table 1. Mathematics domains and constructs in the analytical framework

Domain	Construct
N. Number and Operations	N.1 Whole numbers
	N.2 Fractions
	N.3 Decimals
	N.4 Integers
	N.5 Exponents and roots
	N.6 Operations across number
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter
	M.2 Time
	M.3 Currency
G. Geometry	G.1 Properties of shapes and figures
	G.2 Spatial visualizations
	G.3 Position and direction
S. Statistics and Probability	S.1 Data management
	S.2 Chance and probability
A. Algebra	A.1 Patterns
	A.2 Expressions
	A.3 Relations and functions

Table 2. Reading domains and constructs in analytical framework

Domain	Constructs
Comprehension of spoken or signed language	Retrieve information at word level
	Retrieve information at sentence or text level
	Interpret information at sentence or text level
Decoding	Precision
	Fluency
Reading comprehension	Retrieve information
	Interpret information
	Reflection on information

1.3. Structure of report

Following this introductory chapter, the profiles of the countries analysed are described in Chapter 2. The approach and methodology applied is described in Chapter 3. The main findings from the country and cross-country analyses and the draft framework and its alignment to the GPF is described and discussed in Chapter 4 for mathematics and in Chapter 5 for reading. The conclusions and practical implications are presented in Chapter 6.

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CHAPTER 2. COUNTRIES

As part of the technical work, at least 10 primary and lower secondary education national curriculum and assessment frameworks were analysed. The curricula of 10 countries representing the 5 AU regions were analysed (Table 3). Moreover, three AU languages were represented: English (7), French (2) and Arabic (1).

Table 3. List of countries analysed

Region	Country	Language analysed
North	Morocco	Arabic
West	Senegal	French
	Ghana	English
	Gambia	English
East	Kenya	English
	Rwanda	English
Central	Cameroon	English
	Chad	French
South	Lesotho	English
	Zambia	English

Indicators of country education systems (Table 4) reveal several patterns in the structure and language policies of primary education systems across the 10 countries. Most countries begin primary school at age 6. By Grade 3, learners typically have completed between four and six years of schooling, which varies depending on whether children have attended early childhood education, as participation rates are unequal. A common trend is the use of local or national languages in the early grades, transitioning to English or French as early as Grade 3 and at the latest by Grade 6, depending on their language-in-education/instruction policies. While the naming conventions for educational phases differ—ranging from 'Basic' and 'Stage' to 'Lower Primary' and 'Foundational Phase'—they consistently indicate a progression from foundational to intermediate learning. These patterns show the diversity of educational pathways across the continent, while also highlighting shared challenges in ensuring linguistic inclusion with the perceived need to develop competencies in international languages as early as possible.

Table 4. Indicators of selected country systems

Country	Date of latest curriculum document	Primary school starting age	Language of teaching and learning, Grade 3	Language of teaching and learning, Grade 6	Name of Grades 3 and 6
Cameroon	2016[1], 2018[2], 2023[3]	6	French or English	French or English	Grade 3 = Level 2 Grade 6 = Level 3
Chad	2023[1], 2008[2]	6	French and Arabic	French and Arabic	Grade 3 = CE1 Grade 6 = CM2
Gambia	2022[1], 2021 & 2022[4]	7	National languages	English	Grade 3 = Stage 2 Grade 6 = Stage 3
Ghana	2019[2], 2020[3], 2023[3]	6	English	English	Grade 3 = Basic 3 Grade 6 = Basic 6
Kenya	2017[1], 2019[1]	6	Language of the catchment area	English	
Lesotho	2013[1], 2013[5], 2016[6]	6	Sesotho	English	
Morocco	2021[2], 2009[3]	6	Arabic, Amazigh or French	Arabic, Amazigh or French	
Rwanda	2015[1], 2015[2,3], 2022[2]	6	Kinyarwanda	English	Grade 3 = P3 Grade 6 = P6
Senegal	2016	6	French	French	Grade 3 = CE1 Grade 6 = CM2
Zambia	2023[1], 2024[2,3]	7	English	English	

Note: 1 = Curriculum framework, 2 = Primary, 3 = Secondary, 4 = Syllabus, 5 = Grade 3, 6 = Grade 6

A closer look at the learning areas offered in primary and secondary education across the 10 countries reveals both shared priorities and regional distinctions (Table 5 and Table 6). Core subjects such as mathematics, science, and social studies are consistently present across all systems, reflecting a continental emphasis on foundational competencies. Language education shows greater variation: while English and French are widely taught, the inclusion of local or national languages—especially in primary education—demonstrates efforts to preserve linguistic heritage and improve inclusivity. Arabic appears in North and Central Africa. ICT and vocational subjects are increasingly integrated, though their presence is uneven, suggesting differing levels of resource availability and policy prioritisation. At the secondary level, subjects like business, civics, and arts are offered more selectively, indicating a shift toward specialisation and national development goals. Overall, the tables highlight a trend toward competency-based curricula with growing attention to digital literacy, life skills, and cultural relevance.

Table 5. Comparison of primary school subject/learning areas

Learning area / subject	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
English (Language/ Reading)	✓	—	✓	✓	✓	✓	—	✓	—	✓
Local/ National Language as Subject	✓	✓	✓	✓	✓	✓	✓	✓	—	✓
French as Subject	✓	✓	✓	✓	✓	—	✓	✓	✓	✓
Arabic as Subject	—	✓	✓	✓	✓	—	✓	—	—	—
Mathematics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Science & Technology	✓	✓	✓	✓	✓	—	✓	✓	✓	✓
Social Studies / Our World	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ICT / Computing	✓	✓	✓	✓	✓	—	—	✓	—	✓
Arts / Creative / Handicraft	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Physical Education / Sports	✓	✓	✓	✓	✓	—	✓	✓	✓	—
Religious Education	—	—	✓	✓	✓	—	✓	—	—	—
Vocational / Home Science / Life Skills	✓	—	✓	✓	✓	✓	—	—	—	✓
National Languages and Culture	✓	—	—	—	—	—	—	—	—	—

Table 6. Comparison of secondary school subject/learning areas

Learning area / subject	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
English	✓	✓	✓	✓	✓	✓	—	✓	—	✓
Local/National Language	✓	—	✓	✓	✓	✓	✓	✓	—	—
French	✓	✓	✓	✓	✓	—	✓	✓	✓	✓
Arabic	—	✓	✓	✓	✓	—	✓	—	—	—
Mathematics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Science (one or more)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Social Studies / History / Geography	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ICT / Computer Science	✓	✓	✓	✓	✓	—	—	✓	—	—
Civics / Citizenship	✓	—	✓	✓	✓	—	—	✓	—	—
Arts	✓	—	—	✓	✓	—	—	✓	—	—
Physical Education / Sports	✓	✓	—	✓	✓	—	—	—	—	—
Business / Entrepreneurship	—	✓	—	✓	✓	✓	✓	✓	—	✓
National Languages and Culture	✓	—	—	—	—	—	—	—	—	—

Cameroon

Cameroon's education system is shaped by its colonial history, resulting in two subsystems: the Anglophone and Francophone models (Fallwickl et al., 2021). Basic education comprises nursery (2 years, ages 4–6) and primary education (6 years, ages 6–12), followed by secondary education divided into two cycles: the first cycle (5 years in Anglophone, 4 years in Francophone) and the second cycle (2 years in Anglophone, 3 years in Francophone) (MINESEC, 2020a,b). Governance is centralised under the Ministry of Basic Education (MINEDUB) and the

Ministry of Secondary Education (MINESEC), guided by the 1996 law (updated in 1998) and the 2010 act (MINEDUB, 2025b). The curriculum emphasises literacy, numeracy, and life skills, with recent reforms introducing a harmonised primary curriculum (2018) and a competence-based approach for secondary education (2023) (Alemnge, 2019; MINESEC, 2023a). Assessments include the First School Leaving Certificate, General Certificate of Education (GCE) Ordinary and Advanced Levels, and the Baccalauréat for Francophone learners (Fallwickl et al., 2021).

Chad

Chad's education system consists of preschool (3 years, ages 3–5), primary education (6 years, ages 6–12), middle school (4 years, ages 12–16), and secondary education (3 years, ages 16–19), (MENPC, 2023). The Ministry of National Education and Civic Promotion (MENPC) oversees education. The system is guided by the National Curricular Framework (2023), which emphasises a competence-based approach aligned with Sustainable Development Goal 4 and Vision 2030 (MENPC, 2023). Instruction is bilingual (French and Arabic). Primary education focuses on literacy and numeracy, while middle and secondary education expand to sciences, humanities, and vocational subjects (MENPC, 2004; MENPC, 2008). Assessments include the Certificat d'Études Elémentaire et Primaire Tchadien (CEPE) at primary level and the Baccalauréat at the end of secondary education (MENPC, 2023).

The Gambia

The Gambia operates a 3-3-3-3 structure: Early Childhood Development (ages 3–6), Lower Basic (Grades 1–3), Upper Basic (Grades 4–6), Junior Secondary (Grades 7–9), and Senior Secondary (Grades 10–12) (MOBSE, 2022a). Nine years of basic education is free and compulsory, supported by the Education Sector Policy (2016–2030) and the Basic and Secondary Education Act (2018) (GEM Report, 2025). The Ministry of Basic and Secondary Education (MoBSE) governs education, (MOBSE & MOHERST, 2017). The curriculum framework (revised in 2022) promotes a shift from knowledge-based to competence-based learning, emphasising literacy, numeracy, ICT, and life skills (MOBSE, 2022a). Assessments include National Assessment Tests (Grades 3, 5, and 8), The Gambia Basic Education Certificate Examination (Grade 9), and the West African Senior School Certificate Examination (WASSCE) (MOBSE, 2019; MOBSE, 2024).

Ghana

Ghana's education system follows a structure of kindergarten (2 years), primary (6 years), junior high school (3 years), senior high school (3 years), and tertiary education. The Ministry of Education oversees the sector, supported by agencies such as the Ghana Education Service and the National Council for Curriculum and Assessment (NaCCA) (Raudonyte, 2021). The National Pre-Tertiary Education Curriculum Framework (2019) introduced a standards-based curriculum emphasising the "4Rs" (Reading, wRiting, aRithmetic, and cReativity) and core competencies such as critical thinking, problem-solving, and digital literacy (MOE, 2019a). Basic education (kindergarten to junior high) is free and compulsory under the Free Compulsory Universal Basic Education (FCUBE) policy (GEM Report, 2021a). Assessments include the National Standards Assessment Test (NSAT), Basic Education Certificate Examination (BECE), and the West African Senior School Certificate Examination (WASSCE) (MOE, 2019a; MOE, 2023a).

Kenya

Kenya's Competency-Based Curriculum (CBC) follows a 2-6-3-3 structure: Early Years Education (2 years pre-primary, 3 years lower primary), Middle School (3 years upper primary, 3 years junior secondary), and Senior Secondary (3 years) (KICD, 2019). The Kenya Institute of Curriculum Development (KICD) developed the Basic Education Curriculum Framework (2017, revised 2019) to align with Vision 2030 and global trends (KICD, 2017; 2019). The curriculum emphasises seven core competencies, including communication, critical thinking, and digital literacy. Assessments include the Kenya Early Years Assessment (KEYA) at Grade 3, School-Based Assessments (SBA), and national summative assessments at the end of junior and senior secondary (KNEC, 2021).

Lesotho

Lesotho's education system comprises Early Childhood Care and Development (ages 0–4), primary education (Grades R–7), and secondary education (Grades 8–12), with academic and technical streams (MOET, 2021). The

Ministry of Education and Training (MoET) governs education under the Education Act (2010) and the Lesotho Basic Education Curriculum Policy (2021) (MOET, 2021). The curriculum is competency-based, focusing on literacy, numeracy, life skills, and entrepreneurship (MOET, 2013; MOET, 2016). Primary education is free and compulsory, while secondary education is also free (GEM Report, 2021c). Assessments include continuous assessments and the Lesotho General Certificate of Secondary Education (LGCSE) at the end of upper secondary.

Morocco

Morocco's education system includes pre-primary (2 years), primary (6 years), lower secondary (3 years), and higher secondary (3 years) (Sassi et al., 2021). The Ministry of National Education, Preschool and Sports (MNEPS) oversees education, guided by the National Charter for Education and Training (1999), and the Strategic Vision for 2015–2030 (Mullis et al., 2016). The curriculum emphasises values, competencies, and active learning, with Arabic as the main language of instruction, alongside Amazigh and French (Sassi & Chaibi, 2016). Assessments include the Certificat d'Études Primaires, Certificate of Secondary Education, and the Moroccan Baccalaureate (MNEPS, 2009a-c).

Rwanda

Rwanda's education system consists of pre-primary (3 years), primary (6 years), and secondary (6 years: 3 years lower secondary, 3 years upper secondary) (MINEDUC, 2015). The Ministry of Education (MINEDUC) oversees education, supported by agencies like the Rwanda Education Board (REB). The Competence-Based Curriculum (2015) emphasises literacy, numeracy, ICT, and entrepreneurship, with English as the main language of instruction (MINEDUC, 2015). Nine years of basic education is free and compulsory (MINEDUC, 2017). Assessments include national exams at the end of primary and lower secondary, as well as continuous assessments (REB, 2015a–d).

Senegal

Senegal's education system includes preschool (3 years), primary (6 years), and secondary (4 years middle education, 3 years upper secondary), followed by tertiary education (Djité, 2019). The Ministry of National Education (MEN) governs education under the PAQUET-EF 2018–2030 policy (Diagne et al., 2022). The curriculum is competence-based, focusing on disciplinary, interdisciplinary, and transversal competencies (MEN, 2016a,b). Assessments include the Certificat de Fin d'Études Élémentaires (CFEE) at the end of primary and the Brevet de Fin d'Études Moyennes (BFEM) at the end of lower secondary (Djité, 2019).

Zambia

Zambia's education system follows a 3-6-4-2 structure: Early Childhood Education (3 years), primary ((6 years), secondary (4 years ordinary level, 2 years advanced level), and tertiary education (MOE, 2023). The Ministry of Education governs education under the Education Act (2011) and the Zambia Education Curriculum Framework (2023) (MOE, 2023). The curriculum is competence-based, emphasising analytical thinking, creativity, digital literacy, and entrepreneurship (CDC, 2024a). Assessments include National Competence Assessments at Grades 1 and 3, School-Based Assessments, and national examinations for progression (MOE, 2022).

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CHAPTER 3. METHODOLOGY

In this chapter the approach to the analysis of the countries' curricula is described. Firstly, the sources that were collected and the available frameworks are summarised. Thereafter the specific strategies employed for mathematics and reading. Whilst the general flow of the approach was similar, additional techniques had to be applied for the analysis of the language curricula. Finally, the challenges and limitations of the approach are presented.

3.1. Sources

As part of the framework development process, numerous sources of information were identified and consulted. These include curricula, syllabi, frameworks, policy documents, strategic documents, articles, international reports and others (see appendices). The documents informed the development of the framework to a varying extent. Some informed the conceptualisation, some formed the basis of the analysis or were analysed, and others provided much needed context and background information.

Most documents (particularly documents that provided supporting or background information) were obtained or accessed via the internet sources, from the institutional websites and libraries. However, in the case of curricula, syllabi and assessment frameworks, it was necessary to engage country contacts, in order to gain access to these documents as many of them were either not publicly available or easily accessible. Country contacts also played an important role in ensuring that the frameworks analysed were the most up to date versions available. This was important even when documentation was available online – as they may have been outdated.

3.2. Curriculum and assessment frameworks

As part of the development of the Continental Assessment Framework a request was made to several countries (see Table 7) identified by UNESCO and the AEAA to provide the project team with access to their latest national Curriculum and Assessment framework documents for basic education (grades 1-9 or equivalent). More specifically, the following was requested:

- The latest available curriculum frameworks for basic education (or equivalent, i.e., primary, lower secondary).
- Grade-specific curricula (sometimes available in the form of syllabi/teaching syllabi) for numeracy/mathematics and reading/literacy/language for grades 3, 6 and 9 (or their equivalent grades/forms).
- Specific assessment frameworks for basic education frameworks for basic education (sometimes called assessment syllabi) for numeracy/mathematics and reading/language/literacy for grades 3, 6 and 9 (or their equivalent grades/forms).

These requests were made to several countries representing a range of regions, countries and languages across the continent. If country contacts had not provided any documentation, websites belonging to the relevant government bodies were accessed to obtain documents (see Table 8). In all instances, no specific assessment frameworks were received (with one exception), accessible or available to analyse that were utilisable.

In addition to the curriculum and assessment frameworks, additional documentation was consulted. These include presentations, reports and strategic documents amongst others. In particular, the Global Proficiency Framework (GPF or framework) for Reading and Mathematics was also utilised extensively, as it served as the key reference for analysis and comparison underpinning the development of the Continental Assessment Framework.

Table 7. Source of documentation

Country	Source of documentation
Cameroon	Country contact
Chad	Country contact
Gambia	Country contact
Ghana	Country contact and NACCA website
Kenya	Country contact
Lesotho	Country contact
Morocco	UNESCO contact
Rwanda	Rwanda Basic Education Board's eLearning platform
Senegal	Country contact
Zambia	Country contact

Table 8. Curriculum documents obtained for mathematics and reading

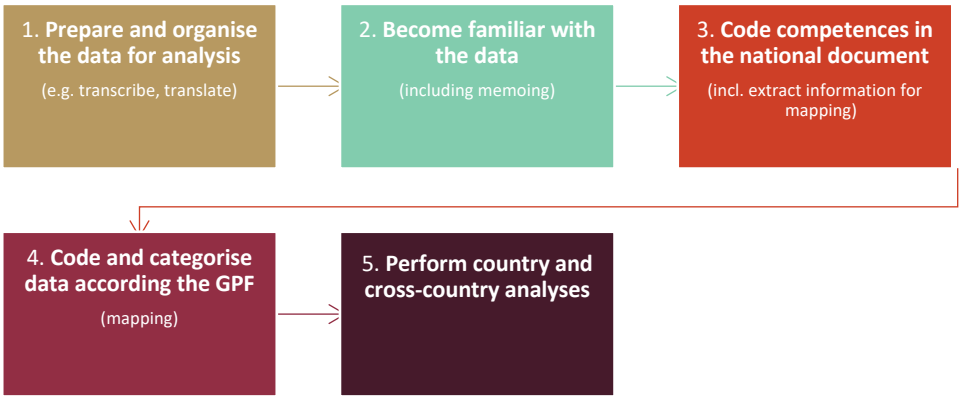
Country	Document Name	Year	Reading	Mathematics
Cameroon	Teaching Syllabus: English Language Form 1, 2, 3, 4, & 5	2023	✓	✓
	Cameroon Primary School Curriculum. English Subsystem. Level 1: Class 1-2	2018	✓	✓
	Cameroon Primary School Curriculum. English Subsystem. Level 2: Class 3-4	2018	✓	✓
	Cameroon Primary School Curriculum. English Subsystem. Level 3: Class 5-6	2018	✓	✓
	Mathematics Teaching Syllabus Form 1 and Form 2	2023		✓
	Mathematics Teaching Syllabus Form 3, 4 and 5	2023		✓
	Cameroon Nursery School Curriculum. English Subsystem	2018		
Chad	Cadre National d'Orientation Curriculaire (CNOC)	2023	✓	✓
	Curriculum de l'Enseignement Fondamental. Niveau : 1. Enseignement Primaire. Cours Préparatoires 1ere et 2eme Années	2008	✓	✓
	Programmes Réactualisés de l'Enseignement Moyen. (6, 5, 4 et 3)	2008	✓	✓
	Programmes Réactualisés de l'Enseignement Primaire	2004	✓	✓
Gambia	National Assessment Policy for Basic and Secondary Education 2024-2030	2024		
	English Language Syllabus. Stage 3: (Grades 4-6)	2022	✓	
	English Language Syllabus. Stage 4: (Grades 7-9)	2022	✓	
	English Language Syllabus. Stage 2: (Grades 1-3)	2021	✓	
	Curriculum Framework for Basic Education in The Gambia	2022	✓	✓
	Mathematics Syllabus. Stage 2: (Grades 1-3)	2021		✓
	Mathematics Syllabus. Stage 3: (Grades 4-6)	2021		✓
	Mathematics Syllabus. Stage 4: (Grades 7-9)	2021		✓
Ghana	Mathematics for Primary Schools (Basic 1 -3)	2019		✓
	Mathematics for Primary Schools (Basic 4 -6)	2019		✓
	Mathematics Curriculum for Secondary Education (SHS 1-3)	2023		✓
	Mathematics Common Core Programme (CCP)	2020		✓
	Mathematics Curriculum for Secondary Education (SHS 1-3)	2023		✓
	English Language Curriculum for Primary Schools (Basic 1 -3)	2019	✓	
	English Language Curriculum for Primary Schools (Basic 4 -6)	2019	✓	
	English Language Common Core Programme (CCP)	2020	✓	
	English Languages Curriculum for Secondary Education (SHS 1-3)	2023	✓	
Kenya	Basic Education Curriculum Framework	2017	✓	✓
	Competency Based Assessment Framework for Early Years Education in Kenya	2021	✓	✓
	Primary School Education Curriculum Design. Mathematical Activities. Grade 3	2024		✓
	Primary School Education Curriculum Design. Mathematics. Grade 6	2024		✓
	Junior School Curriculum Design. Mathematics. Grade 9	2024		✓
	Primary School Education Curriculum Design. English Language Activities.1, 2, 3	2024	✓	

	Primary School Education Curriculum Design. English Language. Grade 6	2024	✓	
	Junior School Curriculum Design. English. Grade 9	2024	✓	
Lesotho	Integrated Primary Curriculum. Grade 3 Syllabus	2013	✓	✓
	Revised Syllabus for Grade 6	2015	✓	✓
	Integrated Primary Curriculum. Grade 3 Syllabus 2013	2013	✓	✓
	Integrated Primary Curriculum. Grade 6 Syllabus 2016	2016	✓	✓
	Grade 9 English Language Syllabus	2019	✓	
	Grade 9 Mathematics Syllabus	2020		✓
	Lesotho Basic Education Curriculum Policy	2021	✓	✓
	Grade 9 Sesotho Syllabus	2020	✓	
	The Lesotho Education Language Policy	2019	✓	
Morocco	Primary Education Curriculum	2021	✓	✓
	Lower Secondary Curriculum	2009	✓	✓
	Mathematics education programmes and guidelines. Secondary education	2009		✓
	Primary Education Curriculum (Arabic)	2021	✓	
	Primary Education Curriculum (French)	2021	✓	
	Primary Education Curriculum (Mathematics)	2021		✓
Rwanda	Mathematics Syllabus for Ordinary Level S1-S3	2015		✓
	Subsidiary Mathematics Syllabus S4-S6	2015		✓
	Mathematics Syllabus for Lower Primary (P1-P3) Second Edition	2022		✓
	Mathematics Syllabus for Upper Primary (P4-P6) Second Edition	2022		✓
	Subsidiary Mathematics Syllabus for PCB Combination	2022		✓
	Subsidiary Mathematics Syllabus for LFK, HLP & HGL	2022		✓
	Competence-Based Curriculum Framework. Pre-Primary to Upper Secondary	2015	✓	✓
	English Language Lower Primary Level P1-P3	2015	✓	
	English Language Upper Primary Level P4-P6	2015	✓	
	English Language Ordinary Level S1-S3	2015	✓	
Senegal	Guide Pédagogique. Enseignement Élémentaire. 1ère étape CI-CP	2016		✓
	Guide Pédagogique. Enseignement Élémentaire. 2ème étape CE1-CE2	2016		✓
	Guide Pédagogique. Élémentaire. étape 3	2016		
Zambia	Lower Primary Education Syllabi. Grades 1-3	2024	✓	✓
	Mathematics I Syllabus. Secondary Education Ordinary Level Form 1-4	2024		✓
	English Language Syllabus. Secondary Education Ordinary Level Form 1-4	2024	✓	
	Literature in English Syllabus. Secondary Education Ordinary Level Forms 1-4	2024	✓	
	2023 Zambia Education Curriculum Framework	2023		
	Grade 7 Assessment Schemes	n.d.		
	Lower Primary Syllabi Grade-1-3	2024	✓	✓
	Mathematics Syllabus-Grade 4-6 Pilot Version	2023		✓
	English Language Primary School Syllabus Grade 4-6 Pilot Version	2023	✓	
	English Language Syllabus Secondary Education Ordinary Level Form 1-4	2024	✓	

3.3. Strategies employed

A summary and overview of the general analytical process is depicted in Figure 1.

Figure 1. General analytical process



The analytical process began with preparing and organising the data for analysis, which includes tasks such as transcription and translation. Once the data were ready, the next step involved becoming familiar with it, often through "memoing" to capture initial impressions and insights. Following this, coded competences outlined in the national document were examined, with relevant information extracted for mapping purposes. The data were then coded and categorised according to the analytical tool (GPF), a process referred to as mapping. Finally, country and cross-country analyses are performed to identify patterns and draw comparative insights across grades and countries. Importantly, given the varying nature of the content (i.e. reading/language curricula vs mathematics) this approach was modified appropriately.

The following definitions, domains and constructs guided the analyses of the mathematics and reading curricula. The GPF (described in Chapter 1) for mathematics and reading provided the analytical frameworks for the analyses of the countries' mathematics and reading curricula and the basis for the frameworks elaborated in Chapters 4 and 5. Table 9 lists the definitions of the Global Proficiency levels for mathematics and reading The GPF is organised in terms of domains, constructs, subconstructs, Skills/Knowledge. Table 10 and Table 11 lists the domains and constructs for mathematics and reading.

Table 9. Proficiency levels in the Global Proficiency Framework

Definitions	
Below partially meets global minimum proficiency	Learners lack the most basic knowledge and skills. As a result, they generally cannot complete the most basic grade level tasks.
Partially meets global minimum proficiency	Learners have limited knowledge and skills. As a result, they can partially complete basic grade-level tasks.
Meets global minimum proficiency	Learners have developed sufficient knowledge and skills. As a result, they can successfully complete the most basic grade-level tasks.
Exceeds meets global minimum proficiency	Learners have developed superior knowledge and skills. As a result, they can complete complex grade-level tasks.

Table 10. Mathematics domains and constructs in the analytical framework

Domain	Construct
N. Number and Operations	N.1 Whole numbers
	N.2 Fractions
	N.3 Decimals
	N.4 Integers
	N.5 Exponents and roots
	N.6 Operations across number
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter

Domain	Construct
	M.2 Time
	M.3 Currency
G. Geometry	G.1 Properties of shapes and figures
	G.2 Spatial visualizations
	G.3 Position and direction
S. Statistics and Probability	S.1 Data management
	S.2 Chance and probability
A. Algebra	A.1 Patterns
	A.2 Expressions
	A.3 Relations and functions

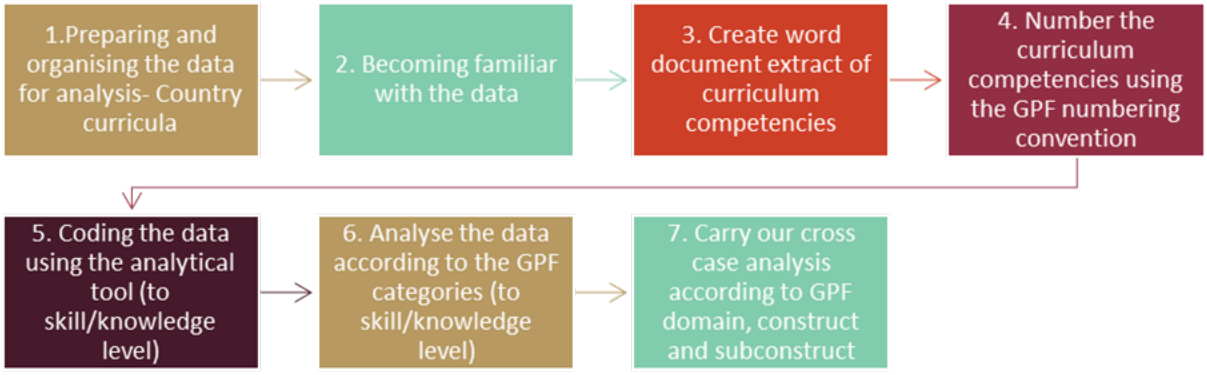
Table 11. Reading domains and constructs in analytical framework

Domain	Constructs
Comprehension of spoken or signed language	Retrieve information at word level
	Retrieve information at sentence or text level
	Interpret information at sentence or text level
Decoding	Precision
	Fluency
Reading comprehension	Retrieve information
	Interpret information
	Reflection on information

3.3.1. Mathematics

The mathematics curricula were analysed using a quantitative coding system of coding to enable processing and analysis of the curriculum (Figure 2). The coding and analysis process is illustrated in the flow diagram below and expanded in the explanation that follows the flow diagram.

Figure 2. Analysis of mathematics curricula



The dataset was created by extracting and numbering the content of the country curricula, i.e. the mathematical concepts and processes to be taught over the course of a year. A systematic coding and categorising approach were used to process the data.

By using content analysis, the data were analysed quantitatively by using categories to support the decision of objective coding decisions which allow for the quantification of the data, largely in the form of frequency counts. A deductive approach was used as the codes were pre-generated from the GPF mathematics coding tool.

All curricula were transcribed and formatted using comparable naming conventions. The most recent curriculum for each country with detail on content to be taught per grade was used. Each curriculum was analysed for alignment to the domain, construct, subconstruct, knowledge and skill indicators of the GPF for mathematics.

The GPF indicators were used as codes to quantify the data via a deductive coding process. Coded data was captured in the Excel GPF mapping tool. Thereafter, capturing and frequency count/ item statistics for the codes generated occurred. Excel data was exported to Power BI for further cleaning, analysis and visualisations.

Frequencies and percentages, unless otherwise stated, are based on distinct counts of competences mapped to the GPF categories. Namely, Domains, Constructs, Subconstructs and Skill/Knowledge. For example, if analyses are performed at the Domain level category, then even if a competency is mapped to several subcategories (i.e. Constructs, Subconstructs or Skill/Knowledge categories) of the GPF, it is only counted once towards that category.

When presented in Pie and Doughnut charts, percentages are normalised (to not exceed 100%) but still maintain proportions. Beyond the purpose of visualisation, the normalisation of values allows for better cross-country comparison – given the variability in the number (frequency) of competencies mapped across countries, grades and languages.

The Excel mapping tool is illustrated in the figure below, followed by an explanation of the mapping process. On this sheet of the mapping tool, the entire set of GPF competences (Grades 1 to 9) are listed sequentially. The country curriculum was mapped into this grid, against the GPF descriptors. Each numbered outcome (using the numbered word document curriculum extract) from the country curriculum was mapped. This enabled a cross check that the entire curriculum was mapped. Each numbered curriculum outcome was mapped against the most appropriate descriptor in the GPF mapping tool according to the process described below.

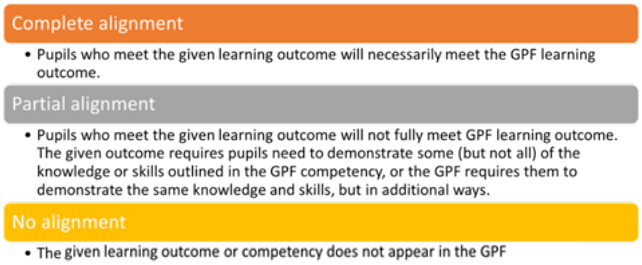
If no GPF descriptor was present to allow for adequate alignment to the GPF, a new descriptor was created, in sequence the most closely aligned GPF descriptor, using the sequential GPF numbering system, but adding an 'X' at the end of the descriptor number to distinguish it from the listed GPF descriptors. The mapping proceeded following the same steps but aligned to the newly created descriptor.

Figure 3. Global Proficiency Framework mapping tool

Domain	Construct	Subconstruct	Skill/knowledge	Code	Proficiency descriptor for "Meets global minimum proficiency"	CODING			
						Corresponding code National Mapping. *(Note: Place code next to corresponding GPF competency/learning outcome)*	**Learning outcome** as described in national document	Indicate level of alignment with corresponding GPF competency/learning outcomes (Options: none, complete, partial)	Comment. In particulary, in case of no or partial alignment, summarize differences between GPF and curriculum competency
Algebra	A.2 Expressions	A.2.1 Evaluate, model, and compute with expressions	A.2.1.1 Use linear expressions to represent problems	A.2.1.1.7	Use linear expressions to represent problem situations with a single variable *(e.g., The cost of buying cinema tickets online is £12 per ticket plus a £2 booking fee. Write this as an expression where x is the number of tickets purchased)*.				
				A.2.1.1.8	Use expressions to represent problem situations with multiple variables *(e.g., Akeelah bought 4 blouses for x dollars and a wristwatch for y dollars. Represent this as an expression)*.				
			A.2.1.2 Add, subtract, mutliply and divide linear expressions	A.2.1.2.7a	Add linear expressions *(e.g., (3x + 4y) + (2x + 5y))*.				
				A.2.1.2.7b	Subtract linear expressions *(e.g., (3x + 4y) - (2x + 5y))*.				
				A.2.1.2.8a	Multiply linear monomials *(e.g., multiply (3x)(5y))*				
				A.2.1.2.8b	Divide linear monomials				
				A.2.1.2.8c	Simplify linear expressions by using the distributive property *(e.g., simplify 2x(3x + 4))*.				
				A.2.1.2.9	Multiply two binomial linear expressions *(e.g., multiply (3x - 4y)(2x + 5y))*.				
			A.2.1.3 Simplify and factor exponential expressions	A.2.1.3.8	Evaluate and simplify exponential expressions using the Laws of Exponents *(e.g., evaluate $2x^3$ when x = 7; simplify $(2x^3)^2$)*.				
				A.2.1.3.9a	Factor linear expressions using the greatest common factor algebraically *(e.g., factor 4x2+ 8xy - 6x to 2x(2x + 4y - 3))*				
				A.2.1.3.9b	Factor exponential expressions using the greatest common factor algebraically				

The mapping proceeded as follows (Figure 3). In column H, the country curriculum outcome number was entered. If more than one curriculum outcomes map to the same GPF descriptor, these are to be separated by a semi-colon followed by a space. In column I, the country curriculum descriptor was entered. The entire descriptor must be pasted into the cell. If more than one curriculum outcomes map to the same GPF descriptor, the descriptors are to be inserted in full, separated by a semi-colon followed by a space. In column J, the coding decisions on the alignment with GPF were entered (None, Complete or Partial) (Figure 4). Finally, in column K, any relevant justifications of the coding decision for reference were entered.

Figure 4. Coding decisions when mapping of competencies onto the GPF



For each country and grade level, two mathematics experts reviewed the curriculum extract on the Word document and the national mapping on Excel. An example for a particular learning outcome is provided below to illustrate the mapping process.

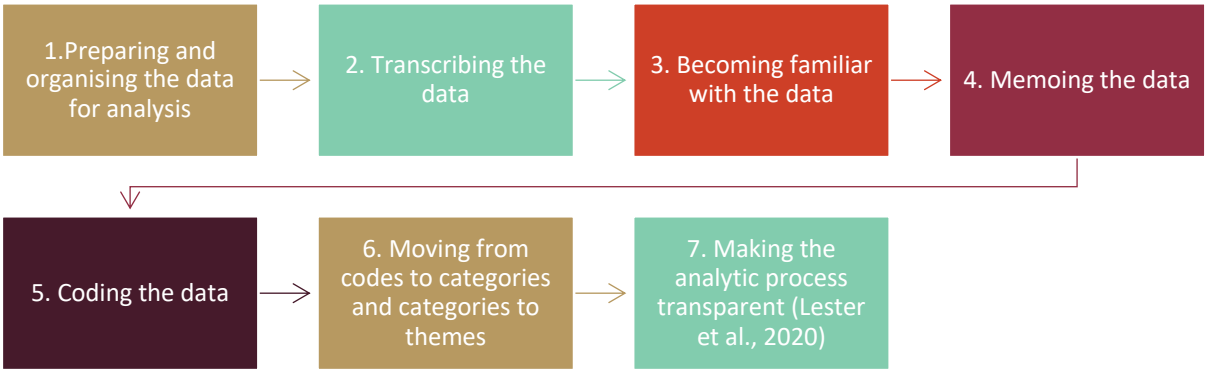
Table 12. Mapping choices for a curriculum outcome according to the GPF tool

Which domain?	N Number and Operations
Which construct?	N.1 Whole numbers
Which subconstruct?	N.1.2 Represent whole numbers in equivalent ways
Which sub-subconstruct?	N1.2.2 Using place value concepts
Which competency?	N1.2.2.4 Use place-value concepts for hundreds, tens, and ones (e.g., compose or decompose a three-digit whole number using a number sentence such as 254 = 2 hundreds, 5 tens, and 4 ones; 254 = 200 + 50 + 4; determine the value of a digit in the hundreds place).

3.3.2. Reading

The nature of the language curricula and seeking the reading specific information within the language curricula required a different approach towards the similar goal of the analysis. Figure 5 illustrates the flow of the analytical approach taken to identify and extract the reading specific information from the country curricula before mapping it against the global proficiency framework.

Figure 5. Analysis of reading curricula



The analysis of the language curricula was conducted applying a qualitative content analysis utilising different strategies used to analyse text, in this instance the language curricula. It is a systematic coding and categorising approach used for exploring large amounts of text information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication. By using content analysis, it is possible to analyse data qualitatively and at the same time quantify the data largely in the form of frequency counts. This analysis method uses a descriptive approach in both coding of the data and its interpretation of quantitative counts of the codes (Vaismoradi, 2013).

A predominantly deductive approach was used as the codes were pre-generated from the GPF reading tool as opposed to inductive coding in which codes are assigned as analysis occurs based on the data presented. The

inductive approach was used for curriculum content outside the parameters of the GPF deductive codes. The inductive coding allowed for a greater depth of understanding of the nature of the language curricula analysed in relation to reading content as well as insights into potential for reading foci outside of the parameters of the GPF. The integrative nature of language curricula wherein reading can be targeted across multiple focus areas of the curriculum meant this was necessary for broader insights.

All curricula were transcribed and aligned/ formatted to comparable naming conventions. Each curriculum was analysed for alignment to the domain, construct, knowledge and skill indicators of the GPF for reading. The GPF indicators were converted to qualitative codes via a deductive coding process. As opposed to just the Reading and Listening and Speaking sections/ components/ focus areas etc. of the curricula, all language components (e.g. grammar; language structure; writing) were analysed due to the integrative nature of language curricula wherein productive and receptive aspects of reading manifest throughout.

Over and above the use of the GPF deductive codes, inductive codes were generated to capture reading focus areas not accounted for in the GPF as well as the rest of the language focus areas. Thereafter, capturing and frequency count/ item statistics for the codes generated occurred. A thematic analysis of the non-GPF codes generated by inductive analysis led to cluster groupings of common focus areas in the curricula beyond the GPF. The content analysis was initially performed using the data analysis software ATLAS.ti, before being transcribed to Excel for further analysis (Figure 6 and Figure 7).

Figure 6. Example of analysis in Atlas

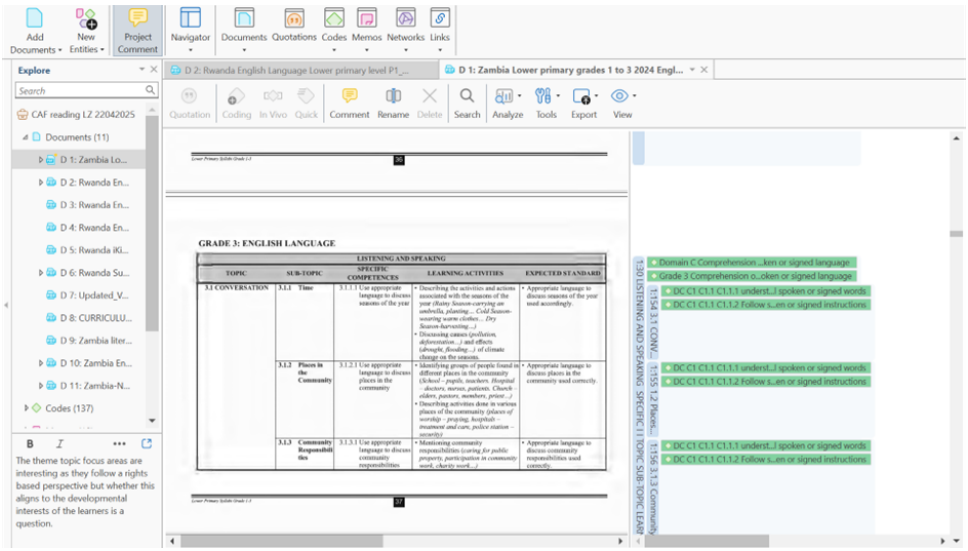


Figure 7. Example of codes extracted in Atlas

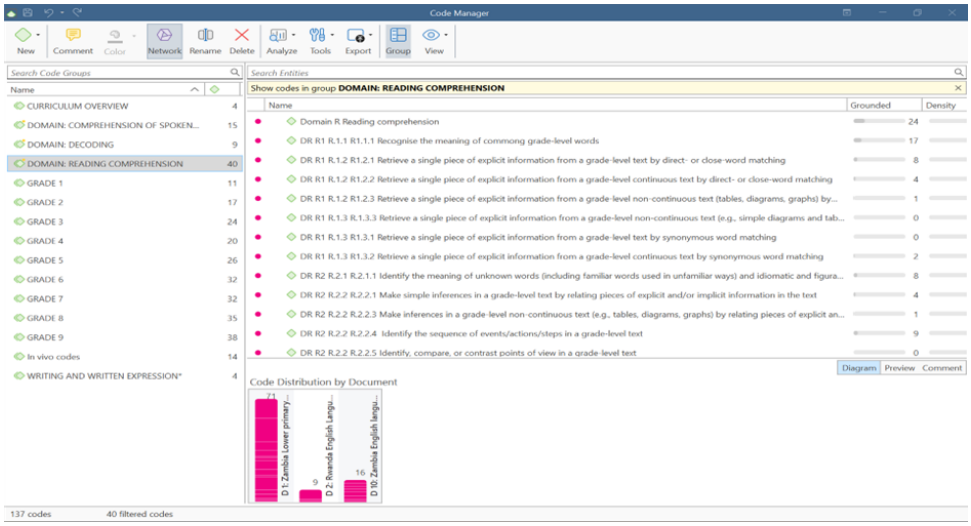
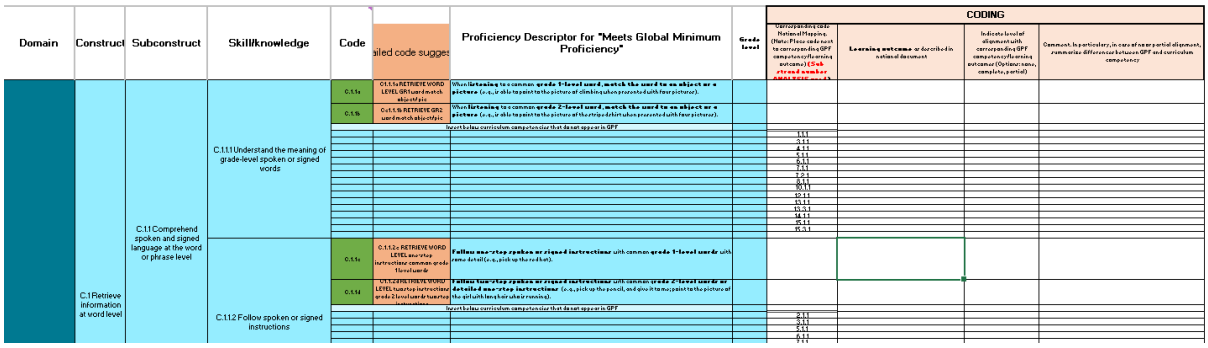


Figure 8. Example of mapping of codes in Excel



Coded data was mapped on to the GPF in Excel (Figure 8). Then the mapped competencies were assigned categories based on the following attributes:

- Whether or not they were mapped to the GPF categories.
- Whether they are mapped only (uniquely) to the GPF or to a Domain that does not belong to the GPF.

Excel data was exported to Power BI for further cleaning, analysis and visualisations. Frequencies and percentages, unless otherwise stated in the reading findings, are based on distinct counts of competences mapped to the GPF categories. Namely, Domains, Constructs, Subconstructs and Skill/Knowledge For example, if analyses are performed at the Domain level category, then even if a competency is mapped to several subcategories (i.e. Constructs, Subconstructs or Skill/Knowledge categories) of the GPF, it is only counted once towards that category.

