

KNOWLEDGE AND PRACTICE IN INTERNATIONAL DEVELOPMENT

What Works in Early Reading Materials

Ana Robledo and Amber Gove



RTI Press publication OP-0058-1902

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Suggested Citation

Robledo, A., & Gove, A. (2018). *What Works in Early Reading Materials* (Knowledge and Practice in International Development, 2). RTI Press Publication No. OP-0058-1902. Research Triangle Park, NC: RTI Press. <https://doi.org/10.3768/rtipress.2018.op.0058.1902>

This publication is part of the RTI Press Research Report series. Occasional Papers are scholarly essays on policy, methods, or other topics relevant to RTI areas of research or technical focus..

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@ Cover photo: RARA project, Alison Pfelpsen

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<https://doi.org/10.3768/rtipress.2018.op.0058.1902>

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Acknowledgments

We gratefully acknowledge the contributions of students, teachers, and ministry staff who allow us to collaborate with them to improve learning outcomes in their countries.

In addition, we thank Melinda Taylor and Jennae Bulat for granting ample time and space to dedicate to this project and for valuable reviewer feedback. Peggy Dubeck and Monika Mattos also provided valuable guidance and references.

This paper would not have been possible without the financial support of RTI International and its Internal Research and Development funding mechanism in support of generating research and lessons from RTI's project activities.

Abstract

Access to books is key to learning to read and sustaining a love of reading. Yet many low- and middle-income countries struggle to provide their students with reading materials of sufficient quality and quantity. Since 2008, RTI International has provided technical assistance in early reading assessment and instruction to ministries of education in dozens of low- and middle-income countries. The central objective of many of these programs has been to improve learning outcomes, in particular reading, for students in the early grades of primary school. Under these programs, RTI has partnered with ministry staff to produce and distribute evidence-based instructional materials at a regional or national scale, in quantities that increase the likelihood that children will have ample opportunities to practice reading skills, and at a cost that can be sustained in the long term by the education system. In this paper, we seek to capture the practices RTI has developed and refined over the last decade, particularly in response to the challenges inherent in contexts with high linguistic diversity and low operational capacity for producing and distributing instructional materials. These practices constitute our approach to developing and producing instructional materials for early grade literacy. We also touch upon effective planning for printing and distribution procurement, but we do not consider the printing and distribution processes in depth in this paper. We expect this volume will be useful for donors, policy makers, and practitioners interested in improving access to cost-effective, high-quality teaching and learning materials for the early grades.

Introduction

Practical guidance documents on how to develop, produce, and distribute educational textbooks are not new in the international development sector. Arguably, many of the best practices contained in such guides, even in those published more than 20 years ago, may still apply today. Despite the shift, in some contexts, toward digital textbooks and open educational resources,¹ textbook publishing has not seen radical advances in the 21st century.

A recent development in the field of international education has created renewed interest, especially among international donors and their implementing partners, on how to produce and disseminate books at a large scale in low- and middle-income countries (LMICs). In 2011, the United States Agency for International Development (USAID) set itself the objective of improving the reading skills of 100 million children by 2015 (USAID, 2011). Among the key strategies USAID would implement to achieve this bold new objective was to “ensure an adequate supply of age and language-appropriate reading materials” (USAID, 2011).² By 2015, USAID-funded early reading programs had distributed close to 150 million copies of early reading materials worldwide (USAID, 2015a). Also around 2010, other major bilateral donors, including the United Kingdom Department for International Development (DfID) and the Australian Agency for International Development (AusAID), made basic literacy a priority of their international education strategies (Department for International Development [DfID], 2010; Australian Agency for International Development, 2011).

The emphasis on early grade reading in international education has created a significant demand for a very specific type of instructional material: research-based reading textbooks and other reading materials for

young learners in low- and middle-income countries (LMICs), particularly in mother tongues. High-quality early reading materials are needed in mother tongues—in sufficient quantities to ensure access for all learners—at a cost that ministries of education in LMICs can sustain in the long term. Publishing and printing content is a (relatively) new area of expertise for many implementers of USAID- and other donor-funded basic education programs, including RTI International. Based on experience, we argue that despite the guidance documents on textbooks that international development agencies have developed, there remains a gap in comprehensive guidance specific to the challenges of early reading programs.

Thus, the focus of this paper is on how to achieve high-quality, cost-efficient teaching and learning materials for early grade literacy in the context of international cooperation programs with ministries of education. In writing this paper we seek to capture and reflect on the practices that RTI—as implementer of nearly 30 donor-funded early reading programs—has applied and refined, particularly in response to the challenges inherent in contexts with high linguistic diversity and low operational capacity for the production and distribution of instructional materials.

This paper is divided into five sections. In the first section, RTI’s Approach, we provide an overview of our approach to literacy instruction and book development and production. A high-level discussion of the main challenges of developing and producing early reading materials in LMICs is included in the second section, Understanding the Book Chain. A third section titled Language Matters discusses the implications of language policy on book development and production. The bulk of the paper is contained in the section Guiding Principles, which outlines our learned operational and technical guidelines and overarching lessons for book development and production. A final section provides concluding remarks and reflections. While this paper touches upon effective planning for printing and distribution procurement, it does not consider the printing and distribution processes in depth.

Because RTI is committed to continuously strengthening its practices and technical knowledge,

¹ Open educational resources are any educational resources “that are openly available for use by educators and students, without an accompanying need to pay royalties or license fees” (Butcher, 2015).

² At the time this paper was being prepared for publication, USAID released its international basic education policy, which replaces the USAID Education Strategy 2011–2015. Under the new policy, the production and distribution of teaching and learning materials continue to be important activities that support improved learning and education outcomes.

the guidance provided in this paper is not the culmination of our learning but, rather, a compilation of the lessons learned and practices strengthened to date. This paper is part of a more comprehensive series of papers on RTI's approach to early grade literacy instruction, *Knowledge and Practice in International Development*, available from RTI Press. We hope that the lessons learned and best practices achieved through our experiences will help to further the efforts of all to provide high-quality, effective literacy instruction to all learners, particularly those in LMICs.

RTI's Approach

Over the past decade, RTI International has developed, tested, and refined its approach to early reading instruction through its work on nearly 30 donor-funded programs in LMICs. RTI's approach is based on the most current scientific research on reading acquisition, learning theory, and motivation and is aimed at helping all students in early primary develop the skill—and the habit—of reading independently and with comprehension (Bulat et al., 2017). RTI's approach to early grade reading promotes systematic, explicit instruction of reading skills, sufficient time on task to practice skills, and regular formative assessment to track children's progress (Bulat et al., 2017). A key component of our evidence-based approach is text, or reading materials. Across our diverse portfolio of programs, we have confirmed, time and again, that a successful reading intervention requires high-quality instructional materials for students and teachers. Students who learn to read in print-rich environments, preferably with text and illustrations that are appropriate for their cultural background, age, and reading level, are more likely to achieve success in reading (Zygmunt et al. 2015).

Teachers who understand how children acquire reading skills and have access to teacher manuals and other tools that support them in delivering effective instruction are more likely to succeed in teaching (Sanden, 2012). Instructional materials are important for setting the structure and the pace of reading lessons, for both teachers and students.

While this paper provides an overview of best practices we have applied across our programs, we do not advocate a one-size-fits-all approach. Deciding which methods and tools to apply depends on many variables, among which are the contractual requirements of each project, the priorities of the local ministry, the assets and constraints of the local environment, and available time and budget.

Our approach has been molded in large part by experience, including iterative improvement and trial and error. RTI certainly did not set out to be a publishing house, nor did we have a long-standing interest in getting involved in the production of teaching and learning materials. But we and our donor and ministry partners, in seeking to improve classroom instruction and student learning, quickly realized that the quality and availability of early reading materials was sorely lacking. We also discovered that developing and providing early reading materials is complex and difficult. Even under optimal conditions, providing teaching and learning materials is a detail-oriented, labor-intensive process that poses difficult tradeoffs between quality and available time and funding.

Our work thus far has focused almost exclusively on the provision of printed, rather than digital, materials for reading instruction. Because RTI's most urgent priority is to increase the effectiveness of early literacy instruction in LMICs, the platform in which we provide instructional content for teachers and learners is currently a secondary concern. Furthermore, available evidence does not suggest that digital materials for teachers and learners are more instructionally effective or cost-efficient than paper-based materials for improving early reading in LMICs (Piper, Zuilkowski, Kwayumba, & Strigel, 2016). When relevant and feasible, we support the inclusion of digital learning aids in programs, yet we do not rely on them as the main support for literacy instruction.

While our point of departure is always research- and evidence-based, our approach is also informed by international best practices on how to manage large-scale educational publishing projects. In addition, ministries of education and local stakeholders, including teachers, have helped us identify the most effective practices in their local contexts.

Whenever possible, we have harnessed guides and tools that other individuals and organizations have developed, many of them with the support of USAID. The guides are an important supplement to this paper and are described in greater detail in the annotated bibliography. We likewise owe a debt of gratitude to our implementation partners, who have supplemented our expertise, especially in such areas as reading instruction in African and Asian languages and book chain development in LMICs.

Understanding the Book Chain

Our efforts to increase and improve the supply of early reading materials do not occur in isolation: they depend on the conditions of the local book chain (see box). To achieve optimum results, each of the main activities of the book chain—content development, printing, and distribution—requires the input of experts from diverse areas (e.g., authors, editors, graphic designers), access to technology and machinery, and the operational and financial systems in place to foster a competitive, transparent market.

The “book chain” refers to the series of activities through which content (e.g., a story) becomes a printed and bound product (e.g., a children’s book of stories) and is then disseminated to its final users (e.g., packaged and delivered to schools). Each activity or set of activities is performed by different specialized actors or stakeholders, such as publishers, printers, booksellers, and distributors.

Although the constraints vary widely in relevance and severity from one country to the next, in many LMICs local book production is still nascent or under-resourced. In many countries customs duties and taxes on the raw materials for printing make local production more expensive than importing finished books (Crabbe, Nyngi & Abadzi 2014). In others the absence of modernized equipment, trained labor, and transparent procurement processes further dampen local production. All of these factors mean that the expertise, technology, and industrial capacity for producing high-quality, cost-efficient educational materials may be scarce or underdeveloped (Buchan, Denning & Read, 1991; DfID, 2011; Makotsi, 2000; Wafawarowa, 2007).

Governments—usually, ministries of education—are important actors within the book chain. In many countries, government schools drive a very large portion of the demand for instructional materials (Ogechi & Bosire-Ogechi, 2002; Ouane & Glanz, 2011; Makotsi, 2000). Ministries and their affiliated agencies may perform all or several of the book chain activities for instructional materials (Askerud, 1997; DfID, 2011; UNESCO, 2016). Most importantly, ministries make the policies that regulate the provision of instructional materials to schools. Therefore, improving children’s access to early reading materials in LMICs rests heavily on an education system’s capacity to effectively procure and distribute materials to schools.

For many ministries of education, sustaining the recurring cost of providing instructional materials to schools—in quantities that ensure all students have access to them throughout the school year, every year—is difficult, especially if the cost of producing materials locally is high (Fredriksen & Brar, 2015; Read, 2015; UNESCO, 2016). In many LMICs, the high cost of production often means that in government schools, children cannot be guaranteed their own books (Diallo, 2011; Evans, 2010; Fredriksen & Brar, 2015; Read, 2015; UNESCO, 2016). Bottlenecks or corrupt practices in the book supply chain or in the government procurement system may mean that even when appropriate materials exist, they do not reach schools when they are needed or in sufficient quantities so that children can have their “eyes on text” every day (DfID, 2011; Read, 2015; Results for Development Institute, 2016). Because the supply or replenishment of materials to schools is often unpredictable, some teachers (rationally) have been found to lock away existing materials in order to protect them (Sabarwal, Evans, & Marshak, 2014). This hoarding of textbooks results in high student-to-textbook ratios and reduced opportunities for students to use the books (Fredriksen & Brar, 2015; Read, 2015).

RTI’s aim is improving reading instruction through evidence-based instructional content, among other elements—not book chain development per se. However, our main mission cannot be achieved

without addressing the multiple factors that preclude children's access to reading materials in the first place. Assisting ministries in improving the provision of early reading materials often requires interventions for strengthening local capacity to produce high-quality content and print-ready materials. On many occasions, the task also demands modeling cost-efficient and sustainable approaches to the procurement of reading materials. The task may also require implementing accountability mechanisms to verify that children have access to materials in schools. Developing and implementing these solutions has become an integral part of our approach.

Language Matters

Providing early reading instructional materials in indigenous mother tongues is another important element of RTI's approach to early literacy. Many of our technical assistance projects support ministries in their efforts to teach children using their mother tongue (or a language that is familiar to most children) and also teach them how to read and write in this language. Providing reading instruction in the languages that children speak and understand is important because children apply oral language and vocabulary skills, including the thousands of words they learn before coming to school, to the process of learning to read (Abadzi, 2006; Ball, 2011; Bender, Dutcher, Klaus, Shore, & Tesar, 2005; Ouane & Glanz, 2011; RTI International, 2015). Once children have learned to read in their mother tongue, they can transfer this skill to learning to read in another language (August & Shanahan, 2006; Royer and Carlo, 1991), usually the official lingua franca of their country.

RTI's goal is to provide evidence-based, context- and level-appropriate materials for early reading that are cost-efficient to produce, reach schools in a timely manner, and are supplied in quantities that

If a child knows the meaning of the word "cat" in English, she will be able to make meaning of the letters "c," "a," and "t" when they are blended together. If the child does not know the word (because English is not her first language), she will bear the additional burden of having to learn the word as well as the process of reading it.

allow children to practice reading skills every day. However, this is a difficult goal to achieve in many LMICs, due to complex factors that vary from one country to the other. The most prevalent constraint is the dearth of early reading materials, especially in indigenous mother tongues (Results for Development Institute, 2016; RTI International, 2016b; UNESCO, 2016). Evidence-based instructional content in non-Western languages is becoming more available in LMICs. Holding it back is the lack of research that specifically addresses how best to teach literacy in local indigenous languages³ and the low degree of implementation of policies calling for mother tongues in education (Bamgbose, 2011; Ouane & Glanz, 2011; RTI International, 2015b).

Data on the supply of early reading materials in LMICs is scarce, but a recent effort to catalog local language materials in 11 sub-Saharan African countries (RTI International, 2015b) revealed just 6,000 titles. Although the content spanned some 200 African languages, the total number of titles is lower than the total number of books in a single mid-sized elementary school library in the United States (National Center for Education Statistics, 2017). There is also a very low supply of materials for beginning readers, at least in comparison to more advanced reading levels. On average, less than half of all reading textbooks included a phonics-based approach to reading instruction. Therefore, a fundamental aspect of RTI's work in LMICs is developing instructional content to fill critical gaps in materials for early reading.

Table 1 shows the product of these efforts in Kenya, Uganda, and Ethiopia, just three of the countries where RTI partnered with ministries to develop and distribute new materials for students and teachers. In total, more than 400 titles across 20 languages were developed, resulting in 20 million copies distributed to students and teachers.

For detailed guidance on language policy and practice, we refer the reader to USAID's guide to planning for language use in education in LMICs (USAID, 2015c). Our own research from programs that address

³ The lack of research on early literacy instruction in local indigenous languages is examined in greater depth in Bulat et al., 2017.

Table 1. Examples of early reading projects RTI has implemented in contexts with high linguistic diversity

Country	Kenya	Uganda	Ethiopia
Program	Tusome Early Grade Reading Activity	USAID/Uganda School Health and Reading Program	Reading for Ethiopia's Achievement Developed (READ) Technical Assistance Project
Grade levels	1–3	1–4	1–8
Languages	Kiswahili + English	13 (12 local + English)	8 (7 local + English)
Titles developed ^a	43 ^b	104	320
Copies distributed ^a	19.7 ^c million	3.4 million	2.5 million

^a As of November 2018.

