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All Children Reading – Asia (ACR-Asia)

All Children Reading–Cambodia

Student Performance in Early Literacy:

Midterm Impact Report

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Student Performance in Early Literacy: Midterm Report

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Organizations that partnered with All Children Reading–Cambodia and made important contributions to the preparation and implementation of this midterm survey include Real-Time Evaluations, Kampuchean Action for Primary Education, World Education International, Save the Children, and the Open Institute.

Table of Contents

List of Exhibits

Acronyms

EGMA	Early Grade Mathematics Assessment
EGR	early grade reading
EGRA	Early Grade Reading Assessment
GPE-3	Global Partnership for Education—third grant
MoEYS	Ministry of Education, Youth and Sport
NGO	non-governmental organization
USAID	United States Agency for International Development

Executive Summary

This report is a first midterm evaluation of the United States Agency for International Development (USAID) All Children Reading–Cambodia program, which supports the Ministry of Education, Youth and Sport (MoEYS) in the development and piloting of a national early grade reading program. This report presents the evaluation of two USAID-funded intervention groups in Kampong Thom and the Global Partnership for Education—third grant- (GPE-3-) funded intervention group in Siem Reap for pre-school and grade 1 after one year of implementation.

The program pilots were implemented using a phased approach, beginning with the literacy pilot rolled out for grade 1 in 2018–2019 for all intervention groups, with the addition of pre-school in one of the Kampong Thom treatment groups. Grade 1 math and grade 2 literacy will be rolled out in 2019–2020. In addition, the program will also be used in Kampot with USAID funding. Consequently, this report also details baseline outcomes for grade 1 mathematics, grade 2 literacy, and grade 1 literacy in Kampot.

The report addresses the following research questions:

1. What are the impacts of the pilot programs in upper pre-school and grade 1 on basic pre-literacy and early literacy skills?
2. In what ways does this impact differ for boys and girls?
3. Are there differences in the impacts on student learning outcomes in each of the four comparison groups?
4. What are some defining characteristics of the schools included in the study in Kampot?
5. Are there differences in those characteristics compared with the other groups?
6. How do students perform in grade 1 on basic mathematics skills?
7. In what ways do those levels of performance differ for boys and girls?

The baseline assessment was conducted in June 2018 with the follow-up midterm in June 2019. The exhibits in this executive summary respond to research questions 1 and 3, assessing program impact after one year.

The program impact for pre-school grades is shown in **Exhibit ES-1** which compares the pre-school intervention in Kampong Thom with the Battambang control group.

Exhibit ES-1: Pre-school Impact

Subtask	Treatment	Mean Score Baseline 2018	Mean Score Midterm 2019	Impact
Expressive Vocabulary *(mean correct words out of 40)*	Kampong Thom Intervention A	9.3	10.4	-0.3
	Battambang Control	10.8	12.2	
Identifying Letters *(mean correct letters out of 20)*	Kampong Thom Intervention A	5.8	5.2	-0.1
	Battambang Control	5.6	5.1	
Listening Comprehension *(mean correct questions out of 5)*	Kampong Thom Intervention A	3.0	2.5	-0.8**
	Battambang Control	2.8	3.1	

** p<0.01

The ***Impact*** column displays the intervention gain between baseline and midterm averages minus the corresponding average gain from the control group. The exhibit shows that there was no intervention impact for expressive vocabulary and identifying letters subtasks. The control group significantly gained over the intervention group for listening comprehension with a small net gain of an additional 0.8 correct questions out of five.

The program impact for grade 1 is shown in **Exhibit ES-2**. This table compares each of the three grade 1 interventions with the Battambang control group. The program impact is again displayed in the final column. Reading instruction for grade 1 in Cambodia has a strong focus on learning consonants and vowels, which is where some of the biggest reading skills gains were demonstrated at midterm.

Exhibit ES-2: Grade 1 Impact (selected subtasks)

		Mean Scores		Impact
Subtask	**Intervention**	**2018 Baseline**	**2019 Midterm**	**Mean**
Consonant Identification *(mean percent correct out of 33)*	Kampong Thom Intervention A	41.8	57.3	**12.0*** **
	Kampong Thom Intervention B	47.7	55.6	**4.5**
	Siem Reap Intervention C	46.6	50.8	**0.8**
	Battambang Control	47.0	50.4	
	3 Treatment Groups Combined	46.4	53.1	**3.2**
Vowel Identification *(mean percent correct out of 23)*	Kampong Thom Intervention A	35.1	56.3	**18.4*** **
	Kampong Thom Intervention B	36.2	53.6	**14.5*** **
	Siem Reap Intervention C	42.9	57.5	**11.8*** **
	Battambang Control	42.0	44.9	
	3 Treatment Groups Combined	39.8	56.1	**13.4*** **
Familiar Word Reading Fluency *(number correct per minute)*	Kampong Thom Intervention A	1.6	3.3	**1.7*** **
	Kampong Thom Intervention B	1.5	2.4	**0.9***
	Siem Reap Intervention C	2.4	2.5	**0.1**
	Battambang Control	2.3	2.3	
	3 Treatment Groups Combined	2.0	2.5	**0.5**
Text Reading—Oral Reading Fluency *(words correct per minute)*	Kampong Thom Intervention A	0.8	2.3	**1.3****
	Kampong Thom Intervention B	0.9	1.6	**0.6**
	Siem Reap Intervention C	1.1	1.3	**0.1**
	Battambang Control	1.2	1.3	
	3 Treatment Groups Combined	1.0	1.5	**0.4**

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

For each subtask, Kampong Thom Intervention A demonstrated the strongest and most statistically significant gains compared to the Battambang control group. This is particularly evident with vowel identification, where students correctly identified vowels at a rate 18.4 percentage points higher. It is important to note that the interventions were different in design, as will be detailed later in this report. The gains for text reading fluency were modest; for example, reading fluency had a small impact of an additional 1.3 correct words per minute for Kampong Thom Intervention A. This gain should not be surprising in grade 1; we would expect the programs to have a bigger impact on word knowledge and text reading in grade 2, next year. This impact is likely to be amplified by the fact that students were tested more than one month before the end of the school year (this was necessary during the baseline due to the national election in July 2018).

It may also be helpful to the MoEYS to consider the overall scores when results are combined across treatment groups. The combined pilot program impact on vowel recognition for grade 1 students must be highlighted. At the 2018 grade 1 baseline, 50% or more of the students combined across the pilot treatment groups could correctly identify only 4 out of the 23 items. At midterm the number of items that at least 50% of the students could recognize increased to 18 out of 23. Further, grade 1 students participating in the pilot program outperformed the grade 2 students (who had not yet received the intervention)in 15 out of the 23 vowel items. This indicates that the pilot programs are well on their way to giving grade 1 students the letter knowledge foundation needed to build their skills in grade 2 in word knowledge, passage reading, and comprehension.

Girls participating in the pilot program demonstrated stronger reading gains across all reading subtasks, including a more rapid reduction in zero scores.

At the school-level of analysis, many schools were demonstrating reasonable improvements in learning outcomes. However, there were still many struggling to have an impact. It would be good to further investigate the main challenges individual schools that are struggling may face to further improve learning gains.

1. Background

USAID's All Children Reading–Cambodia is designed to support the Cambodian MoEYS in developing and piloting a national early grade reading program. The project has helped the MoEYS update the curriculum and materials for grade 1 instruction in Khmer literacy and helped develop supplemental materials for use in upper pre-school. USAID supports piloting of this work in Kampong Thom and Kampot Provinces. Concurrently, GPE-3 funding is supporting implementation in Siem Reap Province.

The rollout of the interventions evaluated in this report is shown in **Exhibit 1**, below.

Exhibit 1: Pilot Intervention Rollout Plan

Location	School Year 2018–2019	School Year 2019–2020	School Year 2020–2021
Kampong Thom Province (Interventions A & B)	Khmer Pre-school (Intervention A) Khmer Grade 1	Khmer Grade 2	Math Grade 1
Siem Reap Province Intervention C	Khmer Grade 1	Khmer Grade 2 Math Grade 1	Math Grade 2
Kampot Province Intervention D		Khmer Pre-school Khmer Grade 1	Khmer Grade 2 Math Grade 1

This phased rollout approach, starting with program implementation in just grade 1 and pre-school in 2018–2019, facilitates more focused program design and implementation.

Consequently, this midterm report, using data collected at the end of the 2017–2018 and 2018–2019 school years, focuses on the impact of the reading program pilots after one year of implementation for pre-school in Kampong Thom (Intervention A), and grade 1 in Kampong Thom (Interventions A and B) and Siem Reap. The objective of this impact evaluation is to make an early determination of how the interventions are contributing to improved learning outcomes in early grade reading in Cambodia. This early insight into program impact will inform both improvements to implementation and provide evidence for planning the scale-up to additional provinces. The grade 2 intervention for reading will be rolled out in the 2019–2020 school year as part of the Kampong Thom and Siem Reap pilots, so this report will also present the baseline for this grade. MoEYS is also piloting a mathematics program in Siem Reap starting with grade 1 in 2019–2020. This report will provide a baseline for this math pilot, as well. Finally, the USAID All Children Reading–Cambodia project will support introduction of the national early grade reading program in Kampot starting in the 2019–2020 school year. Therefore, this report also provides baseline data for the pre-school and grade 1 Khmer implementation in Kampot.

MoEYS, donor partners, and other stakeholders agreed to pilot different intervention approaches, facilitating a comparison of different program supports and thus generating a better understanding of how to operationalize and optimize support for early grade reading and mathematics programs at a national level. The summary details for the pilot interventions are shown in **Exhibit 2**, below.