Importantly, it must be noted that given the complex nature of the language curricula analysed that in many instances competencies were mapped to more than one GPF (or other) category. Accordingly, cumulative percentages presented in tables may exceed 100%. When presented in Pie and Doughnut charts, percentages are normalised (to not exceed 100%) but still maintain proportions. Beyond the purpose of visualisation, the normalisation of values permitted better cross-country comparison, particularly given the variability in the number (frequency) of competencies mapped across countries, grades and languages.

3.3.3. Challenges and limitations

Mathematics

Mathematics curricula generally call for the same content to be covered across the years of schooling in preparation for an exit examination (whatever form that might take, or how it may be named), although the presentation of the content does vary across countries. While the mapping of the mathematics curricula was facilitated by this similarity, the following challenges are noted.

- Unique structure/ layout/ wording of each curriculum.
- Level of detail varies across different country curricula.

Reading

The challenges posed for the analysis included:

- Unique structure, layout and wording of each curriculum
- Lack of detail: for example, there were instances where it was not clear enough how to align with the GPF indicators, which are very specific, although it was apparent a reading activity was prescribed.
- In some instances, there were goals outside of traditional language foci (e.g. mathematical concepts and civic education such as national anthems etc.). The reasons for these may in part be due to the integrated approach to curricula or due to larger national goals beyond just language.
- There was very little, if any, detailed indication of reading genres, text choices, word counts of texts, grade level indicators for texts in the curricula to allow for judgement of specific aspects of the GPF, e.g. continuous and non-continuous text references.

CHAPTER 4. MATHEMATICS

This chapter reports on the main findings from the analyses conducted on the country mathematics curricula. Firstly, the individual country analyses and mapping to the Global Proficiency Framework (GPF) are presented in 4.1. The results of the cross-country analysis are presented in 4.2. The draft framework is presented in 4.3 with a discussion about its structure in 4.3.1 followed by a discussion about its alignment with the GPF in 4.3.2.

4.1. Findings regarding the alignment of country curricula to the GPF

The findings of the mapping of the 10 country mathematics curricula using the analytical tool are presented here per country in alphabetical order. First, for each country an overview of the country curricula for both grades 3 and 6 in relation to the GPF competencies is provided. This is followed by an overlay bar graph in which the GPF expectation for the grade is shown in the blank horizontal bars and the country curriculum spread is shown in the coloured bars, superimposed on the blank bars. The way the country's competencies align (or are different) to those in the GPF is visible to the extent to which the coloured bars overlap with the blank bars. Since it is to be expected that there will always be variation in curriculum expectations across countries based on context and priorities, the differences between the country's curricula and the GPF are not to be read as criticism. The findings do however present an opportunity for reflection on choices that have been made in relation to curriculum content.

Finally, a series of bar graphs show the progression of the content covered from Grade 3 to Grade 6 in the country. Each figure presents four sets of paired columns. The first pair (top left) shows the percentage of competencies by grade and domain. Comments on this pair of bars for each country are provided. The remaining paired columns show the spread and proliferation of content descriptors across constructs, subconstructs and skills/knowledge. These are provided as a reminder that this level of data mapping and analysis per country was carried out, although there is no space to comment on them here. The detailed presentation of the per country curriculum data is provided as a backdrop to the cross-country analysis of the data which was used to draw conclusions used in the development of the Continental Assessment Framework.

It can be seen from the country mappings that all countries essentially cover the expected spread of domains and constructs of a global mathematics curriculum when compared to the GPF. This is important to bear in mind in the discussion of global, or more focused continental teaching, learning and assessment of mathematics. As mentioned above, using the GPF as an analytical framework for the development of the mapping tool allowed a comparison of the curricula of the sample countries with the GPF, which represents a global consensus of what learners must know and be able to do, to be proficient mathematicians as they progress through the grade levels, regardless of where they live in the world. However, the findings of the mapping should all be considered with an awareness that the competencies outlined in the GPF are not meant to be exhaustive - countries all have contextual needs and priorities, that may require the addition of competencies not listed in the GPF. For each country, particularities are noted where these provide useful contextual insights for consideration in the drafting of the Continental Assessment Framework.

Cameroon

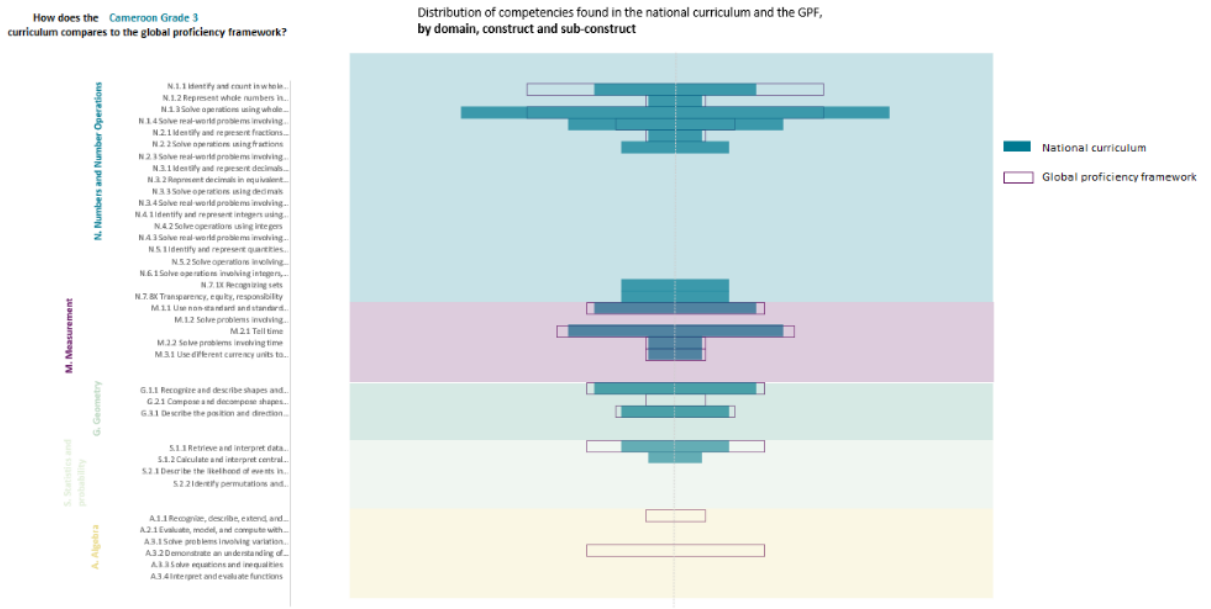
The mathematics curriculum of Cameroon covers all five of the GPF domains. It is a reasonably highly specified curriculum with 126 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF.

Grade 3

The Cameroon Primary School - Curriculum English Subsystem Level II: Class 3 & Class 4. Republic Of Cameroon, Ministry of Basic Education was used in the mapping of the Grade 3 Cameroon curriculum. There is no numbering system in the curriculum document, and so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. There were some issues with the allocation on outcomes per topic, notably that some Algebra was included in Geometry but was mapped to Algebra and that some Geometry was included in Statistics but mapped to Geometry. The overlay bar chart shows the similarities and differences between the GPF and the Cameroon Grade 3 curriculum.

There is general alignment with the GPF for Cameroon Grade 3. In some places (most notably in Number and Operations on the topics of operations with whole numbers and problem solving) it goes beyond what is expected. Cameroon Grade 3 also includes teaching on Sets which is not covered in the GPF. There are two subconstructs under Algebra that are not present in the Cameroon Grade 3 curriculum.

Figure 9. Comparison of competencies with GPF, construct level, Grade 3, Cameroon



Grade 6

Cameroon Primary School - Curriculum English Subsystem Level III: Class 5 & Class 6. Republic of Cameroon, Ministry of Basic Education was used in the mapping of the Grade 3 Cameroon curriculum. There is no numbering system in the curriculum document, and so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. There were some issues with the allocation on outcomes per topic, notably that financial calculations included in money (measurement) and some Algebra were included in Geometry, and some in Statistics and Probability. The overlay bar chart shows the similarities and differences between the GPF and the Cameroon Grade 6 curriculum.

There is general alignment with the GPF for Cameroon Grade 6, although less so than for Grade 3. The curriculum exceeds the GPF expectations of some subconstructs in the domains of Measurement, Geometry, and Statistics and Probability. As in the Grade 3 curriculum for the country, Cameroon Grade 6 also includes teaching on Sets

which is not covered in the GPF. There are five GPF subconstructs not present in the Cameroon Grade 6 curriculum and notable variation in the curriculum expectations of Number and Operations.

Figure 10. Comparison of competencies with GPF, construct level, Grade 6, Cameroon

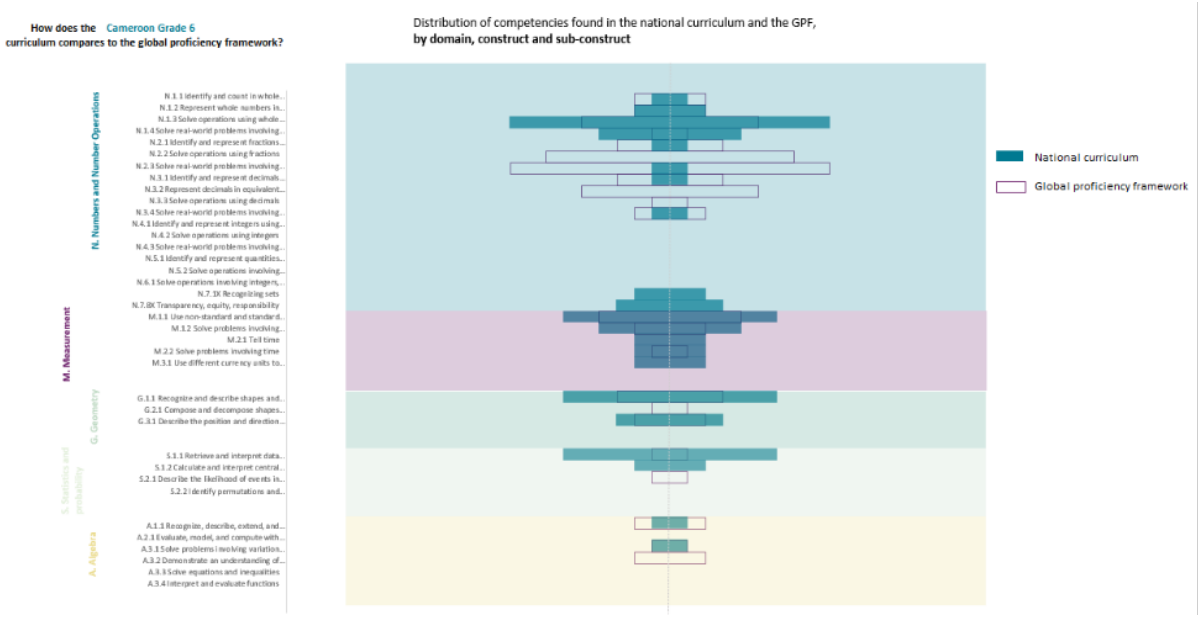
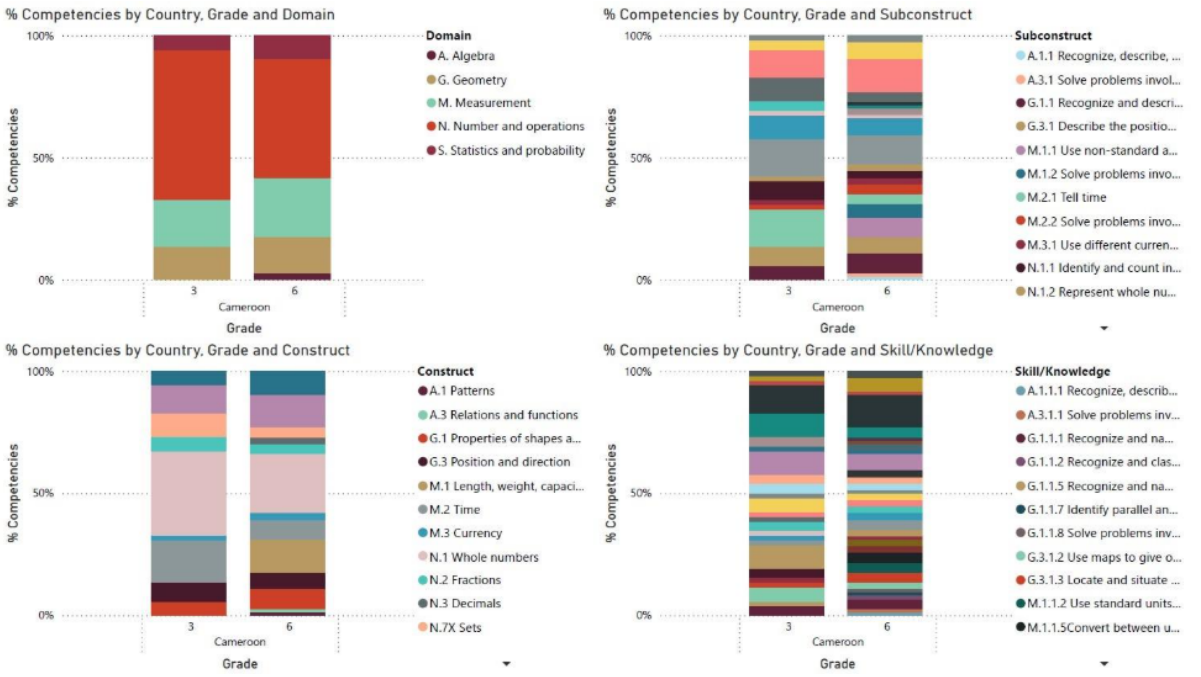


Figure 11 with the percentage of competencies by grade shows that the Cameroon curriculum follows the expected progression from Grade 3 to Grade 6. The emphasis on Number and Operations is reduced and there is greater emphasis on Algebra, Measurement, and Statistics and Probability.

Figure 11. Curriculum progression from Grade 3 to 6, Cameroon



Chad

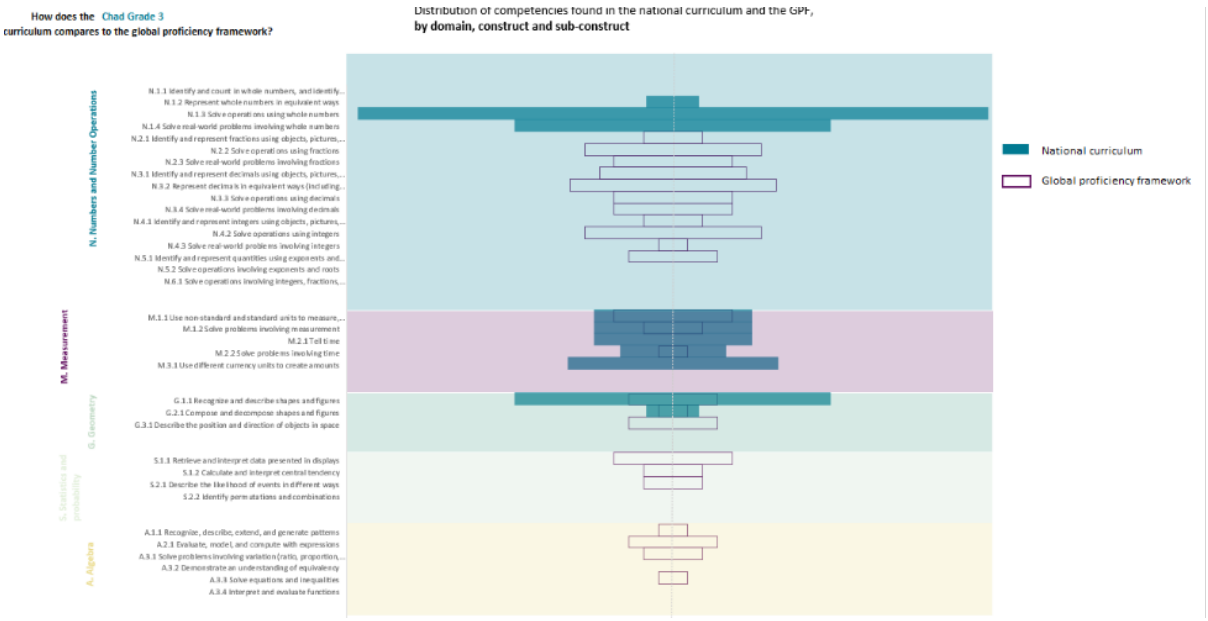
The mathematics curriculum of Chad covers all five of the GPF domains. It is a tightly specified curriculum with only 44 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF.

Grade 3

The Chad *Programmes Réactualisés de l'enseignement primaire* document (2004) République du Tchad, Ministère de l'Éducation Nationale, was used in the mapping of the Grade 3 Chad curriculum. There is no numbering system in the curriculum document, and so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. The overlay bar chart (Figure 12) shows the similarities and differences between the GPF and the Chad Grade 3 curriculum.

There is some alignment with the GPF for Chad Grade 3 although there are some gaps as well. In some places (most notably in Number and Operations on the topics of solving operations with whole numbers and problem solving) it goes beyond what is expected. Chad Grade 3 also goes beyond the GPF regarding certain subconstructs in Measurement and 'recognize and describe shapes and figures' in Geometry. The Chad Grade 3 curriculum does not cover Statistics and Probability, and Algebra.

Figure 12. Comparison of competencies with GPF, construct level, Grade 3, Chad



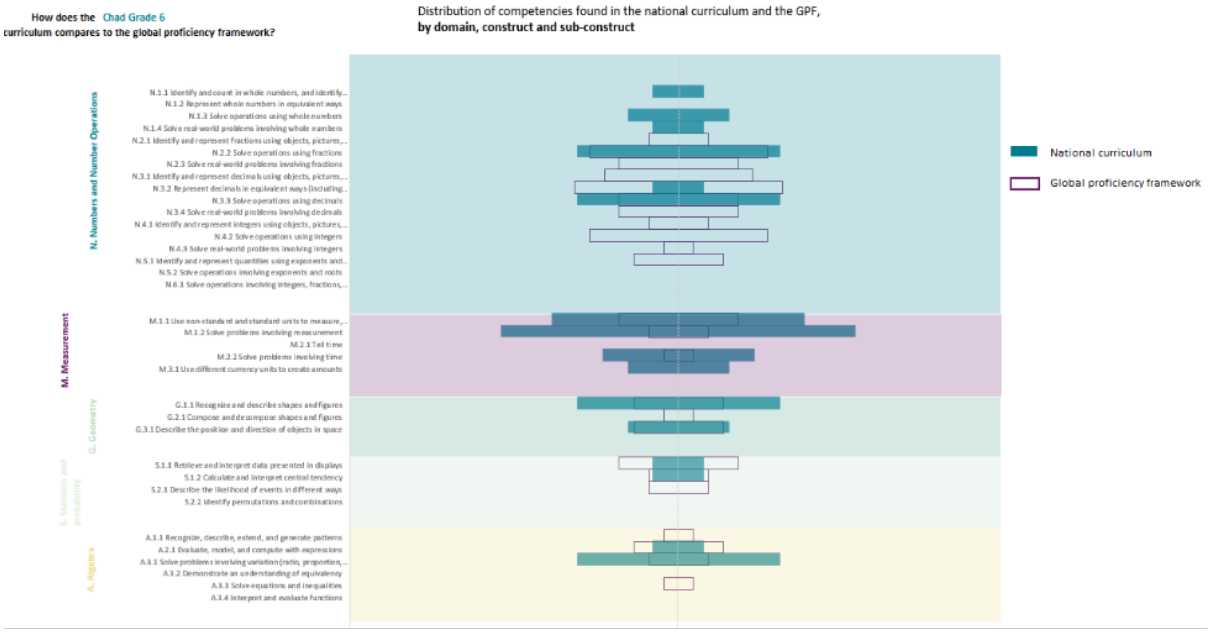
Grade 6

The Chad *Programmes Réactualisés de l'enseignement primaire* document (2004) République du Tchad, Ministère de l'Éducation Nationale was also used in the mapping of the Grade 6 Chad curriculum. There is no numbering system in the curriculum document, and so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. The overlay bar chart shows the similarities and differences between the GPF and the Chad Grade 6 curriculum.

This figure shows that there is some alignment with the GPF for Chad Grade 6. This alignment is close with the GPF in some places (such as 'solve operations using fractions', describe the position and direction of objects in space' and 'calculate and interpret central tendency'). However, there is a notable difference in Number and Operations, where the Chad Grade 6 curriculum covers some content that are below or beyond Grade 6. Some GPF content is not covered at all by the Chad Grade 6 curriculum. On the other hand, the Chad Grade 6

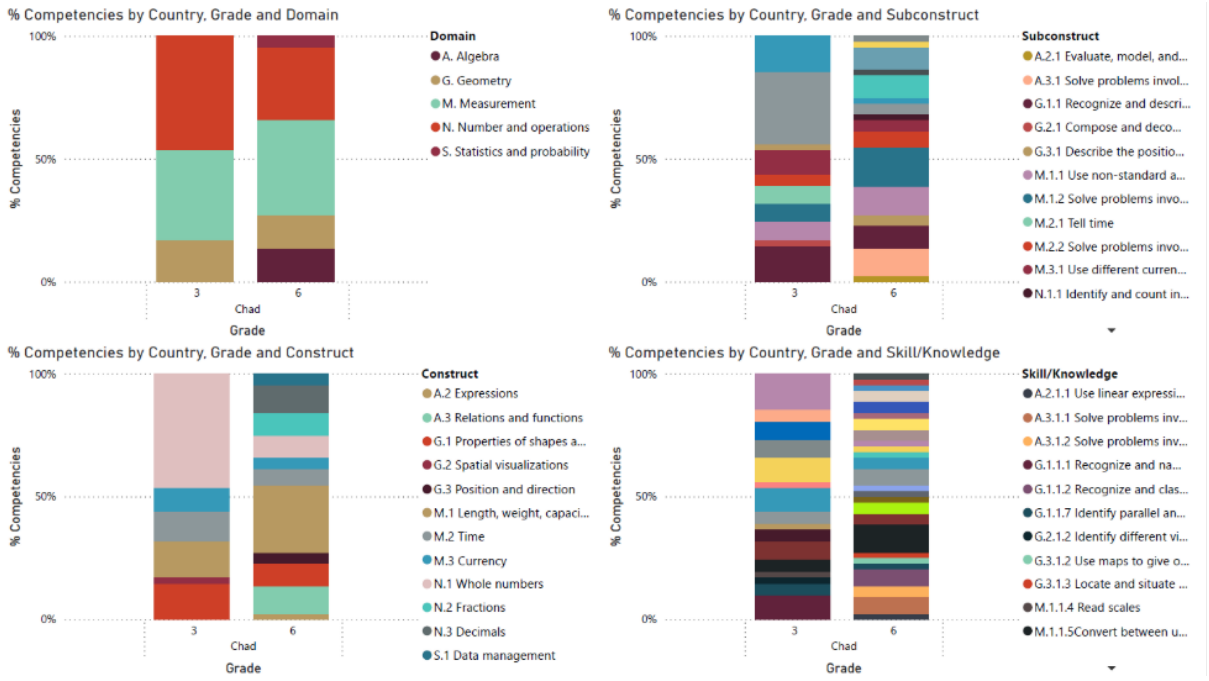
curriculum goes beyond the GPF especially regarding Measurement, ‘recognize and describe shapes and figures’, and ‘solve problems using variation’.

Figure 13. Comparison of competencies with GPF, construct level, Grade 6, Chad



The Chad curriculum follows the expected progression from Grade 3 to Grade 6 (Figure 14). The emphasis on Number and Operations is reduced and there is a slightly greater emphasis on Measurement, while Algebra and Statistics and Probability appear now.

Figure 14. Curriculum progression from Grade 3 to 6, Chad



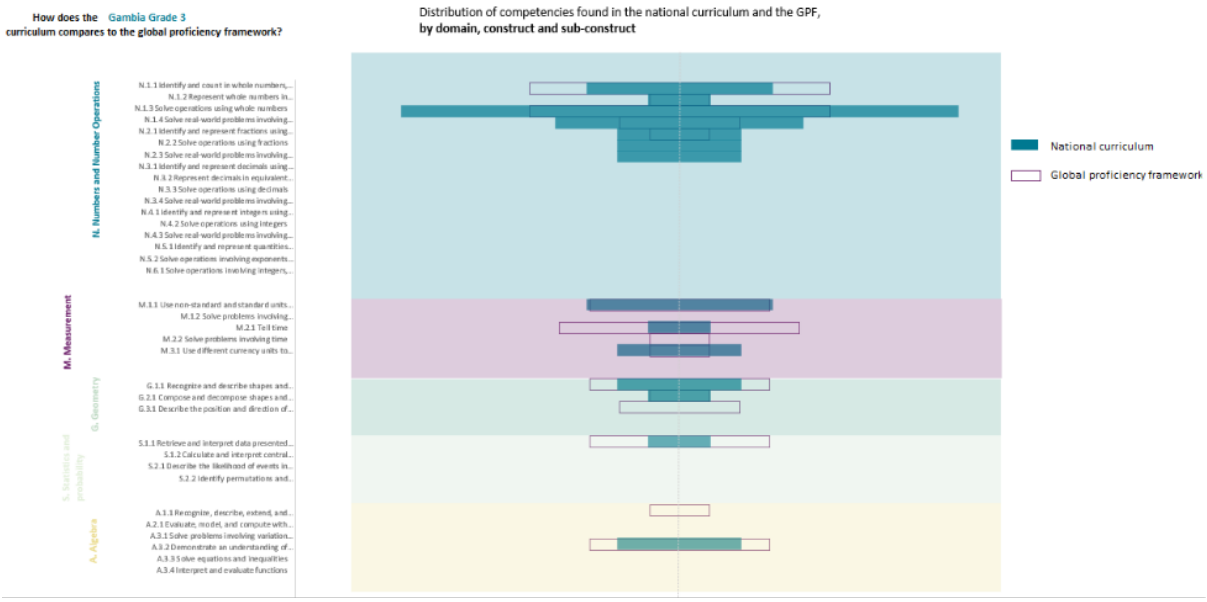
The Gambia

The mathematics curriculum of The Gambia covers all five of the GPF domains. It is a well specified curriculum with 106 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is highly focused on Number and Operations.

Grade 3

The Gambia Mathematics Syllabus Documents Grade 1-3, 2021, Ministry of Basic and Secondary Education curriculum, Research, Evaluation and Development Directory was used in the mapping of The Gambia Grade 3 curriculum. The syllabus has a numbering system which was used, with content letter specification as per the GPF mapping numbering system. The overlay bar chart (Figure 15) shows the similarities and differences between the GPF and The Gambia Grade 3 curriculum.

Figure 15. Comparison of competencies with GPF, construct level, Grade 3, Gambia



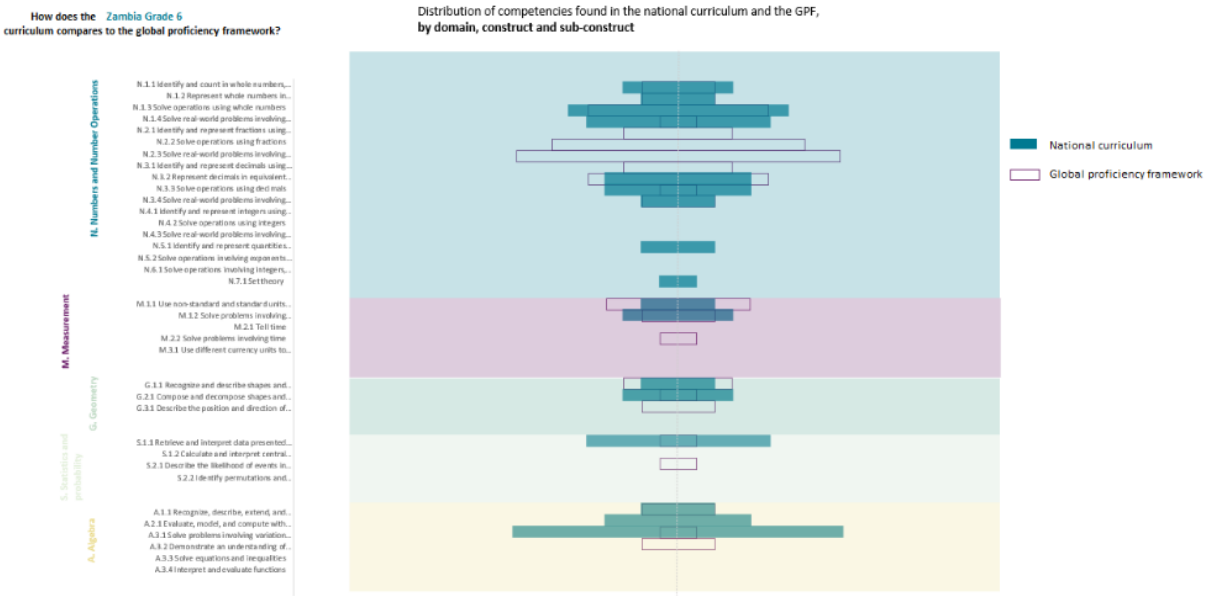
This figure shows that there is some alignment with the GPF for The Gambia Grade 3. This alignment is close with the GPF in some places (such as 'represent whole numbers', 'use non-standard and standard units of measurement', and 'compose and decompose shapes and figures'). However, there is a notable difference in Number and Operations, where the Gambia Grade 3 curriculum goes mainly over the GPF, except for 'identify and count in whole numbers'. In Measurement, the Gambia Grade 3 curriculum goes below for time but exceeds in currency.

Grade 6

The Gambia Mathematics Syllabus Documents Grade 4-6, 2021, Ministry of Basic and Secondary Education curriculum, Research, Evaluation and Development Directory was used in the mapping of The Gambia Grade 6 curriculum. The syllabus has a numbering system which was used, with content letter specification as per the GPF mapping numbering system. The overlay bar chart (Figure 16) shows the similarities and differences between the GPF and The Gambia Grade 6 curriculum.

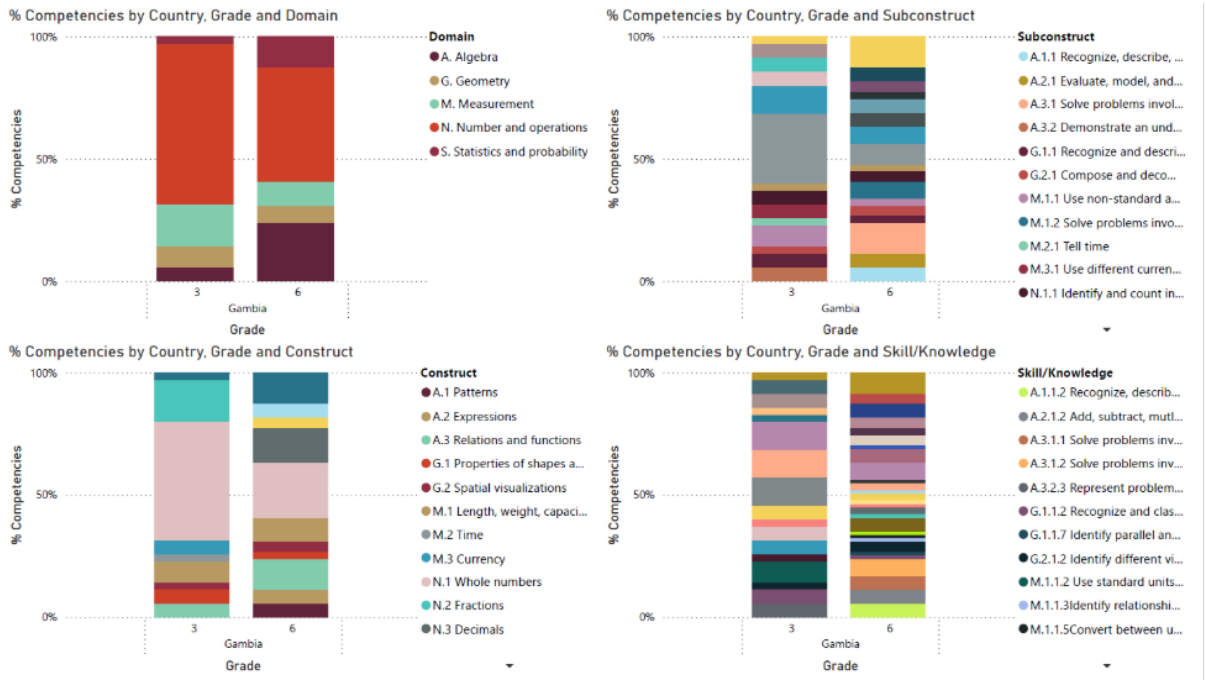
This figure shows that there is some alignment with the GPF for Gambia Grade 6. This alignment is close with the GPF in some places such as Number and Operations, Measurement and Geometry. As for Statistics and Probability and Algebra, The Gambia Grade 6 curriculum goes beyond the GPF.

Figure 16. Comparison of competencies with GPF, construct level, Grade 6, Gambia



The Gambia curriculum follows the expected progression from Grade 3 to Grade 6 (top left) (Figure 17). The emphasis on Number and Operations is reduced and there is a greater emphasis on Algebra and Statistics and Probability. Geometry and Measurement decreased over time.

Figure 17. Curriculum progression from Grade 3 to 6, Gambia



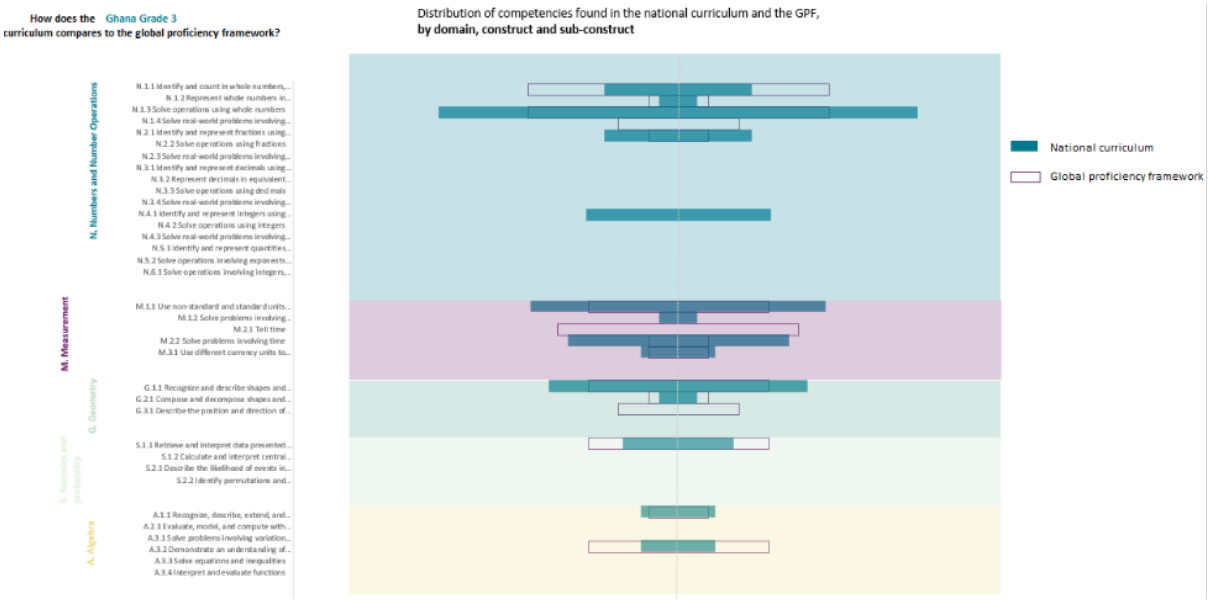
Ghana

The mathematics curriculum of Ghana covers all five of the GPF domains. It is a well specified curriculum with 143 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is highly focused on Number and Operations.

Grade 3

The Ghana Mathematics Curriculum for Primary Schools documents Basic 1-3, 2019, Ministry of Education, republic of Ghana was used in the mapping of the Grade 3 Ghana curriculum. The syllabus documents do have a numbering system, so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. The overlay bar chart (Figure 18) shows the similarities and differences between the GPF and the Ghana Grade 3 curriculum.

Figure 18. Comparison of competencies with GPF, construct level, Grade 3, Ghana



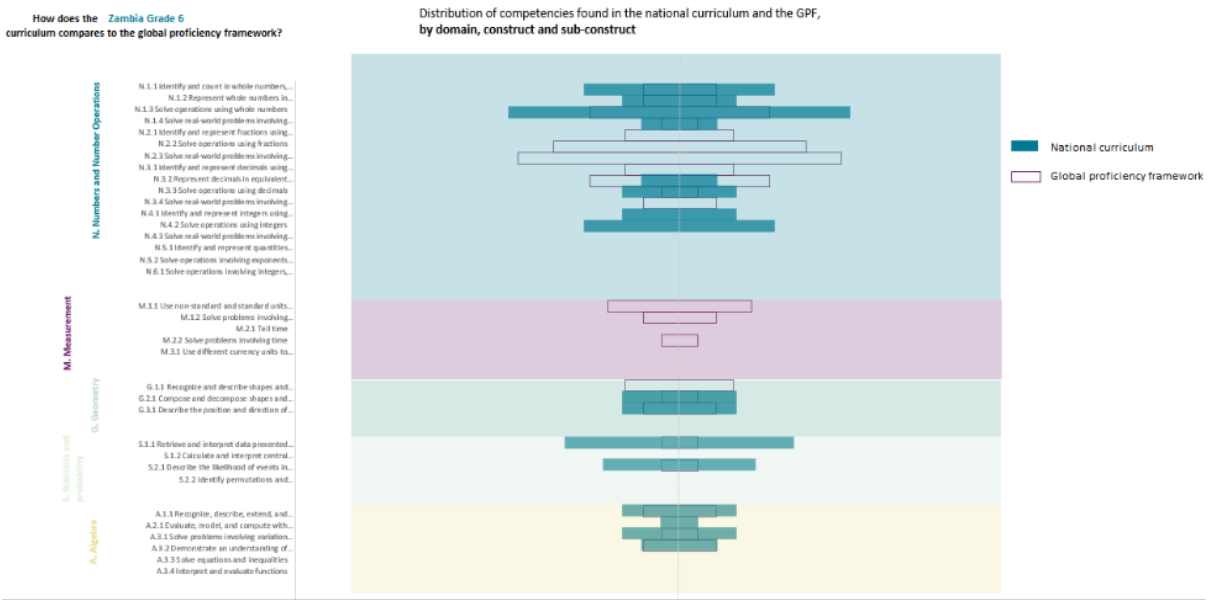
This figure shows that there is some close alignment with the GPF for Ghana Grade 3 regarding use different currency units and recognize, describe, extend. This alignment is quite different with the GPF in many places, where the Ghana Grade 3 curriculum goes beyond or below the GPF.

Grade 6

The Ghana Mathematics Curriculum for Primary Schools document Basic 4-6, 2019, Ministry of Education, republic of Ghana was used in the mapping of the Grade 6 Ghana curriculum. The syllabus documents do have a numbering system, so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. The overlay bar chart shows the similarities and differences between the GPF and the Ghana Grade 6 curriculum.

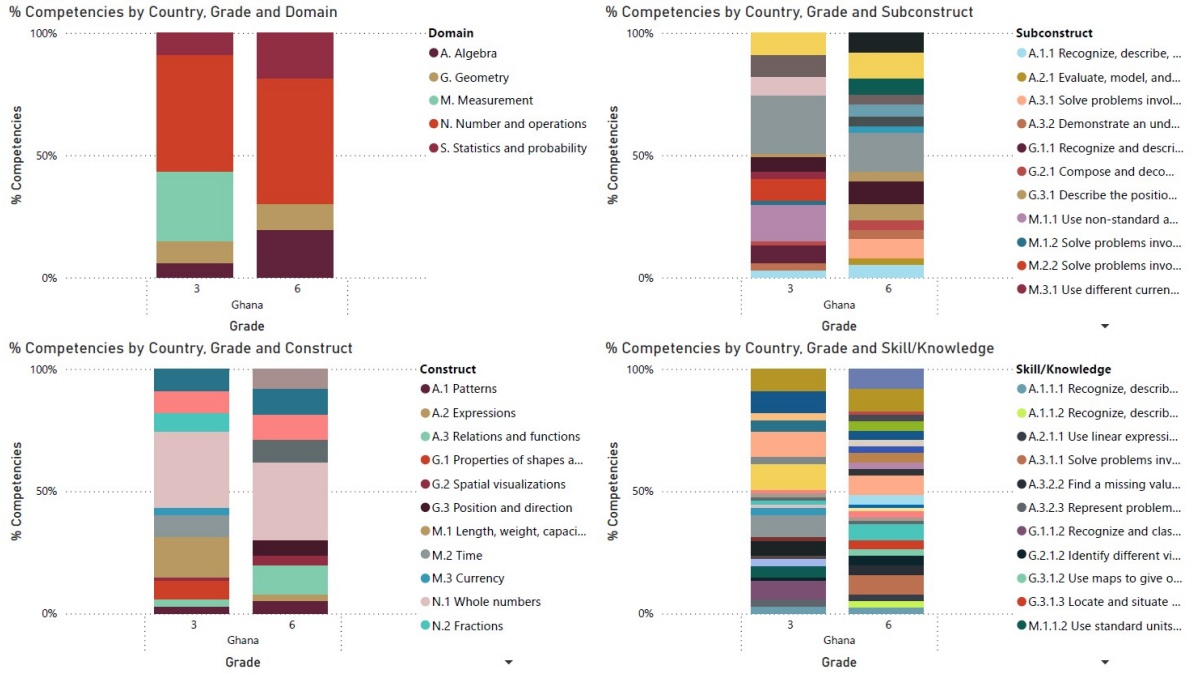
This figure shows that there is some alignment with the GPF for Ghana Grade 6. This alignment is the same as the GPF in interpret and evaluate functions. Otherwise, the Ghana Grade 6 curriculum goes beyond the GPF in Geometry, Statistics and Probability and Algebra. For Number and Operations, Ghana Grade 6 curriculum goes beyond and below the GPF for different subconstructs. There is no alignment at all for Measurement, because the Ghana Grade 6 does not present specific content in this domain.

Figure 19. Comparison of competencies with GPF, construct level, Grade 6, Ghana



The Ghana curriculum, between Grade 3 and Grade 6, increases the emphasis on Number and Operations, Algebra, and Statistics and Probability, while it reduces the emphasis on Measurement (top left) (Figure 20).

Figure 20. Curriculum progression from Grade 3 to 6, Ghana



Kenya

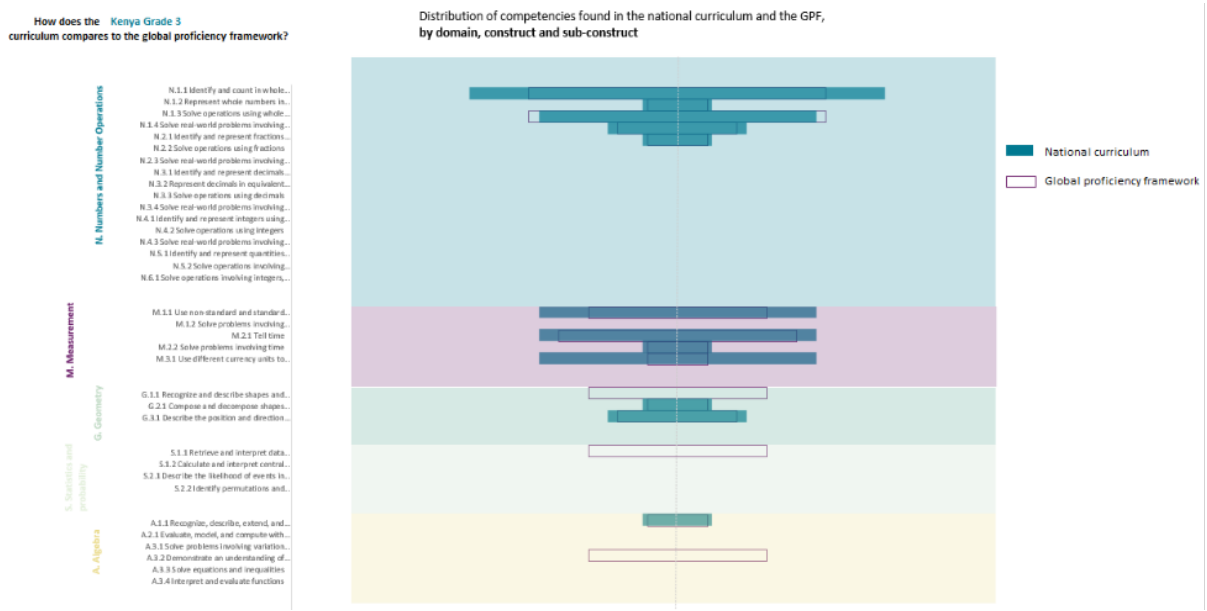
The mathematics curriculum of Kenya covers all five GPF domains. It is a well specified curriculum with 176 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF.