^b Titles developed does not include supplementary readers distributed by the program.

^c Total distributed copies includes supplementary readers.

language issues seeks to better understand such complex issues as the secondary effects of mother tongue literacy instruction on English, Kiswahili, and mathematics (Piper, Zuilkowski, Kwayumba & Oyanga, 2018); cross-linguistic transfer of reading skills (Kim & Piper, 2018); and the gap between

language policy and practice (Piper & Miksic, 2011). While a full discussion of the implications of language selection and use on book development and production is outside of the scope of this paper, these resources should serve as a starting point for policy makers and practitioners alike.

Tusome Early Grade Reading Activity (2015–2019)

Tusome (“Let’s Read” in Kiswahili) is a flagship partnership between USAID and the Government of Kenya’s Ministry of Education. Tusome is implemented in all public primary schools and 1,500 low-cost private schools across Kenya. Tusome’s goal is to improve the literacy outcomes of 7.4 million pupils in Kiswahili and English by 2019.

USAID/Uganda School Health and Reading Program (2012–2019)

The program supports the Uganda Ministry of Education and Sport to improve reading outcomes in primary grades and strengthen HIV/AIDS interventions in schools. Among other activities, RTI and its partners provided technical assistance to the National Curriculum Development Center of Uganda in producing, testing, and improving early reading instructional materials in 12 mother tongues and English for grades 1–4.

Reading for Ethiopia's Achievement Developed (READ) Technical Assistance Project (2012–2017)

The Ethiopia READ project supported the Ethiopian Ministry of Education (MOE) in its efforts to develop a nationwide reading and writing program. Among other activities, RTI and its partners provided technical assistance to the Ethiopian MOE and regional education authorities in developing reading and writing materials for grades 1–8 classrooms in seven mother tongues and their dialectical variations.

Guiding Principles

Although program design varies and the circumstances of each context are different, five principles consistently guide RTI’s efforts for the provision of instructional materials for early grade reading.

1. **Optimal selection and quantity of early reading materials.** We provide teachers and students with the types of materials that will be most effective in helping learners develop reading skills.
2. **Quality.** We produce materials of the best possible quality in terms of instructional content, readability, functionality, and consistency across titles.
3. **Responsible management of copyright issues.** We comply with contractual, national, and international provisions for copyrighted materials.
4. **Cost-efficiency.** We produce materials cost-efficiently so that, in the long term, ministries of education can provide many of them to schools and replenish them regularly.
5. **Timely delivery of books to schools.** We plan and coordinate our production and distribution processes carefully so that instructional materials arrive in schools when they are needed.

Optimal Selection and Quantity of Early Reading Materials

For RTI, the successful implementation of a reading program demands sound choices about which materials to provide to teachers and students. To arrive at the most favorable and effective set of materials for achieving program results, our programs weigh both pedagogical and practical considerations (time and funding) of different alternatives. We guide our decision-making approach by considering three factors:

- Which types of early reading materials are most effective in supporting systematic, explicit instruction of early reading skills?
- Of the different types of materials that support effective early reading instruction, which best respond to the needs and constraints of this specific program?
- For each of the materials selected for this program, will students need their own copy or can they share a copy with several of their classmates?

An optimal set of materials is instructionally effective, responsive to the needs and constraints of the context, and provided in quantities that ensure access for all learners.

Types of Materials

In the context of large-scale programs in LMICs, which have the ambitious goal of improving the effectiveness of reading instruction, instructional materials should

- support teachers in teaching the foundational literacy skills in a systematic and explicit manner;
- allow learners to follow lessons without having to copy lesson content from the board;
- give learners individual access to text daily; and
- allow learners opportunities to practice decoding and comprehension skills by gradually exposing them to more difficult text, in line with their level of reading skills.

In RTI's approach to materials provision, materials that fulfill these minimum objectives are considered **core materials**. Materials that fulfill objectives

that are beyond these minimum, core requisites for early reading materials—such as materials that provide additional practice with reading, either in the classroom or at home—are referred to as **supplemental materials**. Even though RTI prioritizes the provision of core materials, when time and funding allow we provide as many supplemental materials as possible to maximize learners' exposure to print.

Core materials most commonly provided are a teacher guide and a student textbook. The teacher guide provides teachers with the content and the teaching strategies for each lesson, as well as tools for lesson planning and formative assessment (see Figure 1). The student textbook includes the content learners will study in each lesson, such as letters, syllables, words, sentences, stories, comprehension questions, and activities for practice or review (see Figure 2). Individual access to a student textbook helps students follow lessons without having to copy content from the board, which increases the efficient use of time during reading lessons and increases student engagement in learning (Abadzi, 2009). Together, the teacher guide and student textbook provide the structure and set the pace for reading lessons.

Decodable and Leveled Texts

Decodable and leveled texts are essential in RTI's approach to early reading instruction. Decodable and leveled texts are usually part of the student textbook but they can also be provided as separate materials. Decodable text is text that students can read on their own based on the letter sounds they know or the words they recognize (see Figure 3). Decodable text strengthens children's decoding skills (Davidson, 2013).

A **decodable reader** is a book made up exclusively of decodable texts, usually in the form of words, sentences, and short narrations that students use to practice decoding skills.

Leveled readers are usually provided as a series of books—each with a standalone story or informational text with illustrations—and are intentionally targeted at different levels of reading difficulty (e.g., difficulty of vocabulary, sophistication of grammar, and sentence length). These levels increase in a systematic manner.

Figure 1. Sample teacher guide pages developed as part of the Liberia Teacher Training Program Phase II

WEEK 1, DAY 3 continued

4 Reading and Comprehension 17 minutes

Today I will read a story aloud and you will listen carefully. After I have finished reading, I will ask you questions about the story elements such as the setting, characters, events, and story problem.

Read the following text aloud as students listen.

The Mother Hen and the Hawk
by Benjamin G. Everett

In a little corner not far from the henhouse where she lived, Mother Hen scratched the ground. She used her feet to dig, and she pecked with her beak. Mother Hen had to work very hard to find food, because she had many chicks and they were always hungry.

Suddenly, Mother Hen looked up and saw a big hawk. She gathered her chicks and covered them with her wings. One of the chicks slipped away to chase a bug that was hopping along. The hawk saw this chick, and came down to steal the little chick. But Mother Hen raced toward her little chick, raising her wings to challenge the hawk. The hawk could not stay and fight for long, so she flapped her wide wings and flew away.

Mother Hen was glad that the hawk was gone, and that her chicks were safe. She led her chicks to a new spot in the shade to rest and hide from the hawks.

Comprehension Questions

- *Where does this story take place?* (outside, near the hen's home)
- *Who are the characters in the story?* (Mother Hen, her chicks, the hawk)
- *What is the first story event?* (Mother Hen scratches ground looking for food)
- *What is the problem in the story?* (hawk tries to take one of the hen's chicks)
- *How is the problem solved?* (Mother Hen flaps her wings to make the hawk go away)
- *The text says that Mother Hen challenged the hawk. What does challenge mean?* (to confront or go up against someone)

Ask students to turn to a partner and retell the plot events in order.

5 Daily Assessment 2 minutes

1. Call on individual students to orally spell one of the week's spelling words: **plant** and **stick**.
2. Flash the week's sight word cards for individual students to check if they can read them quickly.

Homework

Have students retell the story about the mother hen and the hawk to someone at home. Ask students to practice the spelling words **plant** and **stick** in their copybooks.

WEEK 1, DAY 3

Supplementary Language Arts

Lesson Objectives

By the end of the lesson, students will be able to:

- identify common and proper nouns.
- complete a grammar activity page.

Student Materials

- *Student Activity Book page 7*

Oral Language and Grammar 30 minutes

Write the words **month** and **March** on the board and read them aloud.

Both of these words are nouns. The word **month** is a common noun. It doesn't need a capital letter at the beginning. **March** is a proper noun. It is the name of a specific month and it needs a capital letter.

Turn to your partner and think of three examples of common nouns and three examples of proper nouns that you can share with the class.

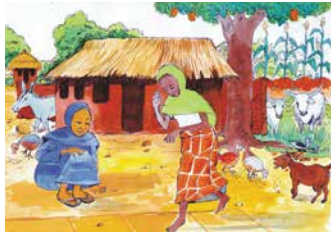
As students share their examples, choose some of the nouns to record on the board. Correct any errors concerning the difference between common and proper nouns.

Have students turn to *Student Activity Book page 7*. Explain that they will read the sentences and identify the nouns. They will circle the proper nouns and underline the common nouns. Guide them through the first example to make sure they know what to do.

Tell students that after they finish the first part of the page, they should read the sentences in the second part to look for errors in the use of capital letters on the proper nouns. First they should underline all the nouns in the sentence. Then they should find and circle the errors and write the correct spelling of the words on the line beneath the sentence.

Source: RTI International.

Figure 2. Sample student textbook pages developed as part of the Nigeria Reading and Access Research Activity

Zango Na: 1	Mako Na: 1
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> Nn Aa </div> <div style="text-align: center;"> na an nan </div> <div style="text-align: center;"> Nana na ana </div> <div style="text-align: center;"> Nana na gida. </div> </div> <div style="margin-top: 10px;"> <p>N n N n N n</p> <p>A a A a A a</p> <p>Na Annan</p> </div>	 <p style="color: #008080; font-weight: bold;">Karatun labari</p> <p>Nana na nan.</p> <p>Nana na gida.</p> <p>Nana na wasan gala-gala.</p>
2	3

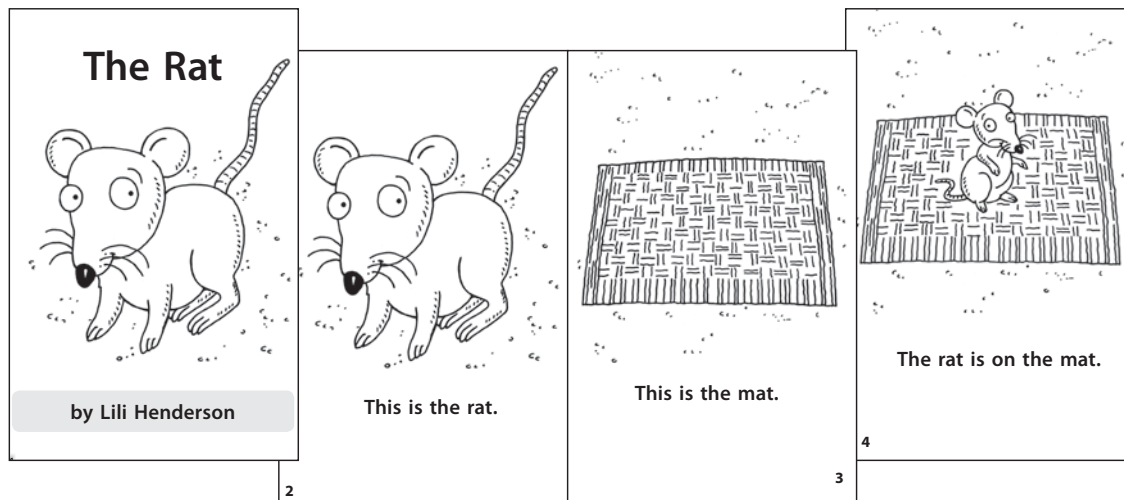
Source: Figure was created under the Nigeria Reading Access and Research Activity and is licensed under CC BY.

Leveled texts are a series of texts with increasing levels of difficulty, primarily in terms of vocabulary and sentence construction (see Figure 4). Leveled texts support children’s gradual progress in reading by exposing them to text that is slightly more difficult

than their level of proficiency in reading (Fountas & Pinnell, 1999).

RTI’s approach to assigning reading levels is explained in further detail in the section *Content* (page 11).

Figure 3. Example of a decodable reader developed as part of the Liberia Teacher Training Program Phase II



Source: RTI International.

Figure 4. Leveled readers developed for the Tusome Early Grade Reading Activity



Source: RTI International.

Categories of Reading Materials

Aside from the distinction between “core” and “supplemental,” there are other ways of categorizing instructional content and materials.

The type of book refers to the function of a book (or other material) in instruction. The broadest categories of book types are *textbooks* and *non-textbooks*.

Textbooks are the study manuals for reading lessons and contain the contents and activities for each lesson. There is usually a manual for the teacher (teacher guide) and one for the student (student book or student textbook).

Non-textbooks offer learners opportunities to practice reading skills. There are many *non-textbook* types. RTI programs commonly provide supplementary readers: books with text and illustrations that are meant to be used by students to practice reading skills on their own.

Read aloud storybooks are collections of stories that can be read aloud to children so they can practice their oral comprehension skills.

Big books are illustrated storybooks in a large format that the teacher can read aloud to learners to develop their listening skills and familiarize them with books. Big books are most commonly used at the pre-primary school level.

Workbooks, also known as consumables, are books in which learners can write (or draw) to practice a skill, like writing or mathematics. There are also **cards** with letters, syllables, or short texts that teachers can use to demonstrate or reinforce lessons.

Genre refers to the intention of the text and images. In the context of early grade reading, the most common genres are stories (narrative); songs, rhymes, and poems (poetic); and texts that provide information on a topic, such as farm animals or modes of transportation (informational). Another common genre for early reading materials is oral tradition, that is, stories that a community, ethnic group, or religious group has passed down orally through generations.

Additional Supplemental Materials

Likewise, some programs develop cards with decodable or leveled stories, which are known as **story cards**.

The main difference between cards and readers is the number of pages. Story cards provide a decodable or leveled text in a single sheet of paper, usually printed on both sides. Story cards can be laminated to increase their durability. Because story cards are printed on a single sheet of durable paper, they are one of the most cost-efficient alternatives for creating print-rich environments. (The impact of the number of pages on printing cost is further explained in the *Cost-Efficiency* section, which starts on page 24.)

In addition to decodable and leveled readers, supplemental materials for learners include posters with letters to decorate classroom walls and classroom libraries with dictionaries and picture storybooks, among others. Workbooks and activity books that learners can write and draw in can also be helpful supplements. However, in most cases RTI avoids consumable books—that is, books that are no longer useful after a child has written or drawn in them—because the recurring cost of replenishing these types of books may not be sustainable in the long term.

Supplemental materials are also available as additional tools for teachers. For example, the Primary Math and Reading Program in Kenya provided an assessment kit that included an assessor manual, learner stimulus sheets, a stopwatch, a report card template, a pocket chart and letter cards, and home reading trackers to monitor learners’ reading progress and engage parents.

Regardless of the combination of core and supplemental materials that a program may select, an optimal provision of early reading materials should include both narrative and expository texts, texts that interest all sub-populations of students in a classroom, and texts that are culturally and socially relevant and sensitive. The number of books learners read and their access to many different text genres are important factors influencing reading achievement (Duke, Pearson, Strachan, & Billman, 2011). Because each text genre requires specific comprehension strategies, becoming familiar with different types of text in the early stages of reading development prepares learners for “reading to learn” in later primary grades (Duke & Pearson, 2008).

Young learners are most familiar with stories and songs, so early grade materials (grades 1, 2, and 3) should emphasize rhymes and narratives. Expository texts can also be introduced in early primary grades and take on greater complexity and a more central role as readers gain proficiency and maturity.