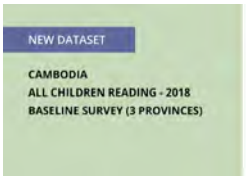
Exhibit 2: Comparison Groups Included in the Evaluation Design for the Pilot Implementation of the National Early Grade Learning Program

Location	Control Battambang	Intervention A Kampong Thom (6 districts)	USAID-Funded Intervention B Kampong Thom (2 districts)	Intervention D Kampot (6 districts)	GPE-3 Funded Intervention C Siem Reap (all districts)
Upper Pre-school	No	Yes	No	Yes	No
Textbooks	Existing books	Existing books	Existing books	Existing books	Existing books
Teacher Activity Guide	No	Provided for reading and math	Provided for reading and math	Provided for reading and math	Provided for reading and math
Supplementary Materials	No	Provided	Provided	Provided	Provided
Training	No	Staggered, Khmer starting in year 1 and math in year 3	Staggered, Khmer starting in year 1 and math in year 3	Staggered, Khmer in year 1 and math in year 2	Staggered, Khmer in year 1 and math in year 2
Coaching/ Mentoring	No	Twice per month from NGO coaches	Six visits per year from senior mentor	Twice per month from NGO coaches	Six visits per year from senior mentor

In Siem Reap, the approach is to support teachers with school-based senior mentors who will interact with teachers roughly six times during the school year. In Kampong Thom, All Children Reading–Cambodia and MoEYS implement that same model of support in two districts (Intervention B) and a model of more intensive teacher support and coaching in the other six districts (Intervention A).

The USAID-supported Kampong Thom Intervention A also includes support to upper pre-school. This includes supplementary materials and training for pre-school teachers to support improvements in pre-literacy skill development. To capture the effect of this effort, this midterm report also looks at performance of upper pre-school students in the six districts included in Kampong Thom Intervention A to then compare their performance to that of upper pre-school students in the control province of Battambang. The Kampot Province pilot, which will be implemented a year later, mirrors the program design of Kampong Thom Intervention A and will be informed by the results of this evaluation.

The baseline evaluation is available on the EGR Barometer.



The midterm survey of student performance was designed to enable comparison across the groups shown in **Exhibit 2** after one year of implementation of the national early learning program and then again at future points—as explained in this section. Following discussion of the survey design and methodology, Section 2 presents the study design and instruments that were used to collect information on student performance and on each school's context, and Section 3 presents the study findings. Section 4 presents the authors' conclusions.

This report is the companion document to the baseline study which can be downloaded from the Early Grade Reading (EGR) Barometer, under “About the Data.”[1]

2. Design of the Study

2.1 Research Questions

All Children Reading – Cambodia and MoEYS designed this study to answer a simple set of questions.

1. What are the impacts of the pilot programs in upper pre-school and grade 1 on basic pre-literacy and early literacy skills?
2. In what ways does this impact differ for boys and girls?
3. Are there differences in the impacts on student learning outcomes in each of the four comparison groups?
4. What are some defining characteristics of the schools included in the study in Kampot?
5. Are there differences in those characteristics compared with the other groups?
6. How do students perform in grade 1 on basic mathematics skills?
7. In what ways do those levels of performance differ for boys and girls?

2.2 Measuring Impact

The impact evaluation was designed to answer the above research questions for the pilot study. This design included a comparison group based in Battambang. The comparison group provides a comparison for “business as usual”—how the reading and mathematics learning outcomes in the early grades are progressing without a pilot intervention. By accounting for this comparison group, this report details the added value of the pilot interventions above typical early grade reading and mathematics instruction in Cambodia’s public schools. The control area was carefully selected to be comparable to the areas of intervention. Similarity was further ensured by selecting a control group with similar socio-economic and urban/rural makeup as the intervention area and by balancing learning outcomes post-baseline.

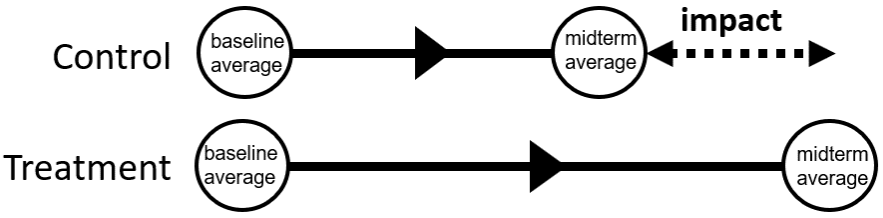
The impact evaluation measures all intervention groups at two (or more) timepoints, returning to the same schools and grades and sampling new students each time. This cross-sectional design measures the impact of improved teaching on student learning outcomes while maintaining the comparability between intervention areas.

Sampling weights were applied to all analysis; this combined with the proportional sampling approach ensured that estimates of learning outcomes were representative of the intended areas of intervention.

[1] The EGR Barometer is available at https://dev.earlygradereadingbarometer.org/cambodia/countries/technical_information .

A typical difference-in-differences analysis was applied to measure impact. This is a calculation of the difference between midterm average and baseline average for the control and pilot treatment groups, as shown in **Exhibit 3**, below.

Exhibit 3: Impact Calculation



If control and treatment averages were not balanced, a control model difference-in-differences would be calculated; however, that was not necessary for the impact evaluation presented in this report.

Impact was assessed in two formats, first, as a difference-in-differences in the unit of assessment, such as percent correct responses or correct words per minute. Second, the impact will be shown as a standardized average, specifically a Cohen's *d* effect size. Cohen's *d* is calculated by dividing the difference-in-differences by the pooled standard deviation. An effect size of 0.2 is considered a small effect, 0.5 a medium effect, and 0.8 a large effect.[2] This effect size ranking creates a useful comparable measure by standardizing the unit of impact, so with careful consideration of context, impacts can be compared across program pilots and other studies.

2.3 Sampling

To answer the research questions, All Children Reading–Cambodia collected data from schools in each of the four comparison groups. The school sample was drawn to detect an effect size of 0.2 standard deviation difference between performance in the intervention groups and performance in the control group. When sampling school clusters, variability across and within schools is an important consideration of estimating an optimal and efficient sample size. It was found that at baseline, the intra-cluster correlation (which compared the variance within and between school clusters) to be 0.07, lower than the 0.2 used to estimate sample sizes. This means that for this impact evaluation, the sample size was sufficient. The sampling was conducted using probability proportional to school size, resulting in a sample with demographic characteristics very similar to the population it was intended to represent. The number of schools and students sampled at midterm is shown in **Exhibit 4**, below. The same schools were also sampled at baseline with the exception of Kampot, for which these data are an initial baseline.

[2] Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, N.J.: L. Erlbaum Associates.

Exhibit 4: Number of Schools Sampled—End of School Year 2018–2019

Treatment	Sampled Number of Schools			Sampled Number of Students						
	with Pre-school	without Pre-school	Total	Pre-school		Grade 1		Grade 2		Total
				Boys	Girls	Boys	Girls	Boys	Girls	
Kampong Thom Intervention A	21	43	**64**	82	87	255	256	246	259	**1185**
Kampong Thom Intervention B		80	**80**			317	310	321	303	**1251**
Siem Reap Intervention C		58	**58**			231	234	227	233	**925**
Kampot Intervention D	28	42	**70**	111	112	278	280			**781**
Battambang Control	27	40	**67**	105	106	266	265	262	263	**1267**
Total	**76**	**263**	**339**	**298**	**305**	**1347**	**1345**	**1056**	**1058**	**5409**

A total of 339 schools were sampled. Of these schools, 76 had pre-schools attached. Schools with and without pre-schools were sampled proportionately to the number of schools in the population area. Changes were made to the sampled school lists if a selected school was unavailable for data collection. To maintain sample size, a matched replacement school was selected; in other words, a school nearby the unavailable school with similar characteristics such as school size was used to replace the unavailable school. This approach maintained the representativeness of the sample.

When field data collection teams visited schools, attention was paid to make sure roughly the same number of students were sampled by gender to enable a large enough sample size to detect differences in boys' and girls' performance. Approximately 8 students were sampled per grade, per school. The total number of students sampled at midterm was 603 in pre-school, 2,692 in grade 1, and 2,114 in grade 2, for a total of 5,409 students.

2.4 Instruments

2.4.1 Survey Instruments

The midterm study employed the same instruments used in the baseline for pre-school and grade 1 students. These instruments were:

- Pre-literacy skills assessment for pre-school students
- Early Grade Reading Assessment (EGRA) for grade 1 and 2 students
- School resources survey

For grade 2, a dictation writing subtask was added to the EGRA. All Children Reading-Cambodia also developed and piloted an Early Grade Mathematics Assessment (EGMA) for grade 1.

These instruments are discussed below and are included in **Annex 1** of this report.

2.4.2 Pre-literacy Assessment for Upper Pre-school Students

The project developed the pre-literacy instrument to assess learning outcomes for upper pre-school students. Prior to the baseline assessment, three tasks were taken from an assessment already adapted for Cambodia and for the upper pre-school age

group and translated into Khmer (the IDELA[3] instrument), then piloted. The three subtasks in the instrument assessed the pre-literacy skills below.

Expressive vocabulary—students were asked to name food items and animals (up to 20 of each).

Letter name identification—students were asked to name 20 Khmer letters, consonants only.

Listening comprehension—students listened to a short, simple story and were verbally asked to respond to five comprehension questions about the story. The questions required both explicit and inferential comprehension.