Grade 3

The Primary School Education Curriculum Design Mathematical Activities Grade 3, Kenya Institute of Curriculum Development (KICD), First Published in 2017, Revised 2024 and Basic Education Curriculum Framework, Kenya Institute of Curriculum Development (KICD),2017 revised 2019. The curriculum descriptive information from the second and third columns was used to map the curriculum descriptors - Sub-Strand and Specific Learning Outcomes. The numbering system in the curriculum documents was used to create the numbering for the mapping, together with the GPF mapping indicators for content areas. The alphabetic point numbering used in the curriculum for the Specific Learning Outcomes [a), b), c) etc.] was replaced with numeric numbering to facilitate the coding using the GPF coding system. The overlay bar chart (Figure 21) shows the similarities and differences between the GPF and the Kenyan Grade 3 curriculum.

The overlay bar chart shows a very close alignment between the Kenyan curriculum in the Number and Operations domain. Measurement is also well represented with some subconstructs exceeding the expectation of the GPF. There are three subconstructs not present – one from each of the domains of Geometry, Statistics and Probability (where only one is expected) and Algebra.

Figure 21. Comparison of competencies with GPF, construct level, Grade 3, Kenya

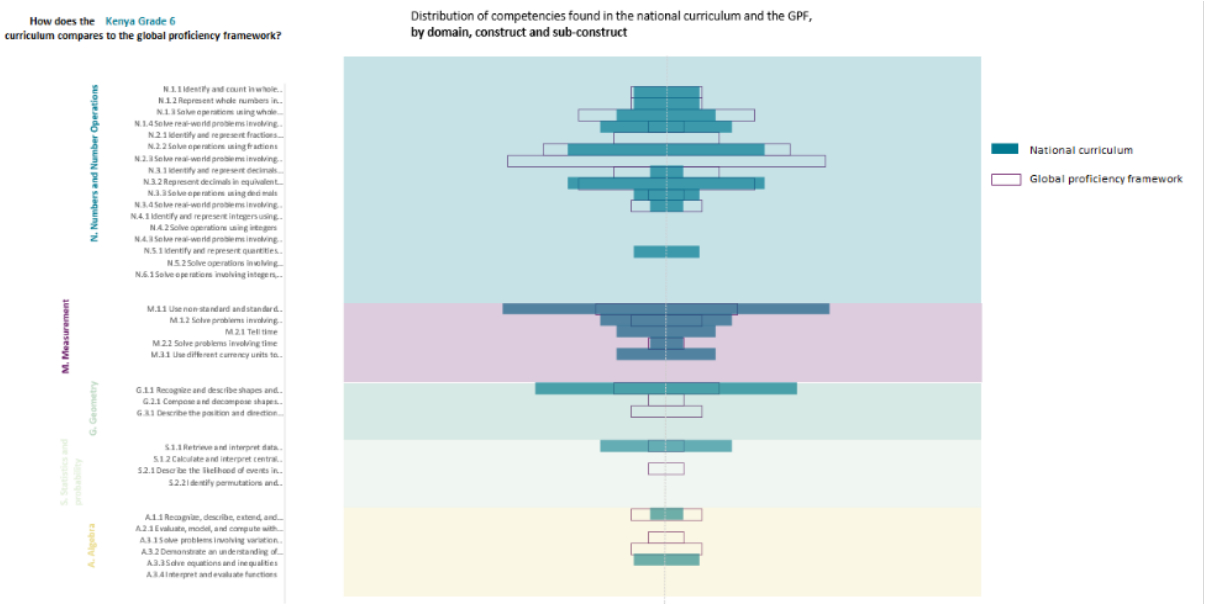


Grade 6

Similarly to Grade 3, the Primary School Education Curriculum Design Mathematical Activities Grade 6, Kenya Institute of Curriculum Development (KICD), First Published in 2017, Revised 2024 and Basic Education Curriculum Framework, Kenya Institute of Curriculum Development (KICD),2017 revised 2019. The curriculum descriptive information from the second and third columns was used to map the curriculum descriptors: Sub-strand and Specific Learning Outcomes. The numbering system in the curriculum documents was used to create the numbering for the mapping, together with the GPF mapping indicators for content areas. The alphabetic point numbering used in the curriculum for the Specific Learning Outcomes [a), b), c) etc.] was replaced with numeric numbering to facilitate the coding using the GPF coding system. The overlay bar chart (Figure 22) shows the similarities and differences between the GPF and the Kenyan Grade 6 curriculum.

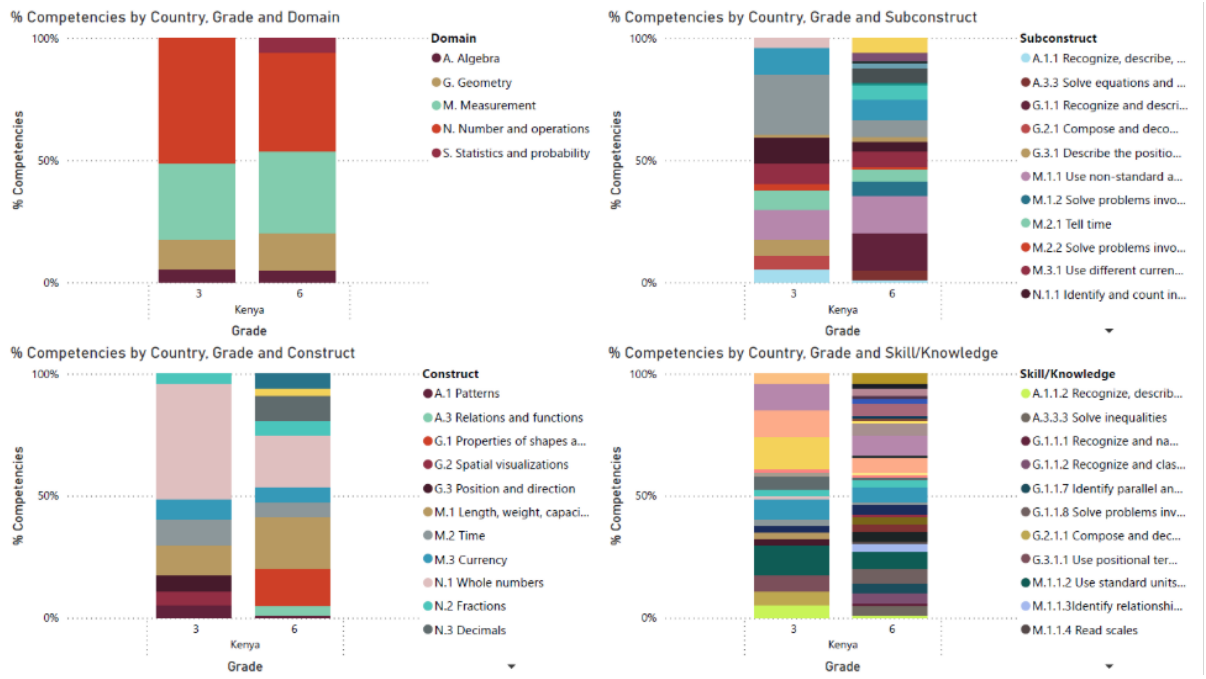
There is again general alignment with the GPF for Kenya Grade 6 with most core subconstructs being represented. The curriculum exceeds the GPF expectations of some subconstructs in the domains of Measurement, Geometry and Statistics. There are seven GPF subconstructs not present in the Kenya Grade 6 curriculum and notable variation in the curriculum expectations in the domains of Number and Operations, Geometry, Algebra, and Statistics and Probability.

Figure 22. Comparison of competencies with GPF, construct level, Grade 6, Kenya



The two columns with the percentage of competencies by grade and domain (top left) (Figure 23) show that the Kenyan curriculum also follows the expected progression from Grade 3 to Grade 6 with Statistics and Probability present in the curriculum at the Grade 6 level.

Figure 23. Curriculum progression from Grade 3 to 6, Kenya



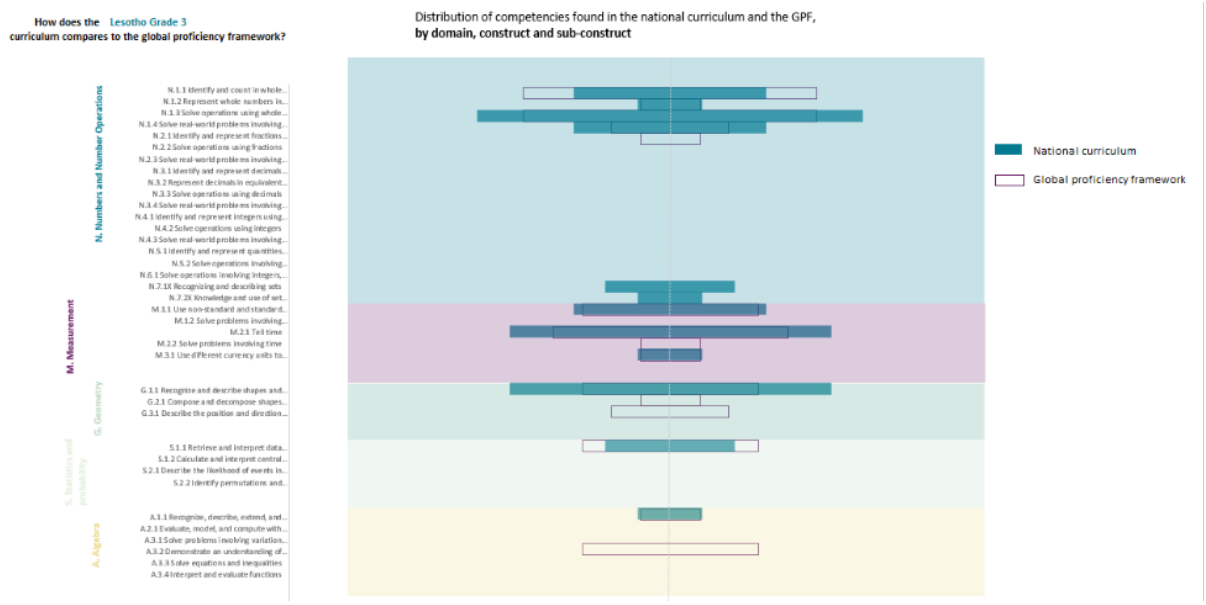
Lesotho

The mathematics curriculum of Lesotho covers all five GPF domains. It is a highly specified curriculum with 205 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF.

Grade 3

The Integrated Primary Curriculum Grades 3 Syllabus (2013) Ministry of Education and Training and the Lesotho Basic Education Curriculum Policy (LBECP), (2021), Ministry of Education and Training Lesotho were used in the mapping of the Grade 3 Lesotho curriculum. Curriculum descriptive information from the first column in the Numeracy Window titled 'Learning outcomes' at the end of this unit learners should be able to' was mapped. There are 2 numbering systems in the curriculum – one in the overview section and another in the 'windows' section. The numbering in the Numeracy Window sections (there are 4 windows linked to 4 themes) was used, since this is where the mathematics content is written up in detail with outcomes and other detail. GPF numbering was used to standardise the final numbering of the curriculum descriptors. The overlay bar chart (Figure 24) shows the similarities and differences between the GPF and the Lesotho Grade 3 curriculum.

Figure 24. Comparison of competencies with GPF, construct level, Grade 3, Lesotho



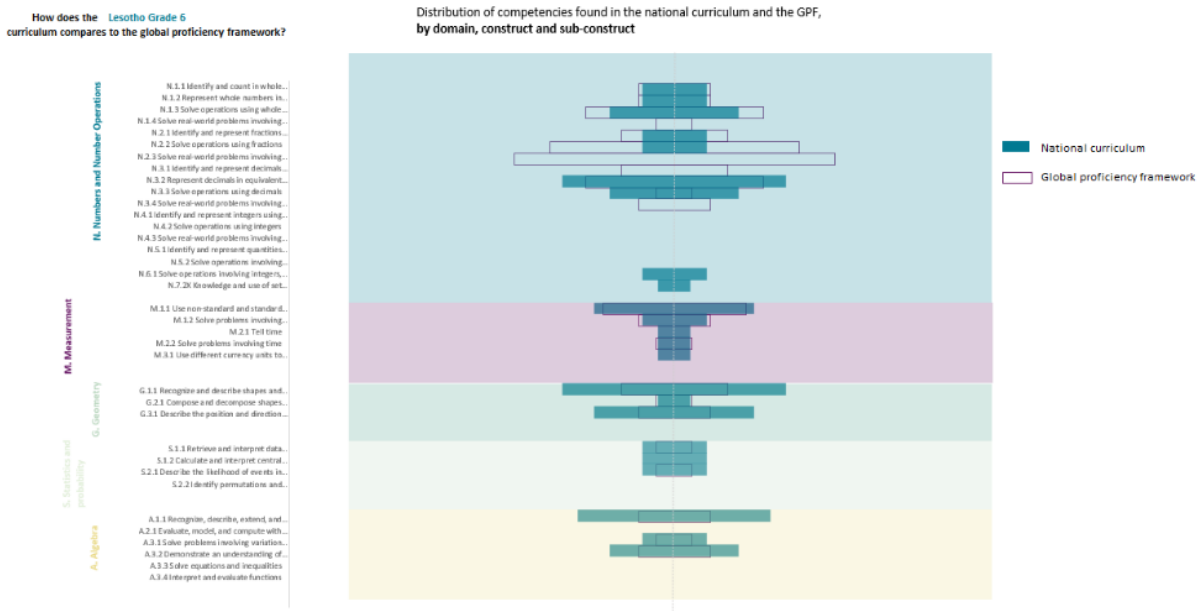
The overlay bar chart shows fair alignment in the Number and Operations, and Measurement domains. In both domains there are some subconstructs that exceed the expectation of the GPF. There is and good alignment for Statistics and Probability. There are four subconstructs not present – one from each of the domains of Number and Operations, Geometry, and Algebra.

Grade 6

The Integrated Primary Curriculum Grades 6 Syllabus (2016), Ministry of Education and Training and the Lesotho Basic Education Curriculum Policy (2021), Ministry of Education and Training, were used in the mapping of the Grade 6 Lesotho curriculum. Curriculum descriptive information from the first and second columns of the table which provides the Numerical and Mathematical Activity Plan were used. Information from the first column headed 'Learning Outcomes' at the end of Grade 6, learners should be able to' was used in conjunction with information from the second column of this table, which elaborates on concepts and skills to be covered in the given outcomes. Information from the fourth column, 'What to assess: the teacher should assess learner's ability to', was also referred to. As in the Grade 3 mapping, GPF numbering was used to standardise the final numbering of the curriculum descriptors. The overlay bar chart (Figure 25) shows the similarities and differences between the GPF and the Lesotho Grade 6 curriculum.

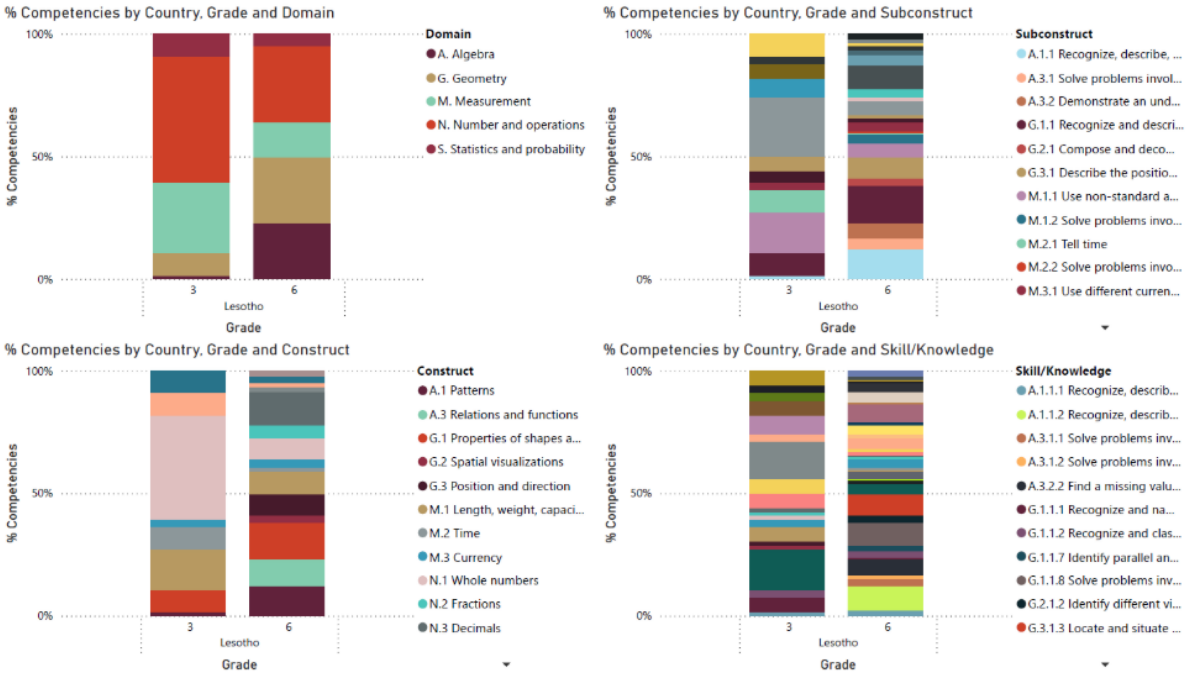
There is general alignment with the GPF for Lesotho Grade 6 with some variation seen in the domain of Number and Operations. This is the only domain in which some subconstructs expected by the GPF are not present while coverage in the other domains is strong.

Figure 25. Comparison of competencies with GPF, construct level, Grade 6, Lesotho



The two columns with the percentage of competencies by grade and domain (top left) (Figure 26) show that the Lesotho curriculum follows the expected progression from Grade 3 to Grade 6 with just a slight difference in the weighting of the representation of content in Grade 6 Number and Operations.

Figure 26. Curriculum progression from Grade 3 to 6, Lesotho



Morocco

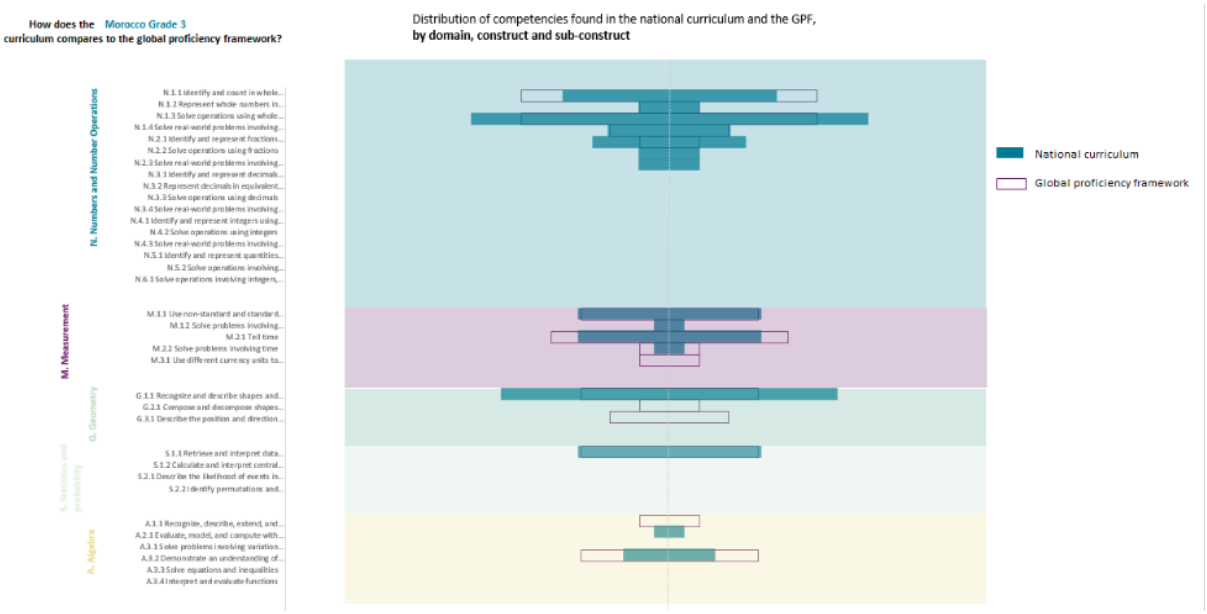
The mathematics curriculum of Morocco covers all five of the GPF domains. It is a very highly specified curriculum with 394 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF. Many of the competencies fall under the construct of Whole Number.

Grade 3

The Morocco Primary School Curriculum (grades 1 to 6) was used in the mapping of the Grade 3 Morocco curriculum. There was no numbering system in the curriculum document extract, and so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. The overlay bar chart (Figure 27) shows the similarities and differences between the GPF and the Morocco Grade 3 curriculum.

The emphasis on Number and Operations in the curriculum exceeds the GPF expectations with regard to the coverage of the subconstruct dealing with operations on whole numbers. Some of the subconstructs are underrepresented and three are not represented (two in Measurement and one in Algebra). There is higher than expected coverage of one of the subconstructs in Geometry. It should be noted that omissions of some of the skills and competencies may have occurred because of the difficulty of translating from Arabic.

Figure 27. Comparison of competences with GPF, construct level, Grade 3, Morocco



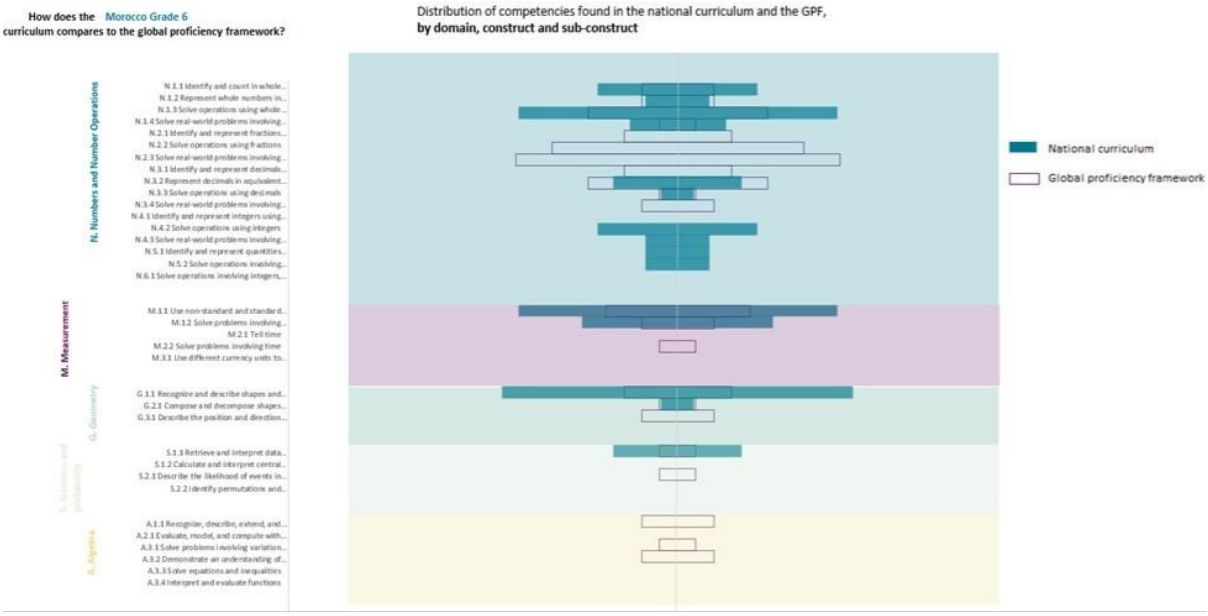
Grade 6

The Morocco Primary School Curriculum (grades 1 to 6) was used in the mapping of the Grade 6 Morocco curriculum. There is no numbering system in the curriculum document, and so for the purposes of mapping, the GPF numbering system following the progression of content given in the country document was used. The overlay bar chart (Figure 28) shows the similarities and differences between the GPF and the Morocco Grade 6 curriculum.

Four of the domains are represented in the Morocco Grade 6 curriculum. There is good coverage of some subconstructs for these domains but a lack of coverage of others. There are notable differences in Number and Operations and absence of coverage of Algebra. Several subconstructs are well covered. As for Grade 3, it should be noted that omissions of some of the skills and competencies may have occurred as a result of the

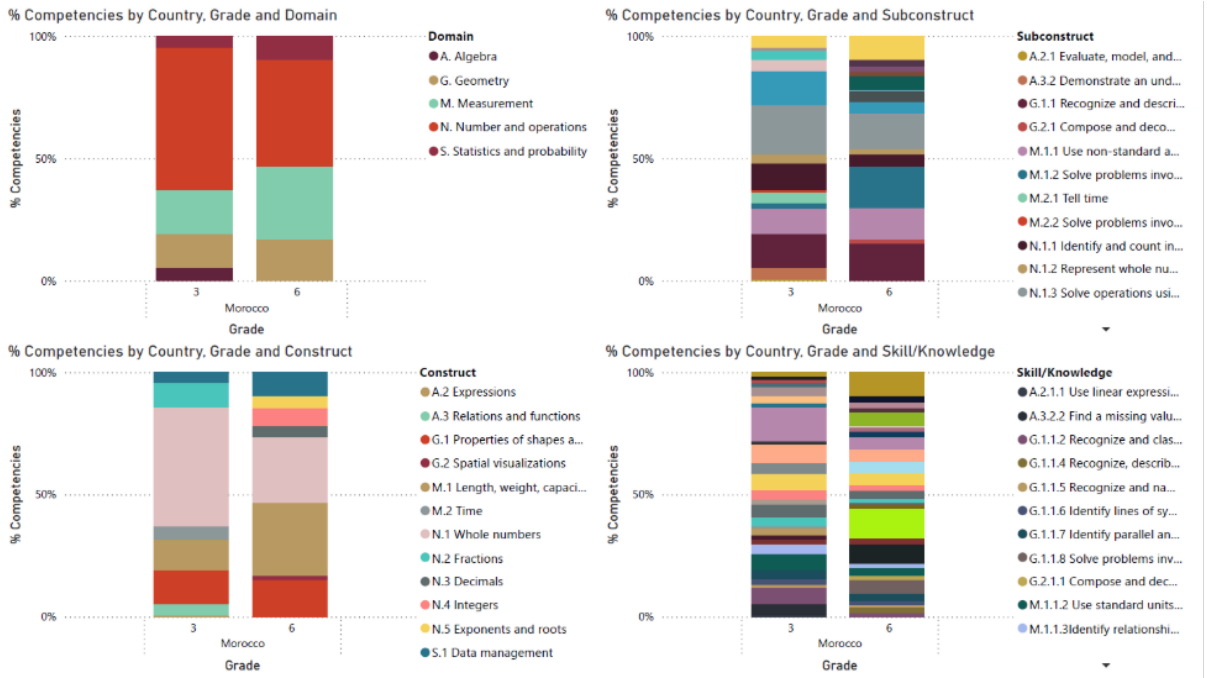
incomprehensibility of some of the translations from Arabic. This issue was more pronounced in the Grade 6 translation however, possibly with greater effect on the overall representation of the mapping.

Figure 28. Comparison of competencies with GPF, construct level, Grade 6, Morocco



The two columns with the percentage of competencies by grade and domain (top left) (Figure 29) show that the Morocco curriculum follows the expected progression from Grade 3 to Grade 6. The emphasis on Number and Operations is reduced and there is greater emphasis on Geometry, Measurement, and Statistics and Probability. As noted above, Algebra is not present in the Grade 6 mapping of the Morrocco Grade 6 curriculum but this may be because of the translation from Arabic.

Figure 29. Curriculum progression from Grade 3 to 6, Morocco



Rwanda

The mathematics curriculum of Rwanda covers all five of the GPF domains. It is a well specified curriculum with 223 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF.

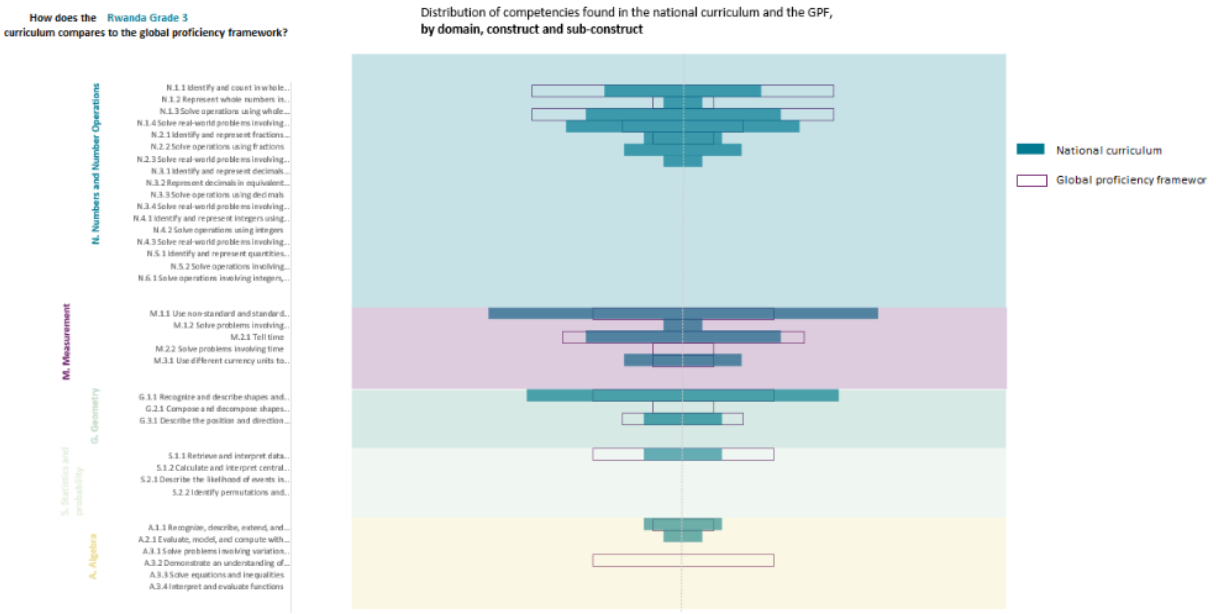
Grade 3

The Mathematic Syllabus for Lower Primary (P1-P3) 2nd Edition, Rwanda Basic Education Board, 2022 and Competence-Based Curriculum - Curriculum Framework Pre-Primary to Upper Secondary 2015, Rwanda Education Board, 2015 were used to map the Rwanda Grade 3 curriculum. The syllabus does not have a numbering system, but it does name and number the units which structure the curriculum (according to constructs) – the numbering of the units was used to create the frame of the numbering assigned. Further numbering was assigned according to the GPF numbering system following the progression of content given in the country document. The overlay bar chart (The emphasis on Number and Operations is a little lower in relation to GPF expectations regarding the coverage of the subconstructs dealing with whole numbers, but coverage is good in regard to the other subconstructs. Only two subconstructs are not represented (one in Geometry and one in Algebra). There is higher than expected coverage of one Measurement and one Geometry subconstruct.

Figure 30 shows the similarities and differences between the GPF and the Rwanda Grade 3 curriculum.

The emphasis on Number and Operations is a little lower in relation to GPF expectations regarding the coverage of the subconstructs dealing with whole numbers, but coverage is good in regard to the other subconstructs. Only two subconstructs are not represented (one in Geometry and one in Algebra). There is higher than expected coverage of one Measurement and one Geometry subconstruct.

Figure 30. Comparison of competencies with GPF, construct level, Grade 3 Rwanda



Grade 6

The Mathematic Syllabus for Lower Primary (P4-P6) 2nd Edition, Rwanda Basic Education Board, 2022 and Competence-Based Curriculum - Curriculum Framework Pre-Primary to Upper Secondary 2015, Rwanda Education Board, 2015 were used to map the Rwanda Grade 6 curriculum. The syllabus does not have a numbering system, but it does name and number the units which structure the curriculum (according to constructs) – the numbering of the units was used to create the frame of the numbering assigned. Further numbering was assigned according to the GPF numbering system following the progression of content given in

the country document. The overlay bar chart (Figure 31) shows the similarities and differences between the GPF and the Rwanda Grade 6 curriculum.

There is general alignment with the core GPF subconstructs for Rwanda Grade 6. The strongest variation occurs in the domain of Number and Operations with good representative coverage in the other domains. There are five subconstructs (four under Number and Operations and the other under Algebra) that are not present in the Rwanda Grade 6 curriculum.

Figure 31. Comparison of competencies with GPF, construct level, Grade 6, Rwanda

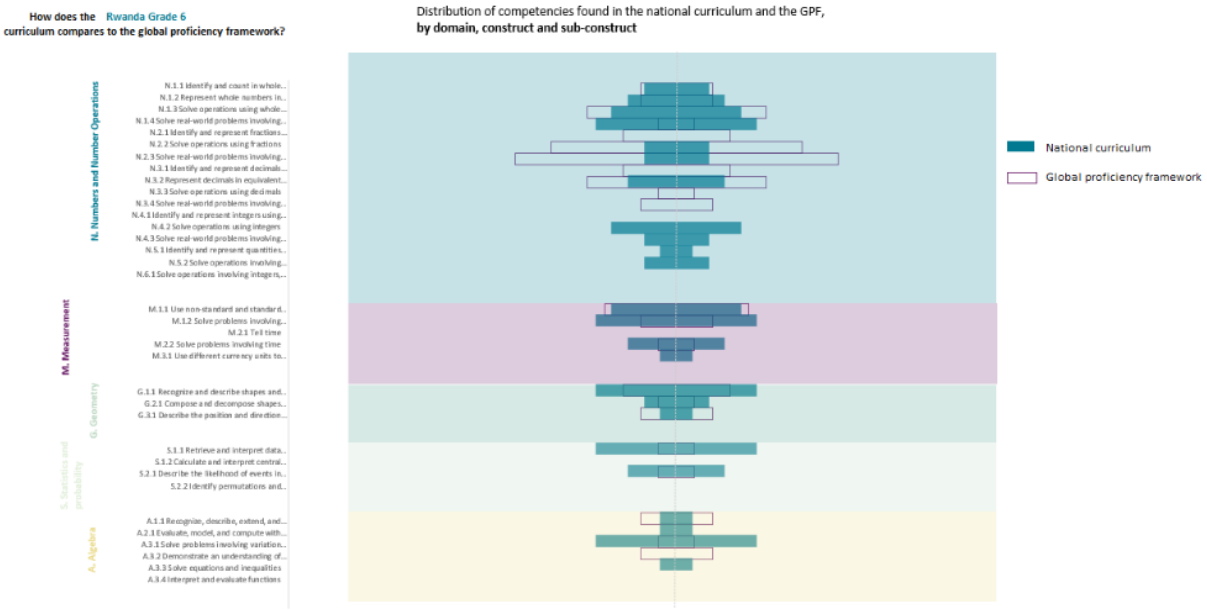
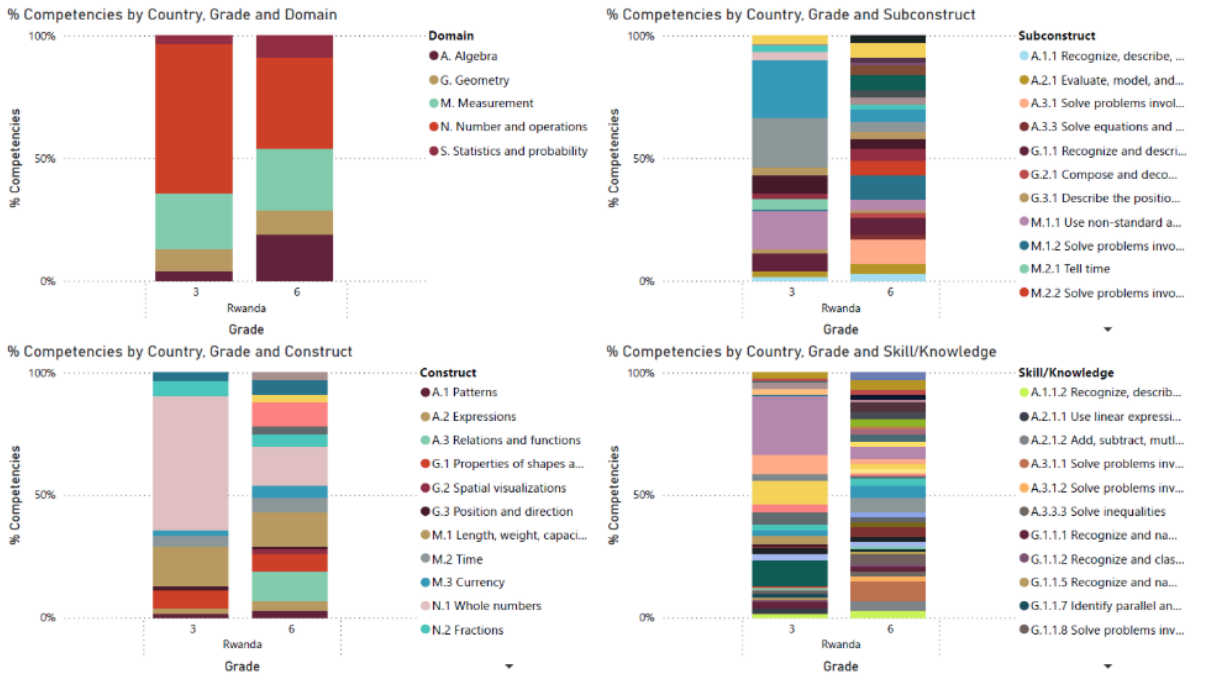


Figure 32 below with the percentage of competencies by grade and domain shows that the Rwanda curriculum follows the expected progression from Grade 3 to Grade 6. All of the domains are covered in both of the grades.

Figure 32. Curriculum progression from Grade 3 to 6, Rwanda



Senegal

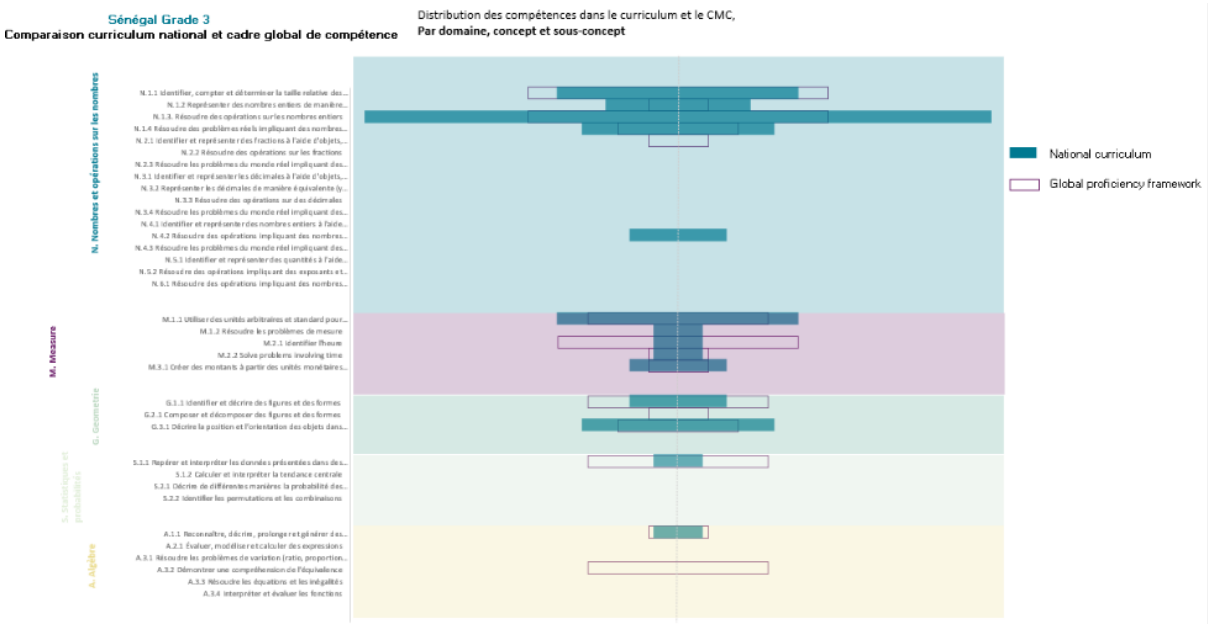
The mathematics curriculum of Senegal covers all five GPF domains. It is a strongly specified curriculum with 178 competencies listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is highly focused on Number and Operations.

Grade 3

The Senegal *Mathematics Guide Pédagogique 2ème étape CE1-CE2* document (Grade 3-4 2016), *Ministère de l'Éducation Nationale, République du Sénégal* was used in the mapping of the Grade 6 Senegal curriculum. The syllabus has a numbering system which was used, with content letter specification as per the GPF mapping numbering system. The overlay bar chart (Figure 33) shows the similarities and differences between the GPF and the Senegal Grade 3 curriculum.

This figure shows that there is some alignment with the GPF for Senegal Grade 3. This alignment is close with the GPF in *reconnaitre, décrire, prolonger et générer en Algèbre*. Otherwise, the Senegal Grade 3 curriculum goes beyond the GPF *in Nombres et opérations sur les nombres*. The alignment is quite mixed for *Mesure and Géométrie*, while it is below for *Statistiques et probabilités*.

Figure 33. Comparison of competencies with GPF, construct level, Grade 3, Senegal

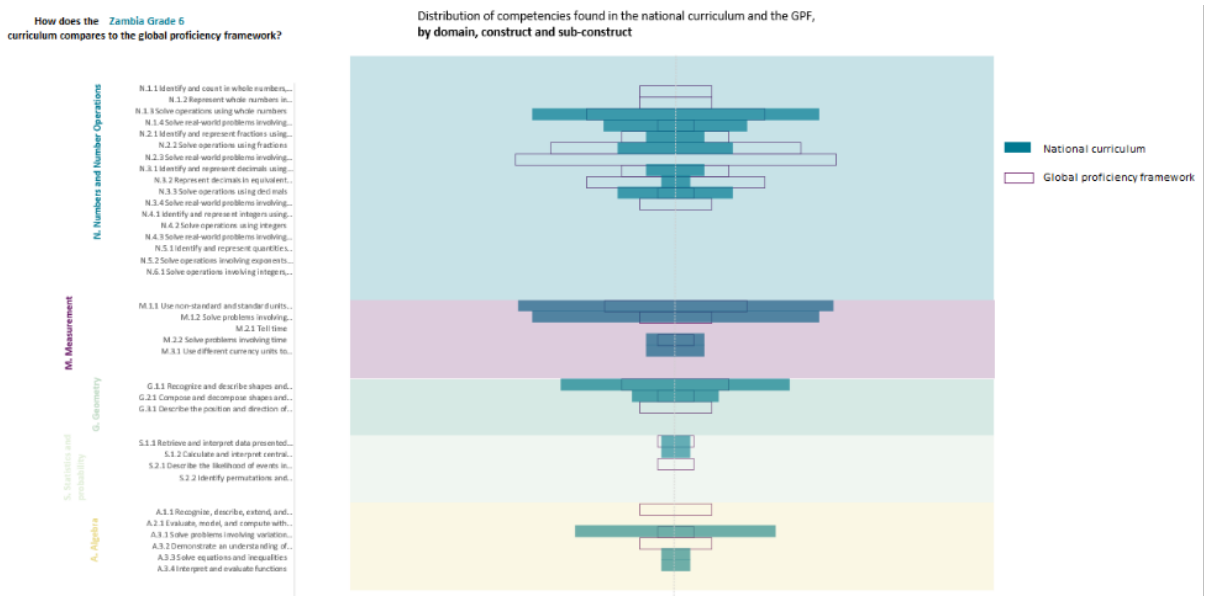


Grade 6

The Senegal Mathematics *Guide Pédagogique 2ème étape CE1-CE2* document (Grade 5-6 2016), *Ministère de l'Éducation Nationale, République du Sénégal* was used in the mapping of the Grade 6 Senegal curriculum. The syllabus has a numbering system which was used, with content letter specification as per the GPF mapping numbering system. The overlay bar chart (Figure 34) shows the similarities and differences between the GPF and the Senegal Grade 6 curriculum.