Selecting Materials for a Program

With the distinction between core and supplemental materials as a useful starting point, we recommend that early reading programs conduct a more focused analysis to select materials to achieve a reading program’s objectives. This analysis helps to ensure that the selection of materials is responsive to contextual

needs and the time and budgetary constraints that are unique to each program. Sometimes, however, the program funder or ministry of education will have already prescribed the preferred set of materials before engaging RTI as the implementing partner or technical assistance provider. In those cases, RTI follows the program design. When it is RTI's role to decide which materials to include in an early reading program, RTI applies the following three criteria:

- **Instructional needs:** What are the most critical instructional gaps that need to be filled? The gaps we usually analyze are children's foundational reading skills, teachers' capacity for effective instruction, and the existing supply of appropriate materials for early reading instruction.
- **Viability:** Which materials can be produced at a high-quality standard and distributed to schools by the beginning of the next school year, with the available time, budget, and local expertise for materials production?
- **Cost:** Is the cost of providing the selected set of materials reasonable enough that the local ministry could sustain the recurring cost of providing and replenishing materials to schools in the long term?

Book-to-User Ratio

Another consideration when planning for the optimal provision of materials is book-to-user ratio (Fredriksen & Brar, 2015; Read, 2015). Attention to book-to-user ratio is important for ensuring that teachers and students have adequate access to materials, but also for ensuring cost-efficiency. Because printing and distributing larger quantities per title increase the total cost of materials provision, programs need to carefully consider the number of copies they provide for each type of material. Depending on the program's instructional objectives, students may need to have daily, one-on-one access to some titles, but not to others. Thus, the number of copies per title is determined primarily by the way a specific title is meant to be used in classroom instruction.

RTI always provides teacher guides and student textbooks at the rate of one copy per user (teacher or student). Even though the contents of the teacher guide and student textbook are aligned with each

other, we nonetheless aim at providing all teachers with a copy of *both* the teacher guide and the student textbook.

In the case of leveled readers, when estimating the number of copies per title per classroom we assume that several students, but not all, will be reading the same book at the same time. We apply the same assumption to all other materials that learners do not need for following daily lessons. To calculate the number of copies per title per classroom, we consider the average number of students per classroom, the total number of titles available, the expected frequency of use of these materials, and the printing and distribution cost of each alternative.

Quality

RTI defines the quality of early reading materials along three dimensions: content, responsiveness to users' needs, and cohesion and consistency within and across titles (see Table 2). In all cases, these principles guide our quality assurance processes during the content planning, production, and printing stages.

RTI strongly recommends considering all these dimensions when developing materials. A common tendency is to think about content quality first and then users' needs and consistency across titles after content is final. To avoid delays that could jeopardize the timely delivery of books to schools, decisions that

Table 2. RTI's dimensions of quality for early reading instructional materials

Dimension	Aspects
Content	<ul style="list-style-type: none"> • Instructional approach • Instructional road map for each grade and language • Teaching and learning activities • Text and illustrations
Responsiveness to users' needs	<ul style="list-style-type: none"> • Readability • Functionality
Cohesion and consistency within and across titles	<ul style="list-style-type: none"> • Alignment between teacher and student materials • Consistent use of elements that are common to several lessons or titles • Logical changes between grade levels and languages

affect quality along other relevant dimensions should be made early in the process alongside decisions about content and readability.

Content

Developing the content for instructional materials begins by laying out the general plan for instruction for the school year. The general plan for instruction outlines the skills and concepts that will be introduced in the school year (scope), the order in which they will be presented to students (sequence), and the pace at which instruction will advance in the school year. We ground the general plan for instruction in RTI's evidence-based approach to literacy instruction (described in Bulat et al., 2017), as well as on a country's national curriculum for reading.

As part of the content planning process, we support staff at ministries of education in selecting the instructional strategies and classroom activities that teachers will implement as they follow the general plan for instruction. Building upon the teaching and learning activities, they then develop the contents for teacher and student materials: the text and the illustrations.

The following sections describe how RTI defines quality for each of the elements that make up or inform the instructional content of our materials.

Evidence-Based Instructional Approach

RTI programs base their instructional approach on the findings of the US National Reading Panel, with research-based adaptations for each language of instruction other than English. In 2000, the US National Reading Panel analyzed many scientific studies on literacy instruction and concluded that the ability to read and write is built upon five foundational skills (National Reading Panel, 2000):

- **Phonemic awareness:** The ability to manipulate the smallest units of sounds (or phonemes) in words.
- **Phonics:** The understanding that the sequence of letters in a written word represents a sequence of sounds in spoken words.
- **Fluency:** The ability to read accurately and at an appropriate rate.

- **Vocabulary:** The breadth and depth of word knowledge and the ability to use and understand these words.
- **Comprehension:** The ability to extract meaning from text.

Additionally, concepts of print—for example, that printed words convey meaning and that words on a page are read in a set order—need to be developed very early in the first year of instruction. Writing should be woven throughout all daily lessons both in support of literacy growth and for its own importance (Bulat et al., 2017).

To support learners' progress in these skills, RTI has identified five core components of an effective early literacy program. These components are based on a wide body of scientific theory and evidence about how humans develop, learn, and acquire reading skills (Bulat et al., 2017):

- **Teaching** = effective teaching strategies
- **Text** = the presence of sufficient quantities of high-quality and relevant materials
- **Time** = sufficient time allocated to literacy instruction and practice
- **Test** = effective use of formative learning assessments
- **Tongue** = the provision of instruction in the most effective language

Although instructional materials represent the “text” component, they are the main instrument for guiding effective teaching, effective use of time in the classroom, and formative assessment in all languages.

Alignment with the National Curriculum for Reading

Because RTI develops materials in collaboration with ministries, the instructional content is often based on the ministry's policies and guidelines for early reading instruction. These policies are usually captured in the national curriculum for reading. Some countries may not have a curriculum for early reading per se but may have learning standards that the ministry expects schools to achieve each school year. Other countries may have additional curricular guidelines for reading instruction. An example is the Lower Primary/

Thematic Curriculum of Uganda, which requires that early reading instruction in all mother tongues be taught around common thematic areas (health, family, etc.). The objective of these cross-cutting curricular themes is to ensure that learners from all language groups have a common learning thread around themes that are familiar to learners (National Curriculum Development Centre, 2017).

In all cases, RTI materials build upon national policies for reading instruction and demonstrate how the proposed instructional approach is linked to the curriculum. Figure 5 illustrates how the instructional approach for each day is aligned with the Liberia National Reading Standards.

A challenge that RTI commonly encounters in LMICs is that the national curricula for reading is not fully research-based (Bulat et al., 2017). Thus, on many occasions, RTI will assist the ministry in updating its curriculum for reading instruction before developing new materials or updating existing materials. In other instances, RTI will develop instructional materials that fill gaps in the curriculum, and these materials become the basis for the reformed reading curriculum.

A Systematic Road Map for Instruction

In its final shape, the road map for instruction for the school year specifies how much content teachers will cover in the school year (scope); the order in which they will introduce new skills and concepts (sequence); and the pace at which instruction will advance throughout the school year. RTI works closely with the ministry and with local and international reading and language specialists to develop the “scope and sequence” for each grade and language. In most countries, the ministry mandates the time available for literacy instruction during the week and the duration of each lesson. The pace of instruction is based on the scope of content that is to be taught in the school year and the time available to

Figure 5. Example correlation with academic standards developed as part of the Liberia Teacher Training Program Phase II

CORRELATION TO LIBERIA NATIONAL READING STANDARDS					
	Day 1	Day 2	Day 3	Day 4	Day 5
Reading Process: The student demonstrates knowledge of alphabetic principles and applies grade-level phonics skills to read text.					
The student will use knowledge of spelling patterns (e.g., vowel diphthongs, difficult word families).	X	X	X	X	X
The student will decode phonetically regular one-syllable and multisyllable words in isolation and in context.	X	X	X	X	X
The student will apply letter-sound knowledge to decode phonetically regular words quickly and accurately in isolation and in context.	X	X	X	X	X
Reading Process: The student uses multiple strategies to develop grade-appropriate vocabulary					
The student will recognize high-frequency words.	X	X	X	X	X
The student will use new vocabulary that is introduced and taught directly.		X	X	X	
The student will use context clues to determine meanings of unfamiliar words.			X		
Reading Process: The student uses a variety of strategies to comprehend grade-level text.					
The student will identify high-frequency, phonetically irregular words in context.	X	X	X	X	
The student will listen to, read, and discuss familiar and conceptually challenging text.		X	X	X	
The student will identify a text's features (e.g., title, subheadings, captions, illustrations), use them to make and confirm predictions, and establish a purpose for reading.				X	
The student will determine the author's purpose in text and ask clarifying questions (e.g., why, how) if the meaning is unclear.				X	
The student will summarize information in text, including but not limited to main idea, supporting details, and connections between texts.			X		
The student will identify cause-and-effect relationships in text.		X	X	X	
Literary Analysis: Students will use a variety of strategies to identify story elements in grade- and age-appropriate literary selections.					
The student will identify and describe the elements of story structure, including setting, plot, character, problem, and resolution in a variety of fiction.		X	X	X	
The student will recognize and understand the purpose of text features (e.g., simple table of contents, glossary, charts, graphs, diagrams, illustrations).				X	
The student will use explicitly stated information to answer a question.		X	X		

Source: RTI International.

cover it in a systematic way. (Alternatively, the scope is often also determined by the available instructional time in the school year.)

Under RTI programs, the scope covers, at minimum, all five foundational reading skills (phonemic awareness, phonics, fluency, vocabulary, and comprehension) from the beginning of grade 1. The instructional sequence begins with the most basic building blocks of each skill and gradually progresses toward more complex skill levels and concepts. For example, under RTI's systematic approach, letters are not introduced in alphabetic sequential order but, rather, beginning with the letters that produce many of the decodable, familiar words in the language—called a productive sequence for letter introduction. In the case of English, reading instruction will begin by introducing the letters *a*, *m*, *d*, and *s*, which produce words like *mama*, *sad*, and *mad*.

Developing the instructional sequence for an alphabetic language that has not been widely used or

that did not exist in written form until recently (as is the case with many African mother tongues) requires a linguistic analysis to determine the order in which letters and words should be taught, from easiest and most frequent to most complex and rare.

When implementing reading programs that span several years and target several primary grades, programs need to ensure that the scopes and sequences create a seamless continuum of learning between one year and the next. Likewise, when implementing programs that support teaching children how to read in their mother tongue first, the scopes and sequences for L1 (mother tongue) and L2 (official lingua franca) should articulate what levels of competency in L1 are required to successfully acquire L2. The scopes and sequences for L1 and L2 should also work together to ensure a successful transition from L1 to L2 in later grades. Finally, the scopes and sequences for L1 and L2 should reinforce skills that students need in both languages, like fluency and comprehension, while helping students learn and apply decoding strategies that are unique to each language.

Based on the time the ministry has assigned to literacy instruction for each day or week, the expert panels that develop the scope and sequence need to determine how to distribute instructional time among the different teaching objectives. Often, the ministry may have predetermined guidelines on how to allot time during reading lessons, in which case programs must follow these guidelines. Panels usually develop a weekly instructional schedule that is used consistently throughout the school year (though the content will, of course, be different for each school day and week). The general pace of instruction for the school year indicates

- the frequency with which each reading skill is taught during the week (e.g., daily, once a week);
- when, and how often, there are pauses in instruction to assess learners’ progress and review skills and concepts (e.g., once a week, once every two weeks); and

- the exact duration of each activity during a daily lesson (Bulat et al., 2017, pp. 26–28).

An effective instructional road map traces a clear learning path for the entire school year in an explicit, detailed, and methodical way. It should clearly summarize the instructional content for each skill, for each day of the school year. Teachers should be able to grasp the pattern of instruction for each day, week, and term easily so that they can use it to plan lessons.

An explicit, detailed, and methodical plan for instruction is often best communicated through visual aids such as graphic organizers. RTI includes scope and sequence graphic organizers in the teacher guide for most of its programs. Figure 6 is an example from the teacher guide developed for the Liberia Teacher Training Program Phase II. In this case, the ministry preferred presenting the scope and sequence at the beginning of each week, but a scope and sequence can be visualized for the full school year, term, or week.

Figure 6. Example weekly scope and sequence graphic organizer developed as part of the Liberia Teacher Training Program Phase II

WEEK 1 SKILL OVERVIEW					
	Day 1 (pp. 6–9)	Day 2 (pp. 10–13)	Day 3 (pp. 14–17)	Day 4 (pp. 18–21)	Day 5 (pp. 22–23)
Reading					
Phonics	Short vowels and beginning consonant blends Daily Reading: Phonics activity page	Short vowels and final consonant blends	Short vowels and consonant blends	Short vowels, blends, and consonant digraphs Daily Reading: Phonics activity page	Review
Spelling	<i>spell, drop</i>	<i>pump, damp</i>	<i>plant, stick</i>	<i>clock, thick</i>	Assessment
Sight Words	<i>work, watch, city, listen</i>	<i>nothing, understand, before, thank</i>	<i>summer, group, across, wind (noun)</i>	<i>pieces, brother, suddenly, children</i>	Review
Reading & Comprehension		Daily Reading: Read story Identify characters, setting, feelings, and problem and solution Reading and comprehension activity page	Oral Comprehension: Identify setting, main characters, events, and problem and solution Retell	Daily Reading: Read book Make predictions Identify setting, characters, events, and problem and solution Daily Reading: Homework activity page	Review Daily Reading: Take home book to read
Fluency	Practice sight words	Practice sight words	Practice sight words	Practice sight words Daily Reading: Read book for fluency	Practice sight words Daily Reading: Read book for fluency
Vocabulary			<i>challenge</i>		
Supplementary Language Arts					
Oral Language & Grammar		Recognize common and proper nouns	Identify common and proper nouns Daily Reading: Complete a grammar activity page		
Writing	Shared Writing: Write a sentence about the rainy season using correct capitalization and punctuation			Shared Writing: Write a story	Continue independent writing

Source: RTI International.

Teaching and Learning Activities

RTI provides detailed guidance for teachers on the instructional strategies they should employ to help students develop each reading skill. These strategies vary by language and context. However, in all instances these strategies are based on the available evidence on how early readers develop each of the foundational literacy skills (Bulat et al., 2017 pp. 5–17).

Based on the instructional strategies that are explicitly outlined for teachers in the teacher guide, the student textbook will include the content learners need to follow lessons, which typically involves

- concepts of print (in early grade 1);
- identifying letter sounds;
- blending letter sounds to form words or syllables;
- learning new vocabulary words;
- decoding text; and
- answering comprehension questions.

Almost every program includes **review lessons** in its instructional plan, or at least review activities within daily plans. In RTI's systematic approach to literacy instruction, review lessons are an opportunity for teachers to reinforce the skills and concepts they have previously taught before moving on to a more complex level. The student textbook includes review activities, and the teacher guide includes guidelines for teachers on how to lead these activities.

Because instructional materials are the main guidance tool for teachers, teacher guides also include activities that address other elements of RTI's approach to effective literacy instruction.

Many of our programs offer explicit guidance on **formative assessment** (Bulat et al., 2017, pp. 28–29). Formative assessment is understood as “all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged” (Black & William, 1998, p. 7). In many of our programs, the teacher guide includes guidelines on how to assess learner progress and tabulate and interpret assessment results.

Formative assessment results provide teachers with information that can help them identify struggling readers as well as the areas in which each student excels or needs help. When feasible, RTI may suggest **guided remediation** activities and **differentiated instruction** strategies (Bulat et al., 2017, pp. 21–22). These are additional strategies that teachers can employ to help struggling readers or to adapt their instruction to respond to the individual readiness levels, interests, and learning profiles of students. Both guided remediation and differentiated instruction require that teachers work with students individually or in smaller groups. Therefore, these activities are more feasible in contexts in which class sizes are manageable.