2.4.3 Early Grade Reading Assessment for Grade 1 and 2 Students

EGRA is an oral assessment of pre-reading and reading skills that serve as a foundation for student academic success. The Khmer EGRA instrument used for this assessment was adapted and piloted in collaboration with MoEYS and several non-governmental organizations (NGOs). There is a fundamental difference between the Khmer EGRA and EGRAs in other languages, namely that the students are assessed on letters in additional separate vowel and consonant subtasks. These subtasks were added at the request of MoEYS as these literacy skills are an essential component of literacy teaching and learning in grade 1, and students are expected to have mastered these letter components by the end of the grade.

In the Khmer EGRA, students were given a stimulus sheet that had the letters for each individual letters subtask arranged randomly in a grid, along with a grid of familiar words and a text passage for oral reading. The following EGRA subtasks were used as a diagnostic of student pre-literacy and literacy skills.

Consonant Identification Stimulus

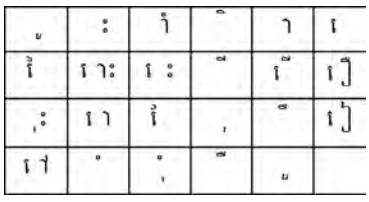
ប	ស	ក	រ	ង	ម	ន	ត	ច	ល	ព
ទ	យ	ជ	ខ	ញ	ដ	អ	គ	ណ	វ	ធ
ភ	ហ	ថ	ធ	ឆ	ឃ	ឡ	ឈ	ប	ឧ	ឈ

Consonant letter identification—students were asked to correctly identify 33 consonant letters. If students did not know the answer, the enumerator moved to the next letter, but students would have the chance to read all letters.

Vowel letter identification—students were asked to correctly identify 23 vowel letters. Again, students had the opportunity to read all vowels.

Letter identification (advanced)—students were given a 10 by 10 grid of letters and asked to identify as many letters as possible in 60 seconds. Their score was then converted into a correct letters per minute rate.

Vowel Identification Stimulus

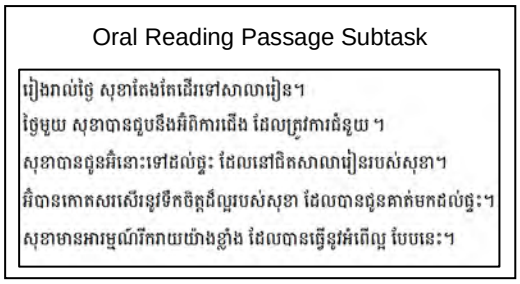


Familiar words—students were given a 5 by 10 grid of words and asked to read as many as they could in 60 seconds. Their score was then converted into a correct words per minute rate. The words chosen for this subtask were frequently used in the grade 1–3 textbooks.

Oral reading fluency—students were given a simple reading passage (61 words) and given up to three minutes to read. Their score was converted to a correct words per minute rate.

[3] Pisani, L., Borisova, I., & Dowd, A.J. (2017). *International development and early learning assessment: Technical working paper*. Washington DC: Save the Children. Available at https://resourcecentre.savethechildren.net/library/international-development-and-early-learning-assessment-technical-paper

Reading comprehension—students were given up to three minutes to completely read a simple reading passage and then asked five reading comprehension questions to assess their ability to understand the meaning of the text they had just read.


Oral Reading Passage Subtask

រៀងរាល់ថ្ងៃ សុខាតែងតែដើរទៅសាលារៀន។
ថ្ងៃមួយ សុខាបានជួបនឹងអំពិកការដើង ដែលត្រូវការជំនួយ ។
សុខាបានជូនអំនោះទៅដល់ផ្ទះ ដែលនៅជិតសាលារៀនរបស់សុខា។
អំបានកោតសរសើរនូវទឹកចិត្តដ៏ល្អរបស់សុខា ដែលបានជូនគាត់មកដល់ផ្ទះ។
សុខាមានអារម្មណ៍រីករាយយ៉ាងខ្លាំង ដែលបានធ្វើនូវអំពើល្អ បែបនេះ។

Dictation—students were read two short sentences and asked to write them on paper. This writing subtask was used for grade 2 students only. Partial credit (half a point) scoring was also possible for each item.

For letter identification, familiar words, and oral reading fluency, if a child could not identify or read the first few designated items, the subtask was discontinued.

2.4.4 Early Grade Mathematics Assessment for Grade 1 Students

EGMA was designed to provide information about basic mathematics competencies that students should be mastering in the early grades. The subtasks used in an EGMA cover early numeracy skills students need in order to progress academically. The numeracy skills and abilities demonstrated form part of the foundation for students to be able to solve more advanced problems and facilitate the acquisition of more advanced mathematics skills.

The criteria of the subtask selection for the EGMA include, but are not limited to

- skills that are predictive of future academic success and proficiency in mathematics,
- skills that can be improved through classroom instruction, and
- skills that meet international standards of numeracy competency in the early grades.

EGMA is administered orally with individual students so that each child's ability to complete a subtask is not dependent on his or her ability to read. In this way mathematics skills are assessed independent of reading ability.

The subtasks for EGMA are described below. The instrument is displayed in Annex 1.

Number identification—students identify up to 20 one- and two-digit numbers in one minute. The score is converted to a correct problems per minute rate.

Number discrimination—students identify the larger of 10 pairs of one- or two-digit numbers. The score is presented as percent correct.

Addition level 1—students solve 20 items of addition of one- and two-digit numbers. The score is converted to a correct items per minute rate.

Subtraction level 1—students solve 20 items of subtraction of one- and two-digit numbers. The score is converted to a correct items per minute rate.

These subtasks were developed in collaboration with MoEYS and other stakeholders and were judged appropriate assessments for grade 1. All Children Reading–Cambodia has made recommendations on which subtasks should be included when the MoEYS conducts the grade 2 baseline.

2.4.5 School Survey

The final instrument developed for the evaluation was a school-level survey. To differentiate between the conditions in schools, the survey gathered objective information on factors such as school size, presence of a library, basic infrastructure

(e.g., toilets, electricity, water source), etc. This approach is similar to that used in large cross-national assessments such as the Trends in International Mathematics and Science Study, which differentiate student "advantages" at the school level of analysis. This approach reduced the assessment time for the children. Additionally, these data collected were used to assess and balance the treatment groups with the control group at baseline and differentiate learning gains by school demographic groupings. This survey is included in Annex 1.

2.4.6 Instrument Reliability and Validity

Internal consistency is an appropriate and standard classical evaluation approach for cross-sectional data. Cronbach's alpha was 0.84 for the reading subtasks and 0.89 for the mathematics subtasks. Cronbach's alpha should be at least 0.70 for adequacy, and coefficients closer to 1 indicate a good assessment.[4] Technical details about instrument reliability and validity testing are presented in **Annex 2** of this report.

3. Main Results

The results presented in this section vary according to the intervention rollout plans detailed in **Exhibit 1**. Consequently, the focus of this section of the report is to

- evaluate the impact of the Khmer reading pilot for Kampong Thom Intervention A after one year of the pre-school program;
- evaluate the impact of the Khmer reading pilots in Kampong Thom Interventions A and B and Siem Reap Intervention C after one year of the grade 1 program; and
- present baseline findings for
  - Khmer Reading pre-school for Kampot Intervention D,
  - Khmer Reading grade 1 for Kampot Intervention D,
  - Khmer Reading grade 2 for Kampong Thom Interventions A and B and Siem Reap Intervention C, and
  - Mathematics grade 1 for Siem Reap Intervention C.

The next USAID All Children Reading–Cambodia evaluation report in 2020 will report impact for all the baseline findings presented in this report alongside a second year impact evaluation of the programs being evaluated after one year in this report.

This report will present findings in the order presented in the bullets above.

3.1 Impact Evaluation

Presented in this sub-section are the impact evaluation findings after one year of implementation of reading programs in Kampong Thom Interventions A and B in pre-school and grade 1, and in Siem Reap Intervention C in grade 1. As mentioned earlier in this report, it is important that we contextualize the outcomes in terms of support provided to the different interventions.

[4] Aron, A., Coups, E.J., Aron, E.N. (2010). *Statistics for the Behavioral and Social Sciences: A Brief Course*, 5 edition. ed. Boston: Pearson.

3.1.1 *Pre-school Intervention A in Kampong Thom*

Students on average were not showing any significant gains after one year of program support for pre-school. The impact of one year of pre-school intervention for Kampong Thom Intervention A is shown in **Exhibit 5**, below.

Exhibit 5: Program Impact on Learning Outcomes, Pre-school

		Mean Scores		Program Impact	
Subtask	**Treatment**	**Baseline 2018**	**Midterm 2019**	**Average**	**Effect Size**
Expressive Vocabulary *(mean correct out of 40)*	Kampong Thom Intervention A	9.3	10.4	**-0.3**	**0.05**
	Battambang Control	10.8	12.2		
Identifying Letters *(mean correct out of out of 20)*	Kampong Thom Intervention A	5.8	5.2	**-0.1**	**0.03**
	Battambang Control	5.6	5.1		
Listening Comprehension *(mean correct out of 5)*	Kampong Thom Intervention A	3.0	2.5	**-0.8****	**0.59**
	Battambang Control	2.8	3.1		

** $p<0.01$

The data in Exhibit 5 show that there was no intervention impact for the expressive vocabulary and identifying letters subtasks, with statistically insignificant differences between the mean scores for both. Since letter knowledge was a focus of the intervention, this result deserves further investigation by the project team to understand how teachers have been teaching letters. Furthermore, average listening comprehension in the treatment schools declined slightly, while it increased a minor amount in control schools. This is also a finding that bears further exploration, The project staff will need to work with the MoEYS to reflect on and consider how the preschool intervention can be strengthened.

3.1.2 *Grade 1, Interventions A, B, and C*

The EGRA used a total of six reading skills subtasks to assess learning impact for grade 1. This report separates them, as shown in **Exhibits 9** and **10**, using assessment of letters or word reading as the identifying feature.