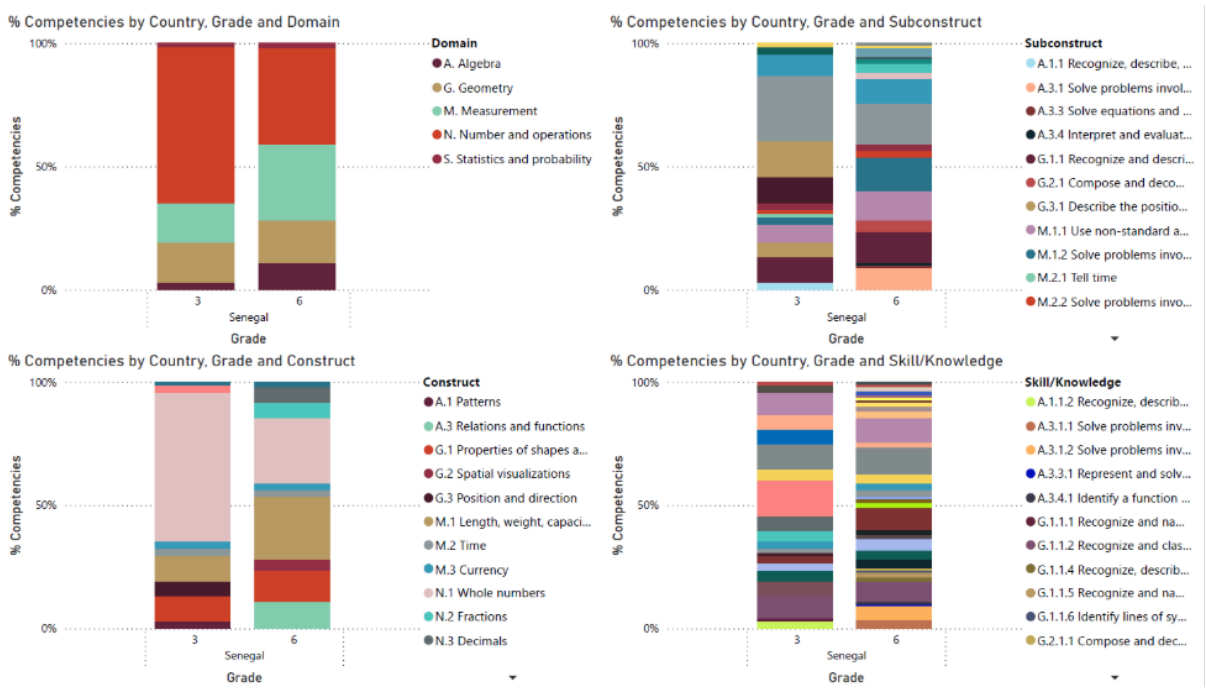
This figure shows that there is some alignment with the GPF for Senegal Grade 6. The Senegal Grade 6 curriculum goes beyond Measurement and almost all of the subconstructs of Geometry. The alignment is different for Number and Operations and Algebra where some subconstructs go beyond and others are below or absent. The Senegal Grade 6 curriculum goes below the GPF regarding Statistics and Probability.

Figure 34. Comparison of competencies with GPF, construct level, Grade 6, Senegal



The two columns with the percentage of competencies by grade and domain (top left) (Figure 35) show that the Senegal curriculum moves from Grade 3 to Grade 6. The emphasis on Number and Operations decreases while Measurement is increased over time.

Figure 35. Curriculum progression from Grade 3 to 6, Senegal



Zambia

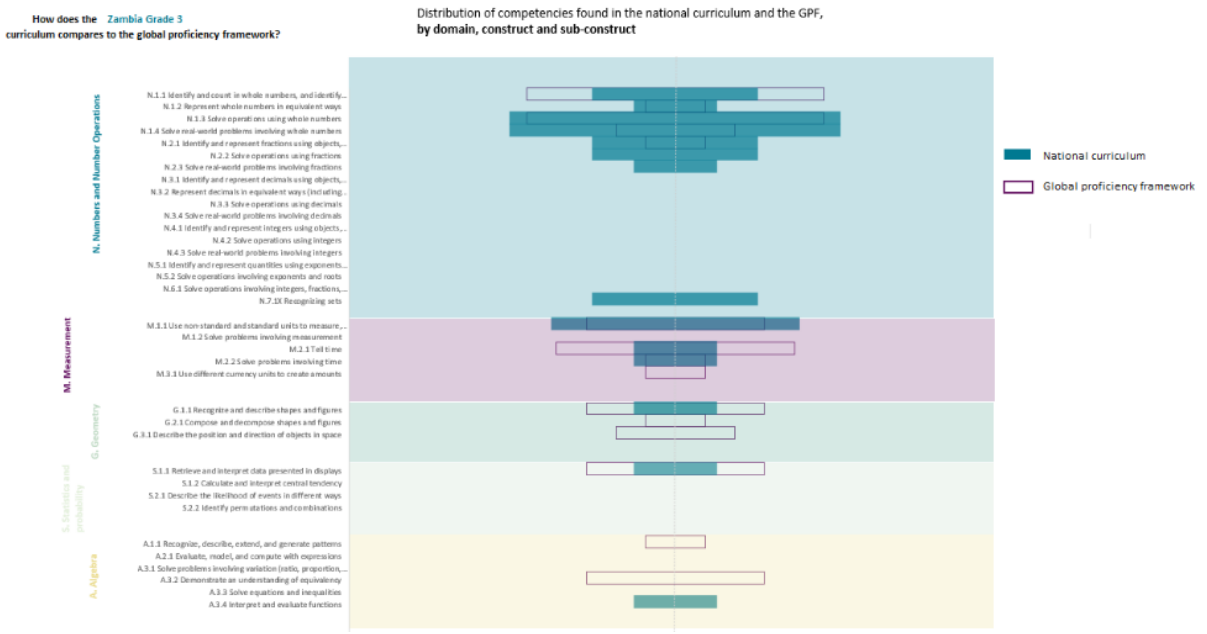
The mathematics curriculum of Zambia covers all five of the GPF domains. It is a tightly specified curriculum with 68 competencies ultimately listed in the description of the content intended for coverage in the teaching of mathematics in Grades 3 and 6 (compared to a total of 189 specified in the GPF). The weighting of the competencies across the domains is balanced in a similar manner to that of the GPF.

Grade 3

The curriculum statement for the mapping of the Zambian curriculum was drawn up from the curriculum statement in the National Numeracy Framework 2021 Zambia Ministry of Education (2021) using the content from the Grade 3 column in the ECE to Grade 4 Scope and Sequence Chart. The syllabus has a numbering system which was used, with content letter specification as per the GPF mapping numbering system. The overlay bar chart (Figure 36) shows the similarities and differences between the GPF and the Zambian Grade 3 curriculum.

There is good alignment between the GPF and the Zambian Grade 3 curriculum in the domain of Number and Operations. Alignment for the other four domains is less strong though all of them are represented. There are five GPF subconstructs, however, that are not present (one in Measurement, two in Geometry and two in Algebra). The Zambian Grade 3 curriculum includes teaching on Sets which is not covered in the GPF.

Figure 36. Comparison of competencies with GPF, construct level, Grade 3, Zambia

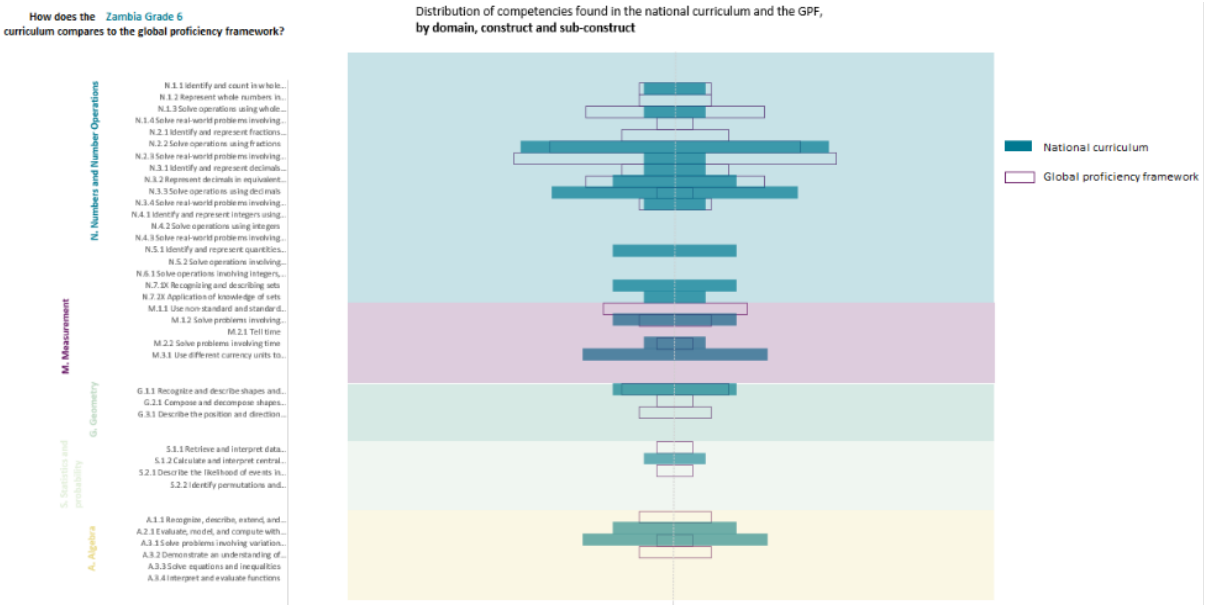


Grade 6

The curriculum statement for the mapping of the Zambian curriculum was drawn up from the curriculum statement in the Ministry of Education, Science, Vocational Training and Early Education Mathematics Syllabus (Grades 1-7) using the content from the Grade 6 table of content. The syllabus has a numbering system which was used, with content letter specification as per the GPF mapping numbering system. The overlay bar chart (Figure 37) shows the similarities and differences between the GPF and the Zambian Grade 6 curriculum.

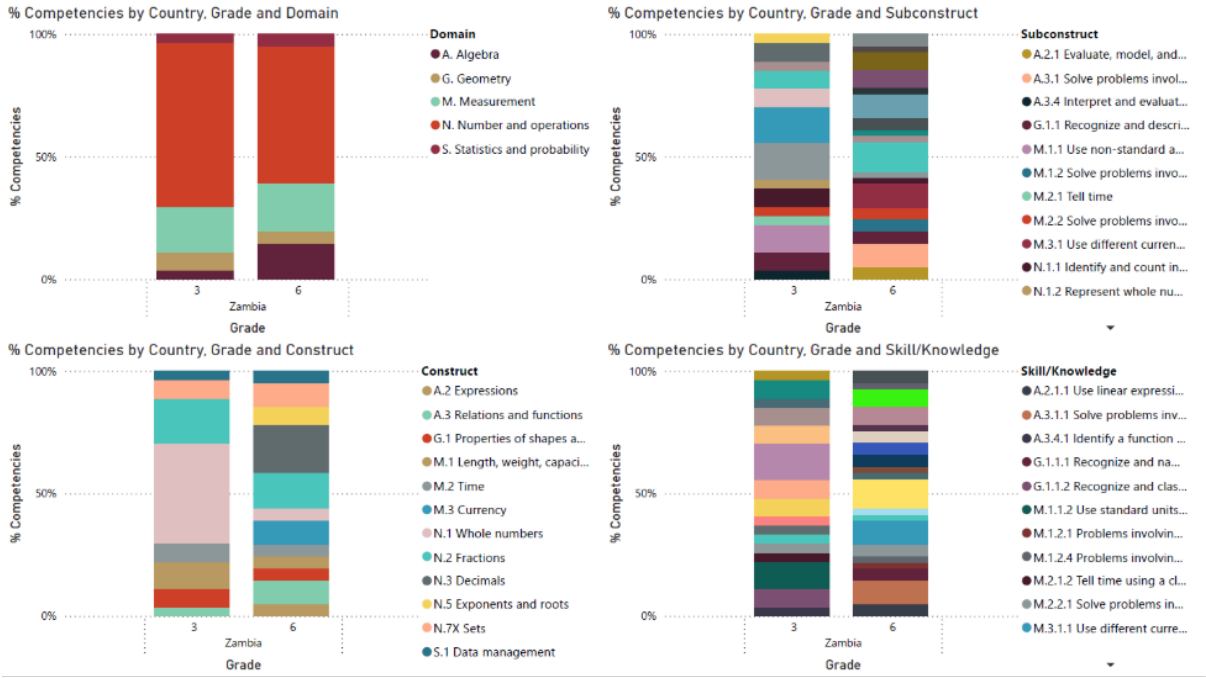
There is general alignment of the core subconstructs of the Zambian Grade 6 curriculum with the GPF expectations. There are nine subconstructs however that are not present however, and the Zambian Grade 6 curriculum includes teaching on Sets which is not covered in the GPF.

Figure 37. Comparison of competencies with GPF, construct level, Grade 6, Zambia



The two columns with the percentage of competencies by grade and domain (top left) (Figure 38) show that the Zambian curriculum follows the expected progression from Grade 3 to Grade 6.

Figure 38. Curriculum progression from Grade 3 to 6, Zambia



4.2. Findings from the cross-country analysis

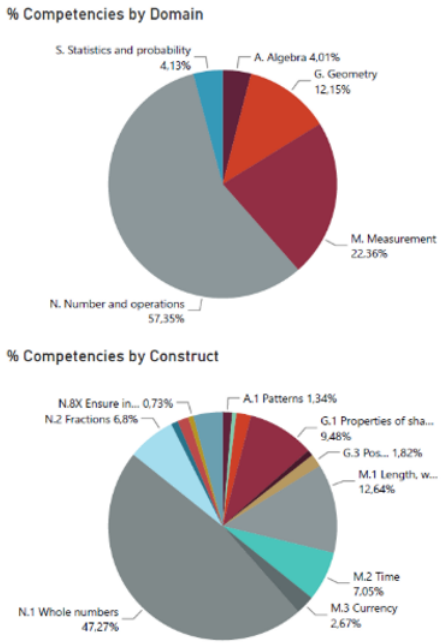
Compiling the country data across the sample set of 10 countries enabled a discussion of similarities and differences across countries in comparison to the country alignment to the GPF. This cross-country analysis enabled a comparison of common coverage which creates the basis of the proposals for the draft common assessment framework. Drawing on the analysis of the per country data and the cross-country analyses of this data, a series of tables are presented which demonstrate the alignment of the curricula of the 10 countries in the cross African sample with the GPF. For both Grades 3 and 6, a series of staged presence/absence graphics are used to show the alignment across the sample of 10 country curricula with the competencies included in the GPF.

The analysis allowed the identification of levels that are aligned with the minimum proficiency levels in the GPF at the end of lower primary and end of primary (end of lower secondary is currently underway). The goal of this activity, is to provide substance, based on the rigorous analysis of sample data to guide the elaboration and development of a common assessment framework for reporting of SDG global indicator 4.1.1 / CESA indicator 4.5.1 to support African countries close the learning data gaps. The data analysis is presented per grade, since each grade has its own particular content focus and emphasis and requires its own justification in terms of the selection of appropriate content to be covered in the framework.

Grade 3

Across the 10 countries, as was shown in the per country presentation and summarised below, the GPF competencies are well represented in the Grade 3 African curricula. There were 3 languages, 5 domains, 15 constructs, 27 subconstructs, 54 skills and 823 competences.

Figure 39. Overall presence of GPF competencies in 10 African countries, Grade 3



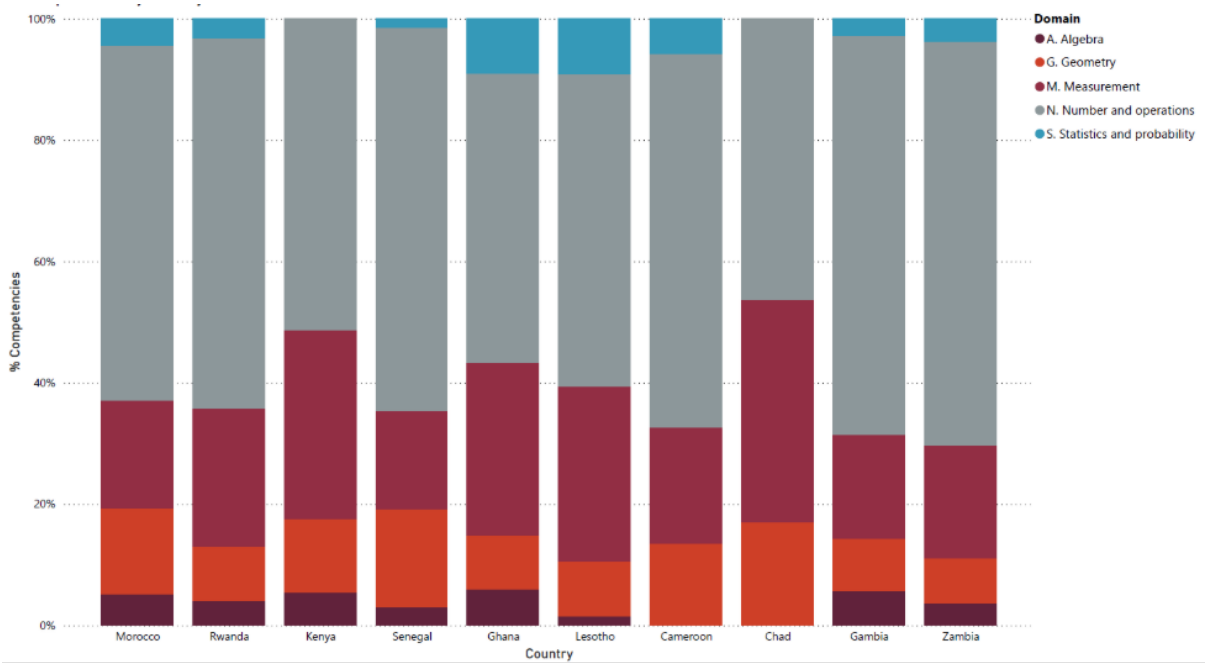
The global Grade 3 pie charts for competencies by domain and construct indicate that across the sample, all mathematics content domains are present in the African curricula, and the spread of competencies is well represented in these curricula. There are some instances where country curricula do not cover certain domains, but these are few as is seen in the next figure. In this figure (Figure 40) and all similar presence/absence figures the domains are colour coded as they appear below.

Figure 40. Presence of domain by country, Mathematics, Grade 3

There is almost 100% alignment at the level of domain for the sample countries. The exceptions are Cameroon and Chad (for Algebra) and Chad and Kenya (for Statistics and Probability. Based on this broad strong presence of all domains, it could be agreed that all of the mathematics domains should be represented in the draft common assessment framework for Grade 3.

Variation across country representation of competencies according to domain is worth noting and is shown in the following bar graph (Figure 41).

Figure 41. Competencies by country and domain, Mathematics, Grade 3



This figure shows that although weightings across the 10 countries are not identical, they are similar, and they are aligned with GPF expectations for Grade 3. This is important as a foundation for agreement of common competencies across the domains when making decisions for the development of a common assessment framework.

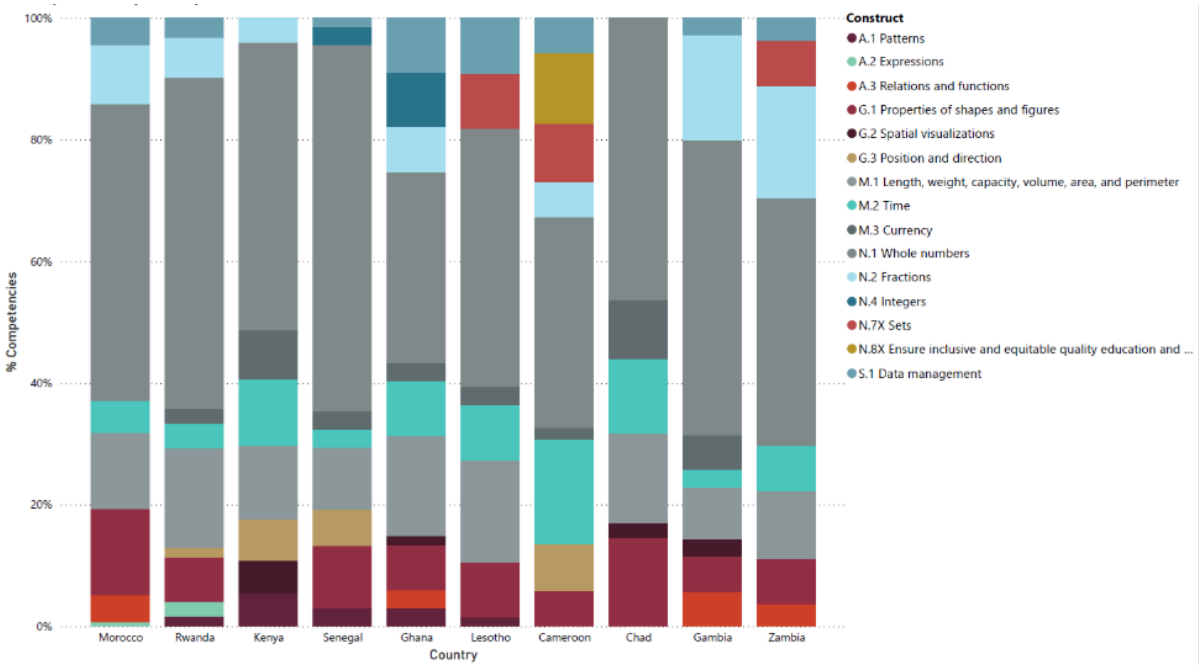
At the level of construct and subconstruct, greater variation becomes evident. Variation at these levels is to be expected since there are different priorities and contexts which begin to surface in curriculum choices made across countries. An understanding of the variation combined with an awareness of core competencies begins to frame decision making around what should be represented in a common framework.

The next two figures present the cross-country findings for competencies by country and construct, providing the next layer of detail in the cross-country sample analysis of curricula, as evidence of the potential for the development of a common assessment framework.

Figure 42. Presence of construct by country, Mathematics, Grade 3

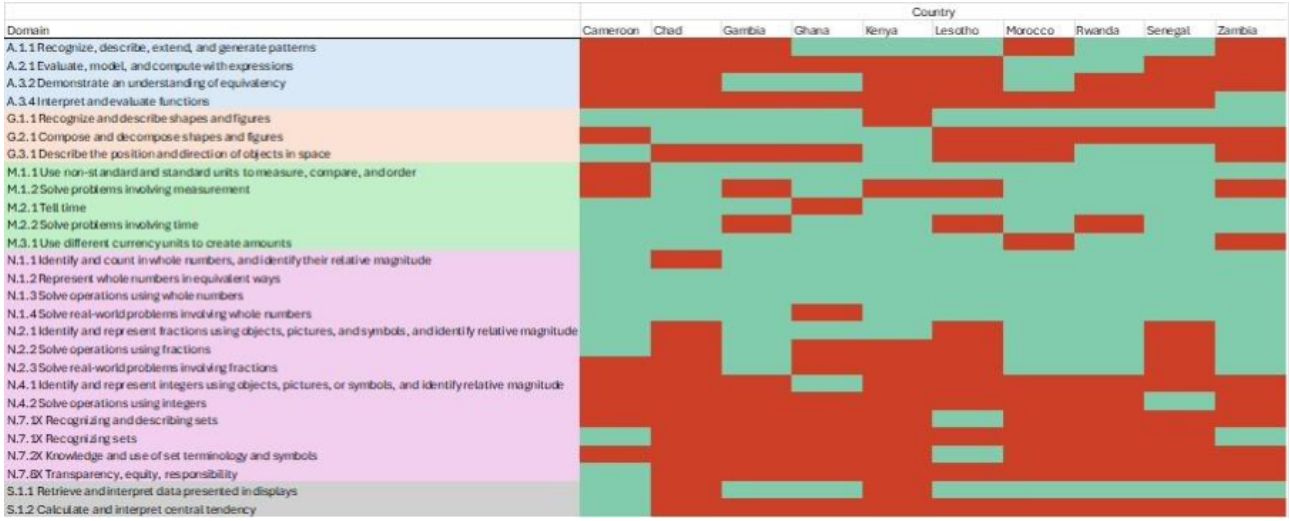
In this figure, the domain colouring remains consistent so it is clear to which domain the constructs align. The differences between country curricula begin to show at the construct level, both in the above figure and in the next figure, where country data for competencies according to construct is represented in a bar graph (Figure 43).

Figure 43. Competencies by country and construct, Mathematics, Grade 3



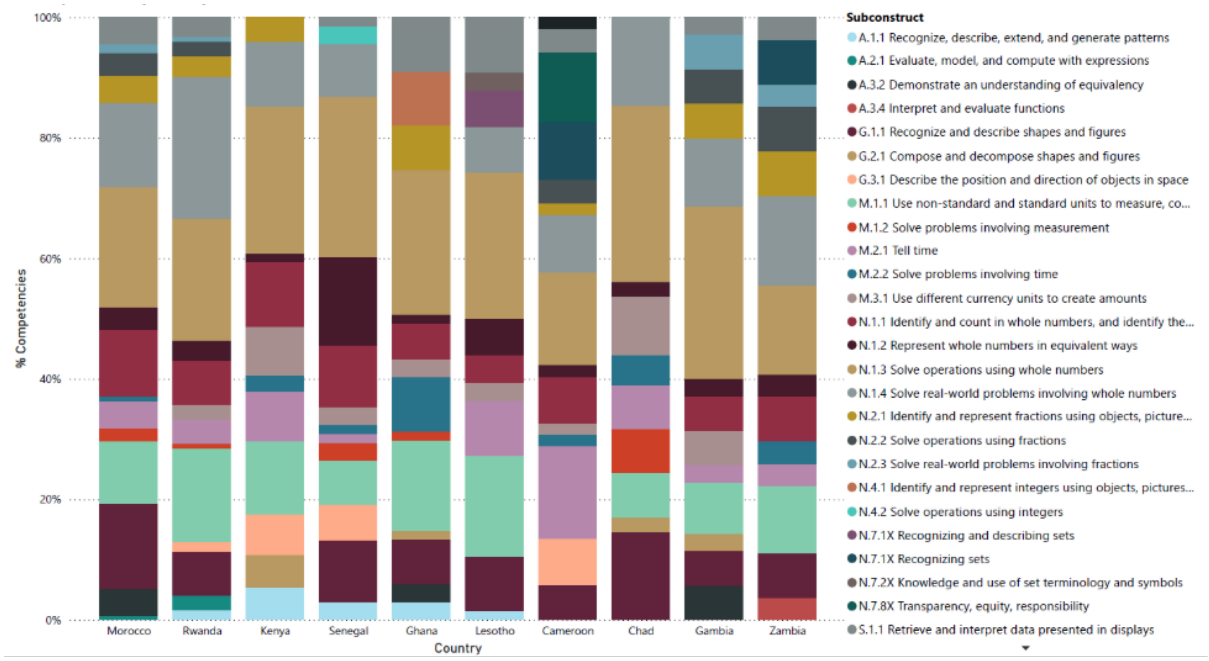
These figures show that across the 10 sample countries there is variation at a construct level, which is to be expected, but there are still similarities and there is still alignment with core GPF expectations for Grade 3. It shows the foundation for agreement of common competencies across the constructs when making decisions for the development of a common assessment framework.

Figure 44. Presence of subconstruct by country, Mathematics, Grade 3



At the subconstruct level, variation is greater but there is still similarity according to GPF expectations for Grade 3. The variation is more visible in the next bar graph showing the representation of competencies according to subconstruct (Figure 45).

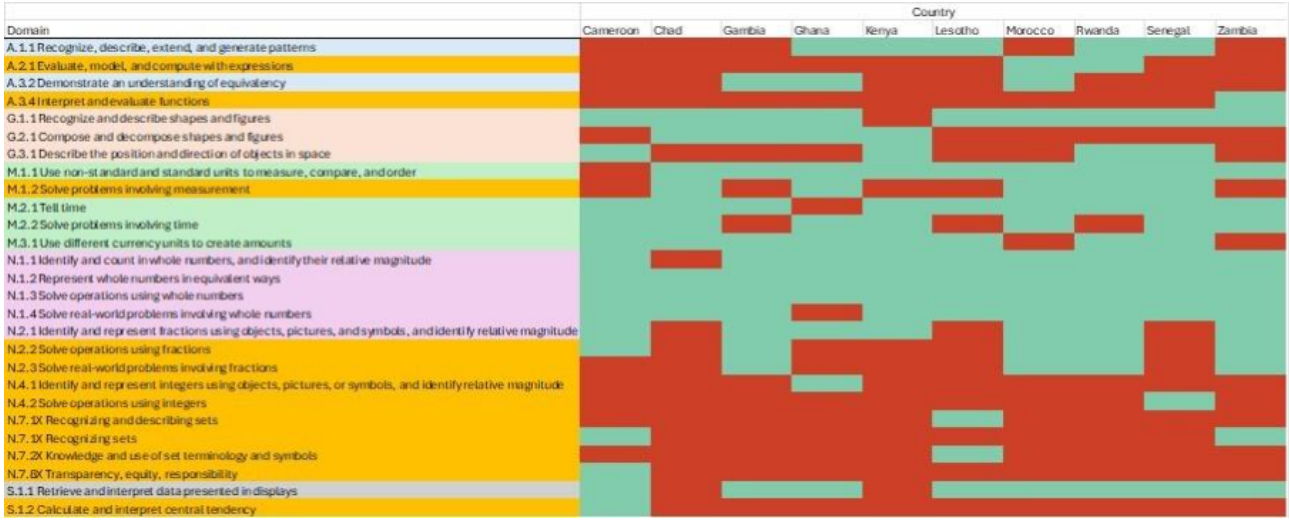
Figure 45. Competencies by country and subconstruct, Mathematics, Grade 3



These figures show that across the 10 sample countries there is even greater variation at a subconstruct level, which is to be expected, but there are still similarities and there is still alignment with core GPF expectations for Grade 3. This strengthens the foundation upon which agreement of common competencies across the subconstructs when making decisions for the development of a common assessment framework can be made.

The main differences between country mappings in the Grade 3 cross-country analysis can be explained by the fact that in some country curricula, the GPF expectations are exceeded. In Grade 3, some mathematical content found in some curricula is not generally taught at Grade 3 level and is not part of the GPF expectation for the grade. The next figure (Figure 46) highlights the subconstructs which are not expected as part of the common core by the GPF for Grade 3.

Figure 46. Subconstructs by country and GPF expectations, Mathematics, Grade 3



Note: Subconstructs that exceed the GPF expectations are highlighted with orange colour.

Topics such as set theory, problem solving and operations with fractions and integers in Number and Operations, evaluation of algebraic expressions and working with functions in Algebra, problem solving involving measurement in Measurement and calculations of measures of central tendency in Statistics and Probability exceed the expectations of the GPF. These correspond largely to the areas where there is less similarity (shown by red in the above figure) for the cross-country sample curricula. Since these subconstructs go beyond Grade 3 in the GPF, they are not recommended for inclusion in the Continental Assessment Framework. Figure 46 above shows GPF-aligned subconstructs for Grade 3 and the extent to which they are present in the sample curricula.

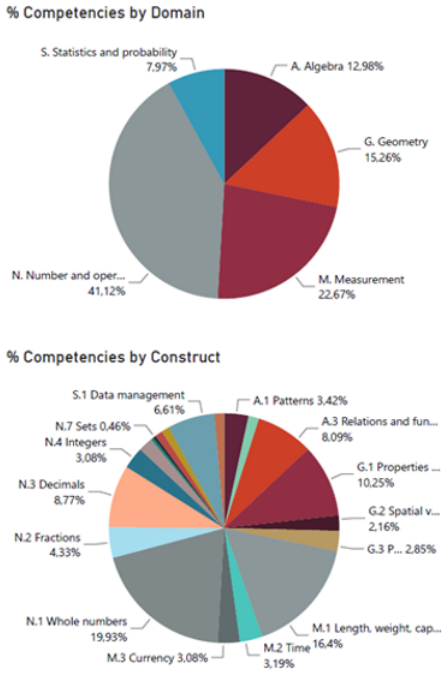
By contrast, there is good alignment for the remaining topics between the majority of curricula and the GPF expectation for Grade 3 at the subconstruct level. Drawing on the cross-country analysis, it is recommended to incorporate these subconstructs in the common assessment framework, firstly because these subconstructs are present among the 10 countries selected, and secondly (and importantly so) because these subconstructs are relevant for development of the Grade 3 African child as a mathematically literate citizen and competent future mathematician.

There is a need for further deliberation on the choice of subconstructs (and competencies aligned to these subconstructs) to be included in the Continental Assessment Framework, but this baseline study provides rigorous data which can inform this deliberation.

Grade 6

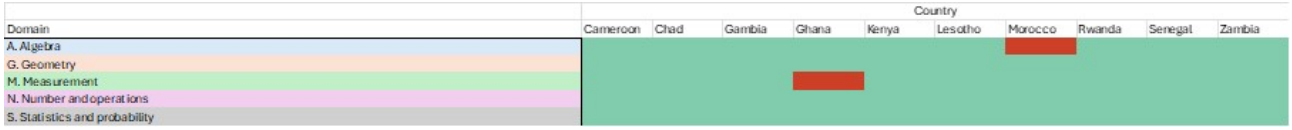
Across the 10 countries, as was shown in the per country presentation and summarised below, the GPF competencies are well represented in the Grade 6 African curricula. There were 3 languages, 5 domains, 20 constructs, 40 subconstructs, 78 skills and 878 competencies.

Figure 47. Overall presence of GPF competencies in 10 sample countries, Grade 6



In the figure (Figure 47) the 10 countries for which data was obtained and analysed are shown. The global Grade 6 pie charts for competencies by domain and construct indicate that a) across the sample all mathematics content domains are present in the African curricula, and the spread of competencies is well represented in these curricula. There are some instances where country curricula do not cover certain domains, but these are few as is seen in the next figure. In this figure and all similar presence/absence figures the domains are colour coded as they appear below.

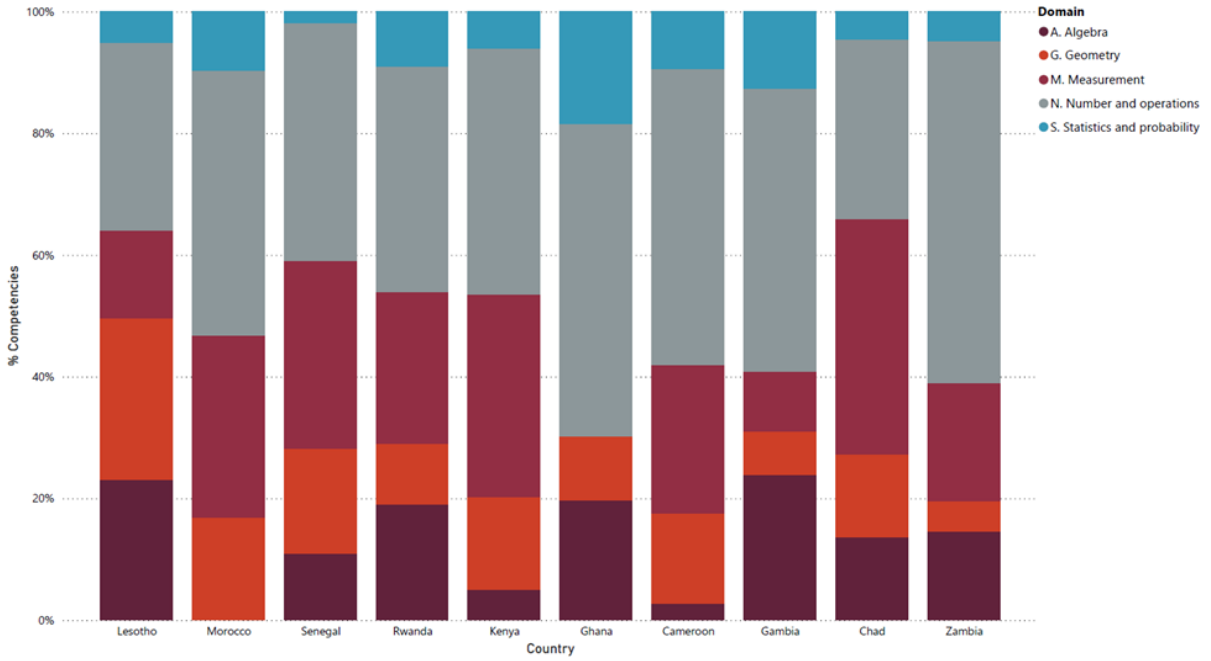
Figure 48. Presence of domain by country, Mathematics, Grade 6



There is almost 100% alignment at the level of domain for the sample countries. The exceptions are Ghana for Measurement and Morocco for Algebra. Based on this broad strong presence of all domains, it could be agreed that all the mathematics domains should be represented in the draft common assessment framework for Grade 6.

Variation across country representation of competencies according to domain is worth noting and is shown in the following bar graph (Figure 49).

Figure 49. Competencies by country and domain, Mathematics, Grade 6



This figure shows that although weightings across the 10 countries are not identical, they are similar, and they are aligned with GPF expectations for Grade 6. This is important as a foundation for agreement of common competencies across the domains when making decisions for the development of a common assessment framework.

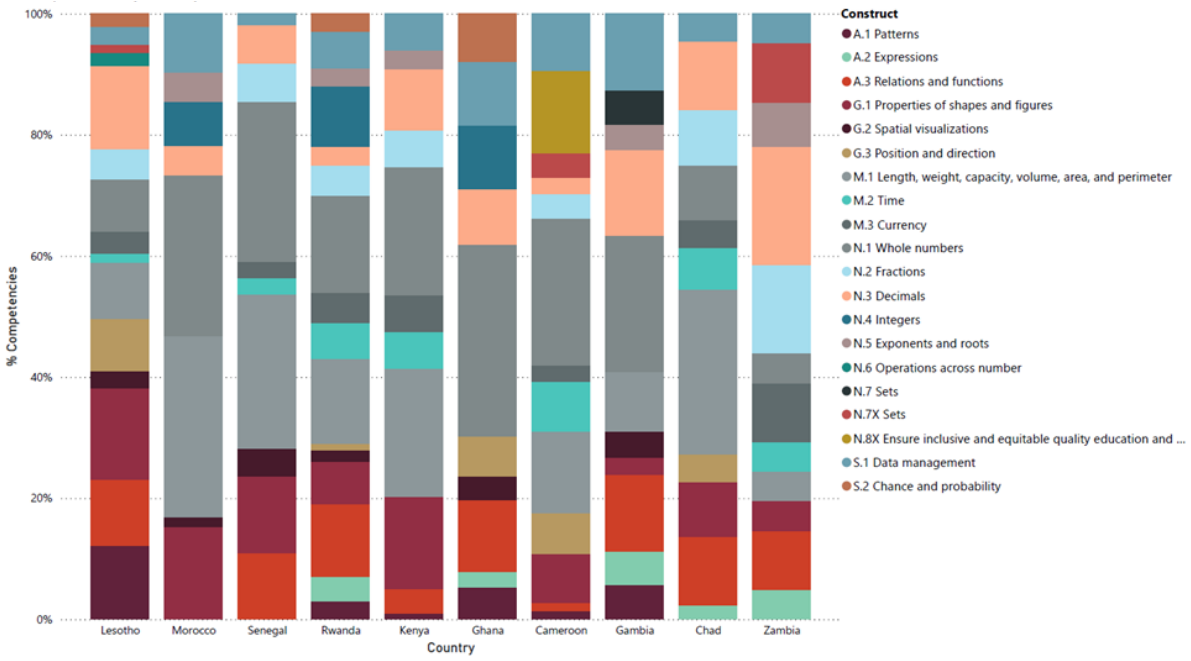
At the level of construct and subconstruct, greater variation becomes evident. Variation at these levels is to be expected since there are different priorities and contexts which begin to surface in curriculum choices made across countries. An understanding of the variation combined with an awareness of core competencies begins to frame decision making around what should be represented in a common framework.

The next two figures present the cross-country findings for competencies by country and construct, providing the next layer of detail in the cross-country sample analysis of curricula, as evidence of the potential for the development of a common assessment framework.

Figure 50. Presence of construct by country, Mathematics, Grade 6

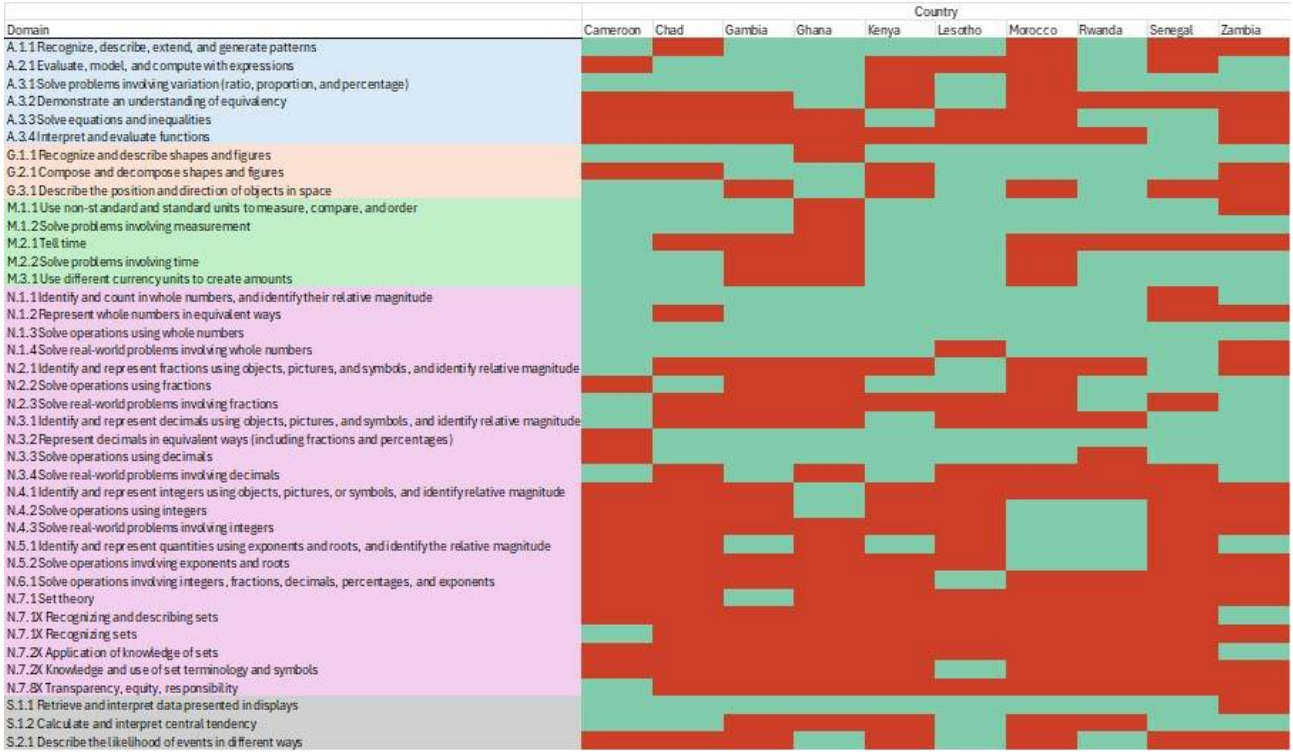
In this figure, the domain colouring remains consistent so it is clear to which domain the constructs align. The differences between country curricula begin to show at the construct level, both in the above figure and in the next figure, where country data for competencies according to construct is represented in a bar graph (Figure 51).

Figure 51. Competencies by country and construct, Mathematics, Grade 6



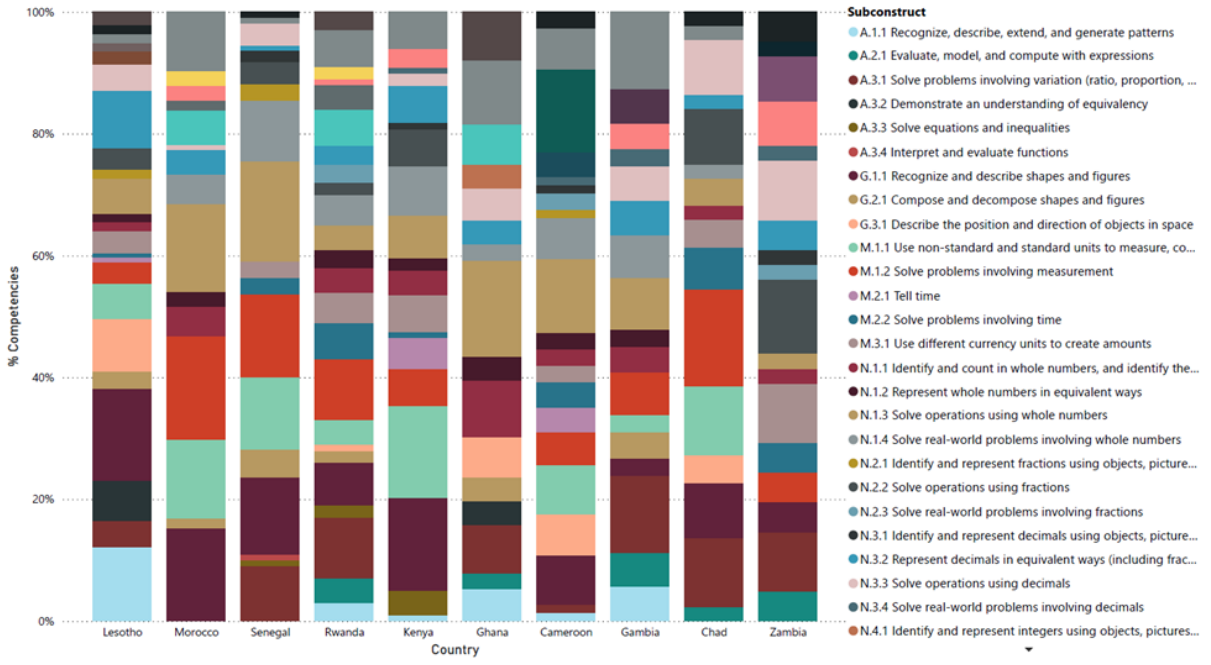
These figures show that across the 10 sample countries there is variation at a construct level, which is to be expected, but there are still similarities and there is still alignment with core GPF expectations for Grade 6. There is a foundation for agreement of common competencies across the constructs when making decisions for the development of a common assessment framework.