For each of these activities, RTI provides guidelines on how to structure the interactions between teacher and students. A teaching practice that most of our programs use is the **gradual release model** (Bulat et al., 2017, p. 19). With skills such as phonics that can be taught through gradual release, a teacher first models the skill or concept herself in front of the class, then invites learners to engage in the activity with her, and finally “releases” learners to practice the skill themselves. The objective of the gradual release model is to balance the time that a teacher talks to learners and the time learners engage in an activity by themselves. Many programs have come to know this practice as “I Do, We Do, You Do,” although it can take many forms depending on the local context. Figure 7 provides an example from the Tusome Early Grade Reading Activity project.

RTI's guided lesson plans also explicitly indicate how much time should be dedicated to each activity or skill within a lesson. Figure 8 shows the number of minutes allocated to each activity: the first clock icon indicates that the activity should last no more than 6 minutes. To make effective use instructional time in each lesson, teachers should balance the time they spend on skill development, practice, review, and assessment.

Finally, RTI's teacher guides may offer guidelines on how to provide students with **diverse opportunities to practice reading skills** (Bulat et al., 2017, p. 20). Reading practice can occur in a whole class setting,



Figure 7. Guidance for teachers on gradual release, developed as part of the Tusome Early Grade Reading Activity

● Oral blending
I do: We will make words by joining sounds. The sounds are /m//a//t/. I join the sounds together. The word is **Mat**.
We do: Let’s do it together. The sounds are /m//a//t/. What is the word? **Mat**.
 Repeat with: **at**.
You do: Now I will say the sounds and you will say the word. The sounds are /m//a//t/. What is the word? **Mat**.
 Repeat with: **met, am**.

 **Pupil text reading**
I do: Open **page 41** of your books. We are going to read and see if what you have said would happen came true in the story. First, I will read as you listen. Place your finger at the start of the **first line** and follow as I read.
Read the story to the learners.
We do: Let us now read the story together. Follow along with your **finger** as we read.
Read the story with the learners.
You do: Now, it is your turn. Read the story with your partner. *Walk around monitoring the learners' reading.*
 Did what your partner say come true?
Ask 3-4 learners to share and give feedback.

Source: RTI International.

Figure 8. Use of clock icons to guide time management during lessons developed as part of the Nigeria Reading and Access Research Activity

Zango Na: 1	Mako Na: 3	Darasi Na 5 da Na 6
<p>Gano Gabar Kalma  Minti-6</p> <p>M 1. Rubuta gabar kalma a kan allo [ka].</p> <p>2. Nuna kowane harafi da ke cikin gabar, kana/kina furta sautinsa a hankali.</p> <p>3. Dora yatsa a kasan gabar ka/ki bi ta daga hagu zuwa dama kana furta sautinta da sauri.</p> <p>MD 4. Jagoranci dalibai zuwa ga sashe mai alamar da'ira. Maimaita matakai na biyu da na uku (2-3) ta hanyar amfani da Littafin Dalibai.</p> <p>D 5. Maimaita matakai na huɗu (4), tare da rukunin dalibai daban-daban.</p> <p>M 6. Maimaita matakai na farko zuwa na biyar (1-5) da sauran gabobin kalma [na].</p>		
<p>Kalmomin da za a Karanta  Minti-5</p> <p>M 1. Rubuta wannan kalmar [Mama] a kan allo.</p> <p>2. Nuna kowane harafi da ke cikin kalmar kana/kina furta sautin kowane harafi da ke cikin kalmar a hankali.</p> <p>3. Dora yatsa a kasan kalma ka karanta ta daga hagu zuwa dama, cikin sauri.</p> <p>MD 4. Jagoranci dalibai zuwa ga sashe mai alamar dala. Maimaita aikin ta hanyar amfani da Littafin Dalibai.</p> <p>D 5. Maimaita aikin tare da rukunin dalibai daban-daban</p> <p>M 6. Maimaita matakai na farko zuwa na biyar (1-5) da sauran kalmomin [Amma, Nama].</p>		

Source: Figure was created under the Nigeria Reading Access and Research Activity and is licensed under CC BY.

peer to peer, or independently. Like gradual release, each of these alternatives for practicing reading skills provides a different level of teacher support and helps learners make gradual progress in reading (Bulat et al., 2017).

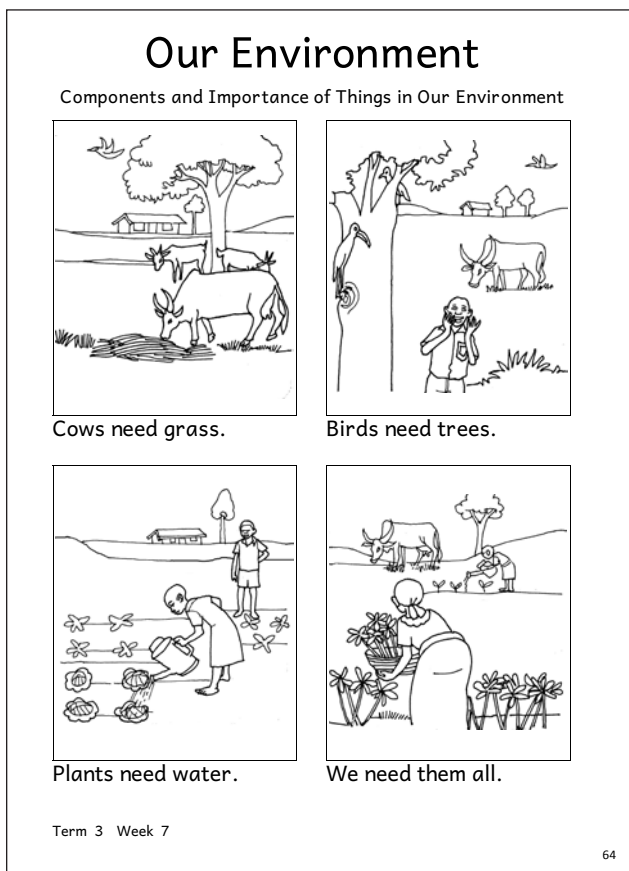
Text and Illustrations

Materials for learners usually include text—in the form of letters, syllables, words, sentences, or longer texts—accompanied by illustrations. Illustrations are an important component of materials for early readers. Not only can images make materials more aesthetically appealing and engaging, but they can also support the development of early reading skills. Illustrations can help beginning readers learn the information in the text, remember what they have read, and understand the meaning of the text (Levie & Lentz, 1982; Levin & Meyer, 1993; Carney & Levin, 2002; Pike, Barnes, & Barron, 2010). RTI encourages using many illustrations in early reading materials. The illustrations should be placed on the page in such a way as to help learners make the link between the text and the image (blueTree Group, 2014), such as in Figure 9. Images should not allow learners to understand the full meaning of the text without having to read (Davidson, 2013).

The criteria for text and illustration quality we describe below are most applicable to materials for learners, including student textbooks, decodable and leveled readers, and supplemental materials. We apply these minimum criteria when developing materials from scratch, as well as when reviewing existing materials.

Content familiarity. The text and illustrations in learner materials should describe characters, situations, and settings that children are likely to have been exposed to. Because background knowledge aids comprehension (Burgoyne, Whiteley, & Hutchinson, 2013), presenting learners with content that is familiar to them allows them to use that knowledge to understand what they are reading. Familiar content is most helpful for learners in the earliest stages of reading development. As learners strengthen their reading

Figure 9. Example of text-image correspondence developed as part of the USAID/Uganda School Health and Reading Program



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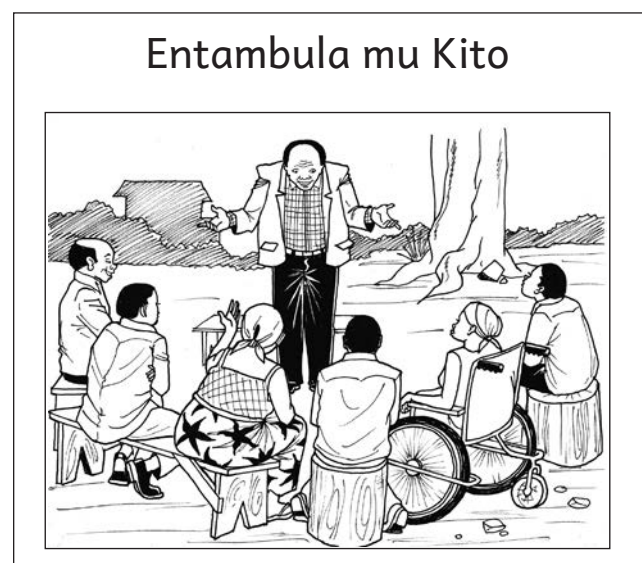
skills, they can also benefit from being exposed to characters, situations, and settings that expand their horizons (for example, a child in Uganda can read a story that takes place where there is snow).

Content appropriateness. When developing content for young children, it is important to consider local cultural and social norms about the topics and situations that are appropriate for children. In most cases, RTI recommends avoiding sensitive content in learners' materials, such as violence or traumatic events, gore, sex and nudity, smoking or drug use, and any other topics against which there may be local taboos. However, RTI also acknowledges that the line between appropriate and inappropriate content for children varies in each culture and according to children's age.

Inclusiveness. RTI advocates for inclusive, equitable, and bias-free representation of the characters in children's stories. The characters in the stories should proportionally reflect the ethnic and religious diversity of that country or region. We also encourage programs to include characters who may be marginalized in communities, like people with disabilities or albinism, as shown in Figure 10. There should also be a balanced and equitable representation of male and female characters in stories. The bias-free representation of characters means that all characters are "portrayed with comparable skills, knowledge, accomplishments, and roles" (USAID, 2015b).

Text is free of spelling and grammatical errors. Accurate use of language is particularly important when developing materials for learners who are still learning to decode. While a reader who has developed full automaticity in reading may not notice a "typo" or a missing word in a sentence, a beginning reader is still learning to blend letter sounds and decodes every word in a sentence. A misspelled word or any mistakes in the text can hinder a beginning reader's efforts to decode.

Figure 10. Example of inclusive content developed as part of the USAID/Uganda School Health and Reading Program



Source: Figure is intellectual property of the National Curriculum Development Centre of Uganda and licensed under CC BY.

Illustrations correspond to the text. Illustrations in early reading materials are most effective when learners can associate the image and the text to recognize a letter sound, a vocabulary word, or the main action, setting, and characters in a longer text (blueTree Group, 2014). To support this association, objects in illustrations should be easily recognizable (e.g., a dog should look like a dog and not be easily confused with another animal). Likewise, illustrations should accurately depict the action or characters in the story (e.g., if the story is about two friends, there should not be three children in the image.) When using illustrations to support letter or word recognition, the illustration should be a simple depiction of the object, person, or animal, without distracting details in the background. Similarly, when the purpose of an image is to place the action or characters in a setting (e.g., “Cows need grass.”), the illustration should not be overburdened with details that are not directly relevant to the text (Dubeck, 2016).

The decision on whether illustrations are in color or in black and white depends mainly on the ministry’s preference and on printing costs (printing in color

is more expensive). Because there is no definitive evidence that color illustrations are better for early reading development than illustrations in black and white (blueTree Group, 2014), RTI does not consider that the color of the illustrations is essential to quality. However, whenever possible, we use color illustrations because providing readers with colorful and engaging materials can have a positive effect on their motivation to read (Fang, 1996; Hartley, 1994; Marinelli, Martelli, Praphamontripong, Zoccolotti, & Abadzi, 2013).

Responsiveness to Users’ Needs

The instructional effectiveness of materials depends on whether teachers and learners can adequately use—that is, read and manipulate—the materials. Thus, the main criteria for ensuring that instructional materials respond to the basic needs of users are readability and functionality. RTI applies these criteria both when developing new materials and when reviewing existing materials.

Readability

Readability is defined as “ease of comprehension because of style of writing” (Harris & Hodges, 1995, p. 203). Many factors of the text contribute to readability.⁴ This paper focuses on the variables related to text difficulty, typography (font), and format (page design).

Text difficulty. In RTI’s systematic approach to early reading instruction, beginning readers should practice reading skills with text that is at their level of reading proficiency and slightly higher. “Reading proficiency” refers to learners’ ability to read a text passage fluently and grasp the meaning of what they have read. Beginning readers should be exposed to text that challenges their current skill level, but not so much that it frustrates them. When a text is too difficult, beginning readers may lose motivation and develop an aversion to reading (Davidson, 2013). However, it is important to note that leveled texts are most useful for learners who are in the process of

Guidelines for Teachers

In early grade reading projects that are tasked with building teacher capacity for effective instruction, the teacher’s guide becomes the main support tool for teachers. Because teachers may rely heavily on the guide for teaching each lesson, instructions must be clear and concise so as not to interfere with the flow of the lesson. This is an example of a set of instructions for teachers from the teacher guide developed under the Nigeria Reading and Access Research Activity:

Word Decoding (5 minutes)

1. Write this decodable word on the chalkboard [].
2. Point to each syllable in the word as you slowly read the syllables.
3. Run your finger under the word left to right and read the word faster.
4. Direct the children to the triangle section. Repeat using the pupil book.
5. Repeat step four (4) with different groups of pupils.
6. Repeat steps one to five (1–5) with the other words [].

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⁴ Factors of text that contribute to readability are “format, typography (font), content, literary form and style, vocabulary difficulty, sentence complexity, concept load or density, cohesiveness, etc.” (Harris & Hodges, 1995, p. 203).

developing fluency and automaticity. After learners have achieved fluency, they should not be limited to text that is strictly at their skill level, but encouraged to explore any text that interests and challenges them (P. Dubeck, personal communication, July 20, 2017).

Matching text to a reader's ability requires assessing the level of text difficulty. Text difficulty is estimated on the basis of (a) how likely a reader is to understand the meaning of the words used in the text and (b) how likely a reader is to grasp the meaning of a sentence, depending on how it is constructed (Davidson, 2013). Sentences become increasingly difficult as they use more words, convey more ideas, and use more sophisticated verb tenses.

There are several ways of evaluating text to estimate how appropriate it would be for readers at different levels of reading proficiency. Some approaches use quantitative formulas (such as the Fry Readability Graph, the New Dale-Chall Readability Formula, Lexiles, DRP Units, or Coh-Metrix) to analyze text and place it along a continuum of difficulty levels; some of these formulas are embedded in word processing software such as Microsoft Word. In most instances, these formulas have been tested and developed for Western languages. Readability formulas for African and Asian languages have, for the most part, not yet been developed (Davidson, 2013).

Consequently, because RTI frequently works with African and Asian languages, we use a qualitative approach to text leveling. Qualitative approaches rely more heavily on subjective criteria to evaluate reading materials and match them with beginning readers of different proficiency levels (Davidson, 2013).

Both when developing and when evaluating early reading materials, RTI uses the following qualitative criteria to ensure that text is at an appropriate level for beginning readers (Dubeck, 2016):

- logical progression of letter sound relationships,
- opportunities to read words in connected text that the child has learned to decode in isolation,
- simple sentence structures,
- sentence structures with repetitive text,

- high picture-to-print ratio,
- minimal ideas in a sentence,
- minimal tense changes within a story,
- familiar topics and vocabulary, and
- large fonts and increased spacing of lines.

RTI applies these criteria to both decodable and leveled texts. (Decodable and leveled texts were discussed in the section *Optimal Selection and Quantity of Early Reading Materials*.) Decodable texts, specifically, fulfill the first two criteria in the list above. Decodable text is “readable” because it only uses letter sounds and words that students have learned to read during the school year. Decodable text should therefore be aligned with the sequence for instruction for the school year. Decodable texts are most useful in the earliest stages of reading development (usually, grades 1 and 2), when children are still learning the alphabetic “code” for their language (Mesmer, 2001).