Letter Knowledge

The learning impact on letter knowledge for the grade 1 pilot programs is shown in **Exhibit 9**, below. Three subtasks are featured; the first two assess vowels and consonants separately, the third combines vowels and consonants and is a timed assessment.

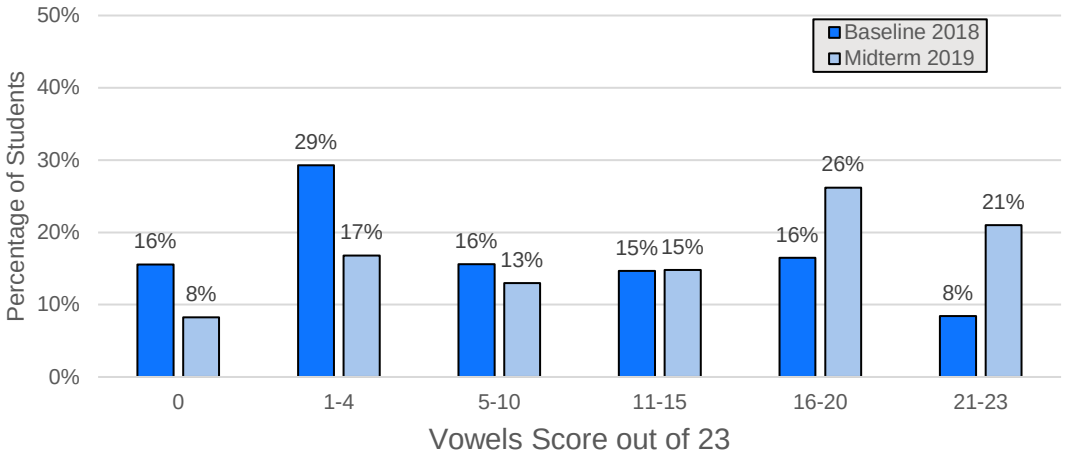
Exhibit 9: Program Impact on Letter Knowledge, Grade 1

		Percent Scoring Zero			Mean Score			
Subtask	**Treatment**	**Baseline 2018**	**Midterm 2019**	**Impact Versus Control**	**Baseline 2018**	**Midterm 2019**	**Impact Versus Control**	**Effect Size Versus Control**
Vowels *(percent correct)*	Kampong Thom Intervention A	18.2%	8.0%	**-12.3%*** **	35.1%	56.3%	**18.4%*** **	**0.56**
	Kampong Thom Intervention B	14.9%	8.3%	**-8.7%** **	36.2%	53.6%	**14.5%*** **	**0.45**
	Siem Reap Intervention C	13.7%	8.6%	**-7.1%***	42.9%	57.5%	**11.8%*** **	**0.35**
	Battambang Control	10.5%	12.6%		42.0%	44.9%		
Consonants *(percent correct)*	Kampong Thom Intervention A	9.5%	3.8%	**-3.4%**	41.8%	57.3%	**12.0%*** **	**0.37**
	Kampong Thom Intervention B	7.8%	4.8%	**-0.8%**	47.7%	55.6%	**4.5%**	**0.14**
	Siem Reap Intervention C	7.7%	6.0%	**0.6%**	46.6%	50.8%	**0.8%**	**0.02**
	Battambang Control	7.6%	5.3%		47.0%	50.4%		
Correct Letters per Minute	Kampong Thom Intervention A	15.1%	10.2%	**-2.3%**	8.6	12.6	**3.2****	**0.33**
	Kampong Thom Intervention B	17.3%	12.5%	**-2.2%**	9.1	11.2	**1.3**	**0.14**
	Siem Reap Intervention C	19.4%	11.2%	**-5.6%**	9.5	10.6	**0.4**	**0.04**
	Battambang Control	12.6%	10.0%		9.8	10.6		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

The pilot program impact on students' letter knowledge was particularly significant on vowel knowledge. Kampong Thom Intervention A improved the average percent of vowels correctly identified by over 18 percentage points in a single year. This corresponds with a medium effect size of 0.56. Impact on consonant knowledge was also good; only the impact of Kampong Thom A was statistically significant ($p<0.001$). The correct letters per minute had more moderate impact, with a statistically significant increase of 3.2 additional correct letters per minute only in Kampong Thom Intervention A. The difference between this subtask and the vowels and consonants subtasks is accounted for by some combination of increased difficultly and that 60 seconds was given students in the third subtask to recognize as many letters as possible, compared with untimed vowels and consonants subtasks. The distribution of scores for vowels, combining the three intervention groups, is shown in **Exhibit 10**, below.

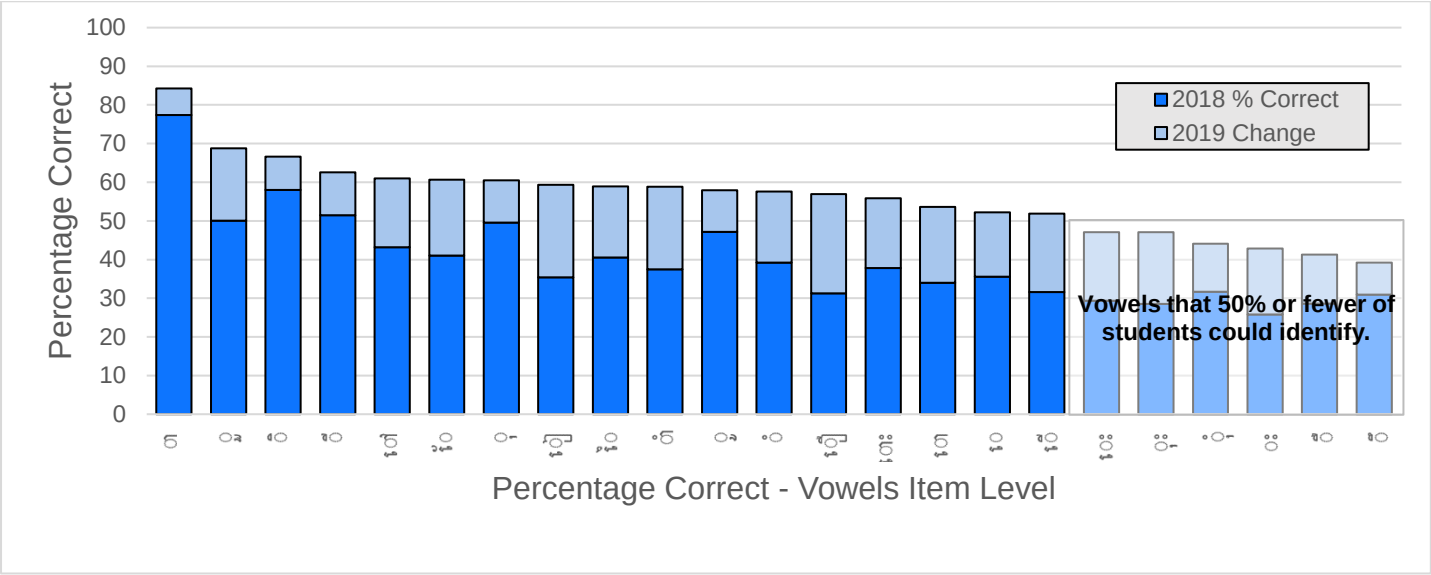
Exhibit 10: Distribution of Vowel Scores (out of 23)—Three Interventions Combined, Baseline and Midterm Grade 1



As shown in Exhibit 10, 47% of the students were able to identify at least 16 out of 23 vowels, compared with 24% at baseline. It is encouraging that more students were able to demonstrate competency with letter recognition at midterm, as this literacy skill provides a good foundation on which to build more advanced reading skills.

At baseline, there were only four vowels that more than 50% of students could identify. The progress against this benchmark is shown in **Exhibit 11;** at least 50% of the students could recognize 18 of the 23 vowels at midterm.