Figure 52. Presence of subconstruct by country, Mathematics, Grade 6



Finally, the cross-country findings for competencies by country and subconstruct are presented. The domain colouring remains consistent so that it is clear to which domain the subconstructs align. As it can be seen in the figure above at the subconstruct level, variation is greater but there is still similarity according to GPF expectations for Grade 6. The variation is more visible in the next bar graph showing the representation of competencies according to subconstruct (Figure 53).

Figure 53. Competencies by country and subconstruct, Mathematics, Grade 6

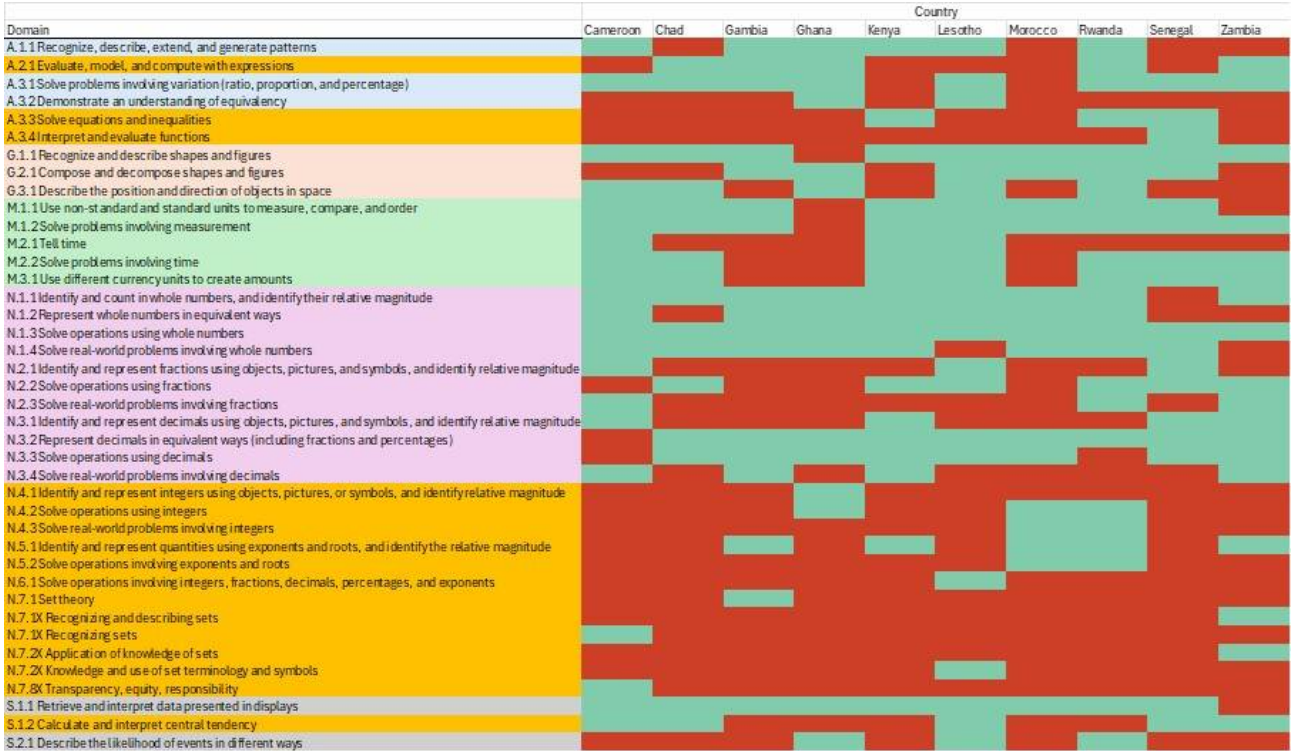


These figures show that across the 10 countries there is even greater variation at subconstruct level, which is to be expected, but there are still some similarities and some alignment with core GPF expectations for Grade 6.

This strengthens the foundation upon which agreement of common competencies across the subconstructs when making decisions for the development of a common assessment framework can be made.

The main differences between country mappings in the Grade 6 cross-country analysis can be explained by the fact that in certain of the sample country curricula, the GPF expectations are exceeded. In Grade 6, some mathematical content found in sample curricula is not generally taught at Grade 6 level and is not part of the GPF expectation for the grade. The next figure highlights the subconstructs which are not expected as part of the common core by the GPF for Grade 6.

Figure 54. Subconstruct by country and GPF expectations, Mathematics, Grade 6



Note: Subconstructs that exceed the GPF expectations are highlighted with orange colour.

Topics such as set theory, integers, exponents and roots in Number and Operations, evaluation of algebraic expressions and modelling using algebraic expressions, and solution of equations and inequalities in Algebra and calculations of measures of central tendency in Statistics and Probability exceed the GPF expectations. These correspond largely to the areas where there is less similarity (shown by the red areas in the above figure) for the cross-country sample curricula (Figure 54). Since these subconstructs go beyond Grade 6 in the GPF, they are not recommended for inclusion in the Continental Assessment Framework.

By contrast, there is good alignment for the remaining topics between the majority of curricula and the GPF expectation for Grade 6 at the subconstruct level. Drawing on the cross-country analysis, it is recommended to incorporate all of these subconstructs in the common assessment framework, firstly because these subconstructs are present among the 10 countries selected, and secondly (and importantly so) because these subconstructs are relevant for development of the Grade 6 African child as a mathematically literate citizen and competent future mathematician. There is a need for further deliberation on the choice of subconstructs (and competencies aligned to these subconstructs) to be included in the Continental Assessment Framework, but this baseline study provides rigorous data which can inform this deliberation.

4.3. Framework

In this section a structure of the Continental Assessment Framework for mathematics is considered in the light of a review of a series of existing international frameworks. The alignment of the Continental Assessment Framework in relation to the GPF is then discussed. In addition, some considerations regarding the contextual adaptation of the framework are noted.

The structure and content of the Continental Assessment Framework needs to be backed up by evidence, stakeholder participation and appropriate technical expert support. Some background to support the decision can be found through an examination of other assessment frameworks in the international domain. Comparable frameworks from the African regional studies PASEC and SEACMEQ, as well as from the international comparative studies TIMSS, PISA and AMPL were reviewed. The contents of the frameworks were evaluated in terms of their domains, processes and structure in relation to the domains of the GPF.

PASEC

The PASEC documentation does not include an explicit framework, but it provides a description of competency levels (4 levels each for early and late primary). Both the early and late primary levels include descriptors for Number and Operations, Measurement, and Geometry. The tables below show the links between the GPF domains and PASEC domains, their weightings and the content assessed for the domain.

Table 13. GPF domains assessed by PASEC 2019 in mathematics, early primary

GPF domains	PASEC domains	Share of content	Content assessed
Number and Operations	Arithmetic	72.5%	1. Counting to 100 2. Recognising figures and numbers 3. Quantifying objects 4. Distinguishing quantities of objects 5. Arranging numbers in order - (the largest) 6. Arranging numbers in order - (the smallest) 7. Completing number series 8. Adding and subtracting 9. Solving problems
Measurement **Geometry**	Measurement Geometry and Space	27.5%	10. Recognising geometric shapes 11. Determining spatial location 12. Appraising sizes

Table 14. GPF domains assessed by PASEC 2019 in mathematics, late primary

GPF domains	PASEC domains	Share of content	Content assessed
Number and Operations	Arithmetic	47.6%	Arithmetic skills were assessed with reference to the understanding of numbers: knowledge and understanding of the sequence13 of operations and of the properties of the four operations; and operations on numbers such as adding, subtracting, multiplying and dividing. They were also assessed through the understanding of decimals and percentages.
Measurement	Measurement and Size	35.7%	Skills relating to measurements and sizes were assessed with reference to the knowledge and understanding of units of measurement for length, mass, capacity, angle and duration, and the conversion of these measurement units. They were also assessed through calculations of size (length, duration, mass, capacity, angle, area, volume) in different contexts, in particular using plane geometric figures (triangles, rectangles, squares, parallelograms, disks) and solids (cubes or rectangular parallelepipeds).
Geometry	Geometry and Space	16.7%	Skills relating to geometry and space were assessed through exercises involving recognition of the properties of two or three-dimensional geometric shapes, geometric relations and transformations, and spatial position and representation.

Source: https://pasec.confemen.org/wp-content/uploads/sites/2/2022/08/PASEC2019-report-English-version.pdf

PASEC recommends three cognitive processes for testing: knowing the concepts; applying the procedures; and solving problems.

SEACMEQ

Documentation on SEACMEC also does not include an explicit framework but a development process for the construction of the test items is described which included a basis of competency or skills levels for mathematics (SEACMEQ IV Technical report, 2017, p.15). The table below shows the links between the GPF domains and SEACMEQ domains and a descriptor of the content assessed for each domain. SEACMEQ does not indicate weighting for the content according to the domains.

Table 15. GPF domains assessed by SEACMEQ in mathematics, late primary

GPF domains	SEACMEQ domains	Content assessed
Number and Operations	Number	Operations and number line, square roots, rounding and place value, significant figures, fractions, percentages, and ratios
Measurement	Measurement	Distance, length, area, capacity, money, and time
Geometry	Space-Data	Geometric shapes
Statistics and Probability		Charts (bar, pie, and line), and tables of data

In addition to the indication of content spread, SEACMEQ carried out a skills audit for the mathematics tests which resulted in the identification of eight levels of competence. Level 1-4 were designated as Basic Mathematics and involved mainly manipulation of basic operations and recognition of shapes and figures. Levels 5-8 were designated as Advanced Mathematics and encompassed problem-solving skills. The eight competency levels provide a more concrete analysis of what pupils and teachers can do and they also suggest instructional strategies relevant to pupils who are learning at each level of competence.

TIMSS

Explicit details on the content covered for each domain are provided in the TIMSS documentation. TIMSS gives target percentages for given domains for Grade 4 and Grade 8. The table below shows the links between the GPF and TIMSS domains, their weightings and the content assessed for the domain.

Table 16. GPF domains assessed by TIMSS, Grade 4

GPF domains	TIMSS domains	Content share	Content assessed
Number and Operations	Number	50 %	Whole numbers (25%) Expressions, simple equations, and relationships (15%) Fractions and decimals (10%)
Measurement	Measurement and Geometry	30%	Measurement (15%)
Geometry			Geometry (15%)
Statistics and Probability	Data	20%	Reading and displaying data (10%) Interpreting, combining, and comparing data (10%)

Table 17. GPF domains assessed by TIMSS, Grade 8

GPF domains	TIMSS domains	Content share	Content assessed
Number and Operations	Number	30 %	Integers (10%) Fractions and decimals (10%) Proportions, ratios, and percentages (10%)
Algebra	Algebra	30%	Expressions, operations, and equations (20%) Relationships and functions (10%)
Measurement Geometry	Geometry and Measurement	20%	Geometry and Measurement (20%)
Statistics and Probability	Data and probability	20%	Data (15%) Probability (5%)

Source: https://timssandpirls.bc.edu/timss2023/frameworks/chapter-1.html

TIMSS recommends three cognitive domains for testing and assigns weights to them as follows:

- Grade 4: knowing: 40%; applying: 40%; and reasoning: 20%.
- Grade 8: knowing: 35%; applying: 40%; and reasoning: 25%.

PISA

PISA documentation does include a detailed framework which is available in the *PISA 2022 Assessment and Analytical Framework* (OECD, 2023). Mathematics is defined as students' capacity to reason mathematically and to formulate, employ and interpret mathematics to solve problems in a variety of real-world contexts. It includes concepts, procedures, facts and tools to describe, explain and predict phenomena. It helps individuals make well-founded judgements and decisions, and become constructive, engaged and reflective 21st-century citizens (OECD, 2022, p.40). PISA tests cover all five GPF mathematics domains. It does not give weightings but rather provides a description of the eight levels (complexity, difficulty) of mathematics proficiency for (the equivalent of) Grade 9.

AMPL

The GPF is the framework used by AMPL. Items to be included in an AMPL test are determined through a process of construct alignment of national assessment content to the subconstructs in the GPF. There are two AMPL tests, AMPL(a) and AMPL(b). AMPL test content specification is not given using percentage weightings but rather numbers of items. The tables below show the links between the GPF domains and AMPL(a) and (b) domains, their weightings and the content assessed for the domain. The naming of the GPF subconstructs is used in the specification of the AMPL content for coverage.

Table 18. GPF domains assessed by AMPL(a), early primary

GPF domains	Content share	Content assessed
Number and Operations	16 items	N1.1 Identify and count in whole numbers, and identify their relative magnitude N1.2 Represent whole numbers in equivalent ways N1.3 Solve operations using whole numbers N1.4 Solve real-world problems involving whole numbers
Measurement Geometry	8 items	M1.1 Use non-standard and standard units to measure, compare, and order M2.1 Tell time M2.2 Solve problems involving time G1.1 Recognize and describe shapes and figures G2.1 Compose and decompose shapes and figures G3.1 Describe the position and direction of objects in space
Statistics and Probability Algebra	6 items	S1.1 Retrieve and interpret data presented in displays A1.1 Recognize, describe, extend, and generate patterns A3.2 Demonstrate an understanding of equivalency

Table 19. GPF domains assessed by AMPL(b), late primary

GPF domains	Content share	Content assessed
Number and Operations	35-40%	N.1.1 Identify and count in whole numbers, and identify their relative magnitude N.1.2 Represent whole numbers in equivalent ways N.1.3 Solve operations using whole numbers N.1.4 Solve real-world problems involving whole numbers N.2.1 Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude N.3.2 Represent decimals in equivalent ways (including fractions and percentages)
Algebra	5-10%	A.3.2 Demonstrate an understanding of equivalency
Measurement	15-20%	M.1.1 Use non-standard and standard units to measure, compare, and order M.1.2 Solve problems involving measurement M.2.1 Tell time M.2.2 Solve problems involving time
Geometry	15-20%	G.2.1 Compose and decompose shapes and figures G.3.1 Describe the position and direction of objects in space
Statistics and Probability	5-10%	S.1.1 Retrieve and interpret data presented in displays S.2.1 Describe the likelihood of events in different ways

The information presented from the various frameworks above clearly indicates that there is room for flexibility in the choice and development of an assessment framework. This flexibility is fundamental to the decision making around the constitution of a Continental Assessment Framework. Further support for decision making can also be drawn from the cross-country mapping carried out for this baseline study of a sample of 10 African curricula provided the following broad outlines of the content that could be included in the framework. This content would be sufficient for reporting at the international level, should the necessary validity of the instruments developed based on the framework be ascertained and the rigour of the assessment process guaranteed.

GPF and policy linking

The GPF allows the results of different national, regional or international assessments to be interpreted against a common reference or scale. When countries or jurisdictions link their assessments to the GPF through a process called policy linking, they can set benchmarks for their assessments that allow them to determine the percentage of learners that have partially met, met, or exceeded the Minimum Proficiency Level for reporting against SDG 4.1.1. This linking of existing and future mathematics assessments via a common scale (the GPF) allows for the comparison of results from different assessments, within and across countries; aggregation of country and global mathematics outcomes; and outcome tracking over time. Policy linking requires that items are rated in a similar manner to the way in which the curriculum mapping was done for the sample countries for this cross-country analysis. The rating system is explained in detail in the Policy Linking Toolkit (UNESCO, 2023). Once all items have been rated, the overall alignment to the GPF is determined. The criteria for mathematics alignment are presented in Table 20.

Table 20. Mathematics assessment alignment criteria for Grades 1–9

Level of Alignment	Category	SDG 4.1.1 (a) GPF grade 2	SDG 4.1.1 (b) GPF grade 5	SDG 4.1.1 (c) GPF grade 8
Minimally Aligned	Test length	Minimum total score of 20 if setting only 'meets' level Minimum total score of 45 if setting 'partially meets', 'meets', and 'exceeds' levels		
	Domain (depth):	N (minimum 10 score-points)		
	Subconstructs (breadth):	Score-points covering at least 2 of the 4 N subconstructs	Score-points covering at least 5 of the 10 N subconstructs	Score-points covering at least 4 of the 8 N subconstructs
Additionally Aligned	Test length	Minimum total score of 20 if setting only 'meets' level Minimum total score of 45 if setting 'partially meets', 'meets', and 'exceeds' levels		
	Domain (depth):	N (minimum 10 score-points) and M and G (minimum 5 score-points)		
	Subconstructs (breadth):	Score-points covering at least 6 of the 11 N, M, and G subconstructs	Score-points covering at least 9 of the 17 N, M, and G subconstructs	Score-points covering at least 7 of the 14 N, M, and G subconstructs
Strongly Aligned	Test length	Minimum total score of 20 if setting only 'meets' level Minimum total score of 45 if setting 'partially meets', 'meets', and 'exceeds' levels		
	Domain (depth):	N (minimum 10 score-points) and M and G (minimum 5 score-points) and S and A (minimum 2 score-points)	N (minimum 10 score-points) and M and G (minimum 5 score-points) and S and A (minimum 5 score-points)	
	Subconstructs (breadth):	Score-points covering at least 7 of all 14 subconstructs	Score-points covering at least 12 of all 21 subconstructs	Score-points covering at least 12 of all 21 subconstructs

Key: N – Number and operations
M – Measurement
G – Geometry
S – Statistics and Probability
A – Algebra

Source: UNESCO, 2023, p.14.

When summarising results to the subconstruct level, it is recommended that only subconstructs with knowledge and/or skill(s) expected at the grade level for which alignment is being conducted (Grade 2 for SDG 4.1.1(a), Grade 5 for SDG 4.1.1(b) and Grade 8 for SDG 4.1.1(c)) should be considered.

Numbers of score points recommended for inclusion in a test per domain per grade (at grade levels 2, 5 and 8) are specified in the table for policy linking. Test length and scoring guidance are also given. Content from the five domains in the GPF for inclusion at three different levels (minimally aligned, additionally aligned and strongly aligned) is suggested, in different weightings, indicated through minimum score point recommendations. In four of the six frameworks from the international domain, which were examined in this section (PISA, TIMSS, AMPL

and the Policy Linking framework), all five GPF domains were recommended for inclusion at both early and late primary levels.

4.4. Alignment with the Global Proficiency Framework

The suggestions made here for inclusion into the Continental Assessment Framework (CAF) are based on the cross-country analysis of alignment of 10 African curricula with the GPF, which was shown to be linked substantively to all comparable frameworks reviewed. The choice of the GPF as an analytical tool was explained in Chapter 3. The purpose of the GPF was to provide a common reference or scale for reporting progress on SDG global indicator 4.1.1 in the form of a common definition of the minimum knowledge and skills learners must demonstrate at key points along their learning trajectory. The cross-country analysis revealed that curriculum coverage of the minimum proficiency standards for Grade 3 and 6 specified in the GPF were satisfied across the sample.

Grade 3

A recommendation for the broad structure of the CAF for Grade 3 is that it should cover, in line with international standards, but interpreted specifically in relation to the country curriculum, the following domains and constructs.

Table 21. Mathematics domains and constructs for inclusion in the CAF, Grade 3

Domain	Construct
N. Number and Operations	N.1 Whole numbers
	N.2 Fractions
A. Algebra	A.1 Patterns
	A.3 Relations and functions
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter
	M.2 Time
	M.3 Currency
G. Geometry	G.1 Properties of shapes and figures
	G.2 Spatial visualizations
	G.3 Position and direction
S. Statistics and Probability	S.1 Data management

The outcome of the cross-country analysis showed that there was sufficient alignment across the following GPF subconstructs for Grade 3 mathematics which could further guide CAF construction.

Table 22. Mathematics subconstructs for inclusion in the CAF, Grade 3

Subconstructs
A.1.1 Recognize, describe, extend, and generate patterns
A.3.2 Demonstrate an understanding of equivalency
G.1.1 Recognize and describe shapes and figures
G.2.1 Compose and decompose shapes and figures
G.3.1 Describe the position and direction of objects in space
M.1.1 Use non-standard and standard units to measure, compare, and order
M.2.1 Tell time
M.2.2 Solve problems involving time
M.3.1 Use different currency units to create amounts
N.1.1 Identify and count in whole numbers, and identify their relative magnitude
N.1.2 Represent whole numbers in equivalent ways
N.1.3 Solve operations using whole numbers
N.1.4 Solve real-world problems involving whole numbers
N.2.1 Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude
S.1.1 Retrieve and interpret data presented in displays

No specific recommendations for specific inclusion in the Grade 3 CAF are made at the level of competencies, as these need to be the subject of further discussion with the appropriate stakeholders and technical experts.

Mathematics Grade 6

A recommendation for the broad structure of the CAF for Grade 6 is that it should cover, in line with international standards, but interpreted specifically in relation to the country curriculum, the following domains and constructs.

Table 23. Mathematics domains and constructs for inclusion in the CAF, Grade 6

Domain	Construct
N. Number and Operations	N.1 Whole numbers
	N.2 Fractions
	N.3 Decimals
A. Algebra	A.1 Patterns
	A.3 Relations and functions
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter
	M.2 Time
	M.3 Currency
G. Geometry	G.1 Properties of shapes and figures
	G.2 Spatial visualizations
	G.3 Position and direction
S. Statistics and Probability	S.1 Data management
	S.2 Chance and probability

The outcome of the cross-country analysis showed that there was sufficient alignment[2] across the following set of GPF subconstructs for Grade 6 mathematics which could further guide the construction of the Continental Assessment Framework.

Table 24. Mathematics subconstructs for inclusion in the CAF, Grade 6

Subconstructs
N.1.1 Identify and count in whole numbers, and identify their relative magnitude
N.1.2 Represent whole numbers in equivalent ways
N.1.3 Solve operations using whole numbers
N.1.4 Solve real-world problems involving whole numbers
N.2.1 Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude
N.2.2 Solve operations using fractions
N.2.3 Solve real-world problems involving fractions
N.3.1 Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude
N.3.2 Represent decimals in equivalent ways (including fractions and percentages)
N.3.3 Solve operations using decimals
N.3.4 Solve real-world problems involving decimals
A.1.1 Recognize, describe, extend, and generate patterns
A.3.1 Solve problems involving variation (ratio, proportion, and percentage)
A.3.2 Demonstrate an understanding of equivalency
M.1.1 Use non-standard and standard units to measure, compare, and order
M.1.2 Solve problems involving measurement
M.2.1 Tell time
M.2.2 Solve problems involving time
M.3.1 Use different currency units to create amounts
G.1.1 Recognize and describe shapes and figures
G.2.1 Compose and decompose shapes and figures
G.3.1 Describe the position and direction of objects in space
S.1.1 Retrieve and interpret data presented in displays
S.2.1 Describe the likelihood of events in different ways

No specific recommendations for specific inclusion in the Grade 6 CAF are made at the level of competencies, as these need to be the subject of further discussion with the appropriate stakeholders and technical experts.

Mathematics Grade 9

The Grade 9 curriculum mapping and cross-country analysis was not completed in time for inclusion in this document. Since mathematics learning occurs along an expected trajectory and the analysis of the Grades 3 and 6 curricula revealed a strong case in favour of the GPF as an appropriate assessment framework, it is recommended that a similar path be followed for Grade 9. The broad structure of the CAF for Grade 9 could thus be guided by the GPF. As for Grades 3 and 6, the framework guideline should be interpreted specifically in relation to the country curriculum.

Table 25. Mathematics domains and constructs for inclusion in the CAF, Grade 9

Domain	Construct
N. Number and Operations	N.5 Exponents and roots
	N.6 Operations across number
A. Algebra	A.2 Expressions
	A.3 Relations and functions
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter
	M.2 Time
G. Geometry	G.1 Properties of shapes and figures
	G.2 Spatial visualizations
	G.3 Position and direction
S. Statistics and Probability	S.1 Data management
	S.2 Chance and probability

Table 26. Mathematics subconstructs for inclusion in the CAF, Grade 9

Subconstructs
N.5.1 Identify and represent quantities using exponents and roots, and identify the relative magnitude
N.5.2 Solve operations involving exponents and roots
N.6.1 Solve operations involving integers, fractions, decimals, percentages, and exponents
A.2.1 Evaluate, model, and compute with expressions
A.3.1 Solve problems involving variation (ratio, proportion, and percentage)
A.3.3 Demonstrate an understanding of equivalency
A.3.4 Interpret and evaluate functions
M.1.2 Solve problems involving measurement
M.2.2 Solve problems involving time
G.1.1 Recognize and describe shapes and figures
G.2.1 Compose and decompose shapes and figures
G.3.1 Describe the position and direction of objects in space
S.1.1 Retrieve and interpret data presented in displays
S.1.2 Calculate and interpret central tendency
S.2.1 Describe the likelihood of events in different ways

No specific recommendations for specific inclusion in the Grade 6 CAF are made at the level of competencies, as these need to be the subject of further discussion with the appropriate stakeholders and technical experts.

Weightings

The GPF defines minimum proficiency levels that constitute the benchmark of basic knowledge in a domain at a given age/grade measured through learning assessments. Hence in constructing the CAF, it was essential to compare the alignment of the content and emphases of the CAF at Grades 3, 6 and 9 with the GPF. The GPF does not allocate weightings to the mathematics domains specified. Rather it indicates at which grade a learner should demonstrate the minimum proficiency level for a skill.

In terms of the content to be included in the CAF for mathematics, guidance was taken from the cross-country analyses and suggestions made by the AEAA workshop mathematics group. The working group felt strongly that there must be provision for the framework to be contextualised and that weighting must be proportional to the country curriculum so that assessment gives a fair representation of the content covered. Contextualisation and weighting according to the different country curricula will guard against prescriptive implementation. There was no consensus on the weightings and thus the recommendations given here draw on the review of the series of international assessments discussed above.

Table 27. Overview of domains and weightings for the CAF, by grade

Domain	Weighting (%)		
	Grade 3	Grade 6	Grade 9
Number and Operations	60	60	30
Algebra			30
Measurement	35	30	20
Geometry			
Statistics and Probability	5	10	20

Note: Weighting refers to the percentage of the test items allocated per domain.

In order to provide more flexibility, the CAF groups the domain of Number and Operations with the domain of Algebra, and the domain of Measurement with the domain of Geometry for Grades 3 and 6. There are countries that do not have the domain of Algebra in their early grade mathematics curriculum (for example, Cameroon and Chad in Grade 3). However, there are concepts in the Number and Operations domain that could develop algebraic reasoning, such as patterns and types of numbers (for example even and odd numbers), finding the missing number in number sentences (for example 8 = 3 + ?) or problem solving (using different representations, such as line diagrams or tables). Thus, it is appropriate to group those two domains in elementary school for Grade 3 and Grade 6. In Grade 9, where the domain of Algebra is extensively present in all curricula, separate weightings are given for the domains of Number and Operations, and Algebra.

Similarly, and in line with several of the international framework examples that were reviewed, the domain of Measurement is grouped with the domain of Geometry, because there are concepts in these domains that overlap, such as geometry of circles (circumference, radius and diameter) and measurement in relation to figures (perimeter and area). The weightings are close, but not identical to those present in the GPF. They are recommended in line with international framework examples. The weighting shows the greatest variation from the GPF in relation to the representation of the domain of Number and Operations in Grade 9. Here, the inclusion of a higher percentage of items creates the opportunity for assessment aligned more strongly with the country curricula on the domain of Number and Operations.

Table 28. Alignment of the CAF with the GPF

	Grade 3		*Grade 6*		*Grade 9*	
Domains	GPF Proportion of domain specific skills/ knowledge)	CAF weighting	GPF Proportion of domain specific skills/ knowledge	CAF weighting	GPF Proportion of domain specific skills/ knowledge	CAF weighting
Number and Operations	34	60	50	60	10	30
Algebra	15		12		30	30
Measurement	21	35	12	30	15	20
Geometry	27		16		20	
Statistics and Probability	3	5	10	10	25	20

Note: Weighting refers to the percentage of the test items allocated per domain

Further, there should be three cognitive domains for testing, weighted in the following way:

Table 29. Weighting of cognitive domains for testing for the CAF, by grade

Grade	Weighting (%)		
	Knowing	Applying	Reasoning
Grade 3	40	40	20
Grade 6	35	40	25
Grade 9	30	45	25

In the majority of primary school mathematics curricula, the Number and Operations domain has the greatest emphasis. It is highest in Grade 1 and decreases as the grades progress. By Grade 6, the emphasis across the domains becomes more evenly spread. The importance of Algebra is low in Grade 1 (where it is sometimes

embedded in the domain of Number and Operations) and increases until Grade 9, when it has a higher emphasis than that of Number and Operations. The domains of Measurement and Geometry are more stable in representation but show some decrease in emphasis as the grades progress. The importance of the domain of Statistics and Probability increases over time in mathematics curricula.

Minimum proficiency levels

In consideration of the draft Continental Assessment Framework, the minimum proficiency levels from the GPF were re-examined in line with draft framework described in 5.3. The following description of the minimum proficiency levels for mathematics are therefore.

Table 30. CAF minimum proficiency levels for mathematics

	Description
Grade 3	Students demonstrate skills in number sense and computation, measurement, shape recognition and spatial orientation, and reading simple data displays.
Grade 6	Students demonstrate skills in number sense, computation, real world problems, basic measurement, 2D shape recognition, and reading and interpreting simple data displays.
Grade 9	Students demonstrate skills in computation, solving problems in measurement and constructing a variety of data display, and making use of algebraic representations.

Adapted from UIS (2019) Minimum Proficiency Levels: described, unpacked and illustrated (GAML 6/REF/2).

CHAPTER 5. READING

This chapter reports on the main findings from the analyses conducted on the country curricula. Firstly, the individual country analyses are presented in 5.1 and the subsequent mapping to the Global Proficiency Framework (GPF) in 5.2. The Continental Assessment Framework (CAF) is presented in 5.3 and thereafter a discussion about its alignment with the GPF is outlined in 5.4.

5.1. Findings regarding the alignment of country curricula to the GPF

The findings of the mapping of the country reading curricula using the analytical tool are presented here per country (see Appendix 5.1 for more details). First, for each country an overview of the country curriculum for both grades 3 and 6 in relation to the GPF competencies is shown through the presence or absence of the domains, constructs and subconstructs mapped per grade.

As discussed in Chapter 3, the GPF as an analytical framework permitted the comparison of the curricula with benchmarks representing a global consensus of what learners should know and be able to do, to be proficient readers as they progress through the grade levels, regardless of the country they live in. As emphasised earlier, the findings of the mapping of the competencies outlined in the GPF are not meant to be fully comprehensive given countries individual characteristics, needs and priorities. Differences and choices within countries may require the addition of (or exclusion at particular grade levels) competencies not listed in the GPF. Some exceptions are noted where appropriate and where these provide useful additional/contextual insights for consideration in the drafting of the Continental Assessment Frameworks. This section offers a short summary of the main findings for each of the participating countries.

Cameroon

In Grade 3, the curriculum places significant emphasis on Reading Comprehension, followed by Comprehension of Spoken Language and Decoding. Constructs such as word-level retrieval and reading retrieval or literal comprehension are dominant, with subconstructs focusing on vocabulary and oral comprehension. In Grade 6, the emphasis on Reading Comprehension increases compared to Grade 3, while Decoding and Comprehension of Spoken Language slightly decrease. Constructs shift toward fluency and inference, with subconstructs emphasising fluent reading and deeper comprehension. Overall, the curriculum progresses from foundational literacy to more advanced reading skills.

Chad

The curriculum for Grade 3 in Chad emphasises Decoding and Comprehension of Spoken Language, with a strong focus on fluency and word-level retrieval. Subconstructs highlight decoding accuracy and oral comprehension. In Grade 6, the curriculum becomes more balanced across domains, with equal emphasis on Decoding, Comprehension of Spoken Language, and Reading Comprehension. Constructs introduce interpretation and maintain fluency, while subconstructs reflect deeper comprehension and expressive fluency. The curriculum transitions from foundational decoding to interpretive reading skills.

The Gambia

In Grade 3, The Gambia's curriculum emphasizes Comprehension of Spoken Language and includes a high proportion of other domains. Constructs focus on word-level retrieval and include many competencies outside the global framework. Grade 6 sees increased emphasis on Comprehension of Spoken Language and Reading Comprehension, with constructs shifting toward interpretation and retrieval. Subconstructs reflect growth in

analytical reading and vocabulary. The curriculum evolves from oral and decoding skills to more complex comprehension and interpretation.

Ghana

Grade 3 in Ghana emphasises Comprehension of Spoken Language and Decoding, with limited focus on Reading Comprehension. Constructs centre on word-level retrieval and decoding precision. In Grade 6, Reading Comprehension increases significantly from Grade 3, while Decoding decreases. Constructs shift toward retrieval and interpretation, with subconstructs emphasizing vocabulary and analytical reading. The curriculum transitions from foundational literacy to advanced comprehension and textual analysis.

Kenya

In Grade 3, Kenya's curriculum emphasizes Comprehension of Spoken Language and Decoding, with constructs focused on word-level retrieval and fluency. Subconstructs highlight oral comprehension and instruction-following. Grade 6 shifts toward Reading Comprehension and introduces interpretive constructs. Subconstructs emphasize explicit information retrieval and inference. The curriculum progresses from oral and decoding skills to advanced reading and analytical competencies.

Lesotho

Grade 3 in Lesotho emphasizes Comprehension of Spoken Language and Decoding, with constructs focused on word-level retrieval and fluency. Subconstructs highlight oral comprehension and vocabulary. In Grade 6, Reading Comprehension increases to a major focus, and interpretation constructs are introduced. Subconstructs reflect growth in analytical reading and reduced emphasis on decoding. The curriculum evolves from foundational oral skills to advanced comprehension and inference.

Morocco

Grade 3 in Morocco emphasises Decoding, Comprehension of Spoken Language, and Reading Comprehension. Constructs focus on precision, fluency, and retrieval. In Grade 6, Decoding and Comprehension of Spoken Language increase further, while Reading Comprehension decreases. A large proportion of competencies fall under other constructs, indicating a shift toward broader or integrated learning outcomes. The curriculum maintains strong foundational literacy while incorporating unique competencies.

Rwanda

In Rwanda, the Grade 3 curriculum emphasizes Comprehension of Spoken Language and word-level retrieval, with nearly half of the competencies categorized under other domains. Decoding is present but limited, and many competencies fall outside the global framework, suggesting a curriculum that integrates broader educational priorities. By Grade 6, the curriculum shifts toward more structured literacy instruction, introducing Reading Comprehension and interpretive constructs while maintaining a strong focus on oral language skills. This progression reflects Rwanda's approach to foundational literacy development alongside context-specific and holistic learning outcomes.

Zambia

In Grade 3, African languages emphasize Comprehension of Spoken Language and other domains, with minimal Decoding. English emphasizes Decoding and Reading Comprehension. Constructs vary by language, with African languages focusing on oral skills and English on decoding and vocabulary. In Grade 6 (English), Reading Comprehension increases, and other domains dominate. Constructs shift toward retrieval and interpretation. The curriculum demonstrates differentiated priorities across languages and progression toward analytical reading.

Grade 3

The analyses revealed that all the countries covered the spread of the three reading domains at grade 3 level when compared to the GPF. However, individual differences began to emerge at the **Construct** level (see Table 32). For example, with respect to the Comprehension domain, the Construct of "retrieve information at word level" was not expected to appear in the Grade 3 curricula but globally was expected at grades 1 and 2. In the analyses all the countries appear to include this construct.

Most of the countries included the other Comprehension Constructs (Retrieve information at sentence or text level and Interpret information at sentence or text level) except for two countries. The constructs for Decoding

were also expected and were found in all countries with one exception for "precision" and one other exception for "fluency".

One more significant finding was that for the Reading Comprehension construct "interpret information", despite being expected globally, only six countries dealt with this construct. Furthermore, for a construct not expected globally in grade 3, three countries included this construct, namely "reflect on information" in grade three.

Linked to the inclusion of C1 mentioned above, two of the **Subconstructs** (C.1.1 Comprehend spoken and signed language at the word or phrase level and C.1.2 Recognize the meaning of common grade-level words in a short, grade-level continuous text read to or signed for the learner) were included in all countries (C1.1) and six countries (C1.2) which were not included globally (see Table 33 for details).

For four further subconstructs, under Comprehension and Decoding, only two countries did not include these as expected globally. Under Reading Comprehension, perhaps most countries did not include several Subconstructs as are expected globally (R1.3, R2.1, R2.3). However, under R3.2. 'evaluate a text with justification', three countries included this subconstruct which is not expected globally.

In line with the comments on Construct and Subconstruct level, there were several **skills/knowledge** competencies not included for Comprehension related to retrieval and inference as expected globally (C1.3.1.1., C3.1.2, C3.1.3). On the other hand, there were skills/knowledge not expected globally at grade 3 level such as C.1.1.1, C1.1.2 and C1.2.1 found for all or 6-8 countries, which were expected at grade 1-2 level. Conversely, a competency such as R 1.2.2 not expected at grade 3 and expected at Grade 5 level was found to be included by one country (see Table 33 for more details).

Table 31. Presence of domain by country, Reading, Grade 3

Domain	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C. Comprehension of spoken or signed language	1-3	1	1	1	1	1	1	1	1	0	1
D. Decoding	1-9	1	1	1	1	1	1	1	1	1	1
R. Reading comprehension	1-9	1	1	1	1	1	1	1	0	1	1

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Table 32. Presence of construct by country, Reading, Grade 3

Construct	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.1 Retrieve information at word level	1-2	1	1	1	1	1	1	1	1	0	1
C.2 Retrieve information at sentence or text level	1-3	1	0	1	1	1	1	1	0	0	1
C.3 Interpret information at sentence or text level	2-3	1	0	1	1	1	1	1	0	0	1
D.1 Precision	1-9	1	0	1	1	1	1	1	1	1	1
D.2 Fluency	2-9	1	1	1	1	1	1	1	0	1	1
R.1 Retrieve information	1-9	1	1	1	1	1	1	1	0	1	1
R.2 Interpret information	3-9	1	0	1	1	1	0	1	0	1	1
R.3 Reflect on information	4-9	0	0	0	1	1	0	1	0	1	0

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Table 33. Presence of subconstruct by country, Reading, Grade 3

Subconstruct	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.1.1 Comprehend spoken and signed language at the word or phrase level	1-2	1	1	1	1	1	1	1	1	0	1
C.1.2 Recognize the meaning of common grade-level words in a short, grade-level continuous text read to or signed for the learner	1-2	0	0	1	1	1	1	1	0	0	1
C.2.1 Retrieve explicit information in a short grade-level continuous text read to or signed for the learner	1-3	1	0	1	1	1	1	1	0	0	1
C.3.1 Interpret information in a short grade-level continuous text read to or signed for the learner	2-3	1	0	1	1	1	1	1	0	0	1
D.1.1 Identify symbol-sound/fingerspelling and/or symbol-morpheme correspondences	1-9	1	0	1	1	1	1	1	0	1	1
D.1.2 Decode isolated words	1-9	1	0	1	1	1	1	1	1	1	1
D.2.1 Say or sign a grade-level continuous text at pace and with accuracy	2-9	1	1	1	1	1	1	1	0	1	1
R.1.1 Recognize the meaning of common grade-level words	1-9	1	1	1	1	1	1	1	0	1	1
R.1.2 Retrieve explicit information in a grade-level text by direct- or close-word matching	2-9	0	0	1	1	1	1	1	0	1	1
R.1.3 Retrieve explicit information in a grade-level text by synonymous word matching	3-9	0	0	0	0	0	0	0	0	0	1
R.2.1 Identify the meaning of unknown words and expressions in a grade-level text	3-9	0	0	0	1	1	0	0	0	0	1
R.2.2 Make inferences in a grade-level text	3-9	1	0	1	1	1	0	1	0	1	1
R.2.3 Identify the main and secondary ideas in a grade-level text	3-9	0	0	1	0	1	0	1	0	0	0
R.3.1 Identify the purpose and audience of a text	4-9	0	0	0	1	0	0	0	0	0	0
R.3.2 Evaluate a text with justification	4-9	0	0	0	1	1	0	1	0	1	0
R.3.3 Evaluate the status of claims made in a text	6-9	0	0	0	0	0	0	0	0	0	0
R.3.4 Evaluate the effectiveness of a text	8-9	0	0	0	0	0	0	0	0	1	0

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Table 34. Presence of skill/knowledge by country, Reading, Grade 3

Skill/Knowledge	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.1.1.1 Understand the meaning of grade-level spoken or signed words	1-2	1	1	1	1	1	1	1	1	0	1
C.1.1.2 Follow spoken or signed instructions	1-2	1	0	1	1	1	1	1	1	0	1
C.1.2.1 Identify the meaning of common words in grade-level continuous texts read to or signed for the learner	1-2	0	0	1	1	1	1	1	0	0	1
C.2.1.1 Retrieve explicit information from grade-level continuous texts read to or signed for the learner	1-3	1	0	1	1	1	1	1	0	0	1
C.3.1.1 Make simple inferences based on explicit information in grade-level continuous texts read to or signed for learner	2-3	0	0	1	0	0	0	1	0	0	1
C.3.1.2 Infer the meaning of words in grade-level continuous texts read to or signed for the learner	3	0	0	0	0	0	0	0	0	0	0
C.3.1.3 Associate noun and pronoun references in grade-level continuous texts read to or signed for the learner	3	0	0	0	0	0	0	0	0	0	1
C.3.1.4 Demonstrate a broad understanding of grade-level continuous texts read to or signed for the learner	3	1	0	1	1	1	1	1	0	0	1
D.1.1.1 Sound out or sign grade-level symbols, if the curriculum introduces new symbols at this grade-level	1-9	1	0	1	1	1	1	1	0	1	1
D.1.2.1 Say or sign common, isolated grade-level words	1-9	1	0	1	1	1	1	1	1	1	1
D.2.1.1 Accurately say or sign a grade-level continuous text	2	0	0	1	1	1	0	1	0	0	1
D.2.1.2 Say or sign fluently a grade-level continuous text	3-9	1	1	0	1	1	1	1	0	1	0
R.1.1.1 Recognize the meaning of common grade-level words	1-9	1	1	1	1	1	1	1	0	1	1
R.1.2.1 Retrieve a single piece of explicit information from a grade-level text by direct- or close-word matching	2-3	0	0	1	1	1	1	1	0	1	1
R.1.2.2 Retrieve a single piece of explicit information from a grade-level continuous text by direct- or close-word matching	5-9	0	0	0	0	0	0	0	0	0	1
R.1.2.3 Retrieve a single piece of explicit information from a grade-level non-continuous text (tables, diagrams, graphs) by direct- or close-word matching	5-9	0	0	0	0	0	0	0	0	0	1
R.1.3.1 Retrieve a single piece of explicit information from a grade-level text by synonymous word matching	3	0	0	0	0	0	0	0	0	0	0
R.1.3.2 Retrieve a single piece of explicit information from a grade-level continuous text by synonymous word matching	5-9	0	0	0	0	0	0	0	0	0	1
R.1.3.3. Retrieve a single piece of explicit information from a grade-level non-continuous text (e.g., simple diagrams and tables) by synonymous word matching	5-9	0	0	0	0	0	0	0	0	0	0
R.2.1.1 Identify the meaning of unknown words (including familiar words used in unfamiliar ways) and idiomatic and figurative expressions in a grade-level text	3-9	0	0	0	1	1	0	0	0	0	1

Skill/Knowledge	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
R.2.2.1 Make simple inferences in a grade-level text by relating pieces of explicit and/or implicit information in the text	3-4	0	0	0	1	1	0	1	0	1	1
R.2.2.2 Make inferences in a grade-level continuous text by relating pieces of explicit and/or implicit information in the text	5-9	1	0	1	0	0	0	0	0	0	0
R.2.2.3 Make inferences in a grade-level non-continuous text (e.g., tables, diagrams, graphs) by relating pieces of explicit and/or implicit information	5-9	0	0	0	0	0	0	0	0	0	0
R.2.2.4 Identify the sequence of events/actions/steps in a grade-level text	4-9	0	0	0	1	1	0	1	0	0	1
R.2.2.5 Identify, compare, or contrast points of view in a grade-level text	5-9	0	0	0	0	0	0	0	0	0	0
R.2.2.6 Identify, compare, or contrast evidence in a grade-level text to support or explain an idea, action, or statement	6-9	0	0	0	0	0	0	0	0	0	0
R.2.2.7 Draw a basic conclusion from a grade-level text by synthesizing information in the text (grades 6 to 9)	6-9	0	0	0	0	0	0	0	0	0	0
R.2.2.8 Apply information from a grade-level text to a new example or situation	9	1	0	0	0	1	0	1	0	0	0
R.2.3.1 Identify the main idea in a grade-level text when it is not explicitly stated	3-9	0	0	1	0	1	0	1	0	0	0
R.2.3.2 Distinguish between a prominent main idea and secondary ideas in a grade-level text	5-9	0	0	0	0	0	0	0	0	0	0
R.3.1.1 Identify the purpose of a grade-level text when it is not explicitly stated, or of features of the text (e.g., vocabulary or images, graphics or other paratextual features)	4-9	0	0	0	1	0	0	0	0	0	0
R.3.1.2 Identify evidence in the text to support the purpose of a grade-level text or of features of the text	6-9	0	0	0	0	0	0	0	0	0	0
R.3.1.3 Identify the audience of a grade-level text and the evidence in the text that supports that assertion	6-9	0	0	0	0	0	0	0	0	0	0
R.3.2.1 Give an opinion about a grade-level text and use evidence from the text to justify that opinion	4-9	0	0	0	1	1	0	1	0	1	0
R.3.2.2 Evaluate the conclusion presented in a grade-level informational text	9	0	0	0	0	0	0	0	0	0	0
R.3.3.1 Distinguish between factual information and opinion in a grade-level text	6-9	0	0	0	0	0	0	0	0	0	0
R.3.3.2 Assess the credibility of a grade-level text in digital format or on social media	9	0	0	0	0	0	0	0	0	0	0
R.3.4.1 Evaluate the effectiveness of the features of a grade-level text (e.g., images/graphics, paratextual features, and vocabulary)	8-9	0	0	0	0	0	0	0	0	1	0

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Grade 6

The analyses revealed that all the countries covered the spread of the three reading domains (Table 35) at grade 6 level when compared to the GPF. Unexpectedly the domain Comprehension of Spoken Language still featured, which was only expected globally up to Grade 3 and not beyond.