RTI has also developed text-leveling frameworks for supplemental reading materials with ministries of education in Kenya (for English and Kiswahili), Tanzania (Kiswahili), and Indonesia (Bahasa). As an example, the text-leveling guidelines RTI developed in collaboration with the Ministry of Education, Science and Technology of Kenya are available in the appendix. These leveling approaches were informed by text-leveling frameworks developed by reading specialists in North America, such as Lori Rog and Wilfred Burton (2002) and Irene Fountas and Gay Su Pinnell (1996). These frameworks have been useful for classifying existing materials according to their level of difficulty and for writing new text.

Typographical settings. Early readers benefit when the text on the page is easy to process visually (blueTree Group, 2014; Katzir, Hershko, & Halamish, 2013). The ease with which text can be visually processed depends on typographical factors like font type, size, and color.

RTI recommends using sans serif fonts for student materials, preferably with a shape that resembles the teacher's handwriting on the blackboard, and in which the differences between letters are clear. For

languages that use a Latin script, RTI prefers the Andika⁵ font.

RTI supports using larger font sizes for early reading materials (Table 3). Evidence suggests that a larger font size can have a positive effect on fluency and comprehension in the early stages of literacy development (Marinelli et al., 2013; Katzir et al., 2013; Wilkins, Cleave, Grayson, & Wilson, 2009). The USAID-commissioned guide *Best Practices for Developing Supplementary Reading Materials* (blueTree Group, 2014) provides helpful guidelines for selecting the font size for each reading level or school grade.

Font Types

Serif fonts. Times New Roman, for example, is a font with serifs, which look like little feet under each letter. Serif fonts work best for longer texts that fill an entire page, usually with reduced space between lines. Notice how letters like the “a” and the “g” do not have the shape they would have in normal handwritten text in Latin script.

The quick brown fox jumps over the lazy dog.

Sans serif fonts. Andika is an example of a sans serif font, or a font without little feet. Notice how all the letters look like normal handwritten text.

The quick brown fox jumps over the lazy dog.

As with Times New Roman, the differences between letters like “n” and “h,” “g” and “q,” and “a” and “o” are easily noticeable.

The amount of print on the page is also important for readability at the early stages of reading development. In combination with font size, programs should consider factors like words per sentence, words per line, and number of lines on a page. RTI developed

Table 3. Recommendations for the choice of font size

Visual Aspect	Grade K (±5 years old)	Grade 1 (±6 years old)	Grade 2 (±7 years old)	Grade 3 (±8 years old)
English/ Latin script	30–32 points	28–30 points	26–28 points	24–26 points
Thai/Arabic script	38 points	36 points	34 points	32 points

Note: Font size depends on script type. All sizes provided are approximate.

Source: Extracted and adapted from USAID’s “Best Practices for Developing Supplementary Reading Materials” (blueTree Group, 2014), cited by blueTree Group as the system used by the South African Department of Basic Education.

guidelines for the amount of print on the page, for each reading level, as part of the leveling framework it developed with the Ministry of Education, Science and Technology of Kenya (see the appendix).

RTI also recommends that text for beginning readers be black. Black text on a white page creates contrast, which increases the legibility of text (Hartley, 1994). In instances in which programs choose a color other than black for typography, the color should create a visible contrast against a white page and should be used only to highlight certain aspects of text.

Page design. Page design refers to how the different elements—titles, page numbers, illustrations, text, etc.—are distributed on a page. When the distribution of these elements is not organized, logical, and consistent, users may find it difficult to read the text and follow the lesson.

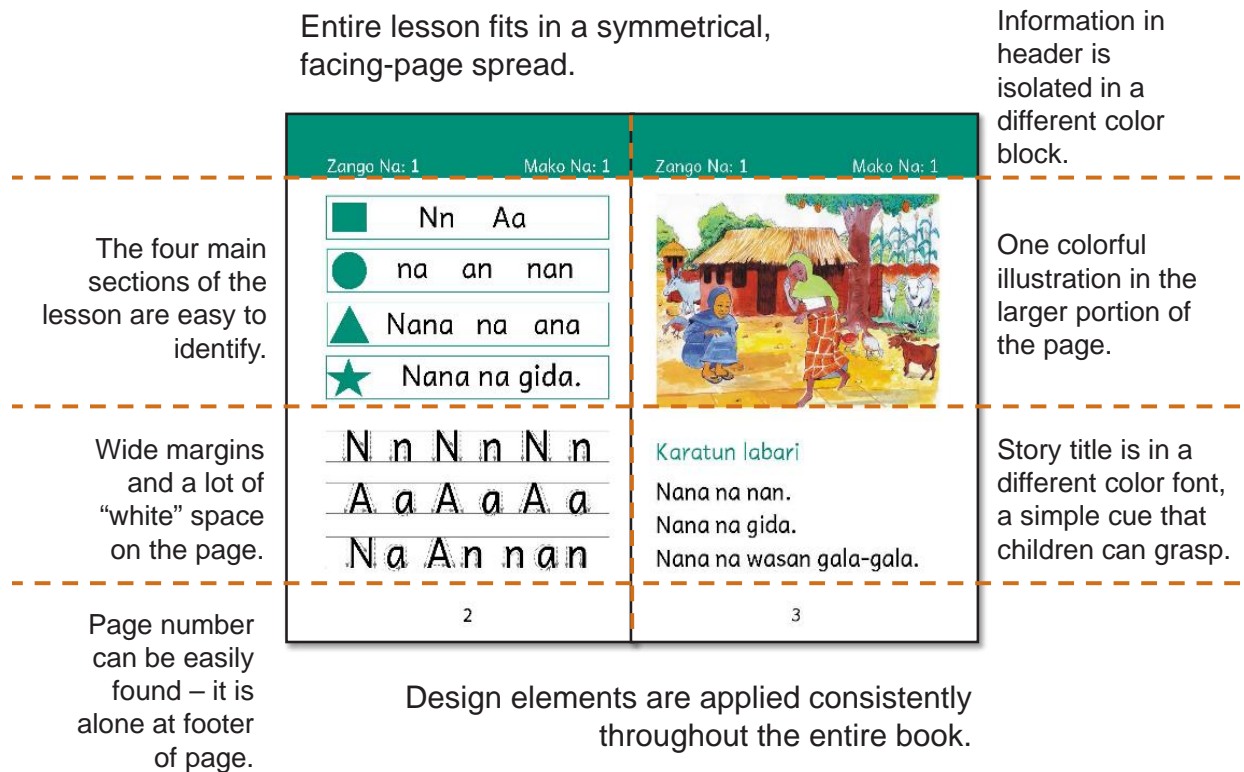
Figure 11 is an example from the pupil reading book that RTI developed under the Nigeria Reading and Access Research Activity (Sankey & Robledo, 2016) that illustrates some key elements of good page design for early reading materials. This example illustrates use of large font to draw attention, a colorful and engaging illustration, and an appropriate amount of text (four lines) on the page.

Functionality

Functionality refers to the physical characteristics of instructional materials, in their final printed and bound form, that help users manipulate them with greater ease. These physical characteristics include trim size (width × height), paper type and weight, and binding. RTI programs design the physical characteristics of materials with the end user in mind.

⁵ Andika was developed by the Summer Institute of Linguistics (SIL; <https://software.sil.org>), an organization affiliated with one of RTI’s lead implementation partners, SIL LEAD. Andika can be downloaded for free and is compatible with most operating systems and professional book design software programs. Because Andika was developed specifically for early literacy development in multiple languages, it offers a wide range of additional characters and symbols. RTI also recommends using early literacy fonts developed by SIL for other scripts, like the Annapurna font for Devanagari script, which is used to write over 170 languages in South Asia.

Figure 11. Example page design of a pupil book developed as part of the Nigeria Reading and Access Research Activity



Source: Sankey & Robledo (2016).

Physical characteristics should also be cost-efficient, as is further explained in the section on cost-efficiency (page 24).

Trim size. RTI usually prefers making student materials smaller than teacher materials. Most programs produce teacher guides in a standard A4 trim size, which is the same size as regular letter-size paper. Student materials are produced in an A5 or B5 size, both of which are about half the size of A4. RTI works on the assumption that a smaller sized book may be easier for small children to carry and manipulate.

Paper type is another factor that can influence how early readers visually process text and illustrations. RTI recommends selecting white paper for the interior pages of materials because white paper creates good contrast against dark ink. However, paper should absorb, rather than reflect, light. Paper that has an additional protective coating, referred to as “coated” paper—such as the paper used in fashion magazines—tends to reflect more light, and that

reflection may make it difficult to see text on the page clearly. Likewise, paper should be opaque enough so that what is printed on one side of the sheet cannot be seen on the other side of the sheet. Among other factors, paper opacity is determined by the paper “weight” in grams per square meter (gsm). In RTI’s experience, the paper that best fulfills the criteria we have just described, including cost-efficiency, is “(bond) white, wood-free, uncoated, 80 gsm.”

Binding, the mechanism used to adhere the interior pages of a book to the cover, can affect the way materials are manipulated. When feasible from a cost perspective, RTI has produced teacher guides with spiral binding, as was the case with the teacher guide for the Nigeria Reading and Access Research Activity. Spiral binding allows teachers to fold the book over completely, making it easier for the teacher to hold the guide in one hand while using the other hand to direct class or write on the blackboard (Figure 12). When books are bound with staples, a mechanism known as saddle stitching, the “stitches” need to be completely closed to prevent users from cutting

Figure 12. With spiral binding, the teacher can hold her teacher guide in one hand



Source: Photo by Alison Pfelpsen.

themselves. In cases in which the interior pages are glued to the cover at the spine, a mechanism known as perfect binding, the glue,⁶ as well as the binding finishes, must be of high quality to ensure durability. A book that begins to fall apart during the school year does not support adequate use or access.

Cohesion and Consistency Within and Across Titles

Programs develop materials for several grades and languages, as well as for different target users (teachers and students), and all the materials make up a larger whole, or set. A lack of consistency between different titles can have an adverse effect on their instructional effectiveness. These are some of the elements of consistency that RTI programs check for during their quality assurance process for materials:

- **Are the contents of the teacher guide and the student textbook perfectly aligned?** A potential error that can occur when assembling materials is that the lesson contents for a given week may not be the same in the teacher guide and the student textbook. If the lack of cohesion between teacher and student materials is not corrected before books go to print, mismatched materials can have a disruptive effect on classroom instruction.

⁶ The most durable book binding glue is polyurethane reactive (PUR) (RTI International, 2014), but not all printers in LMICs have access to PUR technology.

- **Are the elements that are applicable to several lessons used consistently throughout the entire book?** As explained earlier in this paper, daily lessons tend to follow the same pattern throughout the school year. Therefore, each lesson, or weekly unit of lessons, should have the same structure in both the student and teacher materials. The lesson structure should be consistent throughout the school year.
- **Are the elements that need to change from one language or grade level to the next changed in a logical manner?** Developing high-quality instructional materials that are part of a larger set requires planning ahead to ensure that elements that change from one language or grade level to the next do so logically. There have been instances in which the font size used for grade 3 was larger than the font for grade 2, for example. Fortunately, because RTI programs apply a rigorous quality assurance process, these errors were not reflected in the final printed materials.

Copyright

Copyright is a type of intellectual property. Intellectual property is a legal concept that protects the rights of people who invent or create things (stories, illustrations, design templates, songs, machines, software, etc.). Through intellectual property protection, people have the right to earn recognition or financial benefit from what they invent or create. Instructional materials for early grade reading are an example of a literary or artistic creation, as are other types of books and also movies, music recordings, etc.

Copyright protects the right of the individual or organization that created the original work to receive credit for and make profit from for every single copy of their work. For example, the author of a novel will not only receive recognition as the creator of the novel, but will also receive part, or all, of the profit for each copy of the novel that is sold in the market. Copyright prohibits others from reproducing or modifying the original work without the authorization of the copyright owner (Copyright Clearance Center, 2017; World Intellectual Property Organization, 2017; Zimmerman, 2015).

Responsible management of copyright issues is important for several reasons:

- **Copyright is protected and regulated by law.** Each country has its own copyright legislation. Program implementation contracts also usually contain specific guidelines and expectations for copyright management. Copyright management requires following laws, policies, and contracts to the letter to avoid serious consequences.
- **Following international best practices for copyright management is an important contribution to efforts for increasing the availability of early reading materials in LMICs.** There are international best practices for copyright management. These best practices facilitate the wide circulation of copyrighted materials both within and across countries and languages (Copyright Clearance Center, 2017). “Wide circulation” refers to the possibility of distributing materials in a context different from where they were originally produced. (For example, reading materials originally written in Kiswahili in Kenya could be translated into English and distributed in South Africa.) When stakeholders from different countries and language groups approach copyright negotiations based on the same principles and practices, sharing content can become easier and more efficient.

RTI staff involved in the production of instructional materials are trained in the following basic principles of copyright management.

Adhere to the copyright provisions in the implementation contract for the program. This is the contract between the international development donor and the agency that implements the program. The implementation contract provides information about which program stakeholder holds the copyright for materials originally developed under the program. The contract also states the licensing terms, which is the method for granting permissions to third parties interested in reproducing or adapting the materials developed under the program. If guidelines for copyright management are not clear or explicit in the contract, programs should request clarification as early as possible.

Read and understand national copyright laws.⁷

National educational policies may also include provisions for copyrighting educational materials developed through the ministry. Program staff should become familiar with these policies as well. If the conditions in the implementation contract are not aligned with national copyright laws and policies, the program should request expert guidance from the donor agency or intellectual property lawyers.

Do not reprint or adapt materials originally published by another organization without a license.⁸ It is illegal to copy and distribute materials that belong to another individual or organization without their explicit permission (that is, license). Copyright holders are free to set their licensing terms and restrictions, so acquiring a license may require a negotiation and have a cost. There are also open licenses, which are free of cost and have fewer restrictions.

Include information on copyright and licensing terms in every material that the program produces, and update it as necessary. Among the international best practices for copyrighted materials is to clearly indicate the terms under which a material can be reproduced or adapted by other people or organizations. This information should be provided on the copyright page. When copyright ownership and licensing terms are not clearly communicated, sharing early reading materials—whether openly or with restrictions—becomes more difficult.

Keep a written record of all agreements related to copyright and licensing. RTI recommends leaving a “paper trail” to ensure that copyright negotiations are compliant with the program contract and national law. When programs include materials previously published by another organization, programs should keep a file of the licenses they have acquired to use these materials.

A common copyright negotiation that programs may undertake is a “work for commission.” Under

⁷ A database of the copyright legislation for each country is available on the World Intellectual Property Organization (WIPO) website: <http://www.wipo.int/directory/en/>

⁸ An exception to this rule is fair use (Zimmerman, 2015).

many of our programs, many of the people who write the stories and activities, draw the illustrations, or create the page and cover design for materials are not program staff. They are people external to the

Some Licensing Terms

Licensing terms are the conditions under which the copyright holder grants permission to reuse, adapt, and distribute the work to interested third parties.

There are two main approaches to licensing:

- **All Rights Reserved.** Under All Rights Reserved, third parties interested in reusing or adapting and distributing the material must have explicit authorization from the rights holder. The rights holder reviews licensing requests on a case-by-case basis and can deny or grant the license.

All Rights Reserved is most commonly used by persons or organizations that want to retain control over where and how the work is adapted and distributed, and by whom.

Negotiating a license under All Rights Reserved requires successfully contacting the rights holder, having the time to negotiate terms, being able or willing to pay for a fee, and being prepared for the negotiation to be unsuccessful.

- **Open licensing.** Open licenses usually allow interested parties to reuse the work without having to contact the rights holder. Furthermore, open licenses often do not require the payment of a fee.

Open licensing is most commonly used by persons or organizations that are interested in disseminating their work as widely and as quickly as possible. By reducing restrictions and not requiring case-by-case negotiations, content can be reused or adapted and distributed more easily.