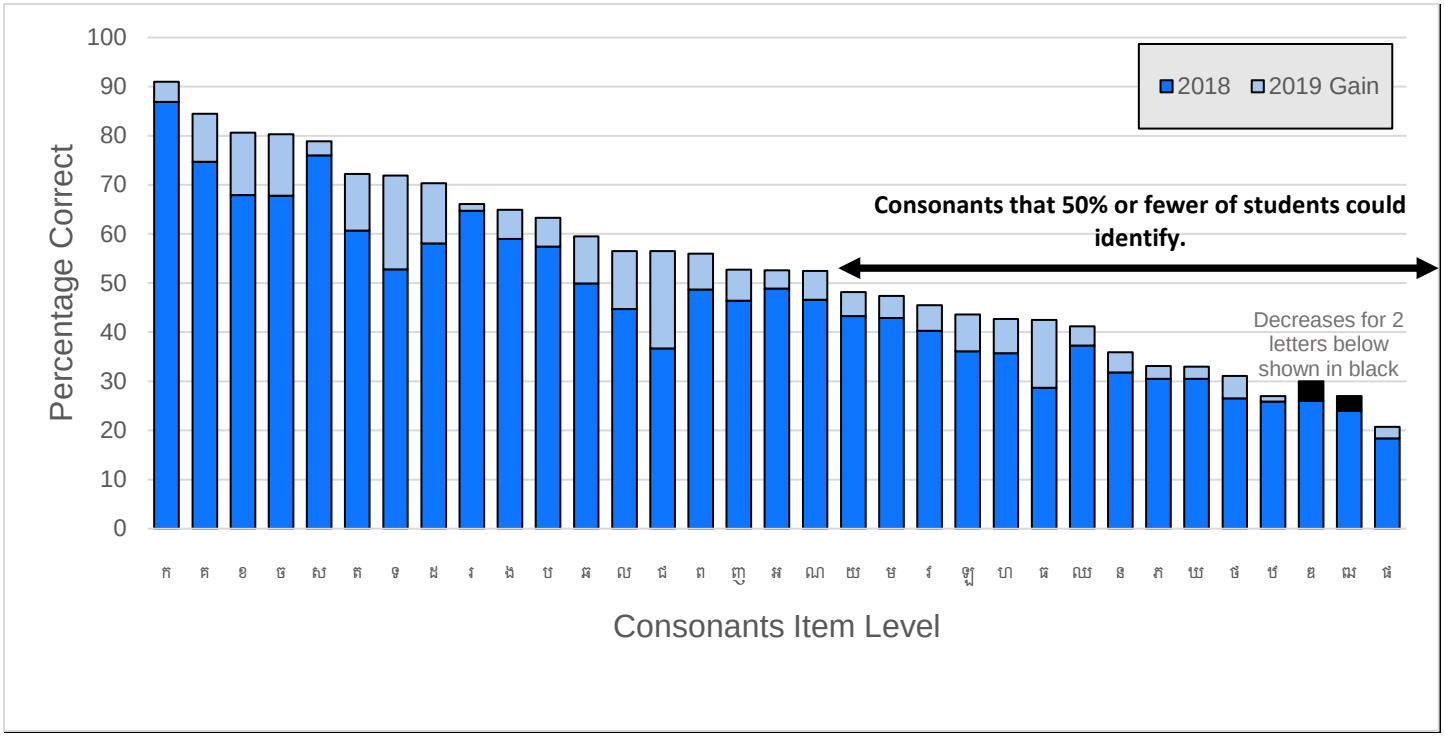
Exhibit 11: Percent Correct of Vowel Items—Three Interventions Combined, Baseline and Midterm Grade 1



The improvement in vowel recognition was quite uniform; the overall improvement in the percent correct score for vowels is explained by an overall improvement in all the items, rather than just a few items showing the biggest gains.

At baseline, 12 of the 33 consonants were correctly identified by at least 50% of grade 1 students. **Exhibit 12** demonstrates the student progress on this literacy skill after one year of the literacy programs. Fifty percent or more of students could recognize at least 18 items. As it is with vowel identification, this improvement is helping to lay the groundwork for students to be able to move on to higher level literacy skills.

Exhibit 12: Percent Correct of Consonant Items—Three Interventions Combined, Baseline and Midterm Grade 1



The black bars in **Exhibit 12** indicate that at midterm fewer students were able to identity two uncommon consonants than during the baseline testing, but these differences are small, not statistically significant, and do not likely warrant cause for concern.

Recognizing Words and Reading Comprehension

Recognition of familiar words and the ability to read and comprehend a passage of text are more advanced reading skills. The impact of the interventions on these skills among the grade 1 students are shown in **Exhibit 13**.

Exhibit 13: Program Impact on Recognizing Words and Reading and Comprehending a Text Passage, Grade 1

		Percent Scoring Zero			Mean Score			
Subtask	**Treatment**	**Baseline 2018**	**Midterm 2019**	**Impact Versus Control**	**Baseline 2018**	**Midterm 2019**	**Impact Versus Control**	**Effect Size Versus Control**
Correct Familiar Words per Minute	Kampong Thom A	75.1%	63.4%	**-11.4%****	1.6	3.3	**1.7*****	**0.32**
	Kampong Thom B	77.5%	72.2%	**-5.0%**	1.5	2.4	**0.9***	**0.18**
	Siem Reap C	68.1%	62.4%	**-5.4%**	2.4	2.5	**0.1**	**0.01**
	Battambang Control	67.2%	66.9%		2.3	2.3		
Oral Reading Fluency *(correct words per minute)*	Kampong Thom A	87.7%	77.2%	**-11.7%*****	0.8	2.3	**1.3****	**0.29**
	Kampong Thom B	87.3%	83.9%	**-4.6%**	0.9	1.6	**0.6**	**0.12**
	Siem Reap C	86.4%	81.3%	**-6.3%**	1.1	1.3	**0.1**	**0.02**
	Battambang Control	83.2%	84.4%		1.2	1.3		
Reading Comprehen-sion *(score out of 5)*	Kampong Thom A	91.7%	80.7%	**-9.2%*****	0.1	0.4	**0.2*****	**0.35**
	Kampong Thom B	91.7%	86.4%	**-3.6%**	0.1	0.3	**0.1***	**0.17**
	Siem Reap C	91.4%	86.0%	**-3.6%**	0.1	0.3	**0.1**	**0.12**
	Battambang Control	88.4%	86.7%		0.2	0.2		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

The program impact on familiar words and passage reading and comprehension is far more modest than that seen for letter knowledge. The biggest impact is Kampong Thom Intervention A, which saw an increase from 1.7 to 3.3 correct words per minute, with an effect size of 0.32. Kampong Thom Intervention A had the most statically significant impacts, with reductions in zero scores for all three subtasks highly significant ($p<0.0001$). That the impacts on average word and text reading are modest is no real surprise considering the focus in grade 1 teaching of literacy in Cambodia was on letter knowledge. The reduction in zero scores does indicate that the intervention is beginning to help students who would otherwise be at the bottom of the distribution. In addition, considering the high level of baseline zero scores, there is no reason to expect high percentages of students in grade 1 to be reading text with comprehension. Next year as impact of grade 2 is reported, one would hope for a different story as grade 2 builds on the pilot progress demonstrated in grade 1.

The change in distribution between baseline and midterm for oral passage reading is shown in **Exhibit 14**, below.

Exhibit 14: Distribution of Passage Reading Fluency—Kampong Thom Intervention A, Baseline and Midterm Grade 1

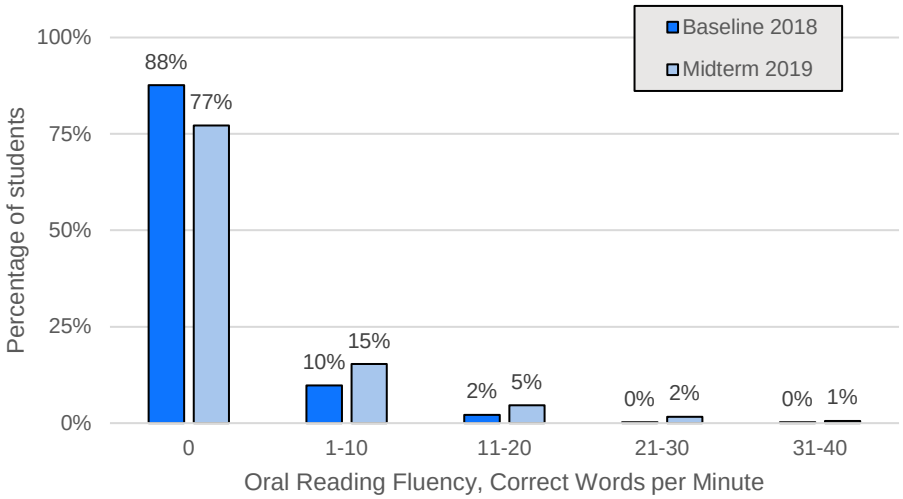
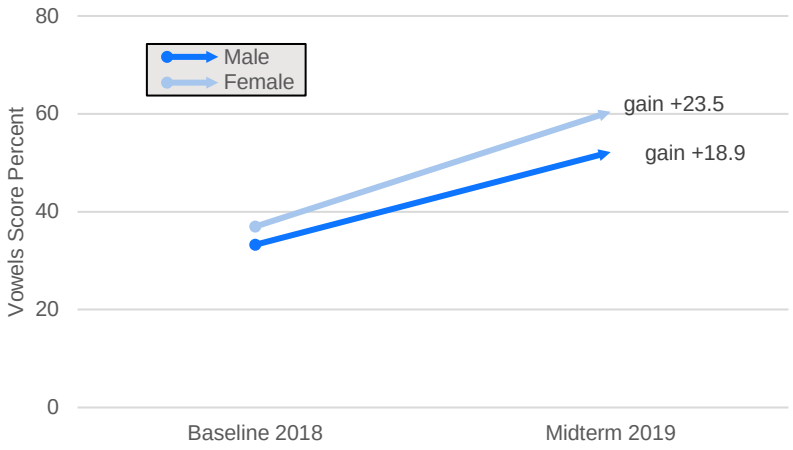


Exhibit 14 confirms the 11% reduction in zero scores, and most of these students were performing at the 1–20 correct words per minute rate at midterm, meaning they had progressed to sounding out and recognizing words, but had not yet progressed to reading a passage fluently with accuracy.