More nuanced differences emerge at the **construct** level (see Table 36). For example, with respect to the Comprehension domain, the construct 'C.1 Retrieve information at word level' was not expected to appear in Grade 6 curricula but one appears to include it. Furthermore, three countries included 'C.2 Retrieve information at sentence or text level' and six countries included 'C.3 Interpret information at sentence or text level' contrary to the global expectation.

Most countries included the constructs for Decoding which were also expected at Grade 6 level and were found in five countries for 'precision' and all countries for 'fluency'.

For the Reading Comprehension constructs, 'R.1 Retrieve information' was included by all countries as was 'R.2 Interpret information' (except for one country), as was expected globally. Notably only three countries dealt with 'R.3 Reflect on information' in grade 6, despite this being expected globally by this grade.

Linked to the inclusion of C1, C2 and C3 mentioned above, four of the **subconstructs** (Table 37) (C.1.1 Comprehend spoken and signed language at the word or phrase level, C.1.2 Recognize the meaning of common grade-level words in a short, grade-level continuous text read to or signed for the learner, C.2.1 Retrieve explicit information in a short grade-level continuous text read to or signed for the learner and C.3.1 Interpret information in a short grade-level continuous text read to or signed for the learner) were included in almost all countries (C1.1) and three countries (C1.2 and C2.1), and six countries which were not included globally.

For two further subconstructs, under Decoding, three countries did not include these as expected globally.

Under Reading Comprehension, most countries did not include several Subconstructs as are expected globally (R1.3, R2.1, R2.3, R3.1, R3.2, R3.3). No countries included R.3.3 *Evaluate the status of claims made in a text* expected globally in Grade 6.

In line with the comments on Construct and Subconstruct level, all the skills/knowledge competencies for Comprehension related to retrieval, inference, interpret which were not expected globally were included in most countries (C1.1.1, C1.1.2, C3.1.4) and the rest in multiple countries.

Most countries included the **Skills/Knowledge** required for Decoding (see Table 8). In contrast most of the Reading Comprehension Skills/Knowledge indicators were not included for almost all or most countries. Exceptions were:

- 'R.2.2.1 Make simple inferences in a grade-level text by relating pieces of explicit and/or implicit information in the text' included by five countries in grade 6 eve if it should be completed by Grade 4;
- 'R.2.2.4 Identify the sequence of events/actions/steps in a grade-level text' included by four countries.

Some of the Skills/Knowledge were not included in any countries' curricula:

- R.1.3.2 Retrieve a single piece of explicit information from a grade-level continuous text by synonymous word matching
- R.1.3.3. Retrieve a single piece of explicit information from a grade-level non-continuous text (e.g., simple diagrams and tables) by synonymous word matching
- R.2.2.3 Make inferences in a grade-level non-continuous text (e.g. tables, diagrams, graphs) by relating pieces of explicit and/or implicit information
- R.2.2.5 Identify, compare, or contrast points of view in a grade-level text
- R.1.3.3. Retrieve a single piece of explicit information from a grade-level non-continuous text (e.g. simple diagrams and tables) by synonymous word matching
- R.3.1.3 Identify the audience of a grade-level text and the evidence in the text that supports that assertion
- R.3.3.1 Distinguish between factual information and opinion in a grade-level text) despite being expected globally.

Many of these exclusions link to the focus on comprehension linked to texts for the GPF meaning that they could not be mapped as text choices were not stated in the curricula analysed. The risk is that if these are not explicit then this could result in deficits in exposure to the array of text types needed for educational development and later critical literacy development for dealing with multiple and potentially conflicting/ contrasting sources of information. Moreover, many of these unaccounted-for skills/ constructs are linked to higher order comprehension development which should be introduced as early as possible to learners to cement the foundations for thinking and reasoning skills needed at higher levels of education.

On the other hand, there were skills/knowledge not expected globally at grade 6 level such as 'R.2.2.8 Apply information from a grade-level text to a new example or situation' found for four countries, which is globally expected at Grade 9 level.

Table 35. Presence of domain by country, Reading, Grade 6

Domain	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C. Comprehension of spoken or signed language	1-3	1	1	1	1	1	1	1	1	1	1
D. Decoding	1-9	1	1	1	1	1	1	1	0	1	1
R. Reading Comprehension	1-9	1	1	1	1	1	1	1	1	1	1

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Table 36. Presence of construct by country, Reading, Grade 6

Construct	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.1 Retrieve information at word level	1-2	1	1	1	1	1	1	0	1	0	1

Construct	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.2 Retrieve information at sentence or text level	1-3	0	0	0	0	1	1	0	0	0	1
C.3 Interpret information at sentence or text level	2-3	0	1	1	1	1	1	1	0	0	0
D.1 Precision	1-9	1	0	1	1	1	1	0	0	1	0
D.2 Fluency	2-9	1	1	1	1	1	1	1	0	1	1
R.1 Retrieve information	1-9	1	1	1	1	1	1	1	1	1	1
R.2 Interpret information	3-9	1	1	1	1	1	1	1	1	1	0
R.3 Reflect on information	4-9	0	0	1	1	0	0	1	0	1	0

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Table 37. Presence of subconstruct by country, Reading, Grade 6

Subconstruct	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.1.1 Comprehend spoken and signed language at the word or phrase level	1-2	1	1	1	1	1	1	0	1	0	1
C.1.2 Recognize the meaning of common grade-level words in a short, grade-level continuous text read to or signed for the learner	1-2	0	0	0	1	1	1	0	0	0	0
C.2.1 Retrieve explicit information in a short grade-level continuous text read to or signed for the learner	1-3	0	0	0	0	1	1	0	0	0	1
C.3.1 Interpret information in a short grade-level continuous text read to or signed for the learner	2-3	0	1	1	1	1	1	1	0	0	0
D.1.1 Identify symbol-sound/fingerspelling and/or symbol-morpheme correspondences	1-9	1	0	1	1	1	1	0	0	1	0
D.1.2 Decode isolated words	1-9	1	0	1	1	1	1	0	0	1	0
D.2.1 Say or sign a grade-level continuous text at pace and with accuracy	2-9	1	1	1	1	1	1	1	0	1	1
R.1.1 Recognize the meaning of common grade-level words	1-9	1	1	1	1	1	1	1	0	1	1
R.1.2 Retrieve explicit information in a grade-level text by direct- or close-word matching	2-9	0	1	1	1	1	1	1	1	1	1
R.1.3 Retrieve explicit information in a grade-level text by synonymous word matching	3-9	0	0	1	0	0	0	0	0	1	0
R.2.1 Identify the meaning of unknown words and expressions in a grade-level text	3-9	0	1	0	1	1	1	0	0	0	0
R.2.2 Make inferences in a grade-level text	3-9	1	0	1	1	1	1	1	1	1	0
R.2.3 Identify the main and secondary ideas in a grade-level text	3-9	0	0	1	1	0	1	0	1	1	0
R.3.1 Identify the purpose and audience of a text	4-9	0	0	1	1	0	0	1	0	0	0
R.3.2 Evaluate a text with justification	4-9	0	0	0	1	0	0	1	0	1	0
R.3.3 Evaluate the status of claims made in a text	6-9	0	0	0	0	0	0	0	0	0	0
R.3.4 Evaluate the effectiveness of a text	8-9	0	0	0	0	0	0	0	0	1	0

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

Table 38. Presence of skill/knowledge by country, Reading, Grade 6

Skill/Knowledge	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.1.1.1 Understand the meaning of grade-level spoken or signed words	1-2	1	1	1	1	1	1	0	1	0	1
C.1.1.2 Follow spoken or signed instructions	1-2	1	0	1	1	1	1	0	0	0	1
C.1.2.1 Identify the meaning of common words in grade-level continuous texts read to or signed for the learner	1-2	0	0	0	1	1	1	0	0	0	0
C.2.1.1 Retrieve explicit information from grade-level continuous texts read to or signed for the learner	1-3	0	0	0	0	1	1	0	0	0	1
C.3.1.1 Make simple inferences based on explicit information in grade-level continuous texts read to or signed for the learner	2-3	0	0	1	1	1	1	0	0	0	0
C.3.1.2 Infer the meaning of words in grade-level continuous texts read to or signed for the learner	3	0	0	0	1	0	1	0	0	0	0
C.3.1.3 Associate noun and pronoun references in grade-level continuous texts read to or signed for the learner	3	0	0	0	0	0	0	0	0	0	0

Skill/Knowledge	GPF Grade level	Cameroon	Chad	Gambia	Ghana	Kenya	Lesotho	Morocco	Rwanda	Senegal	Zambia
C.3.1.4 Demonstrate a broad understanding of grade-level continuous texts read to or signed for the learner	3	0	1	1	1	1	1	1	0	0	0
D.1.1.1 Sound out or sign grade-level symbols, if the curriculum introduces new symbols at this grade-level	1-9	1	0	1	1	1	1	0	0	1	0
D.1.2.1 Say or sign common, isolated grade-level words	1-9	1	0	1	1	1	1	0	0	1	0
D.2.1.1 Accurately say or sign a grade-level continuous text	2	1	1	1	1	1	1	0	0	1	0
D.2.1.2 Say or sign fluently a grade-level continuous text	3-9	1	1	1	1	1	1	1	0	1	1
R.1.1.1 Recognize the meaning of common grade-level words	1-9	1	1	1	1	1	1	1	0	1	1
R.1.2.1 Retrieve a single piece of explicit information from a grade-level text by direct- or close-word matching	2-3	0	1	1	1	1	1	1	1	1	1
R.1.2.2 Retrieve a single piece of explicit information from a grade-level continuous text by direct- or close-word matching	5-9	0	0	0	1	1	1	0	0	1	0
R.1.2.3 Retrieve a single piece of explicit information from a grade-level non-continuous text (tables, diagrams, graphs) by direct- or close-word matching	5-9	0	0	0	0	0	0	0	1	1	1
R.1.3.1 Retrieve a single piece of explicit information from a grade-level text by synonymous word matching	3	0	0	1	0	0	0	0	0	0	0
R.1.3.2 Retrieve a single piece of explicit information from a grade-level continuous text by synonymous word matching	5-9	0	0	0	0	0	0	0	0	0	0
R.1.3.3. Retrieve a single piece of explicit information from a grade-level non-continuous text (e.g., simple diagrams and tables) by synonymous word matching	5-9	0	0	0	0	0	0	0	0	1	0
R.2.1.1 Identify the meaning of unknown words (including familiar words used in unfamiliar ways) and idiomatic and figurative expressions in a grade-level text	3-9	0	1	0	1	1	1	0	0	0	0
R.2.2.1 Make simple inferences in a grade-level text by relating pieces of explicit and/or implicit information in the text	3-4	0	0	1	1	1	1	1	1	1	0
R.2.2.2 Make inferences in a grade-level continuous text by relating pieces of explicit and/or implicit information in the text	5-9	1	0	1	0	1	0	0	0	1	0
R.2.2.3 Make inferences in a grade-level non-continuous text (e.g., tables, diagrams, graphs) by relating pieces of explicit and/or implicit information	5-9	0	0	0	0	0	0	0	0	1	0
R.2.2.4 Identify the sequence of events/actions/steps in a grade-level text	4-9	0	0	1	1	1	1	0	1	1	0
R.2.2.5 Identify, compare, or contrast points of view in a grade-level text	5-9	0	0	0	0	0	0	0	0	0	0
R.2.2.6 Identify, compare, or contrast evidence in a grade-level text to support or explain an idea, action, or statement	6-9	0	0	0	1	0	0	0	0	0	0
R.2.2.7 Draw a basic conclusion from a grade-level text by synthesizing information in the text (grades 6-9)	6-9	0	0	0	1	0	0	0	0	0	0
R.2.2.8 Apply information from a grade-level text to a new example or situation	9	1	0	0	1	1	1	0	0	0	0
R.2.3.1 Identify the main idea in a grade-level text when it is not explicitly stated	3-9	0	0	1	1	0	1	0	1	1	0
R.2.3.2 Distinguish between a prominent main idea and secondary ideas in a grade-level text	5-9	0	0	0	1	0	1	0	0	1	0
R.3.1.1 Identify the purpose of a grade-level text when it is not explicitly stated, or of features of the text (e.g., vocabulary or images, graphics or other paratextual features)	4-9	0	0	1	1	0	0	0	0	0	0
R.3.1.2 Identify evidence in the text to support the purpose of a grade-level text or of features of the text	6-9	0	0	0	0	0	0	1	0	0	0
R.3.1.3 Identify the audience of a grade-level text and the evidence in the text that supports that assertion	6-9	0	0	0	0	0	0	0	0	0	0
R.3.2.1 Give an opinion about a grade-level text and use evidence from the text to justify that opinion	4-9	0	0	0	1	0	0	1	0	1	0
R.3.2.2 Evaluate the conclusion presented in a grade-level informational text	9	0	0	0	0	0	0	0	0	0	0
R.3.3.1 Distinguish between factual information and opinion in a grade-level text	6-9	0	0	0	0	0	0	0	0	0	0
R.3.3.2 Assess the credibility of a grade-level text in digital format or on social media	9	0	0	0	0	0	0	0	0	0	0
R.3.4.1 Evaluate the effectiveness of the features of a grade-level text (e.g., images/graphics, paratextual features, and vocabulary)	8-9	0	0	0	0	0	0	0	0	1	0

Note: Cells highlighted in yellow indicate that the Grade analysed overlaps with Grade Levels where the category Is present in the GPF.

5.2. Findings from the cross-country analysis

This section reports on the cross-country analyses done on the countries analysed for the purpose of the reading framework. Curricula in multiple languages were assessed: Arabic, English, and French. In total 20 curricula were analysed in depth leading to a total of 1064 competencies analysed within 192 knowledge/skills, within 143 sub-constructs, embedded within 84 constructs and 38 domains.

Table 39. Overview of the countries and analyses undertaken across countries

Country	Grades	Languages	Domains	Constructs	Subconstructs	Skill/Knowledge	Competencies
Cameroon	2	1	4	9	10	13	47
Chad	2	1	2	6	7	8	17
Gambia	2	1	4	10	15	20	223
Ghana	2	1	4	9	15	26	180
Kenya	2	1	4	9	14	21	107
Lesotho	2	1	4	9	24	33	72
Morocco	2	1	4	10	25	20	67
Rwanda	2	1	4	6	7	10	154
Senegal	2	1	4	7	12	20	121
Zambia	2	1	4	9	14	21	76

Note: Number of Domains, Constructs, Subconstructs, Subconstructs and Skill/Knowledge includes additional category 'Other'

The cross-country analyses are presented in series of doughnut and bar graphs firstly for grade 3 (Figure 55 to Figure 65) and then for Grade 6 (Figure 66 to Figure 76). The graphs reveal the proliferation and spread of content descriptors across Constructs, Subconstructs and Skill/Knowledge. These cross-country analyses are presented as a background reflecting the depth of the data which were used to inform the development of the draft of the Continental Assessment Framework.

In interpreting the figures and tables presented in this chapter, the percentages presented below, unless otherwise stated, are based on distinct counts of competences mapped to the GPF categories. Namely, Domains, Constructs, Subconstructs and Skill/Knowledge For example, if analyses are performed at the Domain level category, then even if a competency is mapped to several subcategories (i.e. Constructs, Subconstructs or Skill/Knowledge categories) of the GPF, it is only counted once towards that category. Importantly, it must be noted that given the complex nature of the language curricula analysed that in many instances competencies were mapped to more than one GPF (or other) category. Accordingly, cumulative percentages presented in tables may exceed 100% (see country specific analyses in in Appendix 5.1). When presented in Pie and Donut charts, percentages are normalised (to not exceed 100%) but still maintain proportions. Beyond the purpose of visualisation, the normalisation of values allows for better cross-country comparison – given the variability in the number (frequency) of competencies mapped across countries, grades and languages.

Grade 3

The grade 3 curricula of 10 countries were analysed. The competencies identified and analysed (n=511) covered 4 domains, 10 constructs, 17 subconstructs and 27 skill/knowledge areas. This includes categories for 'Other' at each level (Figure 55*).* Overall, Comprehension of Spoken or Signed Language (41%) and Reading Comprehension (31%) domains represent the highest proportion of competencies assigned (Figure 55*).* At a construct level (Figure 56) 'C.1 Retrieve information at a word level' and 'R.1 Retrieve information', appear at a higher proportion than other Constructs, and is also represented at a greater proportion than the entire Decoding domain. Overall, there is a considerable proportion of competencies that were mapped to a specific Domain (Figure 55) but could not be assigned to an existing Construct within the GPF (Figure 56).

Figure 55. Overall presence of GPF competencies in 10 African countries, Grade 3

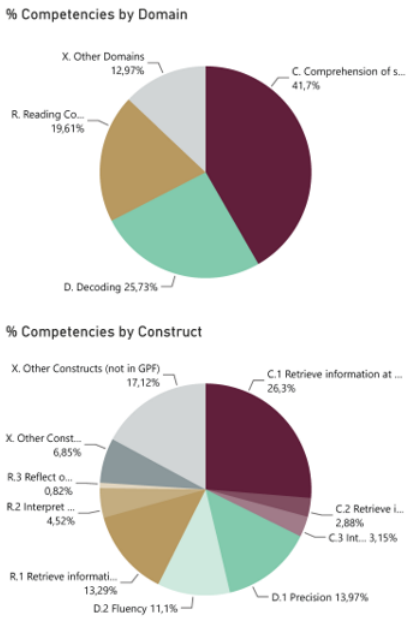
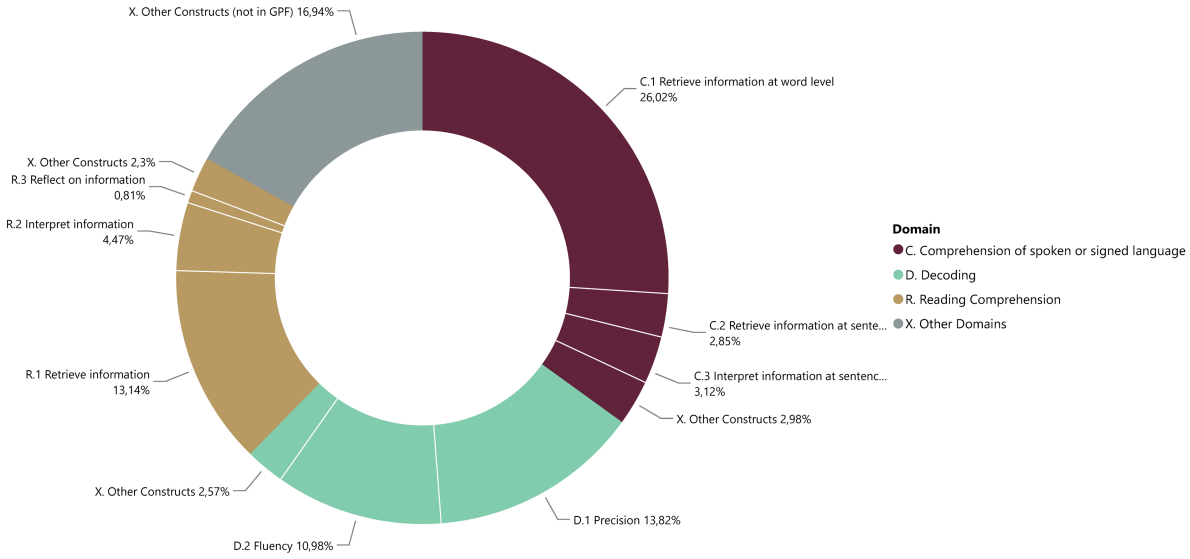
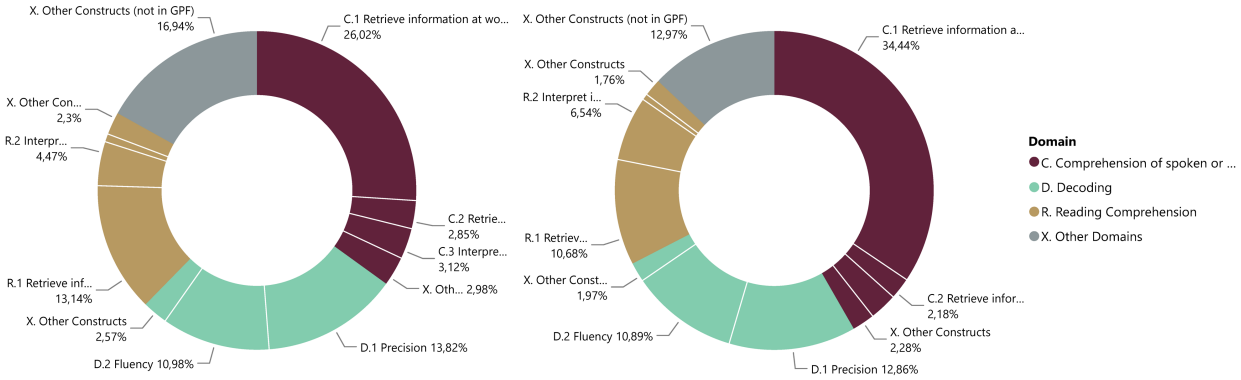


Figure 56. Competencies by construct, Reading, Grade 3



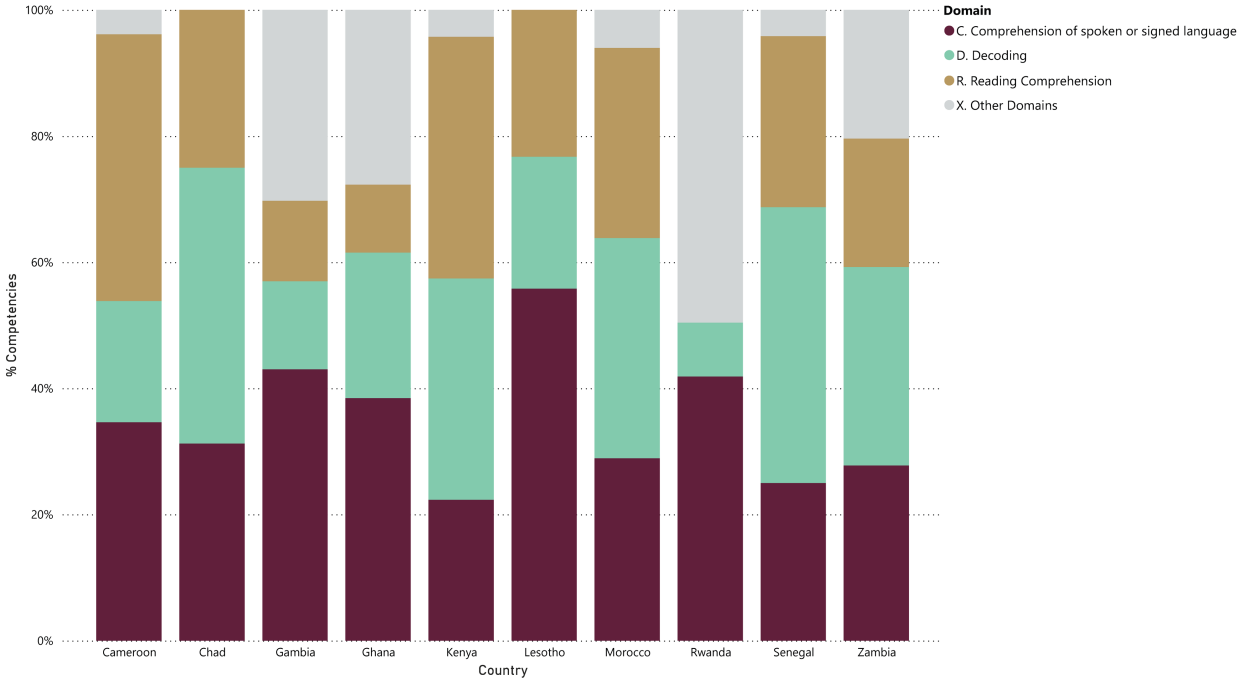
When comparing the overall distinct number of competencies (Figure 57 – *left*) to the frequency of competencies (Figure 57 – *right*) mapped for grade 3, there is a marginal increase in the proportion of Decoding competencies. Whereas at a construct level, the proportional representation of competencies remains consistent, except for 'C.1 Retrieve information at a word level', which occurs at a higher frequency (Figure 57 – *right*).

Figure 57. Competencies by construct, Reading, Grade 3 (distinct and frequency)



While there is a clear emphasis on Comprehension of Spoken Language and Reading Comprehension competences in Grade 3 curricula, there is variability between countries at the domain (Figure 58), construct (Figure 59), subconstruct (Figure 60) and skill/knowledge levels (Figure 61).

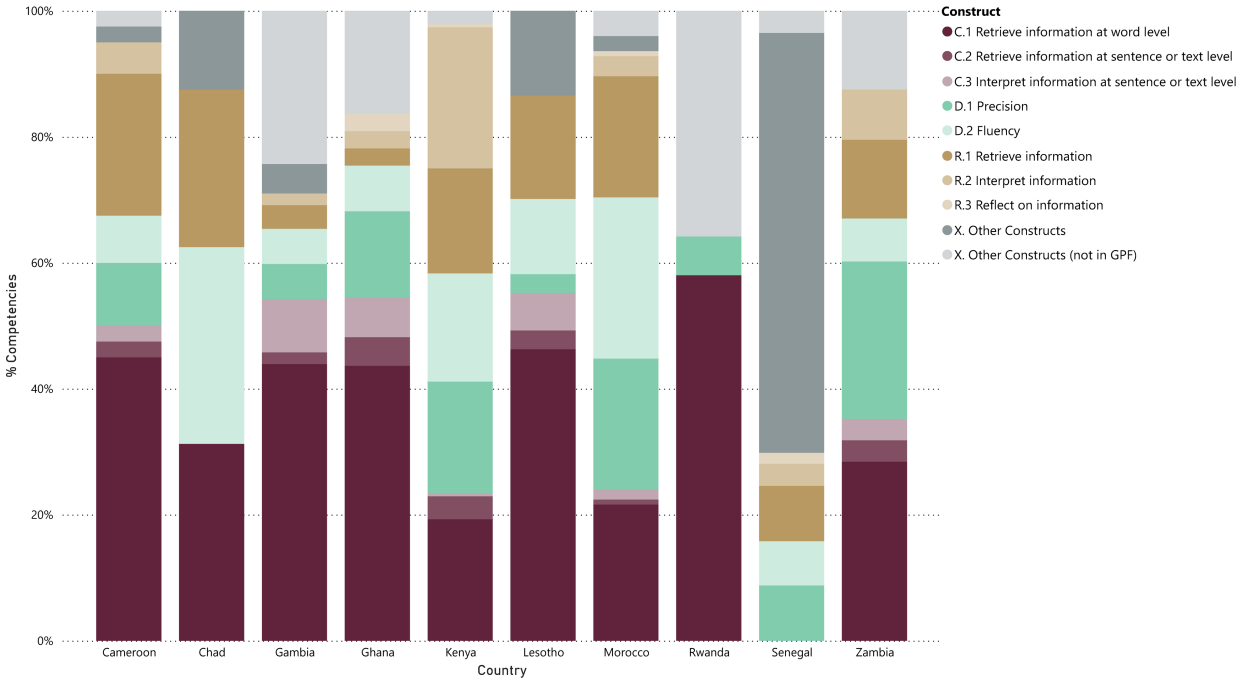
Figure 58. Competencies by domain, Reading, Grade 3



At a **domain** level, most curricula analysed with the exception of those of Kenya, Morocco (which have a significantly higher proportion of Decoding competencies represented), have competencies associated with the Comprehension of Spoken Language and Reading Comprehension domains represented at greater proportion than Decoding (Figure 58), which is consistent with the overall observation. Notably, in The Gambia, Ghana, Senegal and Zambia, there is a considerable proportion of competencies that could not be mapped to any of the GPF domains (Other). This aligns to the larger focus on overall language development in these curricula as well as inclusions of other content areas in some instances.

At the **construct** level (Figure 63), 'C.1 Retrieve information at word level' and 'R.1 Retrieve information' appear at higher proportions than other constructs in their respective domains, with the exceptions of Kenya (where more constructs associated with 'R.2 Interpret Information' are visible. Senegal is also notable for a large proportion of constructs being associated with other domains.

Figure 59. Competencies by country and construct, Reading, Grade 3



Some of the similar patterns observed at the levels of domains and constructs continue with the subconstructs, such as in Rwanda and Senegal. For the latter, the absence of C.3.1 is reflective of a lack of detailed information on oral language tasks especially those associated with texts.

Figure 60. Competencies by country and subconstruct, Reading, Grade 3

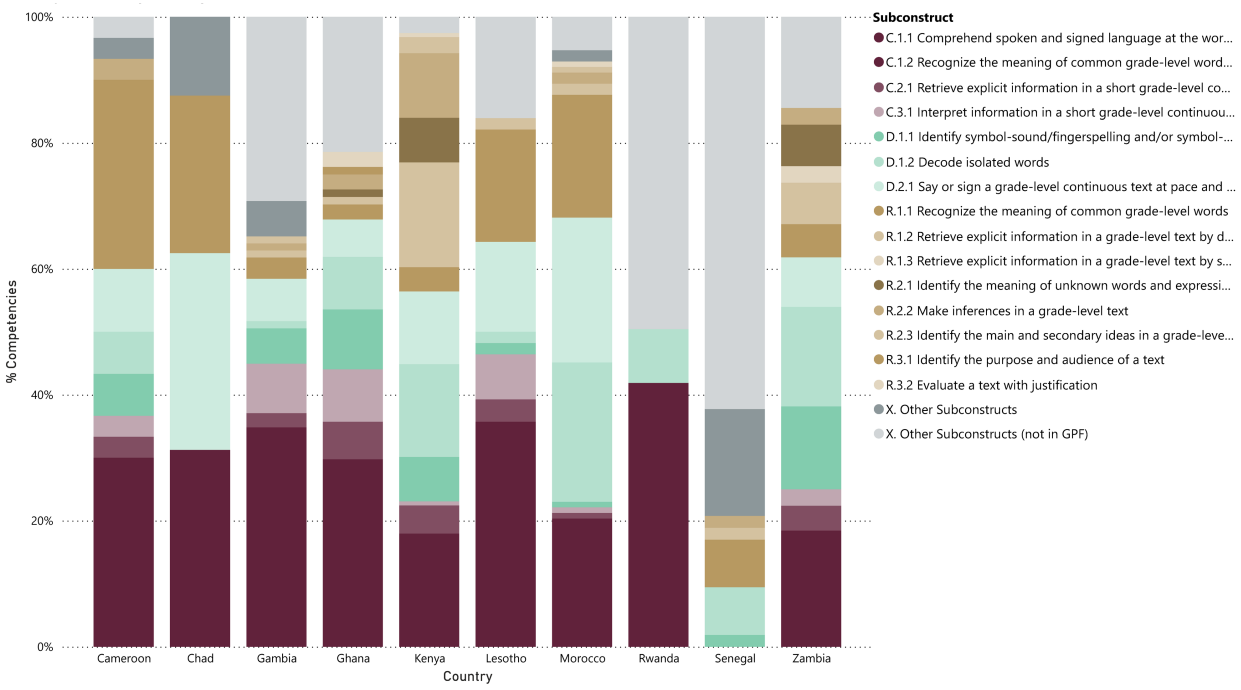
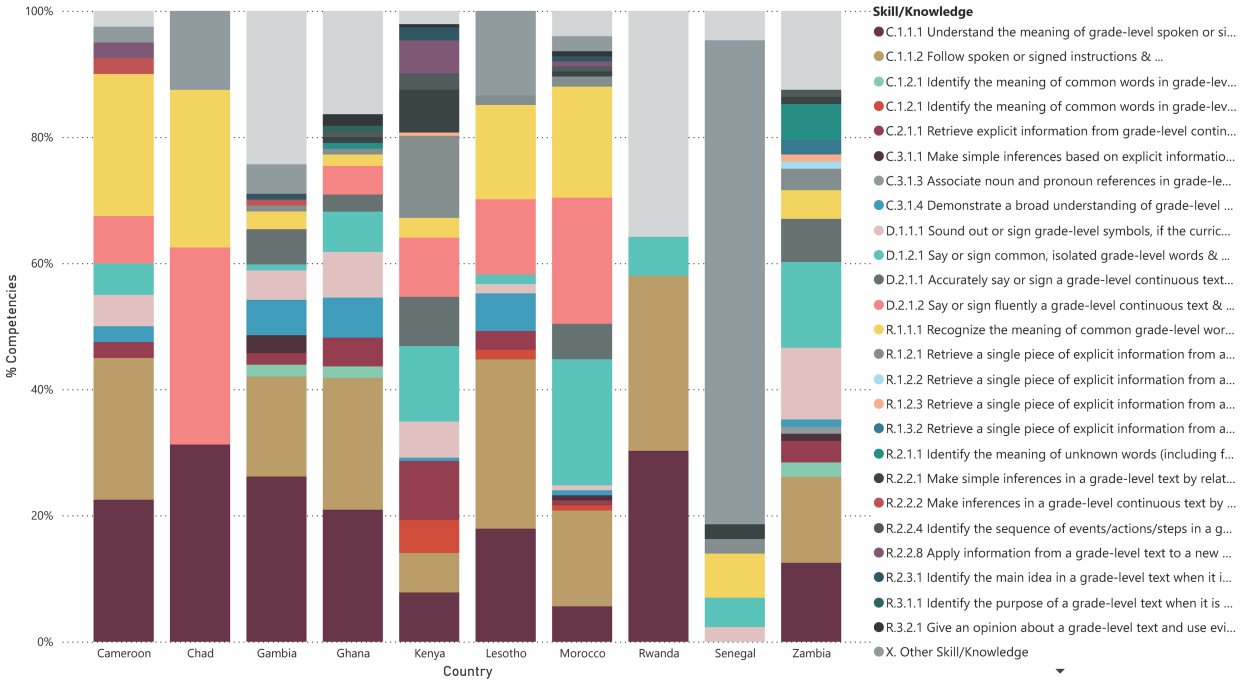


Figure 61. Competencies by country and skill/knowledge, Reading, Grade 3



Finally, at the **skills/knowledge** level, there are visible differences in emphasis. For example, Cameroon places the most emphasis on 'R.1.1.1 Recognising the meaning of common grade level words' compared to other countries. Whilst Chad emphasises 'D.2.1.2 Say or sign fluently a grade-level continuous text' more than other countries.

The next figures group the cross-country analyses by language (Arabic, English and French).

Figure 62. Competencies by country, language and domain, Reading, Grade 3

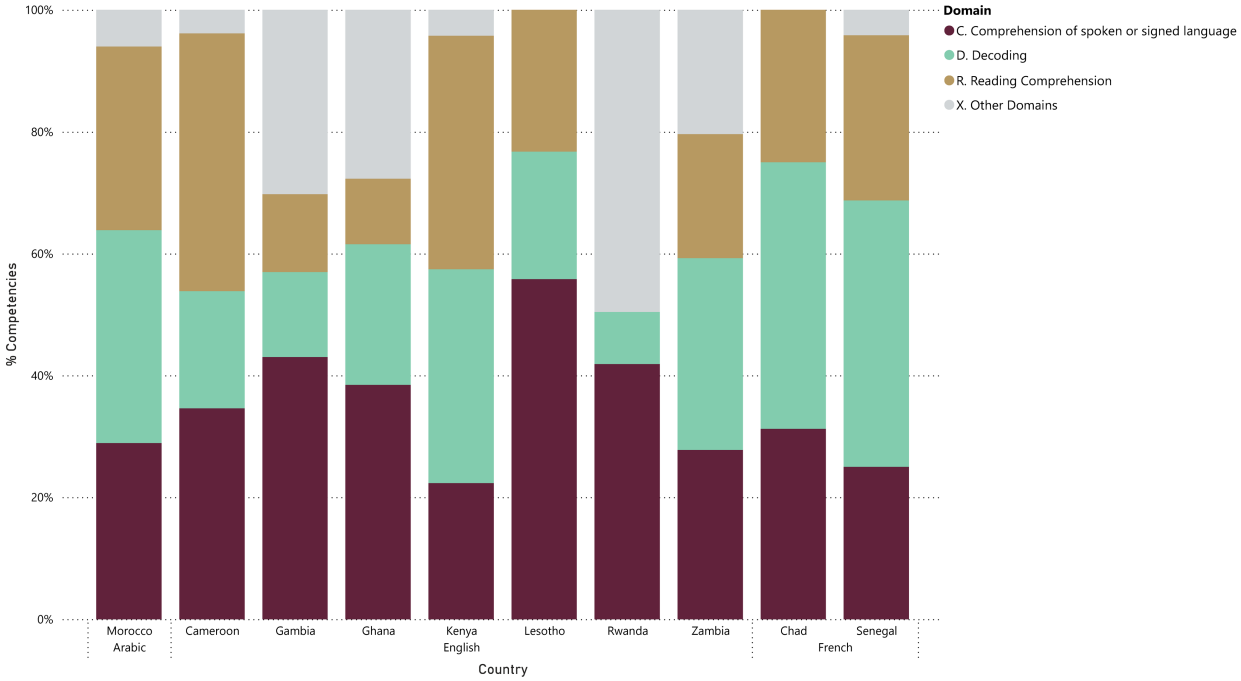
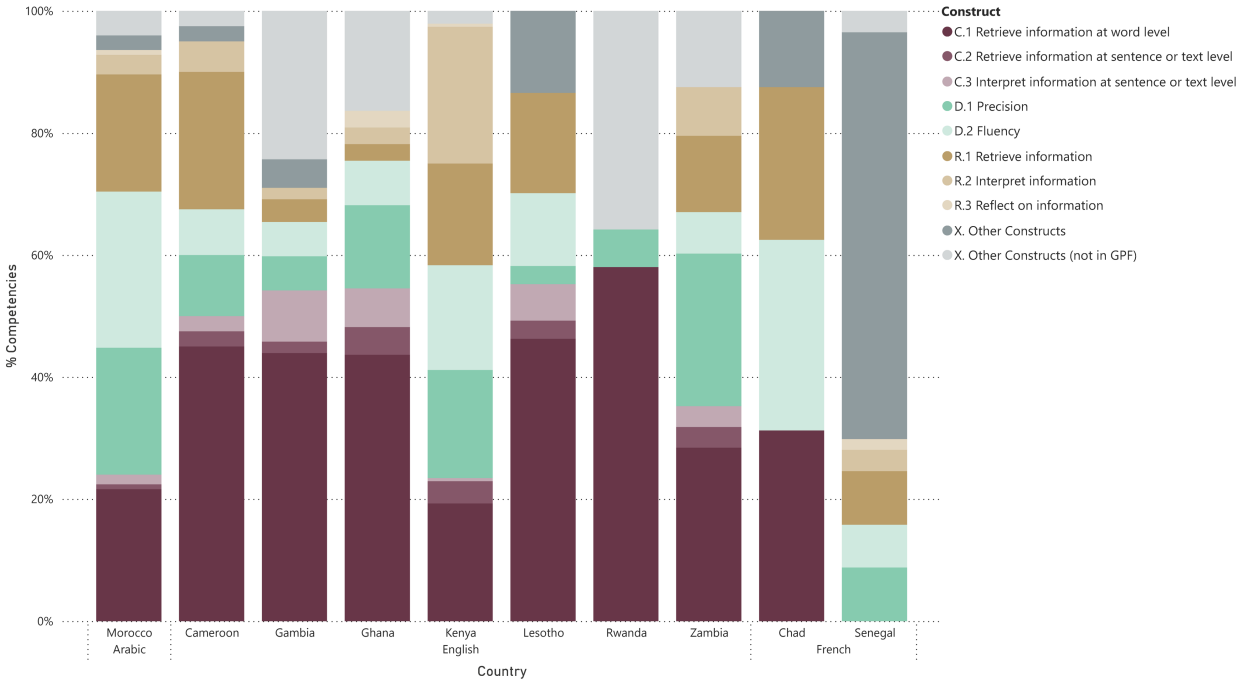
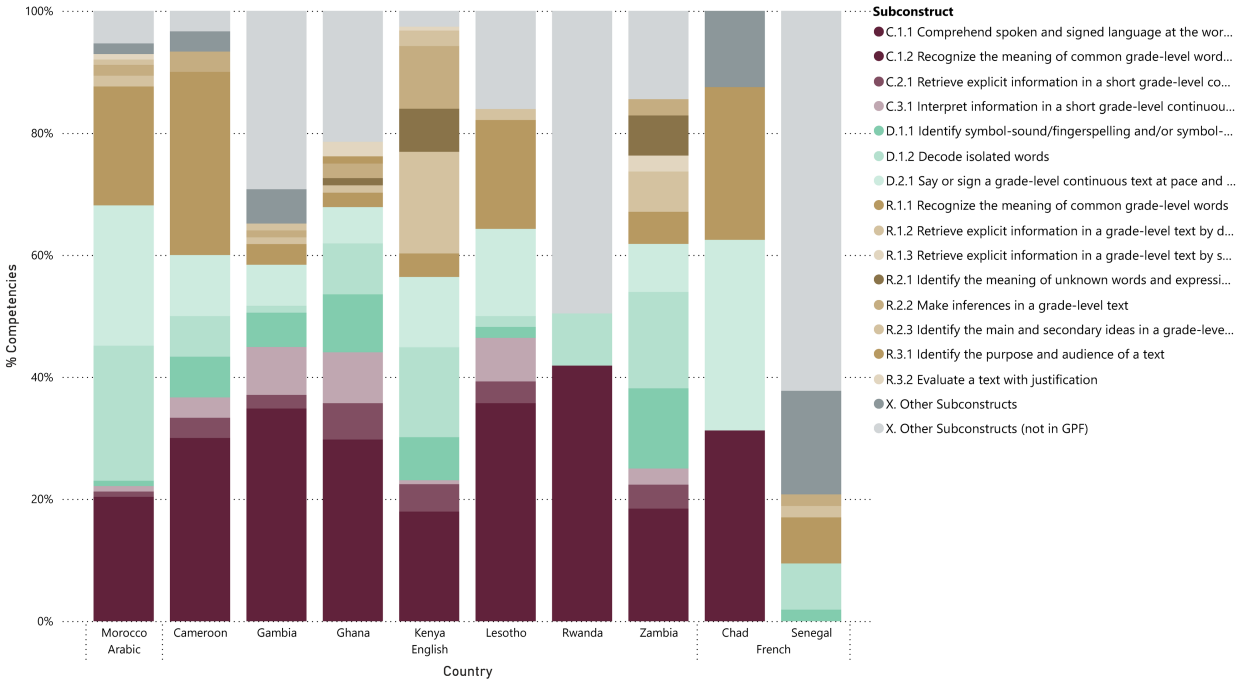


Figure 63. Competencies by country, language and construct, Reading, Grade 3



In analysing some differences by language and country, a few differences emerged including the emphasis on the domain Decoding in the analysis of Arabic and French countries. At the construct level, the emphases on 'C.1 Retrieve Information at word level' for countries curricula where English was analysed are substantial.