The most widely used tool for open licensing is Creative Commons.

There is a global trend toward open licensing for educational materials. Global stakeholders in international education, including the bilateral donors that contract RTI to implement early reading programs, increasingly support open licensing of early reading materials.

Benefits:

- Openly licensed educational materials can support education systems in LMICs to improve literacy outcomes.
- Openly licensed educational content can be easily reused or translated, which serves to quickly increase the supply of early reading materials in underserved languages with a dearth of children's books.
- Because openly licensed educational content can be easily reused or adapted, it can significantly reduce the monetary investment required to develop high-quality early reading materials from scratch (Robledo, 2018).

program who are contracted to perform these jobs. Per copyright law, copyright belongs to the person who creates the text, illustrations, or design for a book (Zimmerman, 2015). Yet, in many countries, copyright can belong to the organization that ordered, or commissioned, the work, rather than to the person who performed the work itself. Works for commission require an agreement in writing between the author and the organization that commissioned the work whereby the author acknowledges that the organization retains copyright.⁹

In some countries, when materials are developed as part of a ministry-led project and involve ministry staff, policies may state that the copyright belongs to the ministry. In these cases, no additional agreements in writing are necessary, but it is important to keep a

The International Standard Book Number (ISBN)



The ISBN is a unique 13-digit number and a corresponding bar code that identifies a book.

To acquire an ISBN, the person or organization that publishes a book needs to register it with the national ISBN agency by providing basic data on its publication. The ISBN agency will issue the ISBN and bar code, sometimes for a fee. A database of national ISBN agencies is available on the ISBN website: <https://www.isbn-international.org/>

The ISBN is not required for printing, selling, or distributing a book and it does not protect a copyright. However, the ISBN is an important support for the circulation of books. The ISBN facilitates cataloging, tracking book circulation, and maintaining up-to-date statistics about the book sector in a country (International ISBN Agency, 2018).

Not all LMICs have an ISBN agency (International ISBN Agency, 2018) and, in some countries, the process of requesting an ISBN may be slow and bureaucratic. Each program should understand the norms, regulations, and processes for acquiring an ISBN in the country where they operate.

⁹ Whenever possible, RTI will give credit to authors, illustrators, and designers. When they are independent contractors, not affiliated with RTI or the ministry, RTI always pays them a competitive fee for their work. The intention of claiming copyright for the program is so that materials can be more easily shared with others in the future. Because early reading materials involve the contribution of many people, and granting copyright licenses to other interested parties would require the permission of all the original contributors, centralizing copyright ownership in a single organization is simpler and more efficient in the long term.

log of the persons involved in materials development workshops and their affiliation as supporting documentation that the contents of the materials were developed by ministry staff.

When in doubt, consult a copyright expert or attorney. At times, copyright issues can become complicated or contentious. In such cases, programs are encouraged to reach out to experts both within and outside of RTI to support complex negotiations.

Finally, it is important to note that RTI does not have a vested interest in owning the copyright for the materials it develops under early grade reading programs. When RTI holds copyright, it is because the program contract requires it.

Cost-Efficiency

Most of the early reading programs RTI has implemented in LMICs have been totally or partially funded by international development donors. However, the long-term goal of many of our programs is to lay the foundations of an early grade reading model that can be sustained and strengthened by the local government, both technically and financially. Therefore, cost-efficiency is a guiding principle of RTI's approach to instructional materials for two main reasons:

1. We owe a contractual and ethical responsibility to international donors to make efficient use of their funding.
2. We owe a responsibility to local ministries to develop book provision models that they can sustain with the resources available to them in the long term.

Strategies for Optimizing the Cost-Efficiency of Developing and Printing Materials

In the early reading programs RTI has implemented, the main costs involved in developing the content of instructional materials, and then assembling the contents to create a print-ready book, are the following:

- labor (writers, editors, illustrators, designers);

- logistics and materials for materials development and production workshops;¹⁰ and
- when applicable, licenses for specialized computer hardware or software that are necessary for professional book design.

Printing is always outsourced to specialized companies. A large part of the printing cost is raw materials, like paper.

There is no single best approach to controlling and reducing the costs of developing and printing materials. On the one hand, labor and printing costs vary widely between one country and the next (DfID, 2011; Fredriksen & Brar, 2015). On the other hand, decisions on cost-efficiency should weigh the tradeoffs in terms of the quality and the instructional effectiveness of materials. RTI programs use two strategies for optimizing the cost of instructional materials: (1) using, or building upon, existing materials and (2) applying the rules of cost-efficiency in printing.

Using, or Building Upon, Existing Materials

Existing reading materials are materials that

- are available in the market and were developed by a publisher or nongovernmental organization;
- were developed by RTI or the program funder but for a different program; or
- were developed by RTI under the same program.

Programs can use or adapt existing materials in their entirety, or they can choose only certain elements, like only the text or the illustrations.

Depending on the types of modifications required, using or adapting existing materials can significantly reduce the time required to prepare materials for print, thereby reducing costs. Using existing materials can also be a way of building upon the contribution of local stakeholders to reading development in a country, which can promote the long-term sustainability of a reading program. Reusing existing

¹⁰ Because RTI often works with host governments to strengthen the skills of local talent to develop instructional content and assemble high-quality reading materials, many of the materials development activities occur in workshop settings.

materials requires special attention to issues of copyright and licensing, which are addressed in greater detail in the previous section of this paper.

Using or adapting existing titles is not always possible. In some cases, existing materials may not match the requirements of the program. In other cases, the scope of work of a program may mandate creating new, original materials. Also, programs should keep in mind that if the modifications to existing materials are extensive or complex, adapting existing materials may not necessarily help the program save time and costs.

Using existing examples requires a review of titles to ensure that they are culturally relevant, appropriate for early readers, and useful for achieving the learning objectives of the program.

Applying the Rules of Cost-Efficiency in Printing

Printing cost is a function of the number of copies per title and the physical specifications of each book. Informed decisions about printing specifications and quantities require familiarity with some of the basics of printing costs.

Printers quote in terms of unit cost, the cost of printing and binding a single copy of a single title. Unit printing costs vary with quantity.

As the quantity of copies per book increases, the unit cost decreases. For example, the unit cost of printing 10,000 copies of a specific book will be lower than the unit cost of printing only 1,000 copies of that same book. **Economies of scale** explain why unit cost decreases as the quantity increases. Basically, the fixed costs of printing get divided among the total number of copies; therefore, if there are more copies of the same book, the total fixed costs are divided into a larger number of units, and the costs become smaller. Economies of scale tend to be less noticeable after 50,000 copies in the case of full-color printing and after 10,000 copies in the case of one-color printing (Fredriksen & Brar, 2015; Read, 2015).

For large printing quantities, the variable with the greatest effect on printing cost is paper (Table 4).

Paper can represent up to 55 percent of the total unit printing cost (RTI International, 2014). The more pages a book has, the more expensive it will be to print. There are no hard-and-fast rules about how to keep page numbers in check, although a factor that can increase page counts is the amount of content covered per lesson, in both the teacher and student materials.

Printers estimate the unit price based on the total amount of paper used for printing. In printing, when paper is wasted or does not make part of the book at the end of the printing process, it is still charged to the client. Paper wastage can be reduced by selecting cost-efficient printing specifications. The two key guidelines for reducing paper wastage are setting up books so that the total page count is divisible by 4 and selecting optimal trim sizes (width × height dimensions).

Books are set up in “signatures,” units of 4 pages. The total number of pages of a book should be evenly divisible by 4 (RTI International, 2014). Some common cost-efficient page counts for early reading materials are 8, 12, 16, 24, 56, 80, and 96 pages, which are all multiples of 4. However, programs should avoid producing books with pages that are completely blank just to reach multiples of 4 because that is a waste of paper as well.

Instructional materials should be designed using trim sizes that optimize the use of paper and reduce paper wastage. RTI recommends using International Standards Organization (ISO) paper sizes (Table 5) to reduce paper wastage because ISO sizes best adjust to the printing presses used in the Eastern Hemisphere (blueTree Group, 2014).

Printing in color is more expensive than printing in black and white (blueTree Group, 2014). Although RTI holds cost-effectiveness as a guiding principle, we

Table 4. Paper cost as a percentage of the total printing cost

Print quantity (copies)	250	500	750	3,000	5,000	10,000
Paper cost percentage	4.0%	7.3%	10.2%	34.0%	40.7%	46.6%

Source: Extracted from USAID's *Best Practices for Developing Supplementary Reading Materials* (blueTree Group, 2014).

Table 5. International Standards Organization standard trim sizes applicable to instructional materials

A-Series Paper Sizes			B-Series Paper Sizes		
Size	Dimensions (mm)	Recommended Use	Size	Dimensions (mm)	Recommended Use
A2	420 × 594 mm	Big books, posters	B2	500 × 707 mm	Posters
A3	297 × 420 mm	Posters	B3	353 × 500 mm	Posters
A4	210 × 297 mm	Teacher guides, read aloud books	B4	250 × 353 mm	Read aloud books
A5	148 × 210 mm	Student textbook, decodable and leveled readers	B5	176 × 250 mm	Student textbook, decodable and leveled readers
A6	105 × 148 mm	Decodable and leveled readers	B6	125 × 176 mm	Decodable and leveled readers
A7	74 × 105 mm	Letter and word cards	B7	88 × 125 mm	Letter and word cards
A8	52 × 74 mm	Letter and word cards	B8	62 × 88 mm	Letter and word cards

do not enforce a strict page limit per book, nor do we require that books always be developed in black and white. Decisions on printing specifications require a balanced consideration of instructional effectiveness and the needs of the context against cost. We do, however, require that programs consider printing costs when making decisions about the instructional content and the physical specifications of materials.

Strategies for Optimizing the Total Annual Cost of Materials Provision

The optimal provision of materials requires analyzing cost-effectiveness from two perspectives: the cost of producing and distributing each individual instructional tool, and the annual cost of providing and replenishing a full set of materials to schools, also known as the **system cost** (Fredriksen & Brar, 2015). This paper focuses more intently on strategies for controlling the cost of developing and printing each instructional tool, as summarized in the previous section. However, increasing cost-efficiency from the system perspective requires considering additional factors, such as the following, several of which were already discussed in the section Guiding Principles:

- **The total number of titles per grade and language.** Many of our programs aim at improving reading instruction in several grades and several languages. Moreover, several of these programs are of national scale, which means they target the majority of children enrolled in early primary grades. Therefore, these programs invest very large sums in materials provision. Depending on the

available funding, controlling costs under these circumstances may demand achieving results with the minimum number of titles per grade and language.

- **The shelf-life of materials.** “Shelf-life” refers to the durability of materials, or how long a book remains in good condition. The frequency and the quantities in which materials are replenished to schools depend on the rate at which books become damaged or lost. If books are not consumable and last more than one year, then possibly more than one cohort of students can use the same materials. Extending the shelf-life of materials is a powerful strategy for reducing the total annual cost of materials provision (Fredriksen & Brar, 2015; RTI International, 2016a). More durable printing specifications can extend the shelf-life of books beyond a single school year (blueTree Group, 2014). Awareness campaigns that encourage parents and children to take good care of books can also help materials last longer in good condition (RTI International, 2016a).
- **The book-to-user ratio.** Although it is crucial to ensure that students have access to the materials they need, not all materials must be provided at the rate of one per child, as explained in the section Optimal Selection and Quantity of Early Reading Materials. Programs can control the total cost of materials provision by carefully considering how many copies per title they really need to adequately support a reading intervention.

Timely Delivery to Schools

The effectiveness of a reading intervention can be seriously compromised if materials are not delivered to users when they need them. In the contexts where we work, where teacher capacity tends to be low, instructional materials become the main support for effective reading instruction. Failure to deliver materials to teacher training events and schools when they are needed can prompt teachers to improvise instructional strategies that are not part of the evidence-based reading program. When the instructional strategies of the reading intervention are not used consistently from day 1 of the school year, the effect of the intervention may not be as strong. Therefore, RTI takes the timely delivery of materials to schools very seriously.

For programs to be most effective,

- teachers should receive their own final, printed and bound copy of the teacher guide, as well as their own copy of the student textbook, on the first day of their annual training, and
- schools should receive one copy per student of the student textbook before the beginning of the school year.

The delivery date of supplemental materials varies by program. In some cases, supplemental materials may be required at the beginning of the school year, and in others, they may not be introduced until the second semester of the school year or not at all.

In RTI's experience, timely delivery of materials to schools can be one of the most challenging aspects of materials provision. Because book distribution is the last milestone in the process, its timeliness depends on whether sufficient time was allocated—and that time was managed adequately—in all the previous stages in the process. Although RTI programs carefully plan activities to ensure that materials reach users on time, RTI programs often have limited control over the time they have for developing and distributing materials. Timelines are often prescribed by program funders.

Regardless of the circumstances, RTI's approach to effective time management is to plan materials production and distribution activities meticulously,

based on a realistic estimate of the duration of each activity (Table 6). RTI's estimates consider factors such as local capacity for book production and the amount of time and effort required to produce quality results. In all cases, RTI always works to make sure that teachers and students receive adequate support for teaching and learning, even if not in the form of finalized materials.

Table 6. RTI's process for developing and providing high-quality early reading materials

Step in the Process ^a	Approximate Duration ^b
Planning contents	4–6 weeks
Developing and testing prototypes	3–6 weeks
Production (full content development and page design)	4 months (16–20 weeks)
Ministry approval	Varies
Printing	Varies (3–12 weeks)
Distribution	Varies (4–6 weeks)
Total approximate duration	52 weeks (1 year)

^a This process estimate does not include the preliminary research that RTI programs conduct before planning the contents for the materials because the research can be performed before program implementation.

^b The duration of each process can vary widely, depending on the number of titles and languages, the complexity of the content of each title, the scale of the program (national, regional, pilot), the degree of control RTI has over development and provision activities, and our capacity to address unforeseen obstacles.

Conclusion

It is currently estimated that 387 million children around the world are failing to learn to read (UNESCO Institute for Statistics, 2017). Many of them have difficult access, or no access at all, to textbooks and reading materials (UNESCO, 2016). If young learners do not have access to reading materials at school and at home, it is less likely that they will develop basic reading skills before the end of early primary. Yet high-quality, age- and level-appropriate reading materials, especially in the languages that children speak at home, are critically scarce in LMICs.

Developing evidence-based, context- and level-appropriate reading materials that reach schools in a timely manner, in quantities that allow children to practice reading skills every day and at a cost that can

be supported in the long term is a difficult challenge for ministries of education, especially in LMICs.

Ensuring access to high-quality reading materials requires interventions all along the chain of activities involved in developing, printing, and distributing content, as well as working hand-in-hand with the diverse range of stakeholders involved in these activities. The task is even more complex in countries with high linguistic diversity and where the capacity to produce high-quality reading materials, especially in local mother tongues, is not yet fully developed.

Over the past decade, RTI has worked with ministries of education across 30 early reading programs in LMICs to increase the availability of high-quality early reading materials. To date, we have distributed more than 25 million books to schools in LMICs. From this experience, RTI has learned that resolving the dearth of early reading materials in LMICs requires not only filling the gaps in content, but implementing activities all along the book chain so that materials successfully reach schools when they are needed. Therefore, while RTI's aim is improving reading instruction through evidence-based instructional content, we have learned—and continue to learn—a lot about what it takes to create print-rich environments for learners in LMICs.