3.1.3 Findings by Gender

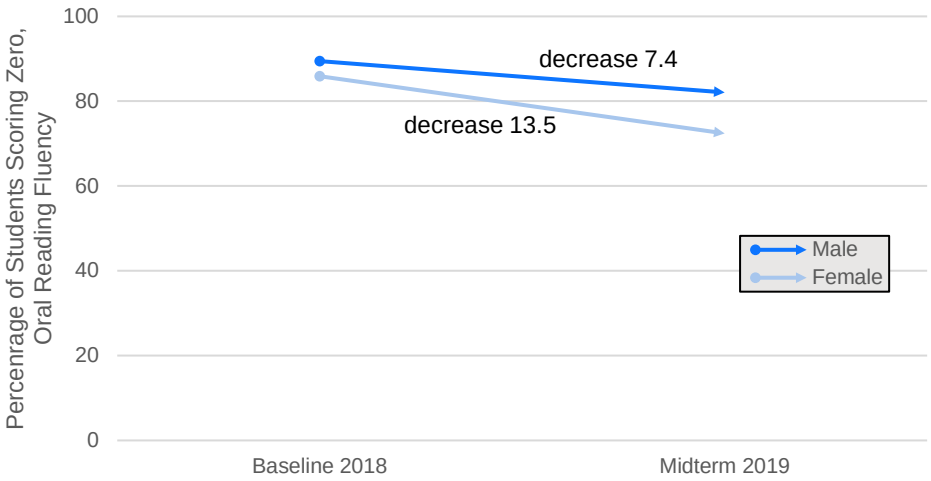
An important research question was to determine if there was a performance difference by gender. The baseline report determined that girls were outperforming boys. Following on from that, this evaluation determines whether there was a difference in *learning gains* by gender at midterm. It is important to note that the sample size calculations for this study were focused on overall impact aggregated at the pilot program level; gender comparisons would mostly be underpowered. This proved to be the case, and while girls' learning gains were stronger than boys' in every subtask without exception, hardly any of these differences proved to be statistically significant. Two of these findings are shown in the next two exhibits. To determine if a pilot program was more beneficial to a single gender, the analysis looked at the learning gains by gender *within* the programs, irrespective of the control group's performance. **Exhibit 15** shows the learning gains in the vowel knowledge score percent between baseline and midterm for Kampong Thom Intervention A by gender.

Exhibit 15: Learning Gains by Gender for Vocabulary Score Percent Between Baseline and Midterm Grade 1, Kampong Thom—Intervention A



The exhibit shows the difference in performance by gender is getting slightly more pronounced as time progresses. In just one year, the girls improved their average score percent by 4.6 percentage points over the boys. A similar pattern was seen across all subtasks and intervention groups. While no gender showed huge gains in the word reading subtasks, the decrease in the percentage of girls scoring zero was greater than for the boys. **Exhibit 16**, below shows the change in zero scores in oral reading fluency for Kampong Thom Intervention A.

Exhibit 16: Change in Zero Scores by Gender for Oral Reading Fluency Between Baseline and Midterm Grade 1, Kampong Thom Intervention A

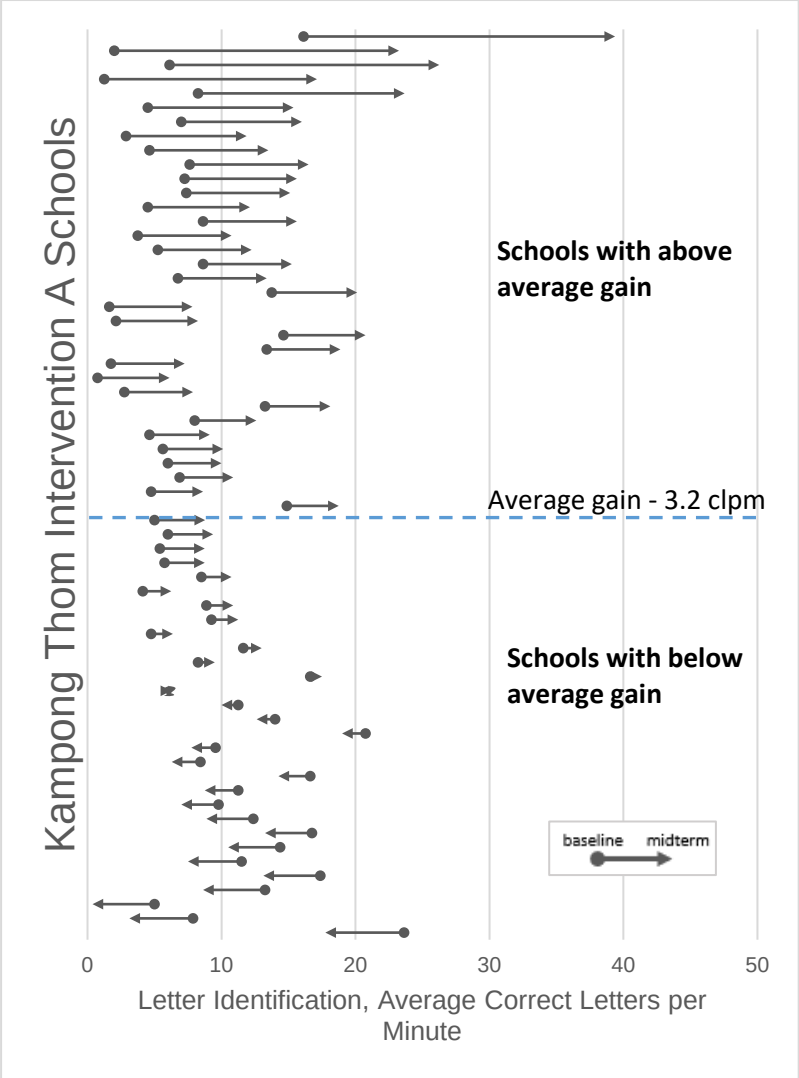


The overall decrease in zero scores for this population was about 11%. However, the girls' decrease was a full 6.1 percentage points more than the boys (13.5% versus 7.4%).

3.1.4 School-Level Findings

The cross-sectional design used for this evaluation collects data from the same sampled schools at multiple points in time but resamples students at those schools each year. Therefore, while student data do not accommodate any longitudinal analysis, the data can be reshaped to facilitate a school-level analysis. This is a useful exercise as it breaks down the school cluster impact on the overall pilot program gain; for example, how many schools are showing learning outcome improvement and how many are having challenges in implementation? This analysis also helps programs focus on the learning gains as opposed to midterm performance; for example, if a school with a low baseline student achievement average score is showing strong learning gains, but is still behind schools at midterm because it is "catching-up," we should most likely consider this to be a positive result. The hope would be that over the life of the pilot program, these schools with low baseline learning outcomes can narrow the gap with schools that had much higher baseline scores. **Exhibit 17** shows the aggregated school-level learning gains for correct letters per minute, for Kampong Thom Intervention A. Each arrow is a school and the ends of the arrow are the baseline and midterm average student performance.

Exhibit 17: School-Level Average Letters per Minute Gains, Kampong Thom Intervention A Grade 1



The limitation of this analysis does need to be considered: due to the small sample size per school (an average of eight students sampled), some of the school-level arrows suffer from natural variability or "noise." This is most likely evident with the few schools at the bottom of the exhibit that show the average score decreasing. It is possible that the students in this school were not demonstrating lower performance, rather the small sample creates this variability. However, until these schools are visited, it would be difficult to ascertain if learning outcomes are truly decreasing.

Depending on how one classifies a "performing school," the percentage of schools considered to be performing will vary according to opinion. However, what the exhibit clearly shows is that the school-level gain is independent of the baseline average. In other words, no matter the baseline average performance of the school and the demographic challenges faced by the school and community, once enrolled in the pilot program, each school has the same opportunity to support students' learning.

3.2 Baseline Findings for Grade 2 and Kampot, Grade 1

This section presents the findings for program components that will be implemented in the school year 2019–2020. The full rollout plan is described earlier in this report in **Exhibit 1**. Specifically, this section presents baseline findings for the following:

- Khmer pre-literacy for upper pre-school for Kampot Intervention D
- Khmer reading grade 1 for Kampot Intervention D
- Khmer reading grade 2 for Kampong Thom Interventions A and B and Siem Reap Intervention C
- Mathematics grade 1 for Siem Reap Intervention C

The baseline design for all the above interventions included a comparison group in Battambang Province. Impact for all these interventions will be shown in the second midterm report in 12 months.

3.2.1 Upper Pre-school Khmer—Kampot Baseline

Implementation of the Khmer reading program in Kampot Province will commence in school year 2019–2020. The program, with support from USAID, will be similar to the intervention implemented in Kampong Thom Intervention A as shown in **Exhibit 1**. Once teachers have been initially trained, they will receive coaching visits twice per month from NGOs supporting the program. **Exhibit 18** below shows the average student score and percentage of students scoring zero for the three pre-school subtasks. Battambang will again be used as a counterfactual to control for "business as usual" in schools.

Exhibit 18: Mean Scores and Percent of Upper Pre-school Students Scoring Zero, Kampot and Battambang Provinces

Subtask	Treatment	Percent Scoring Zero	Mean Scores	*Confidence Interval*
Expressive Vocabulary *(mean correct out of 40)*	Kampot Intervention D	2.2%	10.2	[±1.5]
	Battambang Control	0.5%	12.2	[±1.0]
Identifying Letters *(mean correct out of out of 20)*	Kampot Intervention D	30.5%	4.5	[±1.1]
	Battambang Control	26.8%	5.1	[±1.1]
Listening Comprehension *(mean correct out of 5)*	Kampot Intervention D	5.8%	2.7	[±0.2]
	Battambang Control	2.4%	3.1	[±0.2]

The scores are very similar to the baseline pre-school scores for Kampong Thom and Battambang last year, where the baseline reported average scores of 10.3, 28.3%, and 2.9 for vocabulary, letter knowledge, and listening comprehension, respectively. Taking the confidence intervals into account, there was no significant difference between the baseline pre-school scores for Kampot and those for Kampong Thom. The only significant difference was the percentage of students scoring zero on letter knowledge. The baseline in Kampong Thom Intervention A and Battambang combined the percent of zero scores was 20.7%, and this baseline for Kampot is 30.5%. The Kampot pilot was implemented a year later, so true comparability to the previous year's baseline should be done with caution.