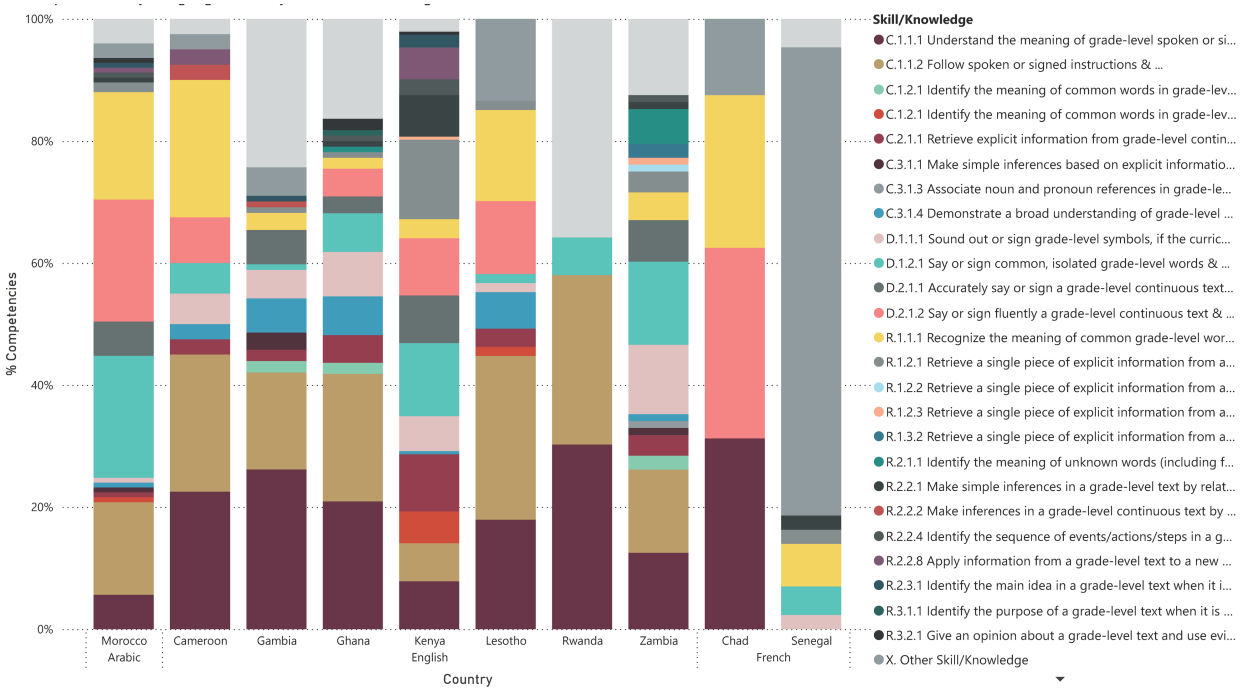
Figure 64. Competencies by country, language and subconstruct, Reading, Grade 3



This emphasis can potentially align to the fact that albeit the English language curricula were selected for analysis given national interests and/or the complexities of presenting education in multiple languages, none of these countries are English only in their curriculum presentations. It could suggest the learning of a language at word level is still prevalent at these grades reflective of emerging proficiency and vocabulary development rather than continuous text access.

The pattern continues at the **subconstruct** level (Figure 68) but is less apparent at skills/knowledge level except for four of the seven countries (Cameroon, The Gambia, Ghana and Zambia) for C1.1.1.

Figure 65. Competencies by country, language and skill/knowledge, Reading, Grade 3



Grade 6

The grade 6 curricula of 10 countries were analysed across three languages. The competencies identified and analysed (n=553) covered 4 domains, 10 constructs, 18 subconstructs and 31 skill and knowledge areas. This includes categories for 'Other' at the Domains, Constructs, Subconstructs, Subconstructs and Skill/Knowledge level (Figure 66). Overall, Comprehension of Spoken/Signed language (37%) and Reading Comprehension (31%) domains represent the highest proportion of competencies assigned (Figure 66). At a Construct level (Figure 66) C.1 Retrieve information at a word level and R.1 Retrieve information, appear at higher proportions than other Constructs, and are also represented at a greater proportion than all the constructs for Decoding domain combined. Overall, the is a considerable proportion of competencies that were mapped to a specific Domain (Figure 66) but could not be assigned to an existing construct within the GPF, see 17% of "Other" constructs (not in GPF) (Figure 66).

Figure 66. Overall presence of GPF competencies in 10 African countries, Grade 6

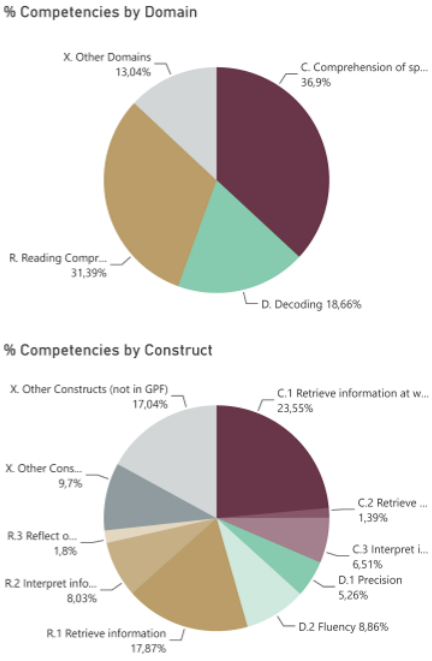
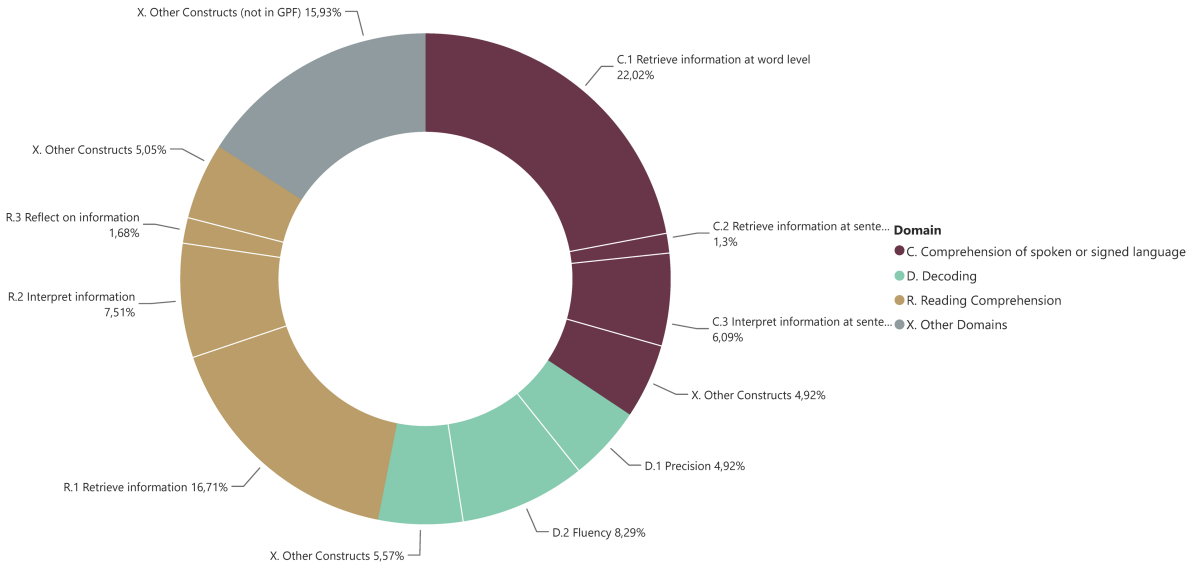
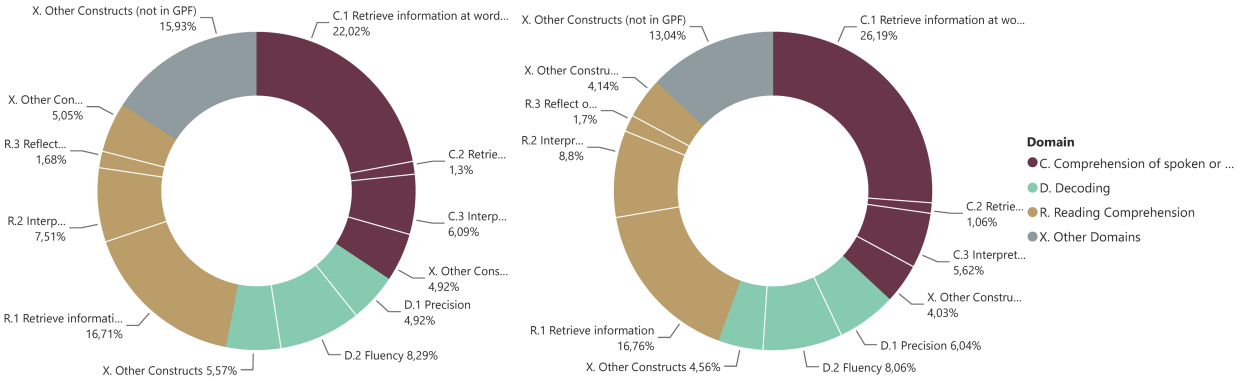


Figure 67. Competencies by country, domain and construct, Reading, Grade 6



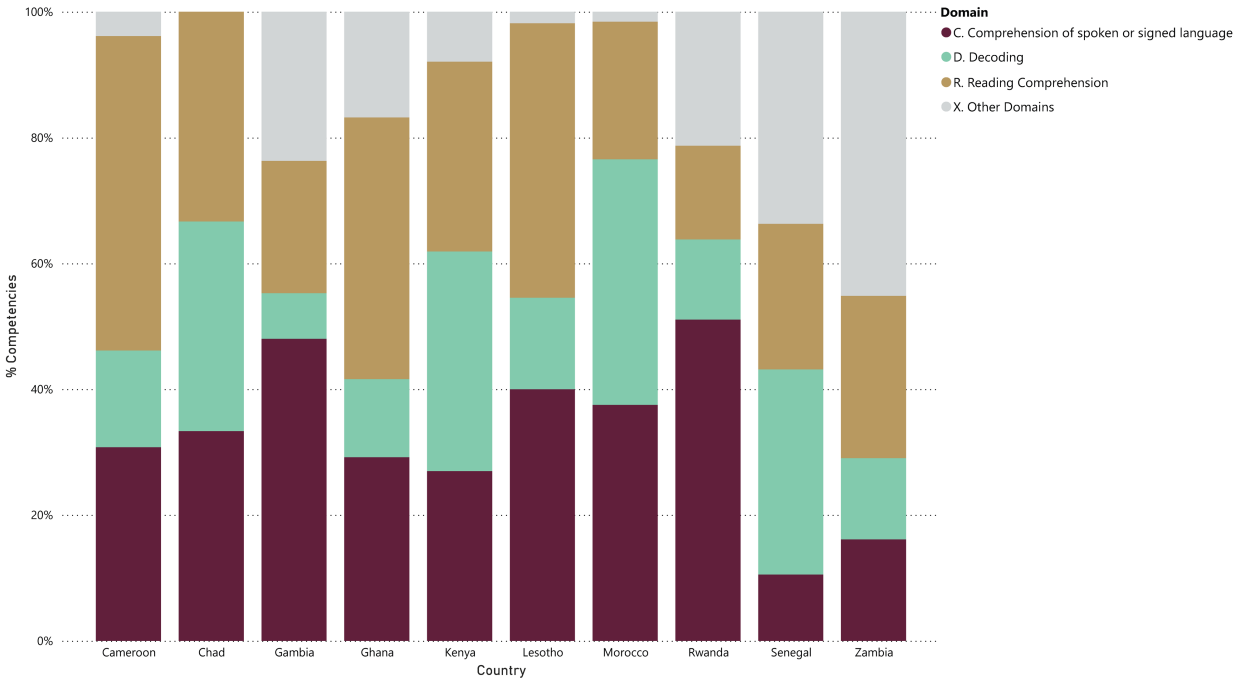
When comparing the overall distinct number of competencies (Figure 68– left) to the frequency of competencies (Figure 68 – right) mapped for grade 6, there is a marginal increase in the proportion of Decoding competencies and slightly larger increase in "Other". Whereas at a construct level, the proportional representation of competencies remains consistent, except for C.1 Retrieve information at a word level which occurs at a higher frequency (Figure 68– right).

Figure 68. Competencies by construct, Reading, Grade 6 (distinct and frequency)



While overall there is an emphasis on domains of Comprehension of spoken/signed language (C) and Reading comprehension (R) competences in most Grade 6 curricula, there is variability between countries at the Domain (Figure 69), Construct (Figure 70), Subconstruct (Figure 71) and Skill/Knowledge levels (Figure 72).

Figure 69. Competencies by country and construct, Reading, Grade 6



At **Construct** level (Figure 70), five countries placed emphasis on Comprehension-related constructs at about 40% or above. Most countries had a reduced emphasis on decoding-related constructs apart from Chad and Senegal both of which offered French language curricula for analysis. Morocco had a significant emphasis on constructs related to the "other domain".

Figure 70. Competencies by country and construct, Reading, Grade 6

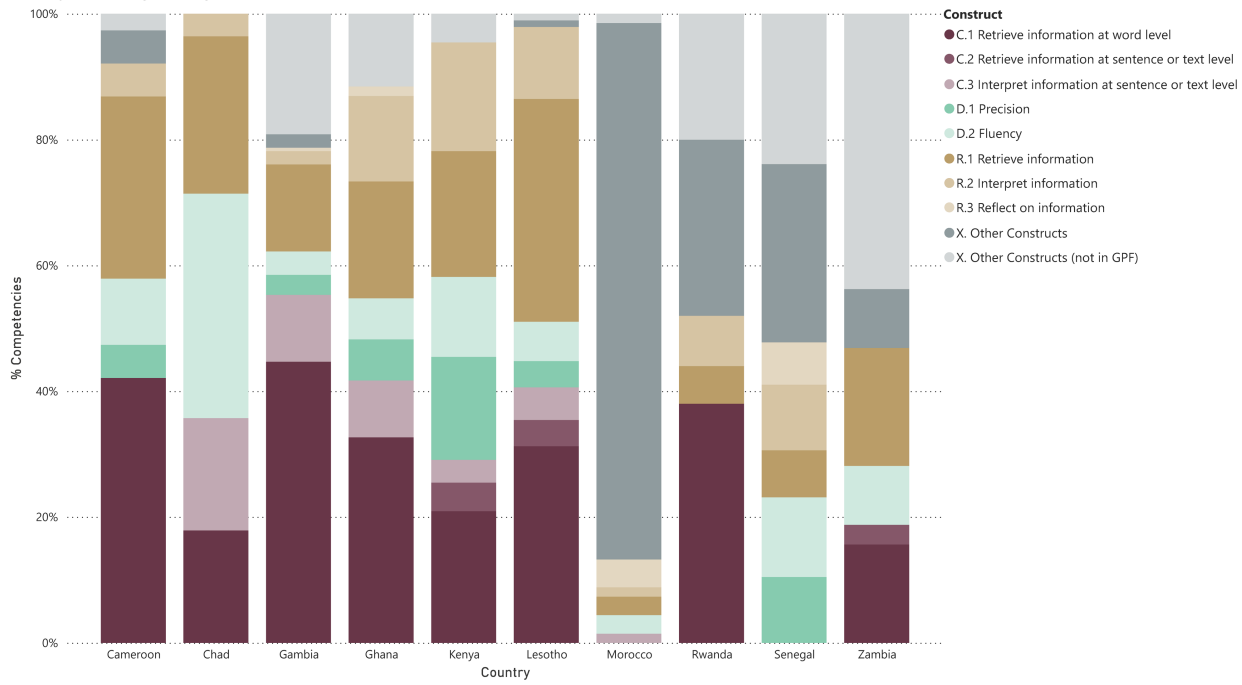
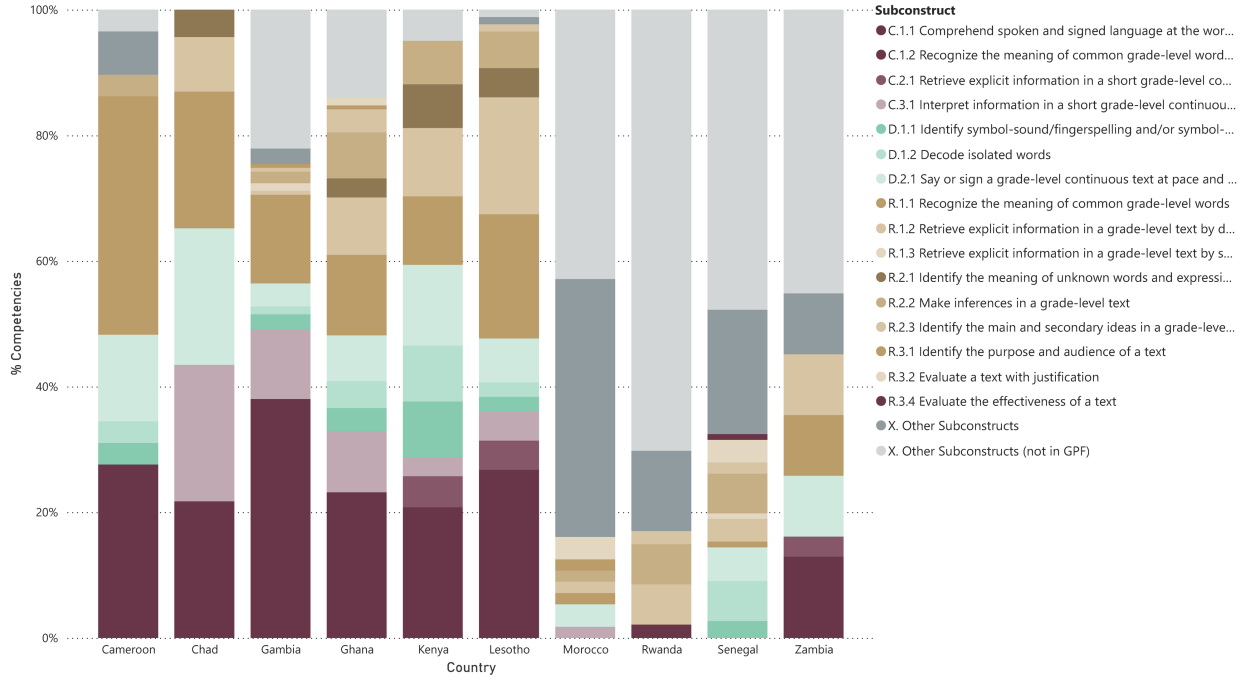
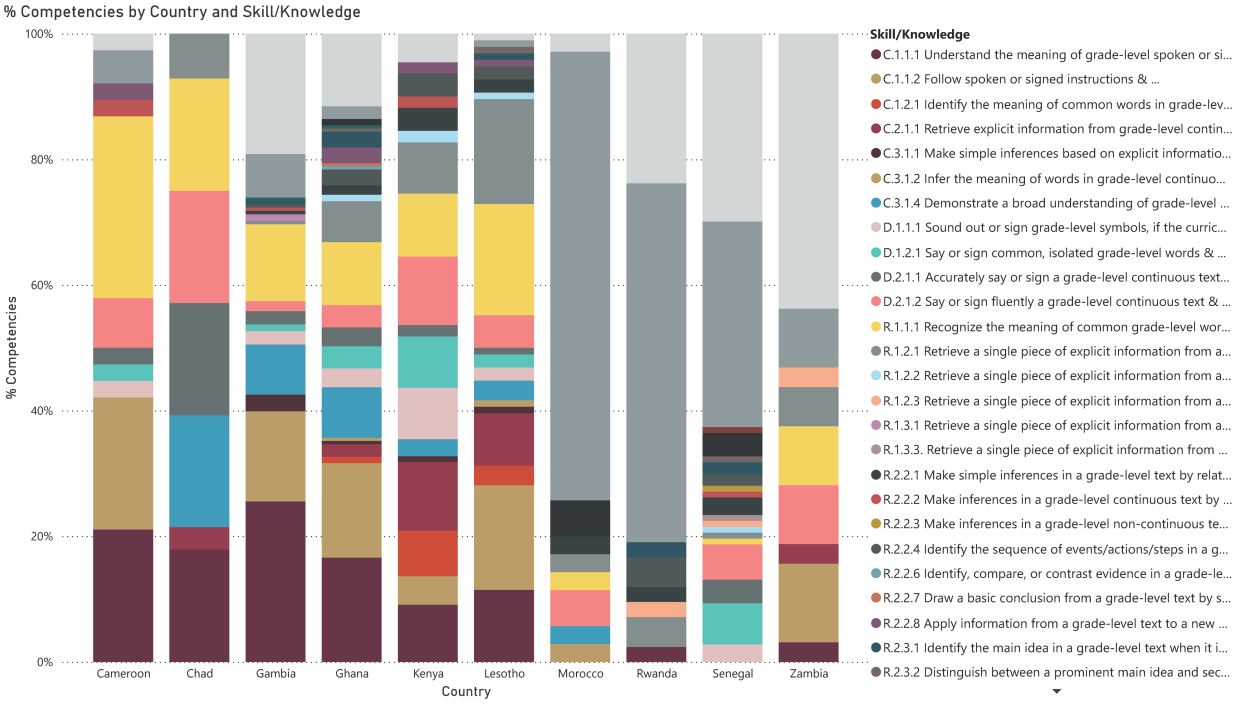


Figure 71. Competencies by country and subconstruct, Reading, Grade 6



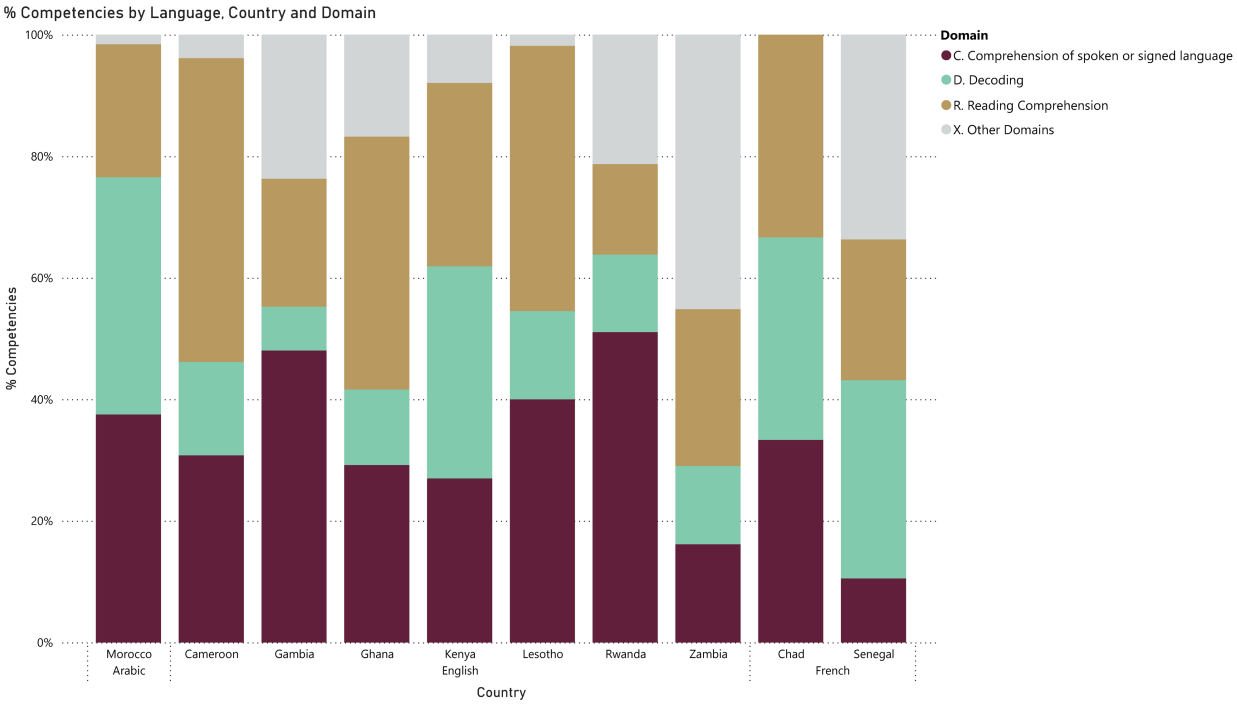
In contrast to grade 3, four countries had significant proportion of their subconstructs related to 'other' domains (Figure 71).

Figure 72. Competencies by country and skill/knowledge, Reading, Grade 6



As reported for grade 3, in Figures 77-80, the cross-country analyses are grouped by language (Arabic, English and French).

Figure 73. Competencies by country, language and domain, Reading, Grade 6



As reported for grade 3, decoding was emphasised in countries where the Arabic and French curricula were analysed.

Figure 74. Competencies by country, language and construct, Reading, Grade 6

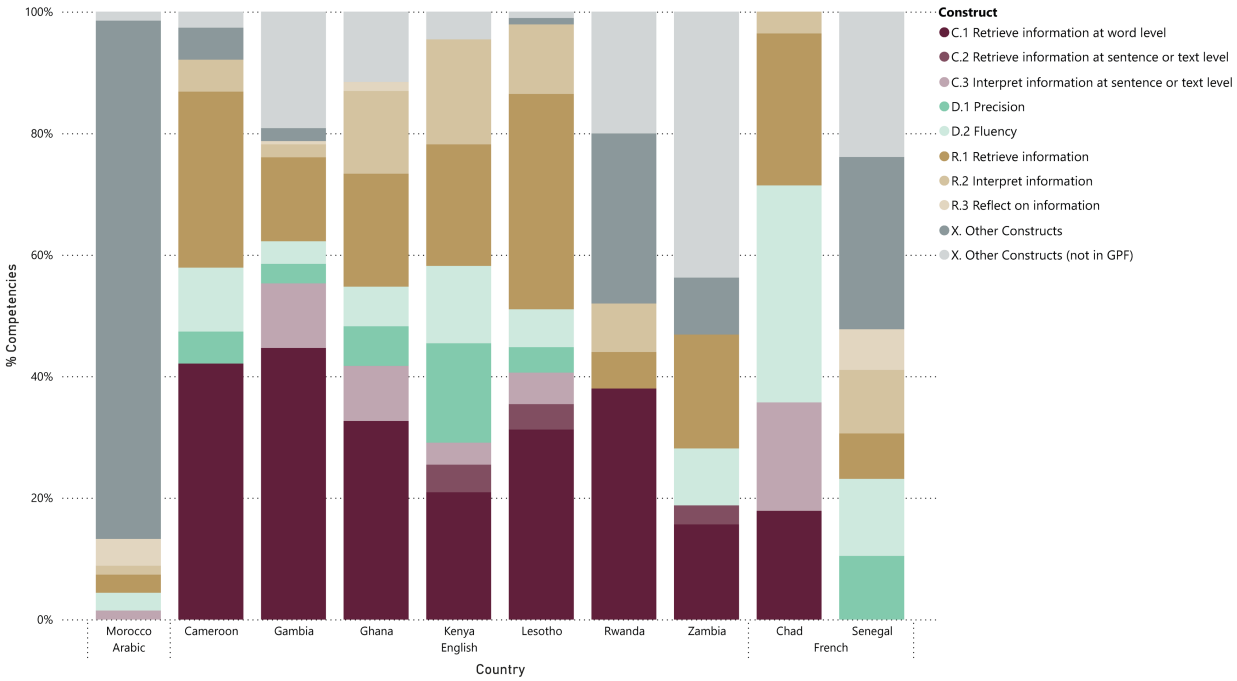
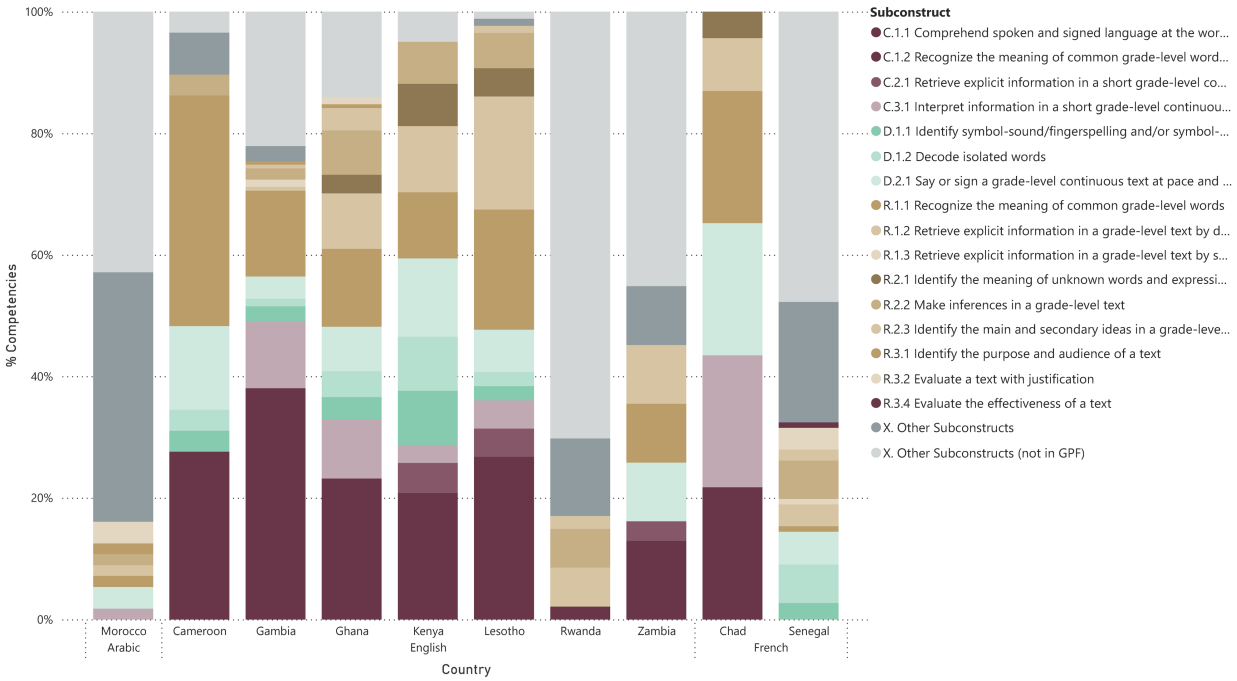
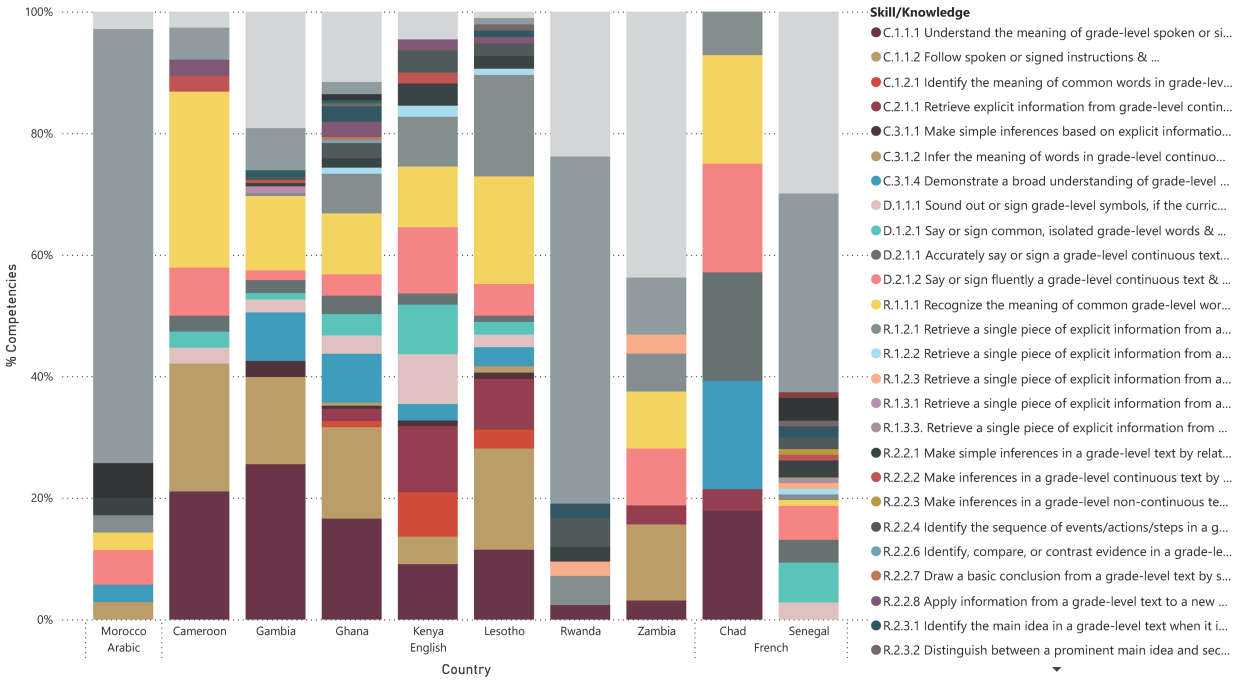


Figure 75. Competencies by country, language and subconstruct, Reading, Grade 6



Like grade 3, countries where English was analysed had a similar emphasis on the subconstructs related to the Comprehension domain and in particular 'C.1.1. Comprehend spoken and signed language at word level' (Figure 75).

Figure 76. Competencies by country, language and skill/knowledge, Reading, Grade 6



5.3. Framework

The shortage or lack of learning data is posing a challenge to the policymakers, especially in countries that have not participated in international or regional learning assessments and whose national assessments are not comparable across countries due to different curriculum objectives, unbalanced coverage of constructs and sub-constructs, and weak assessment frameworks or items used for national assessments.

Pointing at the major gap in learning achievement data, Zambia requested a continental focus on closing it at the October 2023 meeting of the African Union Specialized Technical Committee (STC) on Education, Science, Technology and Innovation. In response, the Specialized Technical Committee decided to endorse the request. The Association for Educational Assessment in Africa (AEAA), the continent's main professional body in this field, under the LEARN initiative and the CESA Planning cluster, is therefore intent on carving a pragmatic way forward to fill the learning data gaps in the continent. One of the three stumbling blocks listed was the absence of a continental proficiency framework would help African countries focus on monitoring the MPL (pp.3-4 IPA).

The Continental Assessment Framework is intended to be appropriate for the African capacity and resource context to support countries' decision-making. The Framework would provide the guidance as to the skills that students should acquire on the pathway to mastery of reading and mathematics and a set of rigorous methods to align existing national and regional assessments to this common framework. The framework would also include the basis for the development of an assessment tool focused on the measurement of the proficiency levels in the grades needed to report /CESA 4.5.1/ SDG4.1.1 indicators to the global and continental commitments

In compiling the Continental Assessment Framework, there is broad recognition that collecting comparable learning data over time and between countries is very challenging (Montoya et al., 2022). This is because:

- most assessments do not measure what is relevant as they often focus on measuring the content knowledge without measuring the specific sub-skills that lead to reading with comprehension: measuring these sub-skills is important as it will allow education actors to identify and target specific gaps among students who need help;

- many assessments are not designed to be psychometrically comparable over time. In addition, comparability is prevented when subject and grade assessed change;
- it is difficult to compare assessments between countries because different assessments test different skills at different grades and at varying levels of difficulty;
- it is true that international assessments may produce comparable data; however, they have low coverage in low-income and lower-middle income countries, particularly for the early grades of primary education.

In addition, primary grade international assessments take place every five to six years which is too long to provide meaningful information and inform decisions. Finally, learning assessments within donor projects are not sustainable as they are often limited to the beneficiaries and timeline of the projects" (Montoya et al., 2022 in Montoya, AMPL_Paper_Kenya_AEAA_2023.0814, pp. 4-5).

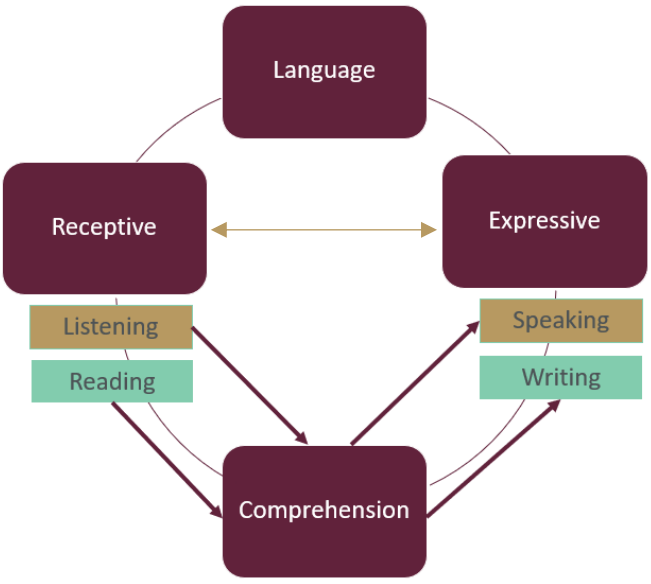
Having introduced the rationale for the framework, the following sub-sections are presented as follows: sub-section describes reading literacy, the next outlines the structure of the reading framework including the development of the domains and rationale for the contents. Thereafter, the alignment of the framework is discussed in relation to the GPF that served as the analytical framework for the Continental Assessment Framework including some considerations regarding some practical implications for the implementation and possibilities of alignment with and integration within regional and national learning assessment programmes.

Definition of Reading literacy

The focus of the Global Proficiency Framework is on reading as a skill encompassing the domains of the comprehension of spoken language, decoding and reading comprehension. These domains are linked in that the development of aspects of any one of these will lead to improvement in the others. Behind the inclusion of these domains lies the focus for the development of reading across education, that is, the development of reading literacy.

The distinction between literacy and reading literacy can be made. Literacy is considered one's overall communicative competence as it is thought to encompass not only all acts of communication - reading and writing, listening and speaking - but also the thinking processes that underlie one's understanding of concepts and knowledge associated with subject areas (Bouwer, 2004). Figure 77 outlines the relationships and interplay between these competencies and the development of comprehension overall.

Figure 77. Positioning reading and comprehension



Note: Based on Zimmerman (2025) and adapted from Bouwer (2004).

In the analysis of a country's language curriculum the interplay of these competencies becomes apparent although the underlying goal of comprehension is not always foregrounded. This can mean that comprehension

development is not always blatant but assumed. Although the importance for language teaching of the integration of all the receptive (i.e. reading and listening) and expressive (i.e. speaking and writing) language components (Lerner, 2003) is recognised, the actual development of reading literacy and reading specifically are crucial (Zimmerman, 2011). Reading literacy can be demarcated according to the definition provided for the PIRLS 2006 by Mullis et al. (2006, p.3) as:

> The ability to understand and use those written language forms required by society and/or valued by the individual. Young readers can construct meaning from a variety of texts. They read to learn, to participate in communities of readers in school and everyday life, and for enjoyment.

This definition highlights that the goal of reading is to derive meaning and, learners without adequate reading comprehension skills cannot do what is expected of them in terms of meaning making at increasing levels of complexity throughout their education and in their daily lives. The Global Proficiency domain inclusions thus incorporate the acknowledgement that reading development is a multifaceted process wherein the basics of fluency and word recognition must be mastered but reading comprehension must be emphasised too. The nature of reading itself involves the mastery of the reading of various texts and the comprehension thereof meaning both the comprehension of spoken language and reading comprehension need to involve the use of texts. It can be argued that a lack of minimum proficiency in comprehension can lead to functional illiteracy meaning learners who can read and write in some capacity, but their reading comprehension level is so low they cannot manage everyday aspects of life.

Such comprehension aligns to the development of higher order thinking and reasoning which is thinking on a level that is higher than memorizing facts or telling something back to someone exactly the way it was told to you. Thinking is taken to higher levels than restating the facts and requires learners to do something with the facts — understand them, infer from them, connect them to other facts and concepts, categorize them, manipulate them, put them together in new or novel ways, and apply them as new solutions to new problems as sought.

Taking into consideration the Global Proficiency Framework domains and their contents as well as ideas around language development related to reading and the crucial need to focus on comprehension development as well higher order thinking and reasoning development underlying reading comprehension growth, a definition of reading literacy for the Continental Assessment Framework must incorporate both the domains of the Global Proficiency Framework as well as integrating a focus on the target of reading literacy via these domains itself. A potential definition is thus:

The ability of an individual to access diverse textual information utilising reading skills and comprehension strategies with the goal to derive meaning and utilise such meaning for further educational development in an ever-changing world as well as personal enjoyment and growth.

Structure of framework

The framework was developed based upon the analysis of 10 countries primary and lower secondary education national curricula (in total 30 curricula) from francophone and anglophone countries in 5 AU regions and identifying the correspondence of these frameworks with the global proficiency and learning progression frameworks. Furthermore, all available documents regarding the assessment frameworks of the two cross-national assessments on the continent (PASEC and SACMEQ), were analysed and the correspondence of these frameworks with the global proficiency and learning progression frameworks was also investigated. After the cross-country analyses were shared and workshopped at a regional workshop in Livingstone, Zambia 29-31 July 2025 involving representatives from agencies, institutions and organisations, this framework was constructed. Finally, the levels were identified that align with the Minimum Proficiency Levels at the at the end of lower primary, end of primary and end of lower secondary to guide the elaboration of the assessment blueprint for reporting of CESA indicator 4.5.1/SDG global indicator 4.1.1., to support African countries to close the learning data gaps.

The Continental Assessment Framework is presented at three levels, namely grade 3, 6, 9. These grade selections are premised on the following:

- Grade 3 is universally close to or end of first cycle of primary schooling
- Grade 6 is universally close to or end of primary school

- Grade 9 is universally the end of basic education

In compiling the Continental Assessment Framework for Reading, comparable frameworks from the African regional studies PASEC and SEACMEQ as well as from the international comparative studies AMPL, PIRLS (including LaNA PIRLS Literacy), PISA, SEA-PLM were reviewed. The contents of the frameworks were evaluated in terms of their domains, processes and structure.

PASEC whilst there was not an explicit assessment framework accessible, PASEC defined the reading comprehension domains that it assessed at two different levels, namely the beginning phase of schooling (at around Grade 2) and the end of primary schooling (at around Grade 6).

Table 40. GPF domains assessed by PASEC 2019 and weighting in reading, primary

	PASEC domain aligned to GPF domain Comprehension	PASEC domain aligned to GPF domain Decoding	PASEC domain aligned to GPF domain Reading Comprehension
Early primary (Grade 2)			
Domain (weighting)	Listening comprehension (37%)	Reading decoding (28%)	Reading comprehension (35%)
	(Listening comprehension is assessed through oral messages combining isolated words and phrases with texts. The development of skills in this area enables pupils to extend their vocabulary to automate decoding in reading through correspondences between oral and written language.)	(Reading-decoding is assessed through situations involving recognition of the characteristics of the written word. Reading-decoding is assessed through graphophonological identification (letters, syllables and words) and easy letter and word reading activities. Developing skills in this area enables students to automate their reading to determine the meaning of words and sentences and thus expand their vocabulary.)	(Reading comprehension is assessed through reading situations involving isolated words and sentences, as well as texts in which the student is asked to find the meaning, combine and interpret information. Developing skills in this area enables students to read independently in a variety of everyday situations, to develop their knowledge and participate in society.)
Late primary (Grade 6)			
Domain (weighting)	Understanding isolated words and phrases (16%)		Informative texts (45%) Literary texts (39%)
Definitions	Comprehension of **isolated words and sentences** is assessed through reading situations involving the discovery of the **explicit meaning of isolated words and sentences**. The development of skills in this area enables students to automate their reading to gradually access the meaning of sentences and texts, and to expand their vocabulary. The level of these tasks is very basic and is equivalent to the **objectives of early primary school curricula.**		Reading comprehension is assessed in a number of different situations **reading narrative and informational texts and documents**, from which students extract, make **simple inferences, interpret and combine information**. The development of skills in this area enables students to read independently in a variety of everyday situations, in order to develop their knowledge and participate in society.
Reading media	Isolated images, words and phrases: literary texts		Informative texts and documents

Whilst there was not an explicit assessment framework accessible in the **SEACMEQ** published documents, the assessment items addressed three domains: Narrative Prose, Expository Prose and Documents (Ross et al., 2010).

Table 41. GPF domains assessed by SEACMEQ in reading, late primary

Texts	Description
Narrative prose	Continuous texts in which the writer aims to tell a story – whether this be fact or fiction.