All the early reading programs RTI has implemented have called upon us to assist the ministry in increasing the availability of evidence-based instructional content for early grade reading. However, the scope of work—including the number of languages for which materials need to be developed—and the available time and budget for each program have varied widely. Likewise, not all countries where we have worked have had the same degree of access to the specialized skills, machinery, and technology required for professional book publishing, printing, and distribution. Therefore, applying a single standard approach to developing and supplying early reading materials to schools is not possible. In light of this, we have identified five key principles to guide our work:

1. **Optimal selection and quantity of early reading materials.** Teachers and learners in LMICs deserve access to a wide variety of high-quality

materials for teaching and learning how to read. However, time and budgetary constraints demand prioritizing the types of materials that will best support a systematic, explicit approach to early reading instruction. Early reading materials should be, at minimum, instructionally effective, responsive to the needs and constraints of the context, and provided in quantities that ensure access for all learners.

2. **Quality.** Producing high-quality reading materials requires applying not only current scientific research on how learners acquire reading skills in alpha-syllabic languages, but also the principles of professional book-making. The ease with which learners can visually process the text on the page, and the durability of materials in classrooms, are just as important as the approach to reading instruction for helping children learn to read. Materials for early grade reading should support the gradual, systematic development of the five core reading skills: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Early reading projects should also pay special attention to factors like font type and size and the binding style used for the books.
3. **Responsible management of copyright issues.** Managing copyright responsibly begins by following national copyright laws and the provisions for copyright in the program's implementation contract. Doing so can help in adapting content developed under the program to be reprinted by third parties to reach more children.
4. **Cost-efficiency.** Producing materials cost-efficiently enables the ministry of education to sustain the effort of providing high-quality reading materials to schools. Incorporating materials that already exist in the country can reduce development costs and foster sustainability. Education programmers should select printing specifications that optimize the efficiency of every dollar spent on printing services.
5. **Timely delivery of books to schools.** Education programs should aim to distribute teacher guides on the first day of teacher training and student materials to schools before the beginning of the

school year. When materials fail to reach users when they need them—i.e., by the beginning of the school year—teachers may not follow an evidence-based instructional approach. Consequently, the reading intervention may not be as strong and children will not make the desired progress in their learning.

Timely delivery of books to schools is a serious matter, but we have found that in some cases, funders and ministries may underestimate the time it takes to develop, print, and distribute materials. When materials development efforts are unnecessarily rushed—especially those with an ambitious scope of many grades and languages—the quality and instructional effectiveness of the materials can suffer.

As noted in the Introduction, providing educational materials is, even under optimal conditions, a detail-oriented, labor-intensive process that poses difficult tradeoffs between quality and available time and funding. The larger the scale of a project for supplying teachers and learners with books, the greater the expectations for quality, and the higher the costs of mistakes and delays in production. The more languages involved in a program, the greater the need for a well-designed development and production process to ensure uniformity and consistency across all materials.

Therefore, RTI has learned that when developing, producing, printing, and distributing instructional materials, the process—the logic behind the steps, the time allowed for each step, and the efficient use of time during each step—matters greatly. Because each step of the process leads into and affects the timely completion of the next, meticulous planning and project management are needed to ensure an efficient workflow, which is critical for the timely delivery of materials to their end users. Additionally, the process requires the input and participation of experts from many areas: reading and language experts, content developers, illustrators and designers, and printing and distribution experts. Understanding the role that these areas of expertise play in the process is important for achieving optimal results.

Annotated Bibliography

“What We Have Learned in the Past Decade: RTI’s Approach to Early Grade Literacy Instruction” (Bulat et al., 2017) describes the core elements that RTI has found improve early grade literacy instruction and learner outcomes: the approach to teaching (Teach), the availability of quality, relevant learner materials (Text), the effective use of instructional time (Time), the use of formative assessment to guide instruction (Test), and provision of instruction in the most effective language (Tongue). The paper focuses on the acquisition of literacy in alphabetic and alpha-syllabic languages in the early primary years (most typically, academic levels 1 through 3) and the kinds of exposures, instruction, and support learners need to become fully literate.

USAID’s “Books That Children Can Read: Decodable Books and Book Leveling” (Davidson, 2013) examines ways to create texts to provide a continuum of reading levels for the primary grades. Using these methods, texts are calibrated to start at an easy level and gradually become more difficult so that children can access books they can read from the earliest weeks of first grade onward.

USAID’s “Best Practices for Developing Supplementary and Reading Materials” (blueTree Group, 2014) captures the highlights of existing research concerning best practices in certain areas of supplementary reading materials development for early grade students. It covers issues of font type and size, letter and word spacing, color and its cost implications, trim sizes and binding methods, paper, production methods and scale, and the potential possibilities of a digital platform of supplementary reading materials.

“A Guide for Strengthening Gender Equality and Inclusiveness in Teaching and Learning Materials” (USAID, 2015b). In 2015, RTI developed this USAID-commissioned comprehensive guide on equitable and inclusive content for instructional materials. This guide provides detailed guidance on how to develop and evaluate materials that are free of bias and that promote equality and inclusiveness of all marginalized, disadvantaged, and underrepresented groups. In support of the Agency’s Education

Strategy and Policy on Gender Equality and Female Empowerment, this guide advances global efforts toward greater gender equality and inclusiveness in education by providing guidance on how to develop and evaluate materials that are free of bias and that promote equality and inclusiveness of all marginalized, disadvantaged, and underrepresented groups.

“Effectiveness of Teachers’ Guides in the Global South: Scripting, Learning Outcomes, and Classroom Utilization” (Piper, Sitabkhan, Mejia, & Betts, 2018). This report presents the results of RTI’s study of teachers’ guides across 13 countries and 19 projects.

Using quantitative and qualitative methods, the paper examines how teachers’ guides across the projects differ and notes substantial variation in the design and structure of the documents. The report includes a set of research-based guidelines that material developers can use to develop teachers’ guides that will support effective instructional practices and help improve learning outcomes. The key takeaway from the report is that structured teachers’ guides improve learning outcomes, but that overly scripted teachers’ guides are somewhat less effective than simplified teachers’ guides that give specific guidance to the teacher but are not written word-for-word for each lesson in the guide.

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Appendix. Text-Leveling Guidelines Developed with the Ministry of Education, Science and Technology of Kenya

The columns on this page describe the different text leveling criteria. The specific characteristics of each reading level (Emergent [A, B, C]; Beginner [D, E, F]; Transitional [G, H]; and Intermediate [I, J]) are described in the pages that follow. Note that the characteristics for each level are different for each language (English and Kiswahili).

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
<ul style="list-style-type: none"> General description of the type of books and text to support literacy growth at this level 	<ul style="list-style-type: none"> Reading level 	<ul style="list-style-type: none"> Word familiarity Types of words Syllables per word Decodability Morphology 	<ul style="list-style-type: none"> Repetition of words Repetition of sentences Sentence structure (e.g., compound, appositives) Type-token ratio (TTR)* Use of rhyme, alliteration, onomatopoeia Use of picture cues 	<ul style="list-style-type: none"> Syllables/words per phrase/ sentence Sentences per page Paragraphs Wrapping Number of pages and use of chapters Capitalization and punctuation 	<ul style="list-style-type: none"> Familiarity of content Level of abstractness Number of ideas or episodes Genres (e.g., informational, realistic, animal fantasy, folktales) Dialogue 	<ul style="list-style-type: none"> Content Relationship to text Quantity per page or percentage of page Method (e.g., hand-drawn vs. computer generated), paint style/finish (i.e., watercolour, computer, collage) Type (e.g., abstract, cartoon, realistic) Colour, grayscale, or line illustrations Outlines on illustrations 	<ul style="list-style-type: none"> Page format and size Font size and font style type Text position on page and wrapping Quotation marks (smart vs. dumb quotes) Speech bubbles and callouts Titles, headers, subheadings Page numbers and position Spacing between words, sentences and paragraphs (kerning, tracking) Leading for multiple lines Margins around text and illustrations Page background color Binding

* The type-token ratio (TTR) is an indicator of the lexical diversity, or diversity of words, used in a text. The TTR for a text is obtained by dividing the number of different words by the total number of words.

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Emergent Guidelines							
<p>Emergents They need simple read-alouds to develop oral language and print awareness.</p> <p>They have minimal alphabetic principle knowledge.</p> <p>They pretend to read.</p> <p>Text with single words helps them to match spoken words to print.</p> <p>They are learning to distinguish print from pictures.</p> <p>They are learning distinctive features of letters and letter naming.</p> <p>They are learning left to right directionality.</p>	Emergent	<ul style="list-style-type: none"> Familiar words from oral language Vocabulary supported by illustration 	<ul style="list-style-type: none"> Repetitive grammar Repetitive naming Type-token ratio not applicable 	<ul style="list-style-type: none"> No paragraphs No wrapping 8 pages including preliminary 	<ul style="list-style-type: none"> Everyday familiar concepts (e.g., home) Emerging issues such as life skills (e.g., handwashing), values (e.g., courtesy) One idea or simple topic 	<ul style="list-style-type: none"> Illustration content defines and provides direct support for the text On each page (do not cut across pages) About 80% of the page and centered Complete images Full colour vivid, flat colours Simple, clear, no clutter in the background Photographs: Realistic and simple Cartoons: Simple and close to realistic illustrations (avoid exaggeration) All illustrations outlined No etching of illustrations 	<ul style="list-style-type: none"> Large sans serif font (24-48 point) Fonts: simple shapes; thick strokes for beginning reading; distinct ascenders and descenders; open letters 'a', 'g', etc. (e.g., Sassoon, Primary, Andika, Arial, Infant) Text at the bottom of the page below the illustration No wrapping Normal font leading Distinct spacing between letters (no typographic ligatures) or words (tracking) Consider hard case binding Clear margins around text and illustrations; no borders; no bleeds Page background colour should be clear, white (i.e., no background colour/ image behind text) No speech bubbles Page numbers: bottom, center of page, legible
	A English	<ul style="list-style-type: none"> Concepts (words not shown) should be simple, familiar words of different syllable length that are in oral vocabulary 	<ul style="list-style-type: none"> No rhyme 	<ul style="list-style-type: none"> Wordless No written text 	<ul style="list-style-type: none"> No storyline Naming familiar content (e.g., objects, actions and more) 	<ul style="list-style-type: none"> See Emergent guidelines on Illustrations 	<ul style="list-style-type: none"> See Emergent guidelines on Design
	A Kiswahili	<ul style="list-style-type: none"> Concepts (words not shown) should be simple, familiar words of different syllable length that are in oral vocabulary 	<ul style="list-style-type: none"> No rhyme Rhyme 	<ul style="list-style-type: none"> Wordless No written text 			

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Emergent Guidelines <i>(continued)</i>							
	B English	<ul style="list-style-type: none"> Simple familiar words 1–2 syllables (e.g., jump, sun) that are in oral vocabulary 1–4 letters 	<ul style="list-style-type: none"> Strong pattern of the type of words used (e.g., a series of actions, objects, emotions) 	<ul style="list-style-type: none"> 1 word Introduction of single letters No capitalization 	<ul style="list-style-type: none"> No storyline More topics (e.g., naming, animals, greetings) Single letter to teach letter names or associated sounds 	<ul style="list-style-type: none"> See Emergent guidelines on Illustrations 	<ul style="list-style-type: none"> See Emergent guidelines on Design
	B Kiswahili	<ul style="list-style-type: none"> Simple familiar words that are in oral vocabulary (e.g., keti, kikombe) 1–3 syllables per word 	<ul style="list-style-type: none"> Strong pattern of the type of words used (e.g., a series of actions, objects, emotions) 	<ul style="list-style-type: none"> 1 word Introduction of single letters No capitalization 			
	C English	<ul style="list-style-type: none"> 1-syllable words High frequency words (e.g., the) to make sentences Words with highly predictable letter sounds relationships 	<ul style="list-style-type: none"> Strong pattern with minimal changes between pages High frequency words (e.g., the) repeated between pages 	<ul style="list-style-type: none"> 1- to 2-word phrases (black cat; the dog) Capital introduced if it contributes to meaning (e.g., proper noun) 	<ul style="list-style-type: none"> Common experiences (see Emergent guidelines on Content) 	<ul style="list-style-type: none"> See Emergent guidelines on Illustrations 	<ul style="list-style-type: none"> See Emergent guidelines on Design
	C Kiswahili	<ul style="list-style-type: none"> 1–3 syllables per word (sometimes more than 3 if needed) Emphasis (but not exclusive) on CV and CVCV pattern with reduplications (mama) and easier sounds such as continuants (m, n, s, z) 	<ul style="list-style-type: none"> Strong pattern with minimal changes between pages 	<ul style="list-style-type: none"> 1- to-3 word phrase or sentence Capital introduced if it contributes to meaning (e.g., sentence or proper noun) Full stop introduced for sentences 			
	Read Alouds	<ul style="list-style-type: none"> All elements of Emergent and levels A-C 	<ul style="list-style-type: none"> Playful language to encourage interaction (e.g., rhyme, alliteration) Introduction of onomatopoeia for animal sounds (e.g., ko ko, meee) 	<ul style="list-style-type: none"> Mostly 3 words per page with full stop and capital. Can be up to 6 words per page if it contributes to meaning. 	<ul style="list-style-type: none"> All elements of Emergent & levels A-C Introduction of a simple story with a beginning, middle, end 	<ul style="list-style-type: none"> All elements of Emergent and levels A-C Introduction of a simple story with a beginning, middle, end 	<ul style="list-style-type: none"> Between A4 and A2. Custom sizes within this range also used

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Beginner Guidelines							
<p>Beginners</p> <p>They are developing knowledge of alphabetic principle. They begin to develop word recognition strategies and develop a bank of words and syllables that are recognized automatically. They are learning to decode and find language patterns. They need simple and repetitive structures help to develop accuracy in word reading. They read slowly and aloud. They practice left to right reading with one line of text before learning to manage a return sweep. They need a larger font size and spacing to support their use of finger pointing. They need illustrations to support the text to help with decoding and word identification (for sight words). Stories have single idea. Informational text is focused.</p>	<p>Beginner</p>	<ul style="list-style-type: none"> • Most words are familiar to children • Most words are related to oral language • Most words support decoding instruction • Some sight words 	<ul style="list-style-type: none"> • Introduction of complete sentences • Repetitive grammar • Rhyme, onomatopoeia 	<ul style="list-style-type: none"> • Capital letters for sentences • Punctuation to conclude a sentence 	<ul style="list-style-type: none"> • Mostly familiar content (e.g., school) • Emerging issues (e.g., being an older sibling) • Life skills (e.g., walking to school) • Values (e.g., friendship) 	<ul style="list-style-type: none"> • Text and its meaning supported by illustrations • Should occupy 60-80% of the page • On each page (should not cut across pages) • Full colour with vivid, flat colours • Photographs: Realistic and simple • Cartoons: Simple, close to realistic illustrations (avoid exaggeration) • All illustrations should be outlined • No etching of illustrations 	<ul style="list-style-type: none"> • Mostly 24 point sans serif font but can increase up to 48 point • Sans serif fonts with simple shapes; thick strokes for beginning reading; distinct ascenders and descenders; with open letters 'a', 'g', etc., e.g. Sassoon, Primary, Andika Arial, Infant • Text at the bottom of the page below the illustration • No wrapping • Use normal font leading • Distinct spacing between letters (no typographic ligatures) or words (tracking) • Consider hard case binding • Clear margins around text and illustrations; no borders; no bleeds • Page background colour should be clear, white. (No background colour or image behind text) • No speech bubbles • Page numbers should be legible appear at the bottom, centre of page or on the outside margins