3.2.2 Grade 1 Khmer—Kampot Baseline

The grade 1 intervention will be rolled out alongside upper pre-school for the Kampot pilot in 2019–2020. This section of the report presents the baseline outcomes for the Kampot pilot. As was the case for pre-school, Battambang Province was used as the control group. The outcomes paint a similar picture as the prior baseline for Kampong Thom and Siem Reap for letter subtasks, as shown in **Exhibit 19**.

Exhibit 19: Mean Scores and Percent of Grade 1 Students Scoring Zero for Letter Subtasks, Kampot And Battambang Provinces

Subtask	Treatment	Percent Scoring Zero	Mean Scores	*Confidence Interval*
Vowels *(score percent)*	Kampot Intervention D	15.8%	34.4%	[±3.6%]
	Battambang Control	12.6%	44.9%	[±4.1%]
Consonants ***(****score percent)*	Kampot Intervention D	6.5%	38.8%	[±3.7%]
	Battambang Control	5.3%	50.4%	[±4.0%]
Correct Letters per Minute	Kampot Intervention D	15.6%	7.5	[±1.0%]
	Battambang Control	10.0%	10.6	[±1.1%]

The learning outcomes demonstrate relatively few students scoring zero; the highest rate of zero scores was 15.6% of the students in Kampot unable to identify a letter on the vowel and consonant combined letter fluency subtasks. The overall mean scores on the combined baseline from 2018 were 34.1%, 46.5%, and 9.3 correct letters per minute for the vowels, consonants, and combined letters subtasks. The Battambang averages for grade 1 in 2019 were consistently on the high end of these estimates, which raises a concern regarding baseline balance. This will be discussed in the grade 2 baseline sections of this report.

As with the 2018 baseline for grade 1, the baseline 2019 EGRA also assessed the literacy skills of familiar word recognition, passage reading, and comprehension. These results are presented in **Exhibit 20**, below.

Exhibit 20: Mean Scores and Percent of Grade 1 Students Scoring Zero for Word Reading and Comprehension Subtasks, Kampot and Battambang Provinces

Subtask	Treatment	Percent Scoring Zero	Mean Scores	*Confidence Interval*
Correct Familiar Words per Minute	Kampot Intervention D	78.6%	1.2	[±1.0]
	Battambang Control	66.9%	2.3	[±1.1]
Oral Reading Fluency *(correct words per minute)*	Kampot Intervention D	94.5%	0.5	[±0.3]
	Battambang Control	84.4%	1.3	[±0.4]
Reading Comprehension *(score out of 5, extended time)*	Kampot Intervention D	96.4%	0.1	[±0.0]
	Battambang Control	86.7%	0.2	[±0.1]

As with the other subtasks, the outcomes reflect the previous baseline in 2018. The high zero scores on oral reading fluency and reading comprehension indicate students' skills in these areas are very underdeveloped. As with the midterm for Kampong Thom and Siem Reap, it is most likely that if there is impact with the Kampot pilot in grade 1, it will be seen mostly in learning outcome improvement for the letter knowledge subtasks, rather than for word recognition and reading and comprehension.

3.2.3 Grade 2 Khmer—Kampong Thom and Siem Reap Baseline

This section of the report offers the first look at findings for grade 2 learning outcomes. The pilot programs in Kampong Thom and Siem Reap will include grade 2 in the 2019–2020 school year, so the midterm assessment included a baseline for grade 2 in these provinces. As before, Battambang served as a control group.

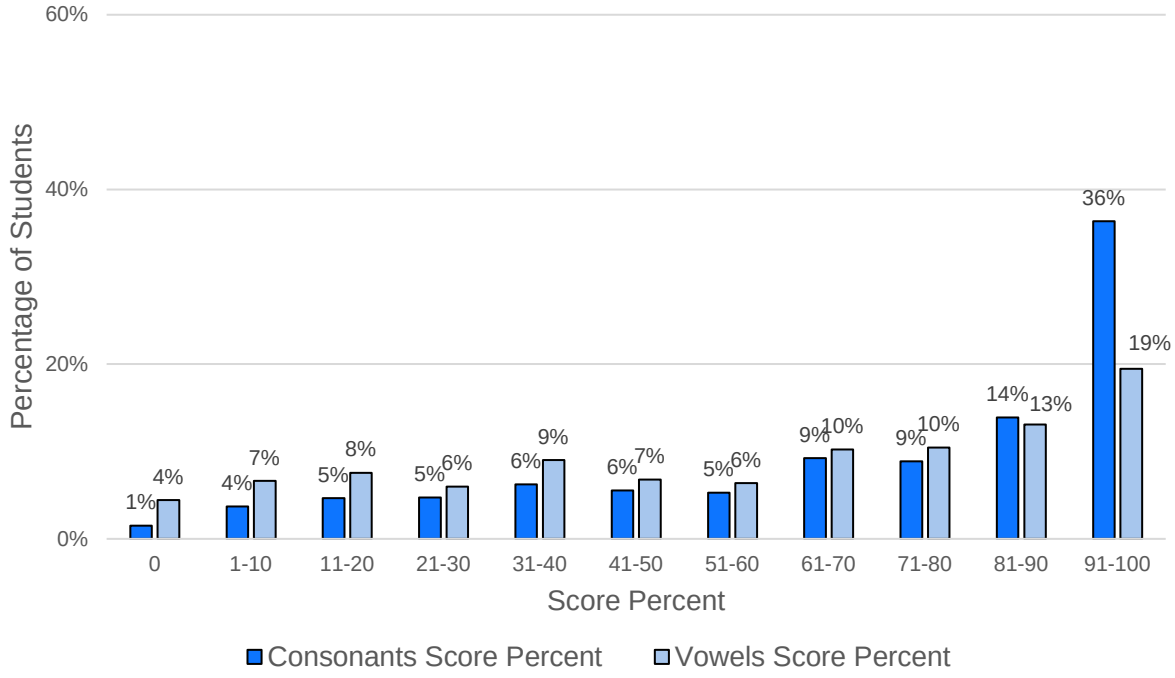
Exhibit 21 shows the grade 2 student learning outcomes for the letter subtasks. The mean scores present a reasonable level of letter knowledge at the end of grade 2.

Exhibit 21: Mean Scores and Percent of Grade 2 Students Scoring Zero for Letter Subtasks, Kampong Thom and Siem Reap Interventions and Control Group

Subtask	Treatment	Percent Scoring Zero	Mean Scores	*Confidence Interval*
Vowels *(score percent)*	Kampong Thom Int. A	4.9%	54.0%	[±4.1%]
	Kampong Thom Int. B	3.6%	51.7%	[±3.3%]
	Siem Reap Int. C	5.4%	59.0%	[±4.3%]
	Battambang Control	3.0%	61.5%	[±4.0%]
	3 Treatment Groups Combined	4.8%	56.1%	[±2.7%]
Consonants *(score percent)*	Kampong Thom Int. A	1.5%	66.9%	[±4.0%]
	Kampong Thom Int. B	2.0%	68.4%	[±3.4%]
	Siem Reap Int. C	1.1%	68.3%	[±3.9%]
	Battambang Control	1.7%	73.3%	[±3.5%]
	3 Treatment Groups Combined	1.5%	68.2%	[±2.5%]
Correct Letters per Minute	Kampong Thom Int. A	5.9%	19.0	[±2.0]
	Kampong Thom Int. B	4.3%	18.6	[±1.6]
	Siem Reap Int. C	8.0%	20.6	[±1.8]
	Battambang Control	5.8%	20.5	[±1.7]
	3 Treatment Groups Combined	6.6%	19.8	[±1.2]

The percentage of grade 2 students unable to recognize a single letter was low across all subtasks and treatment groups, with the highest being 8% of students in Siem Reap unable to recognize a letter in the fluency subtask. The mean scores were also good, but this should be the case at the end of grade 2, which should have a greater focus on word reading and comprehension. Letter recognition should be mastered at the end of grade 1. The distribution of the percent correct scores shown in **Exhibit 22** confirms the general mastery of these skills at the end of grade 2; the left skewed distributions indicate that many students on the right of the distributions were scoring sufficiently well.

Exhibit 22: Distribution of Vowel and Consonant Subtasks—All Treatment Groups Combined (Kampong Thom A & B and Siem Reap), Grade 2



As discussed above, students entering grade 2 should have mastered letter knowledge in grade 1 and move on to learning familiar words and text passage reading and comprehension. Next year, the initial cohort of students who received the pilot intervention in Kampong Thom or Siem Reap in grade 1 will also receive the pilot intervention in grade 2, allowing for evaluation of learning gains for students after two years of intervention. The results presented for grade 2 in this report are of students who did not receive any intervention in grade 1. Consequently, they did not benefit from improved letter knowledge learning instruction in grade 1. Therefore, while the outcomes in grade 2 presented in **Exhibit 23** show students who are progressing in their reading fluency, those students are generally not yet at a level of mastery.