Expository prose	Continuous text in which the writer aims to describe, explain, or otherwise convey factual information or opinion to the reader.
Documents	Structured information organized by the writer in a manner that requires the reader to search, locate, and process selected facts, rather than to read every word of a continuous text

Furthermore, SEACMEQ had compiled eight benchmarks depicting incremental levels of reading proficiency from Pre-reading (level 1) to critical reading (level 8). An assessment framework was presented in the GEMS series (though not found in the SEACMEQ documentation or technical reports), where the three domains presented in Table 42 were combined with five skills levels based upon the SACMEQ II study methodology.

Table 42. SACMEQ II assessment framework for reading

Skill levels	Sub-domains: Narrative	Expository	Documents
1	Word/picture association involving positional or directional prepositions requiring the linkage of a picture to a position or a direction in order to answer the question.	Word/picture association involving positional or directional prepositions requiring the linkage of a picture to a position or a direction in order to answer the question.	Word/picture association involving positional or directional prepositions requiring the linkage of a picture to a position or a direction in order to answer the question.
2	Recognising the meaning of a single word and being able to express it as a synonym in order to answer the question.	Recognising the meaning of a single word and being able to express it as a synonym in order to answer the question.	Linking simple piece of information to item or instruction.
3	Linking information portrayed in sequences of ideas and content when reading forward.	Linking information portrayed in sequences of ideas and content when reading forward.	Systematic search for information when reading forward.
4	Seeking and confirming information when reading backwards through text.	Seeking and confirming information when reading backwards through text.	Linking more than one piece of information in different parts of a document.
5	Linking ideas from different parts of text. Making inferences from text or beyond text, to infer author's values and beliefs.	Linking ideas from different parts of text. Making inferences from text or beyond text.	Use of embedded lists and even subtle advertisements where the message is not explicitly stated.

Note. Adapted from Ross et al. (2004) Chapter 2: Methodology for SACMEQ II study, p.48

PIRLS distinguishes between the purposes for reading and the processes for reading comprehension. In 2011, PIRLS included a less demanding version of its assessment referred to as pre-PIRLS and later PIRLS Literacy (2016) and most recently LaNA (2023), which included four African countries (Burkina Fasso, Egypt, Nigeria and Senegal). PIRLS had four international benchmarks describing the competencies achieved by students at certain score points (Low, Intermediate, High, Advanced).

Table 43. Assessment framework for PIRLS, PrePIRLS PIRLS Literacy/LaNA

IEA PIRLS	Purposes for reading	Processes of comprehension
LaNA	New benchmark description	demonstrated basic literacy skills when reading simple literary and informational texts. They have shown the ability to perform tasks such as retrieving and recognizing explicitly stated details from a specific section of a text and making simple or straightforward inferences"
Pre-PIRLS/ PIRLS Literacy/ LaNA	Literary experience (50%)	Focus on and retrieve explicitly stated information (50%) Make straightforward inferences (25%) Interpret and integrate ideas and information Examine and evaluate content, language and textual elements (25%)
	Acquire and use information (50%)	
PIRLS	Literary Experience (50%)	Focus on and retrieve explicitly stated information (20%) Straight forward Inferences (30%) Interpret and Integrate Ideas and Information and Examination (30%) Evaluate Content, language, and Textual elements (20%)
	Acquire & Use information (50%)	

LaNA introduced a new Basic International Benchmark (325 score points) of reading achievement lying below the PIRLS 'Low' benchmark. Students achieving this new 'Basic' level '*demonstrated basic literacy skills when reading simple literary and informational texts. They have shown the ability to perform tasks such as retrieving*

and recognizing explicitly stated details from a specific section of a text and making simple or straightforward inferences' (IEA, 2025).

Grade 3

In compiling the grade 3 framework, the other regional and international frameworks were considered where appropriate as only AMPL and PASEC focused on the first three years of schooling. A key consideration at the grade 3 level is the importance of the "pre-reading" and "emergent" levels as described in SEACMEQ. The Continental Assessment Framework at this grade 3 level could also be considered by the AU member states as contributing to reflections regarding reading development given this critical age.

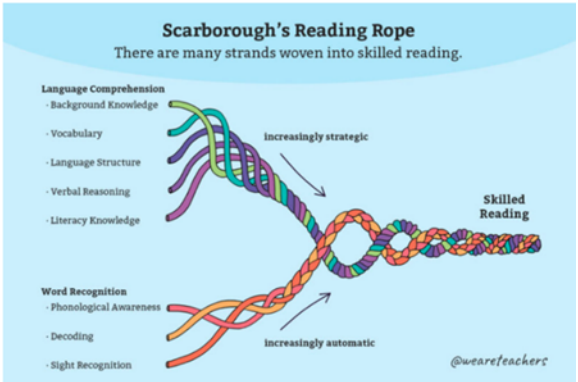
The nature of the development of reading is holistic with the goal of reading to derive meaning. Learners without adequate reading comprehension skills cannot achieve what is expected of them and no comprehension will present as a learner following words on a page while sounding them out but without understanding their meaning.

Reading is a multifaceted process which requires practice and the basics of fluency, word recognition must be mastered with reading comprehension being emphasised during the learning process. Without the development of comprehension skills learners cannot make predictions about what will happen next in the texts they read, they are unable to monitor their understanding of content, sequence or characters, nor would they be able to clarify confusing parts of the text, or connect what they are reading to their own experience or prior knowledge. The lack of comprehension leads to what is termed "functional illiteracy" (learners who can read and write in some capacity, but their reading comprehension level is so low they cannot manage everyday aspects of life) which obviously impacts success in school and later life.

Oral and reading comprehension are educational tools to further develop thinking and reasoning as an element of cognition. Reading is a vehicle for that, and text is how knowledge is increased that is essential to education. More knowledge and thinking and reasoning capacity in theory lead to better educational outcomes (Zimmerman, 2025). Oral and reading comprehension are therefore an essential part of thinking and reasoning development in young children.

Reading comprehension is the combination of skills including learning words (fluency, word reading) and understanding the language children are reading (language structure, knowledge, vocabulary, and reasoning). Language Comprehension and Word recognition woven together leads to complete skilled reading (Cleaver, 2024, Scarborough, 2001). However, there are a number of components leading to skilled reading which can only develop if all the components are strong and connected, given that the skills are interconnected and interdependent. If just one strand is weak (skills is absent), it affects the rope (and the reader) as a whole. Five skills (background knowledge, vocabulary, language structure, verbal reasoning, and literacy knowledge) become more strategic over time as students learn how to apply strategies to different kinds of text and three skills (phonological awareness, decoding, and sight recognition) become more automatic as students master each skill (Cleaver, 2024).

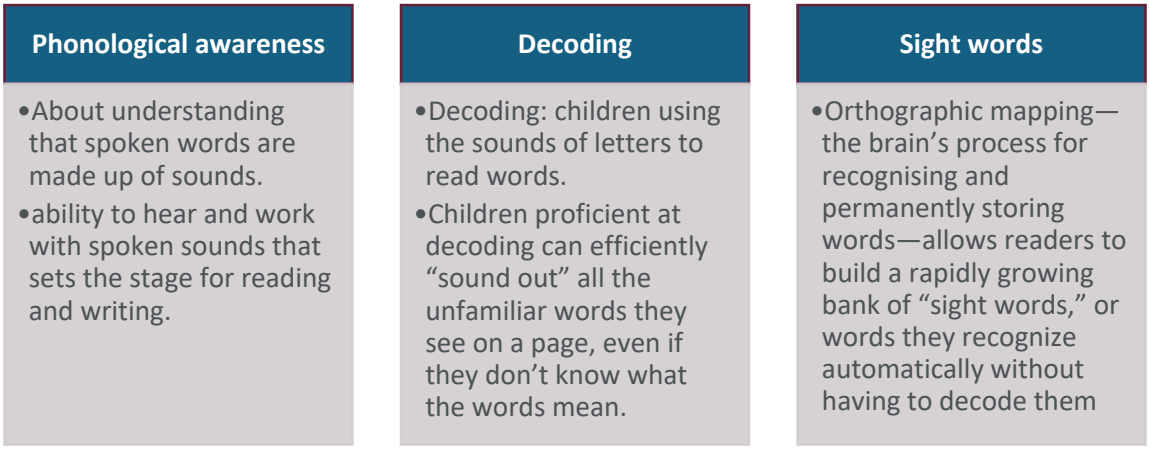
Figure 78. Scarborough's Reading Rope



Source: Scarborough (2001).

Word recognition skills can be clustered into three areas: phonological awareness, decoding and sight words. These are summarised briefly below (Staake, 2024).

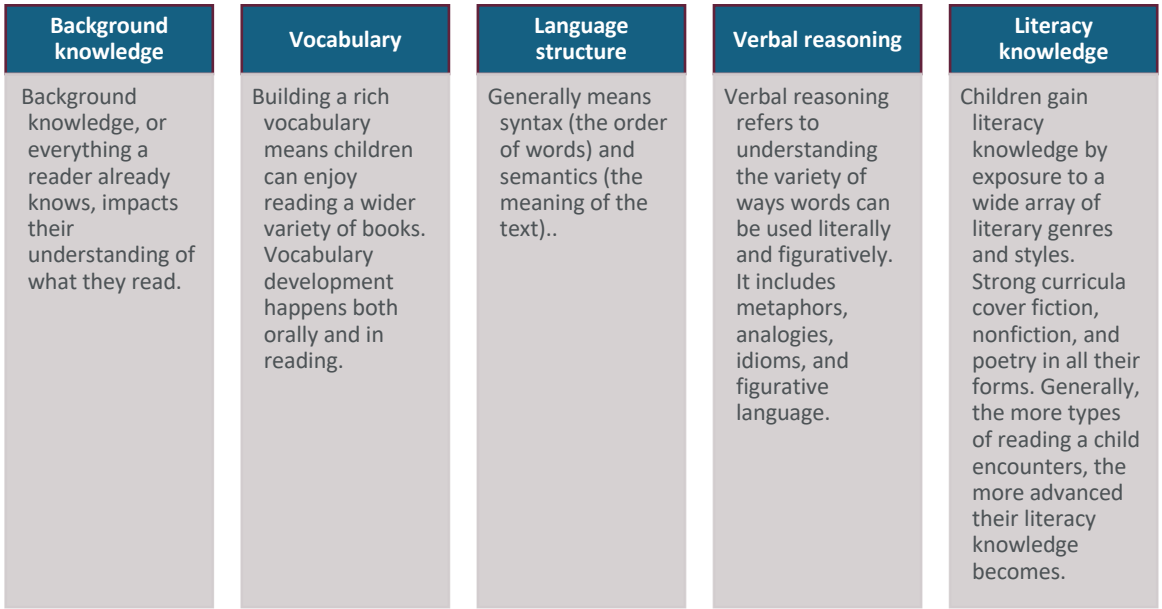
Figure 79. Word recognition skills



Source: Compiled from Staake (2024), based on Scarborough (2001).

Language comprehension is essential for reading development as word recognition alone does not create fluent readers. Children need to know the actual meaning of the words they are reading. Fluent readers understand the text they are reading (as a whole) and can draw meaningful conclusions and find important ideas and learnings (Cleaver, 2024). Language comprehension comprises five skills.

Figure 80. Language comprehension skills



Source: Compiled from Cleaver (2024) and based upon Scarborough (2001).

In compiling the contents of the framework considered in addition to the GPF, literature on reading development holistically in relation to other frameworks and other inputs were also considered. Whilst the holistic approach to reading development is critical to the development of language curricula in the early years, the challenge for the CAF is that not every component can be included and measured within the framework for reading.

Organisation of the reading framework

Comprehension of spoken and signed language and *Decoding* contribute to the development of *reading comprehension*. Theoretically they necessarily feed into the main goal of text-based reading comprehension which is the significant goal in later schooling years and needed for academic success. One of the considerations for the framework was whether Africa should endorse oral language with a text base or comprehension without a text base at the oral level. Verbal discussion is a natural part of any teaching and

learning but whether this transfers to the development of comprehension is not always guaranteed. Development of comprehension via classroom discussion is wholly dependent on the depth and quality of interactions between teachers and learners. The utilisation of text-based oral comprehension discussions acts as a precursor and/or scaffold to the development of individual reading comprehension. As such, text-based comprehension of spoken language is considered important.

The framework in Table 44 specifies and describes which domains are included, detailing the thinking processes to be assessed. The domain of Reading Comprehension is the most significant in terms of the weighting allocated with Comprehension of Spoken Language and Decoding equally weighted.

Table 44. Overview of domains and weightings for the CAF, Grade 3

Domains	Weighting (%)
Comprehension of Spoken or Signed Language	20
Decoding	20
Reading Comprehension	60

Having introduced the main components essential for reading development, the main domains are described with respect to the interpretations included in the framework and the emphases in line with reading development theory and the cross-country analyses done. For each of the three main content domains, the constructs are described and guidelines for the weighting of each construct are provided.

Comprehension of Spoken or Signed Language. Across Africa, the oral tradition is strong for most cultures. Children are accustomed to storytelling and listening to stories and proverbs handed down through generations. In formal classroom settings, oral comprehension is an essential component for reading comprehension development as argued previously. Via listening comprehension learners experience reading as being spoken or signed to them. This process includes words, phrases and continuous texts. With the latter, learners need to be able to understand the meaning of words and words within short texts. They would also include being able to identify and retrieve information that is explicit. In the African context, this domain is crucial (as a scaffold to reading comprehension). Whilst it directly contributes to reading comprehension with the appropriate skills targeted, one reservation is that it may also detract inadvertently from the reading comprehension. In the framework, this domain comprises three constructs (Table 45):

- Retrieve information at word level (20%) entails learners comprehending spoken and signed language at the level of a word or phrase, recognising the meaning of common grade-level words in short, grade-level appropriate continuous texts being read or signed to them.
- Retrieve information at sentence or text level (30%) comprises learners retrieving explicitly stated information from a short grade-level continuous text.
- Interpret information at sentence of text level (50%) entails the learner interpreting information in a short grade-level continuous text being read or signed to them.

Table 45. Comprehension of Spoken Language constructs and weighting, Grade 3

Construct	Weighting (%)
C.1 Retrieve information at word level	20
C.2 Retrieve information at sentence or text level	30
C.3 Interpret information at sentence or text level	50

Decoding. Following the earlier description, decoding is the process of learners translating written words into spoken words by using their knowledge of the relationships between letters and sounds. Decoding involves recognising letter patterns and sounding them out to read unfamiliar words. Children are taught to use the sounds of letters to read words and those who are proficient at decoding can efficiently 'sound out' all the unfamiliar words they see on a page, even if they don't know what the words mean. Decoding helps build word recognition, supports reading fluency and enhances comprehension, forms the foundation for spelling and writing and boosts confidence and motivation. Decoding helps readers recognise words quickly and accurately. As decoding becomes more automatic, readers spend less mental effort on sounding out words and more on understanding the text. Therefore, there are two important constructs underpinning these namely precision and fluency and both would be expected at the Grade 3 level having started at grade 1 and continuing to grade 9. In the framework for Grade 3, Decoding comprises two constructs (Table 46):

- Precision (50%) entails identifying symbol-sound/fingerspelling and/or symbol-morpheme correspondences as well as decoding isolated words
- Fluency (50%) entails saying or signing a grade-level (Grade 3) continuous text at pace and with accuracy

Table 46. Decoding constructs and weighting, Grade 3

Construct	Weighting
D.1 Precision	50%
D.2 Fluency	50%

Reading Comprehension. As described earlier, reading comprehension is a complex process and is the combination of multiple skills including learning words (fluency, word reading) and understanding the language children are reading (language structure, knowledge, vocabulary, and reasoning). According to Scarborough (2001) amongst others, language comprehension and word recognition woven together leads to complete skilled reading. PASEC (at end of grade 2) and PIRLS (grade 4) focus on reading comprehension in their assessments with PIRLS assessing four processes of reading comprehension culminating in four benchmarks. Reading Comprehension comprises three constructs (Table 47):

- Retrieve information (50%) entails recognising the meaning of common grade-level words and being able to retrieve explicit information in a grade-level text by direct- or close-word matching or by synonymous word matching
- Interpret information (40%) comprises identifying the meaning of unknown words and expressions in a grade-level text, making inferences in a grade-level text and identifying the main and secondary ideas in a grade-level (Grade 3) text
- Reflect on information (10%) comprises evaluating a text with justification and although it is not expected in the GPF, a number of countries include this competency at Grade 3 in their curricula.

Table 47. Reading Comprehension constructs and weighting, Grade 3

Construct	Weighting (%)
R.1 Retrieve information	50
R.2 Interpret information	40
R.3. Reflect on information	10

Grade 6

In compiling the grade 6 framework, other regional and international frameworks were considered where appropriate. Both PASEC and SEACMEQ have grade 6 as a target population. Similarly, PIRLS has been implemented at grade 5 and 6 in African countries although the target population is grade 4 internationally. SEA-PLM administered in Southeast Asia was also reviewed and described given their inclusion of reading literacy. By this age internationally children would be expected to be reading for meaning for the past three years. However, the international and regional studies have revealed that this is not the case universally across the continent. Each of the relevant studies is described briefly in terms of its relevance to the Continental Assessment framework contents.

SEACMEQ, a consortium of ministries of education (initially referred to as SACMEQ) was established in 1997. The first study SACMEQ I assessed only reading. Based on extensive analyses of curricula, syllabi, exams and textbooks used in member countries, the project defined three sub-domains to be assessed in the reading test ('narrative prose', 'expository prose' and 'documents'). These sub-domains were combined with five reading skill levels (with increasing skills levels from 1 to 5) to form a framework for the construction of suitable test items (Ross et al., 2004). The SACMEQ II assessment framework for student reading test was shown earlier in the previous section.

PASEC focuses primarily on *reading comprehension* (45%) where it is assessed in a number of different situations reading narrative and informational texts and documents, from which students extract, make simple inferences, interpret and combine information. The development of skills in this area enables students to read independently in a variety of everyday situations, in order to develop their knowledge and participate in society. However, there is a lesser emphasis on comprehension (39%) most of which comprises comprehension of isolated words and sentences is assessed through reading situations involving the discovery of the explicit

meaning of isolated words and sentences. The development of skills in this area enables students to automate their reading to gradually access the meaning of sentences and texts, and to expand their vocabulary. The level of these tasks is very basic and is equivalent to the objectives of early primary school curricula. Only a small proportion of the PASEC assessment comprises *understanding isolated words and phrases* (16%).

The main form of literary texts used in **PIRLS** is narrative fiction. Given differences in curricula and cultures across the participating countries, it is difficult for PIRLS to include some forms of literary texts. For example, poetry is difficult to translate and is therefore avoided. Currently the assessment framework for PIRLS devotes equal weight to Literary Experience (50%) and Acquire & Use Information (50%). Furthermore, in defining the processes for comprehension, PIRLS allocates 20-30% across the four types: Focus on and retrieve explicitly stated information (20%); Straight forward Inferences (30%); Interpret and Integrate Ideas and Information and Examination (30%); Evaluate Content, language, and Textual elements (20%).

SEA-PLM which is administered in Southeast Asia, stipulates the text variables, format and types explicitly dividing the text format into continuous, non-continuous and composite emphasising continuous text more (50-60%). For text type, the assessment framework includes narrative, descriptive, persuasive, instructional, transactional and transitional types favouring narrative (45%). Regarding reading comprehension, the processes of locate (35-45%), interpret (30-40%), reflect (10-20%), recognise words (10-20%) are included with the largest emphasis being on locate (35-45%). This study also has a domain on writing.

Organisation of the reading framework

Having reviewed and considered he contents and weightings of the respective domains and constructs from other regional and international studies, the Grade 6 Framework is presented. The framework below specifies and describes which domains are included, detailing the thinking processes to be assessed. The domain of Reading Comprehension is the most significant in terms of the weighting allocated with Listening Comprehension and Decoding equally weighted.

Description of content domains

The framework below specifies and describes which domains are included, detailing the thinking processes to be assessed. In Grade 6, three are included namely, Comprehension of Spoken or Signed Language, Decoding and Reading Comprehension with the most significant emphasis on the latter.

Table 48. Overview of domains and weightings for the CAF, Grade 6

Domain	Weighting (%)
Comprehension of Spoken or Signed Language	10
Decoding	20
Reading Comprehension	70

For each of the three main content domains, the constructs are described and guidelines for the weighting of each construct are provided.

Comprehension of Spoken or Signed Language. In the framework, this domain comprises three constructs (Table 49):

- Retrieve information at word level (10%) entails comprehending spoken and signed language at the word or phrase level and recognising the meaning of common grade-level words in a short, grade-level continuous text read to or signed for the learner.
- Retrieve information at sentence or text level (20%) comprises retrieving explicit information in a short grade-level continuous text read to or signed for the learner.
- Interpret information at sentence of text level (70%) entails interpreting information in a short grade-level continuous text read to or signed for the learner.

Whilst none of these constructs appear globally, several of the countries included them in their curricula. Therefore, for the purpose of the framework these are included but with the greatest emphasis placed on the more complex construct.

Table 49. Comprehension of Spoken Language constructs and weighting, Grade 6

Constructs	Weighting (%)
C.1 Retrieve information at word level	10
C.2 Retrieve information at sentence or text level	20
C.3 Interpret information at sentence or text level	70

Decoding. In the framework, this domain comprises two constructs. both expected globally:

- Precision (40%) entails identifying symbol-sound/fingerspelling and/or symbol-morpheme correspondences as well as decoding isolated words.
- Fluency (60%) comprises saying or signing a grade-level continuous text at pace and with accuracy.

Table 50. Decoding constructs and weighting, Grade 6

Construct	Weighting (%)
D.1 Precision	40
D.2 Fluency	60

Reading Comprehension. In the Grade 6 framework, this domain comprises three constructs. Both SEACMEQ and PASEC emphasised the interpretation of information. Whilst SEACMEQ appears to emphasise the nature of the text and measuring the progression of reading comprehension across eight benchmarks, PASEC included simple inferences from, interpretation of and combining information. Guided by the regional assessments, the country curricula analyses and the grade level appropriateness, the following weighting is presented (Table 51).

- Retrieve information (25%) entails recognising the meaning of common grade-level words and retrieving explicit information in a grade-level (Grade 6) text by direct- or close-word matching or by synonymous word matching.
- Interpret information (50%) comprises identifying the meaning of unknown words and expressions in a grade-level text, making inferences in a grade-level text and identifying the main and secondary ideas in a grade-level (Grade 6) text.
- Reflect on information (25%) comprises identifying the purpose and audience of a text, evaluating a text with justification and the status of claims made in a text.

Table 51. Reading Comprehension constructs and weighting, Grade 6

Construct	Weighting %
R.1 Retrieve information	25
R.2 Interpret information	50
R.3. Reflect on information	25

Grade 9

In compiling the grade 9 framework, other regional and international frameworks were considered where appropriate. At this grade and age group, only PISA was found to target 15-year-olds who aligned in many countries to Grade 9. By this age internationally children would be expected to be reading for meaning for the past six years. For the purposes of this section, PISA is described briefly in terms of its relevance to the CAF contents. PISA includes Reading Literacy as one of three domains that it assesses (the others being Mathematical and Scientific Literacy). The assessment framework for Reading Literacy refers to both single text and multiple texts.

Single text:

- Scanning and locating (15%)
- Literal comprehension (15%)
- Inferential comprehension (15%)
- Assessing quality and credibility; reflecting on content and form (20%)

Multiple text:

- Searching for and selecting relevant text (10%)
- Multiple text inferential comprehension (15%)
- Corroborating/Handling conflict (10%)

In terms of text processing, to be considered as reading fluently, students need to be able to :

- Locate information (access and retrieve information within a text and search and select relevant text)
- Understand (represent literal meaning and integrate and generate inferences)
- Evaluate and reflect (assess quality and credibility, reflect on content and form and detect and handle conflict).

Organisation of the reading framework

Having considered the other framework information available, the framework below specifies and describes which domains are included, detailing the thinking processes to be assessed (Table 52). In Grade 9, only two are included namely, Decoding and Reading Comprehension.

Table 52. Overview of domains and weightings for the CAF, Grade 9

Domain	Weighting (%)
Decoding	10
Reading Comprehension	90

Description of content domains

For each of the two main content domains, the constructs are described and guidelines for the weighting of each construct are provided.

Decoding. In the Grade 9 framework, this domain comprises two constructs (Table 53):

- Precision (30%) entails sounding out or signing of grade-level (grade 9) symbols as they relate to new vocabulary in pursuit of saying or signing common, isolated grade-level words.
- Fluency (70%) comprises saying or signing fluently a grade-level continuous text.

Table 53. Decoding constructs and weighting, Grade 9

Constructs	Weighting (%)
D.1 Precision	30
D.2 Fluency	70

Reading Comprehension. This domain comprises three constructs (Table 54):

- Retrieve information (20%) entails recognising the meaning of common grade-level (Grade 9) words, retrieving a single piece of *explicit* information from a grade-level *continuous text* by direct- or close-word matching and from a grade-level *non-continuous text* (tables, diagrams, graphs) by direct- or close-word matching and by synonymous word matching as well as from a grade-level non-continuous text (e.g., simple diagrams and tables) by synonymous word matching.
- Interpret information (50%) comprises identifying the meaning of unknown words (including familiar words used in unfamiliar ways) and idiomatic and figurative expressions in a grade-level text, making inferences in a grade-level continuous and non-continuous text (e.g., tables, diagrams, graphs) by relating pieces of explicit and/or implicit information; identifying the sequence of events/actions/steps in a grade-level text, Identifying, comparing, or contrasting points of view in a grade-level text and thereby supporting or explaining an idea, action, or statement; drawing a basic conclusion from a grade-level text by synthesising information in the text ; applying information from a grade-level text to a new example or situation; identifying the main idea in a grade-level text when it is not explicitly stated and distinguishing between a prominent main idea and secondary ideas in a grade-level text.
- Reflect on information (30%) entails identifying the purpose of a grade-level text when it is not explicitly stated, or of features of the text (e.g., vocabulary or images, graphics or other paratextual features); identifying evidence in the text to support the purpose of a grade-level text or of features of the text; identifying the audience of a grade-level text and the evidence in the text that supports that assertion; giving an opinion about a grade-level text and using evidence from the text to justify that opinion; evaluating

the conclusion presented in a grade-level informational text; distinguishing between factual information and opinion in a grade-level text; assessing the credibility of a grade-level text in digital format or on social media and evaluating the effectiveness of the features of a grade-level text (e.g., images/graphics, paratextual features, and vocabulary).

Table 54. Reading Comprehension constructs and weighting, Grade 9

Constructs	Weighting (%)
R.1 Retrieve information	20
R.2 Interpret information	50
R.3. Reflect on information	30

5.4. Alignment with the Global Proficiency Framework

The GPF defines minimum proficiency levels as benchmark for basic knowledge in specific domains (such as mathematics and reading) at a given age/grade measured through learning assessments (AMPL Framework, p.5). In constructing the Continental Assessment Framework, it was therefore essential to assess how well its contents and emphases at Grades 3, 6 and 9 aligned with the GPF. Notably, the GPF does not allocate weightings to the specified reading domains. Rather it defines the grade at which a learner is expected to demonstrate the minimum proficiency level in each skill.

In the terms of the contents, there are slight variations at both Grade 3 and Grade 6 levels. At grade 3 level, the retention of the Comprehension Skills omitted in the Global Proficiency level was argued on the basis of the cross-country analyses that revealed these to be present quite widely, the PASEC assessment and the proposals emerging from the AEAA workshop reading group. This resulted in Grade 1 and 2 skills being retained, namely, *C.1 Retrieve information at word level*, albeit with a small emphasis within the Domain of Comprehension. The other exception was the converse as R.3. Reflect on Information was included despite being expected at the Global Proficiency Level from Grade 4, again albeit with a small emphasis due to it being found in country curricula, aligned with the call of the AEAA workshop reading group to "think out of the box" in terms of the demands of assessment and the vision for reading on the continent.

Table 55. Overview of domains and weightings for the CAF, by grade

Domain	Weighting (%)		
	Grade 3	Grade 6	Grade 9
Comprehension of spoken/signed Language	20	10	0
Decoding	20	20	10
Reading Comprehension	60	70	90

At Grade 6 level, the variations occurred in Comprehension, where although at Grade 6, there were no skills included in the GPF, these were found in the country curricula. Similarly, the AEAA workshop reading group felt that there was still some need to include Comprehension even at Grade 6. Balancing the country findings with the absence of Comprehension skills in PASEC, SEACMEQ, PIRLS with the cross-country curricula findings, some of the skills for Comprehension were included however with the emphasis on the higher-order demands such as Interpret information at sentence level (70%) and significantly reducing the inclusion of the retrieval skills at word/sentence level. A further deviation was the shift in emphasis in Decoding from Precision to a greater emphasis placed upon Fluency. In terms of Reading Comprehension, the emphasises aligned more closely with the GPF, SEACMEQ and towards PASEC in terms of retrieval and Interpretation of information. However, the Reflection on Information mirrored more closely the GPF as well as PIRLS in terms of emphasis on the higher order demands such as inferential and evaluation skills.

At Grade 9 level, the Framework was conceptualised based upon some country curricula, qualitative analysis of the GPF and the analysis of the PISA assessment framework targeting 15 years olds (Grade 9 in many countries). There appeared to be much synergy between the spread across the domains and PISA with regards to the Reading Comprehension. The domain of Comprehension was not included in framework like the GPF (as

mentioned earlier stopped at Grade 3) and was not found in PISA. Likewise, Decoding was not found in PISA although the GPF devoted around 10% of its skills at the Grade 9 level to this domain. In specifying the weightings for the constructs for Reading Comprehension, the PISA framework and the GPF. The alignment is not identical but is quite similar broadly on construct level devoting only 20% to retrieval of information, 50% to interpretation and 30% to reflection. Whilst in other settings, even grater may have been put on Reflection, given the context and the few curricula reviewed, a more conservative approach towards the weighting on Reflection was taken.

In the addition to the specific remarks above regarding some specific deviation from the GPF, in Table 56, a direct comparison is made of the Continental Assessment Framework (CAF) on the Domain level with the GPF. The grade levels included in the GPF are listed in the first column of the table. In the absence of explicit weightings, a proportion of domain specific skills/ knowledge was calculated roughly for each domain (using the total amount of skills/ knowledge in GPF at each grade level). At Grade 3 level, given the emphasis in the Continental Framework is lower on the Comprehension domain and higher for the reading Comprehension, whilst being similar for Decoding. The differences emerge more starkly at Grade 6 with the inclusion of Comprehension. Similarly, there is a slightly greater emphasis on Decoding and less emphasis on Reading Comprehension than in the GPF. However, in Grade 9, there is stronger alignment with the GPF and similar emphases on Decoding and Reading Comprehension.

Table 56. Alignment of the CAF with the GPF

	Grade 3		Grade 6		Grade 9	
Domains	GPF Proportion of domain specific skills/ knowledge)	CAF weighting	GPF Proportion of domain specific skills/ knowledge	CAF weighting	GPF Proportion of domain specific skills/ knowledge	CAF weighting
Comprehension of Spoken or Signed Language GPF grade levels 1-3	36	20	0	10	0	0
Decoding GPF grade levels 1-9	21	20	14	20	10	10
Reading Comprehension GPF grade levels 1-9	43	60	86	70	90	90

In considering the draft Continental Assessment Framework, the minimum proficiency levels from the GPF were re-examined in line with draft framework described in 5.3. There are a few differences as per the descriptions regarding comprehension being retained for grade 3. The following description of the minimum proficiency levels are therefore reflected in Table 57.

Table 57. CAF minimum proficiency levels for reading

	Description
Grade 3	Students read and comprehend most of written words, particularly familiar ones, and extract explicit information from sentences. They read aloud and comprehend many single written words, particularly familiar ones, and extract explicit information from sentences. They make simple inferences when longer texts are read aloud to them.
Grade 6	Students independently and fluently read simple, short narrative and expository texts. They locate explicitly stated information. They interpret and give some explanations about the key ideas in these texts. They provide simple, personal opinions or judgements about the information, events and characters in a text.
Grade 9	Students locate and connect multiple pieces of related information across sections of texts to understand key ideas. They make straightforward inferences when there is some competing information. They reflect and draw conclusions based on evidence, in a variety of text types.

Adapted from UIS (2019) Minimum Proficiency Levels: described, unpacked and illustrated (GAML 6/REF/2).

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CHAPTER 6. CONCLUSIONS AND NEXT STEPS

Assessment has many different functions on system, school and classroom level (Kellaghan and Greaney, 2020, Howie and Plomp, 2006). One important function is to assess the outcomes of learning. There needs to be a clear link between the curriculum of a country and any proposed assessment. The frameworks per phase (nominally at Grades 3, 6 and 9) aligned to the Global Proficiency Framework (GPF), drawing on evidence from the cross-country analyses and a review of several international assessment frameworks, are representative of the curricula and provide a strong basis for the development of assessment for the African continent. This concluding section brings together some subject-specific remarks (6.1), summarizes the Continental Assessment Framework (CAF) for Africa (6.2) and outlines some key next steps for implementation (6.3).

6.1. Subject-specific conclusions

Mathematics

There is a common thread that runs through mathematics curricula internationally, and across the African continent, as it was shown in the analysis of the mathematics curricula across the 10 sample countries selected for this focused study carried out for the purpose of developing a common assessment framework for the African continent. Although there were differences in the content specification across the sample, it was possible to organise the curriculum information in a way that facilitated the mapping to the GPF.

There was some variation between the country curricula, but at the level of domain (Number and Operations, Algebra, Measurement, Space and shape, and Statistics and Probability) there was close to 100% alignment. Greater variation emerges going through the levels of specification, down to the skill/knowledge level, but this variation is catered for in most international testing frameworks, which specify content more broadly in terms of domains and constructs, leaving room for country specific adaptation as suggested by the AEAA mathematics working group.

A number of countries in Africa still include content on Sets (located in the domain of Number and Operations) which is not present in the GPF. Sets is a topic which allows for the development of logical mathematical reasoning. It is hence beneficial to learners, but countries that do cover sets could consider (in terms of global reporting requirements) the benefit of including this topic at the possible expense of time spent on other topics, which equally develop logical reasoning and strategic thinking.

Some countries included content that goes beyond the minimum proficiency levels as specified in the GPF, while they omit other topics. This is another aspect for consideration in terms of choices to be made in the composition of a curriculum. The broad allocation at a domain and construct level of content for inclusion in the assessment framework does allow for considerable variation as long as the item bank developed for use in assessments covers the full range of mathematical content that would be required.

Reading

A number of insights were gained from the analysis of the language curricula across the countries. As per expectations, there were variations in approach to presentation of the overall language curricula for each country in terms of nomenclature, structures and layouts. Even the structure, labelling and layouts for each

grade of one country's curriculum could present consistency challenges. The integrated nature of language curricula meant working across the broad domains to extract reading related content. Generally, the curricula dealt with language structures, listening comprehension, writing and reading (decoding and/or comprehension). Off-subject focus on non-language specific content, such as civic education and mathematical literacy, was also apparent in some instances.

Disentangling the primary language for teaching and learning versus the trajectory for future main language of instruction was not always immediately clear. The complexities of presentation of a primary language of teaching and learning at a grade versus the development of a secondary language, which may or may not become the primary language, was noted. Vocabulary development featured prominently. Oral language development played a large role in many curricula but the alignment of such development to verbal comprehension and specifically text-based understanding was not foregrounded.

Reading development targets were not always explicit in most curricula. Reading per se did not play a prominent role in the curricula with its focus often subsumed into other language activities. There was a lack of detailed exposition of comprehension development and its alignment to the development of higher order thinking and reasoning. Exposure to multiple reading texts and genres is a recognised hallmark for reading development. Yet the analysis did not reveal guidelines for text choices and genre exposure. In some curricula, lists of text types were apparent but further guidance on word counts, genres and developmental appropriateness of text choices was not forthcoming. As the GPF addresses the use of continuous and non-continuous text types as integral parts of comprehension, such lack of detail hindered mapping of the curricula onto the GPF constructs and skills. In other words, judgements of whether the reading could be deemed to be of a continuous text was not viable. Moreover, little or no reference to non-continuous texts (linked to visuals, data, maps etc.) was apparent across the board. Morocco gives word count guidelines and Kenya references screen based/ digital content for reading.

Extensive didactic guidelines on reading, reading comprehension development and reading strategies instruction were availed in the Senegal curriculum. However, it was not clear how these aligned to curriculum task directives. Kenya was the only country to deal with reading strategies instruction (prediction; analysis of titles for content prediction, summarisation, visualisation) within its curriculum task directives. It is unclear why presence of reading strategies as a key skill for successful comprehension is not dealt with in the GPF. Summarisation of texts read featured prominently in many curricula but the closest to this for the GPF was sequencing of a text.

There were only two countries which offered an assessment framework within the curriculum exposition document itself. One assessment framework was nascent in its nature and not reflective of a comprehensive framework to be used as a guide for teaching and assessment. The other was more comprehensive but still not reflective of the GPF details for reading.

6.2. Overview of the Continental Assessment Framework

The mapping process of the 10 countries' curricula shows that:

- All countries essentially cover the spread of five **mathematics** domains and constructs of an expected global mathematics curriculum when compared to the GPF. This is important to bear in mind in the discussion of global, or more focused continental teaching, learning and assessment of mathematics.
- In contrast, the levels of **reading** comprehension needed to enhance the higher order thinking and reasoning for development across schooling subjects are not prominent. There is minimal alignment to GPF indicators. Many of the comprehension skills and knowledge indicators addressed non-text-aligned vocabulary development/word meaning making.

Using the GPF as an analytical framework for the development of the mapping tool allowed a comparison of the curricula of the sample countries with the GPF, which represents a global consensus of what learners must know and be able to do, to be proficient in mathematics and reading as they progress through the grade levels, regardless of where they live in the world. However, the findings of the mapping should be considered with an

awareness that the competencies outlined in the GPF are not meant to be exhaustive. All countries have contextual needs and priorities, that may require the addition of competencies not listed in the GPF. For each country, particularities are noted where these provided useful contextual insights for consideration in drafting the CAF.

The frameworks for mathematics and reading are presented in terms of their domains and constructs per grade. For each framework, the distribution of the domains and constructs is presented across grades 3, 6 and 9 in terms of the weighting (target percentage of testing score points).

Table 58. Domains and constructs for mathematics with weightings, by grade

Domain	Construct	Grade 3	Grade 6	Grade 9
Grouped: N and A		**60**	**60**	**60**
N. Number and Operations	N.1 Whole numbers	60	25	0
	N.2 Fractions	15	25	0
	N.3 Decimals	0	15	0
	N.5 Exponents and roots	0	0	30
	N.6 Operations across number	0	0	20
A. Algebra	A.1 Patterns	20	20	0
	A.2 Expressions	0	0	15
	A.3 Relations and functions	5	15	35
Grouped: M and G		**35**	**30**	**20**
M. Measurement	M.1 Length, weight, capacity, volume, area, and perimeter	20	30	35
	M.2 Time	20	15	5
	M.3 Currency	10	0	0
G. Geometry	G.1 Properties of shapes and figures	30	30	30
	G.2 Spatial visualizations	10	10	10
	G.3 Position and direction	10	15	20
Grouped: S		**5**	**10**	**20**
S. Statistics and Probability	S.1 Data management	100	90	70
	S.2 Chance and probability	0	10	30

The framework for **mathematics** includes 5 domains and 16 constructs; not all of the latter are included at all three grade levels (3, 6 and 9). The distribution of weighting (i.e. target percentage of testing score points) at each grade level across the five domains totals 100%. The recommended percentages for the associated constructs under the two grouped domains (Number and Operations and Algebra, and Measurement and Geometry), and Statistics and Probability also add to 100%. For example, for Grade 3, the grouped domains Number and Operations and Algebra comprise 60% of all the expected score points out of the domains targeted, whilst 'N.1 Whole numbers' comprises 60% of the expected score points when this pair of domains is assessed.

Table 59. Domains and constructs for reading with weightings, by grade

Domains	Constructs	Grade 3	Grade 6	Grade 9
Comprehension of Spoken or Signed Language		**20**	**10**	**0**
	C.1 Retrieve information at word level	20	10	0
	C.2 Retrieve information at sentence or text level	30	20	0
	C.3 Interpret information at sentence or text level	50	70	0
Decoding		**20**	**20**	**10**
	D.1 Precision	50	40	30
	D.2 Fluency	50	60	70
Reading Comprehension		**60**	**70**	**90**
	R.1 Retrieve information	50	25	20
	R.2 Interpret information	40	50	50
	R.3. Reflect on information	10	25	30

The framework for **reading** includes 3 domains and 8 constructs; not all of the latter are included at all three grade levels (3, 6 and 9). The distribution of the weighting (i.e. target percentage of testing score points) at each grade level across the three domains totals 100%. Within each of the domains presented, the associated constructs add to 100%. For example (for Grade 3), the domain Comprehension of Spoken or Signed Language comprises 20% of all the expected score points out of the domains targeted whilst 'C.1 Retrieve information at word level' comprises 20% of the expected score points when Comprehension of Spoken or Signed Language is assessed.

6.3. Implementation

The Continental Assessment Framework (CAF) for Africa should not be viewed as the end goal but rather an essential first step toward a coordinated, African-led and sustainable approach to learning assessment. The following considerations have been identified to guide its implementation.

Contextualisation

- Countries will need to review the CAF to become familiar with its contents and benchmark their own curricula (and, if any, assessment frameworks) against it for contextualisation.
- Given the absence of national assessment frameworks, the CAF could be used as an input to guide the development of a national assessment framework that takes national curricula, languages and resources into account.
- Countries may require specific training to develop their own assessment frameworks, using the CAF as a guidance. The strategic plan of the Association for Education Assessment in Africa (AEAA) is aimed at information sharing, training, and support activities required for country-level implementation.
- AEAA and the AU-IPED should accordingly develop and regularly review a plan for reporting back on the implementation of the CAF-Africa across countries and the related activities.
- More dialogue is needed with the two Africa-based regional assessments (PASEC and SEACMEQ) to support cross-country collaboration. This will also enable alignment in the design of current and future regional assessment frameworks with the CAF.
- In contextualising the CAF for **mathematics**, it is important to take note of the following:
  - Emphasise number sense in the early grades but do not exclude the other core mathematical domains.
  - Instructions should be translated into the local language if it is not assessed and bilingual assessments should be provided with answers accepted in any language.
- In contextualising the CAF for **reading** it is important to take note of the following:
  - Carefully address the development of reading in a primary language of instruction as well as a secondary language which may become the primary later.
  - Comprehension development for all languages is necessary for cementing and transferring skills from one language to another. Foregrounding comprehension levels in a framework is therefore crucial.
  - Reading comprehension strategy development may be particularly beneficial aligned to the country's reflection on its curriculum and assessment.
  - The oral language development tradition needs further explanation in relation to its role for the comprehension of spoken language.

Instrument design and item development

The Education Data and Statistics Commission / Global Alliance to Monitor Learning has specified a set of eligibility criteria for a country to use its assessment to report on SDG global indicator 4.1.1. The first of these criteria is alignment to the Minimum Proficiency Levels. In this sense, CAF is consistent with the eligibility criteria. In the case of national assessment instrument and item development, internationally recognised, published technical standards for measurement in assessment and evaluation need to be met in compliance with the eligibility criteria

- On *test construction, evaluation and documentation*: validity; reliability and measurement errors; test development and revision; scales, norms and score comparability; test administration; scoring and reporting; and supporting documentation.
- On *fairness*: fairness in testing and test use; rights and responsibilities of test takers; and inclusiveness (e.g. test individuals of diverse linguistic backgrounds; with disabilities).
- On *testing applications*: e.g. responsibilities of test users.

The CAF does not, and should not, specify item types as this would be too restrictive. However, global expectations of comparability mean that items must be developed by technical experts and be validated through appropriate psychometric processes, a process that the CAF can support. Each country can use the CAF to develop its own implementation guidelines.

- The use of anchor items developed by technical experts and drawn from an item bank (e.g. as that generated by the AMPL assessment) can be considered.
- There should be cultural sensitivity in terms of text choices for reading assessments.
- Item translations should be flexible but without compromising the validity of the constructs.
- Specification grids for assessment instruments should include the identification and categorisation of Items in terms of levels of difficulty, e.g. for mathematics draw on Bloom's taxonomy:

  - Understanding: recall basic facts and knowledge (Bloom level 1)
  - Application: use knowledge in context to solve a problem (Bloom level 2)
  - Reasoning: analysis, synthesis, evaluation and creativity (Bloom level 3).

  while for reading comprehension draw on Barrett's taxonomy with its five levels:

  - Literal Comprehension
  - Reorganization
  - Inferential Comprehension
  - Evaluation
  - Appreciation