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Beginner Guidelines <i>(continued)</i>							
	D English	<ul style="list-style-type: none"> 1-syllable words, 1–4 letters Many words use predictable short vowels (e.g., mad) and digraphs (e.g., ship) High frequency words for sentences 1–2 interest words with illustration 	<ul style="list-style-type: none"> Repetition of sentence structure that has minimal variation between pages Simple sentences (Sam and Pat.) High frequency words (e.g., and) repeated Type-token ratio 1–0.33 	<ul style="list-style-type: none"> Sentences are 1–4 words 1 sentence per page 8 pages including preliminary Full stop 	<ul style="list-style-type: none"> Introduction of a simple story line with 1 idea per episode Story typically has one character Informational text of familiar topics 	<ul style="list-style-type: none"> See Beginner guidelines on Illustrations 	<ul style="list-style-type: none"> See Beginner guidelines on Design
	D Kiswahili	<ul style="list-style-type: none"> Mostly 1- or 2-syllable words (4–5 syllables for 1 sentence) Digraphs (e.g., ch, sh) and blends (e.g., mw, mb, kw) are minimal No nasal blends (e.g., ng, mb) 1–2 interest words with illustration 	<ul style="list-style-type: none"> Repetition of sentence structure that have minimal variation between pages One idea per sentence Type-token ratio.1–0.4 	<ul style="list-style-type: none"> Sentences mostly 4–5 syllables or 1–3 words 1 sentence per page 8 pages including preliminary Full stop 			
	E English	<ul style="list-style-type: none"> Mostly 1- or 2-syllable words, 3–5 letters Decodables: short vowels; common beginning (e.g., fl, st) and ending blends (e.g., st, mp) High frequency words for sentences 2–3 interest words with illustration 	<ul style="list-style-type: none"> Repeated phrases and sentences minimal variation on page or between pages One idea per sentence Type-token ratio phrases/sentence ≤ 0.2–0.5 Introduction of using a question on one page answered on the next page (e.g., What is it? A hen.) 	<ul style="list-style-type: none"> Sentences are mostly 1–6 words 2 sentences per page 8 pages including preliminary ≤ 12 words per page Full stop, question mark 	<ul style="list-style-type: none"> Clear beginning, middle and end Informational text of familiar topics Simple story line Not more than 3 characters 	<ul style="list-style-type: none"> See Beginner guidelines on Illustrations 	<ul style="list-style-type: none"> See Beginner guidelines on Design
	E Kiswahili	<ul style="list-style-type: none"> 1- to 3-syllable words Digraphs (e.g., ch, sh) and blends (e.g., mw, mb, kw) used more Some nasal blends (e.g., ng, mb) 2–3 interest words with illustration 	<ul style="list-style-type: none"> Repeated phrases & sentences minimal variation on page or between pages One idea per sentence Type-token ratio ≤ 0.2–0.7 Introduction of using a question on one page answered on the next page (e.g. Ni niini? Kuku.) 	<ul style="list-style-type: none"> Sentences mostly 4–7 syllables or 1–5 words 2 sentence per page 8 pages including preliminary ≤ 10 words per page Full stop, question mark 			

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Beginner Guidelines <i>(continued)</i>							
	F English	<ul style="list-style-type: none"> • Mostly 1- or 2-syllable words, 3–5 letters • 2-syllable high use or interest words • Continued emphasis on short vowels and introduction to nasals, silent e for long vowel • High frequency words familiar and repeated 	<ul style="list-style-type: none"> • Increased variation of sentence structure • Multiple ideas can be connected by a conjunction • Some compound sentences • Ratio phrases/sentence ≤0.3–0.6 	<ul style="list-style-type: none"> • Sentences between 1 and 8 words • 2 sentences per page • ≤12 words per page • Wrapping introduced • 16 pages including preliminary pages • Full stop, question mark, comma 	<ul style="list-style-type: none"> • Simple animal fantasy introduced • Characters speak occasionally but no dialogue • More use of informational text (e.g., body parts of the body) 	<ul style="list-style-type: none"> • See Beginner guidelines on Illustrations 	<ul style="list-style-type: none"> • See Beginner guidelines on Design
	F Kiswahili	<ul style="list-style-type: none"> • 1- to 4-syllable words (more syllables to express a full idea) • 2–3 interest words with illustration • More nasal blends 	<ul style="list-style-type: none"> • Increased variation of sentence structure • Multiple ideas can be connected by a conjunction • Some compound sentences • Type-token ratio ≤0.3–0.8 	<ul style="list-style-type: none"> • Sentences mostly 6–10 syllables or 1–5 words • 2 sentences per page • ≤12 words per page • Wrapping introduced • 16 pages including preliminary pages • Full stop, question mark, comma 			
	Read-Alouds	<ul style="list-style-type: none"> • Similar word choices as used in Beginner levels D–F, but they can be of a higher level than the leveled readers 	<ul style="list-style-type: none"> • Use of rhyme and onomatopoeia for animal sounds (e.g., ko ko, meee) • Some repetitive or predictable structure to encourage interaction between the teacher and the learners 	<ul style="list-style-type: none"> • Read-aloud sentences can be longer than leveled readers (8 words+) • 3 sentences per page • ≤16 words per page • Full stop, question mark, comma, exclamation mark, quotations marks, apostrophe 	<ul style="list-style-type: none"> • All elements of Beginner from D–F • Variety of genres • Story can have multiple characters • Dialogue • Multiple episodes 	<ul style="list-style-type: none"> • See Beginner guidelines on Illustrations 	<ul style="list-style-type: none"> • See Beginner guidelines on Design

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Transitional Guidelines							
<p>Transitional They are learning to read more fluently. They begin to read in meaningful phrases with less disruption to flow and use more appropriate voice intonation. They can read longer texts with less reliance on pictures for word identification. They can read more than two lines of text per page and do not need to finger-point to each word. They transition to using more silent reading, the focus shifts from decoding to comprehension, learning to read faster and with expression (prosody). Simple, short chapter books are appropriate.</p>	<p>Transitional Guidelines</p>	<ul style="list-style-type: none"> • A blend of familiar words and new words • Many words solidify decoding skills • Specific morphological units included to focus on word meaning • Information vocabulary may be defined in a glossary 	<ul style="list-style-type: none"> • Even more variation in sentence structure & less repetition 	<ul style="list-style-type: none"> • Length of text will vary to match the purpose • Paragraphs introduced • Full stop, exclamation, question marks, commas 	<ul style="list-style-type: none"> • Length of text will vary to match the purpose • Paragraphs introduced • Full stop, exclamation, question marks, commas 	<ul style="list-style-type: none"> • Support the text but not everything is illustrated • Informational text may have labels, graphics or diagrams • Full colour on every other page • Assume about 50% of the page • More varied modes of artwork • More use of abstract • Cartoon: more exaggeration 	<ul style="list-style-type: none"> • Sans serif, mostly 16–20 point, different sizes used if it adds meaning (e.g., character yelling) • Text at the bottom or top of the page • Wrapping • Spacing between letters, words aligns with the font • Introduce speech bubbles/ callouts if needed

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Transitional Guidelines <i>(continued)</i>							
	G English	<ul style="list-style-type: none"> Mix of familiar & new 1- or 2-syllable words Some multi-syllabic high interest words Emphasis of common long vowels (e.g., wait), less common blends (e.g., bridge), r-controlled (e.g., nurse) Common morphology (e.g., s, es, ly) 	<ul style="list-style-type: none"> May have verb tense changes More compound sentences Informational text uses cause/effect structure Type-token ratio ≤ 0.6 	<ul style="list-style-type: none"> Sentences are mostly 4–8 words Mostly 2–4 sentences per page or 1 simple paragraph 16–24 pages including preliminary pages Quotation marks introduced Apostrophe introduced 	<ul style="list-style-type: none"> Narrative text has more than one episode/idea Introduction of familiar folktales More use of dialogue More use of informational text (e.g., body parts of the body) 	<ul style="list-style-type: none"> See Transitional guidelines on Illustrations 	<ul style="list-style-type: none"> Fonts with simple shape, distinct ascenders and descenders; open letters 'a', 'g', etc. (e.g., Sassoon, Primary, Arial, Infant) Introduction of headers in informational text to separate ideas
	G Kiswahili	<ul style="list-style-type: none"> Mix of 1- to -6-syllable words New interest words supported by illustration Most complex phonics patterns included Common morphological units (e.g., ha) 	<ul style="list-style-type: none"> May have verb tense changes (e.g., Mama anaenda sokoni. / Mama alienda sokoni.) More compound sentences Informational text uses cause/effect structure Type-token ratio $\leq 0.4-0.8$ 	<ul style="list-style-type: none"> Sentences are mostly 3–6 words Mostly 2–4 sentences per page or 1 simple paragraph 16–24 pages including preliminary pages Quotation marks introduced 			

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Transitional Guidelines <i>(continued)</i>							
	H English	<ul style="list-style-type: none"> Mix of 2- to 3-syllable words Some 3-syllable high interest words Emphasis of common long vowels (e.g., wait), less common blends (e.g., bridge), r-controlled (e.g., nurse) Homophones (wait, weight) Further morphological units included (e.g., ed, ing) 	<ul style="list-style-type: none"> Structure begins to more frequently reflect patterns characteristic of written rather than spoken language More compound sentences Type-token ratio ≤ 0.7 	<ul style="list-style-type: none"> Sentences up to 10 words A mix of 1–2 paragraphs per page, mostly 4–8 sentences per page Use of glossary as needed 16–24 pages, mostly 24, including preliminary pages Introduction of chapters of 1–3 pages to designate episodes 	<ul style="list-style-type: none"> Introduction of abstract ideas Introduction of fantasy Informational text including new content that they learn from the book (e.g., musical instruments) 	<ul style="list-style-type: none"> See Transitional guidelines on Illustrations 	<ul style="list-style-type: none"> Fonts with simple shape, distinct ascenders and descenders; open letters 'a', 'g', etc. (e.g., Sassoon, Primary, Arial, Infant) Introduction of some stylized fonts to express meaning (e.g., script to show character receiving a handwritten letter) Chapter titles or numbers introduced
	H Kiswahili	<ul style="list-style-type: none"> Less common morphological units included 	<ul style="list-style-type: none"> Structure begins to more frequently reflect patterns characteristic of written rather than spoken language More compound sentences Type-token ratio $\leq 0.4-0.9$ 	<ul style="list-style-type: none"> Sentences 3–8 words A mix of 1–2 paragraphs per page, mostly 4–8 sentences per page Use of glossary as needed 16–24 pages, mostly 24, including preliminary pages Introduction of chapters of 1–3 pages to designate episodes 			
	Read-Alouds	<ul style="list-style-type: none"> Similar word choices as used in Transitional levels G-H, but they can be of a higher level than the leveled readers 	<ul style="list-style-type: none"> Frequent use of new words 	<ul style="list-style-type: none"> Variation of sentence length to match book purpose A specific number of words per sentences is not monitored 1–3 paragraphs per page Use of chapters for book to read in multiple settings 	<ul style="list-style-type: none"> All elements of Transitional of G and H Story can have multiple characters 	<ul style="list-style-type: none"> See Beginner guidelines on Illustrations 	

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Intermediate Guidelines							
<p>Intermediate</p> <p>They have progressed to reading nearly independently.</p> <p>They read a variety of genres and use reading as a tool for gaining new knowledge.</p> <p>They read for a variety of purposes.</p> <p>They can process subtle ideas in text and they can read more complex stories with multiple episodes, including chapters.</p> <p>Illustrations are not needed to understand the text.</p>	<p>Intermediate Guidelines</p>	<ul style="list-style-type: none"> • Much more use of unfamiliar words that are explained, defined or learned in context • Words can be of any syllable length • More morphological units are learned 	<ul style="list-style-type: none"> • Language reflects patterns more characteristic of written than spoken language • A mix of sentence type for the text structure 	<ul style="list-style-type: none"> • Sentences can be all lengths to match the purpose • All types of punctuation used • Text assumes more of the page 	<ul style="list-style-type: none"> • Narrative content continues to include familiar, relevant topics but it expands to include complex episodes and ideas • Informational text is a means for learning new knowledge and emerging issues (e.g., HIV/AIDS) 	<ul style="list-style-type: none"> • Roughly 10-40% of the book (e.g., chapter might have one on the 1st page) • Assume roughly 25-50% of the page • Informational text has more graphics (e.g., maps, labeled diagrams, graphs) • Complex illustrations may communicate meaning or extend (mood, symbolism), support interpretation, enjoyment • Variety of illustration types (collage, black and white) 	<ul style="list-style-type: none"> • Font is primarily 12 or 14 point font to have space for all ideas • Larger font used to communicate ideas (e.g., someone shouting) • Fonts vary but are typically chosen to support fluent reading
	<p>I English</p>	<ul style="list-style-type: none"> • Words are a mix of familiar and unfamiliar words • Previous phonics patterns are used with emphasis of roots and affixes (prefixes and suffixes) for meaning • New words are used to add precision to the meaning of the text 	<ul style="list-style-type: none"> • New content words might be repeated to help to solidify use • Appositives are introduced • Adjectives and adverbs that are specific for one aspect of the text do not need to be repeated • Type-token ratio is considered to monitor use of new words ≤ 0.8 	<ul style="list-style-type: none"> • Text can assume up to half of the page (about 120 words) • 24-32 pages including preliminary pages depending on the purpose • 3 or more paragraphs per page • Hyphens introduced • Chapters used 	<ul style="list-style-type: none"> • Use of humor • All genres can be used • More unfamiliar informational text • Multiple characters • Multiple ideas and episodes 	<ul style="list-style-type: none"> • See Intermediate guidelines on illustrations 	<ul style="list-style-type: none"> • Introduce serif fonts (e.g. Plantin Infant)
	<p>I Kiswahili</p>	<ul style="list-style-type: none"> • New words are used to add precision to the meaning of the text 	<ul style="list-style-type: none"> • New content words might be repeated to help to solidify use • Adjectives and adverbs that are specific for one aspect of the text do not need to be repeated • Type-token ratio is considered to monitor use of new words ≤ 0.9 	<ul style="list-style-type: none"> • Text can assume up to half of the page (about 90 words) • 24-32 pages including preliminary pages depending on the purpose • 3 or more paragraphs per page • Chapters used 			

Appendix. Text-leveling guidelines developed with the Ministry of Education, Science and Technology of Kenya *(continued)*

Book Types and Purpose	Level	Word Choices	Predictability	Print	Content	Illustrations	Design
Intermediate Guidelines <i>(continued)</i>							
	J English	<ul style="list-style-type: none"> See Intermediate guidelines on Word choices 	<ul style="list-style-type: none"> Type-token ratio is not an issue 	<ul style="list-style-type: none"> Text can assume up to 2/3 of the page (about 200 words) 24–32 pages including preliminary pages depending on the purpose 3 or more paragraphs per page Hyphens introduced Chapters used 	<ul style="list-style-type: none"> More exposure to themes that are appropriate for young adolescents Complex episodes and ideas Informational text for knowledge 	<ul style="list-style-type: none"> See Intermediate guidelines on Illustrations 	<ul style="list-style-type: none"> Introduce normal serif fonts
	J Kiswahili	<ul style="list-style-type: none"> See Intermediate guidelines on Word choices 	<ul style="list-style-type: none"> Type-token ratio is not an issue 	<ul style="list-style-type: none"> Text can assume up to 2/3 of the page, multiple paragraphs (180 words) 24–32 pages including preliminary pages Not all pages are completely full of text Ellipses introduced 			
	Read-Alouds	<ul style="list-style-type: none"> Word choices should be of a higher level than the leveled readers 	<ul style="list-style-type: none"> Type-token ratio is not an issue 	<ul style="list-style-type: none"> Variation of sentence length to match book purpose A specific number of words per sentences is not monitored Multiple paragraphs per page / Text can assume a whole page All punctuation marks are acceptable to match the purpose Use of chapters for book to read in multiple settings 	<ul style="list-style-type: none"> Elements of Intermediate I–J All genres used Content is more sophisticated 		

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RTI Press publication OP-0058-1902