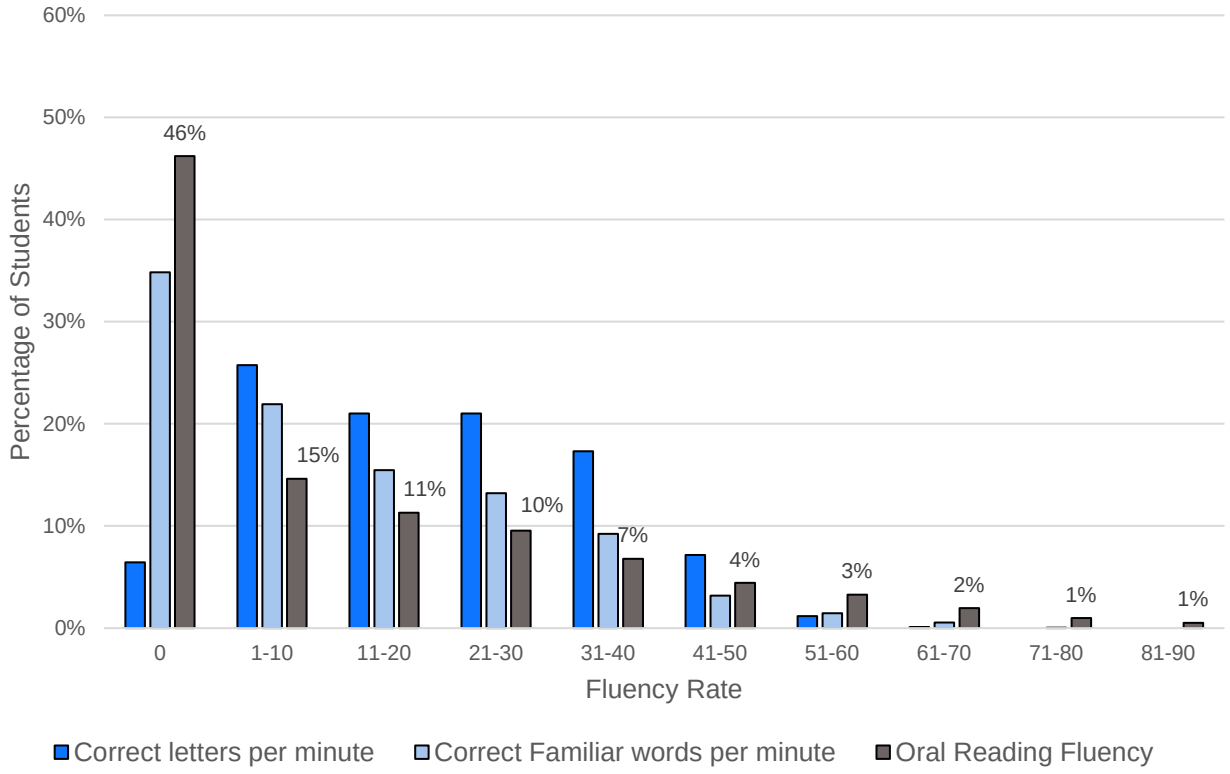
Exhibit 23: Mean Scores and Percent of Grade 2 Students Scoring Zero for Word Reading and Comprehension Subtasks, All Treatment Groups Combined (Kampong Thom A & B and Siem Reap)

Subtask	Treatment	Percent Scoring Zero	Mean Scores	*Confidence Interval*
Correct Familiar Words per Minute	Kampong Thom Int. A	37.1%	11.5	[±2.1]
	Kampong Thom Int. B	39.9%	11.2	[±1.7]
	Siem Reap Int. C	33.1%	13.4	[±2.2]
	Battambang Control	30.6%	13.5	[±1.7]
	3 Treatment Groups Combined	35.8%	12.5	[±1.3]
Oral Reading Fluency *(correct words per minute)*	Kampong Thom Int. A	43.0%	11.9	[±2.6]
	Kampong Thom Int. B	50.3%	12.1	[±2.1]
	Siem Reap Int. C	46.3%	14.5	[±2.6]
	Battambang Control	41.7%	14.8	[±2.2]
	3 Treatment Groups Combined	47.2%	13.4	[±1.6]
Reading Comprehension *(percent score out of 5, extended time)*	Kampong Thom Int. A	49.7%	1.2	[±0.2]
	Kampong Thom Int. B	54.5%	1.2	[±0.2]
	Siem Reap Int. C	46.7%	1.4	[±0.2]
	Battambang Control	43.0%	1.5	[±0.2]
	3 Treatment Groups Combined	49.6%	1.3	[±0.1]
Dictation *(score out of 10)*	Kampong Thom Int. A	39.2%	2.3	[±0.4]
	Kampong Thom Int. B	40.6%	2.3	[±0.4]
	Siem Reap Int. C	38.6%	2.4	[±0.4]
	Battambang Control	38.8%	2.3	[±0.3]
	3 Treatment Groups Combined	39.3%	2.4	[±0.3]

The mean scores for reading fluency are in the 12–15 correct words per minute range. This means that on average the students were reading slowly and methodically, probably taking their time to sound out words and recognize familiar ones. Consequently, they were struggling to understand the meaning of the text. This interpretation is reinforced by three points, that for the three treatment groups combined:

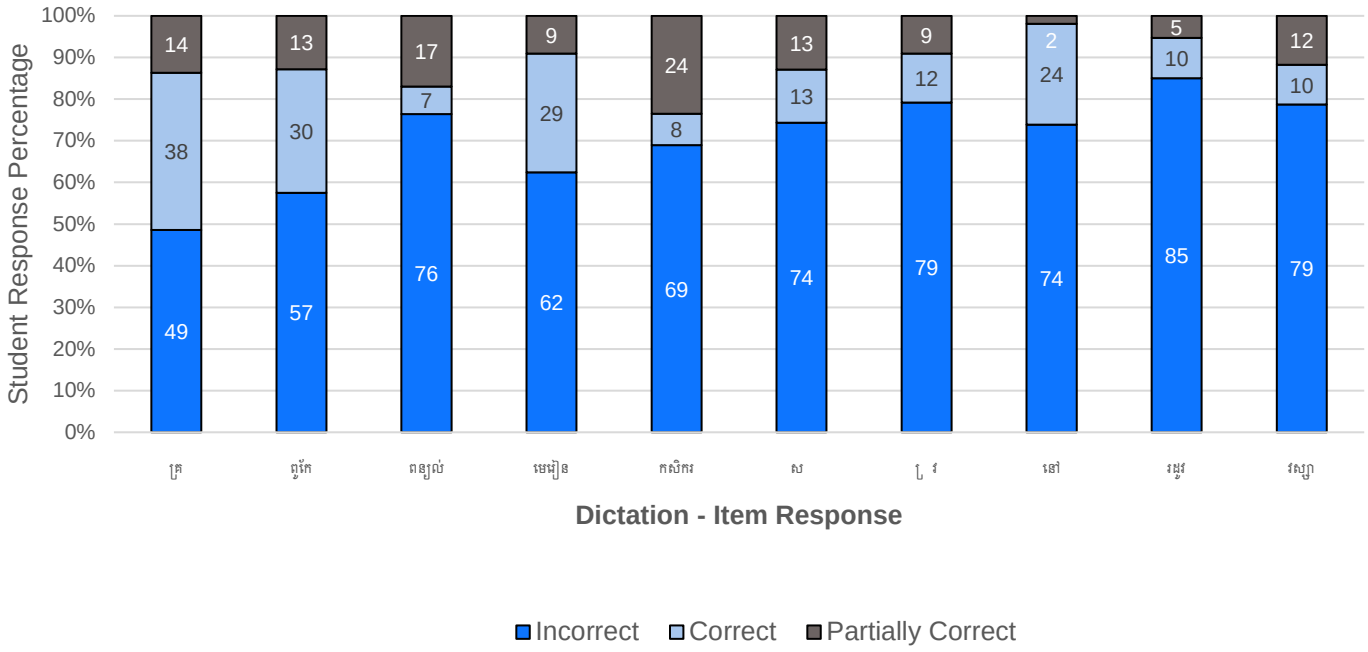
- 72% of the grade 2 students were reading at, or below, 20 correct words per minute, as shown in **Exhibit 24,** and
- Average reading comprehension scores (students had 180 seconds to read a short passage) were no higher than 1.5 correct responses on average out of 5 questions.
- Only 14.2% of students achieved a score of over 4 out of 5 correct answers about the passage.

Exhibit 24: Distribution of Letter and Word Knowledge and Passage Reading Fluency Subtasks— All Treatment Groups Combined (Kampong Thom A & B and Siem Reap), Grade 2



The grade 2 EGRA added a dictation subtask. Students were read two short sentences and asked to write them down. The sentences roughly translated as: "*The teacher / is good at / explaining / the lesson*" and "*The farmer / transplants / rice / in / rainy / season.*" The first sentence was marked out of four and the second out of six. Students were read both sentences and were scored as "correct," "partially correct," or "incorrect" by the assessor. Partial credit solutions were awarded a half mark. Exhibit 23 shows that on average students scored about 2.4. The item distribution in **Exhibit 25** below shows that no more than 38% of the students were able to correctly write a word item.

Exhibit 25: Item Scores for Dictation Subtask — All Treatment Groups Combined (Kampong Thom A & B and Siem Reap), Grade 2



For the second sentence, which was more challenging than the first, at most 24% of the students were able to correctly write one of the words.

3.2.4 Baseline Balance—Kampot

As explained in Section 2, part of the objective of a baseline study is to assess, create and maintain balance between treatment and control groups to ensure an "apples to apples" comparison. The study assessed balance by looking at the effect size difference between the treatment and control baseline grade 2 estimates for reading fluency. It was found that this difference was 0.24 standard deviations. This value is within acceptable range, but What Works Clearinghouse Standards 4.0 recommends running the difference-in-differences impact analysis using a regression control model.[5] This is something that will be considered for the follow-up midterm report.

3.2.5 Grade 1 Mathematics—Siem Reap

The Siem Reap pilot also included a mathematics teaching and learning component. As shown in Exhibit 1, this will roll out for grade 1 in the 2019–2020 school year. Therefore, this report will present the baseline learning outcomes. For this assessment, an EGMA tool was used with four subtasks described earlier in this report.

The zero scores and averages for the four subtasks in **Exhibit 26** show that the students at the end of grade 1 were demonstrating just a rudimentary understanding of numeracy.

[5] The *What Works Clearinghouse Standards Handbook*, version 4.0, is available at https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_standards_handbook_v4.pdf

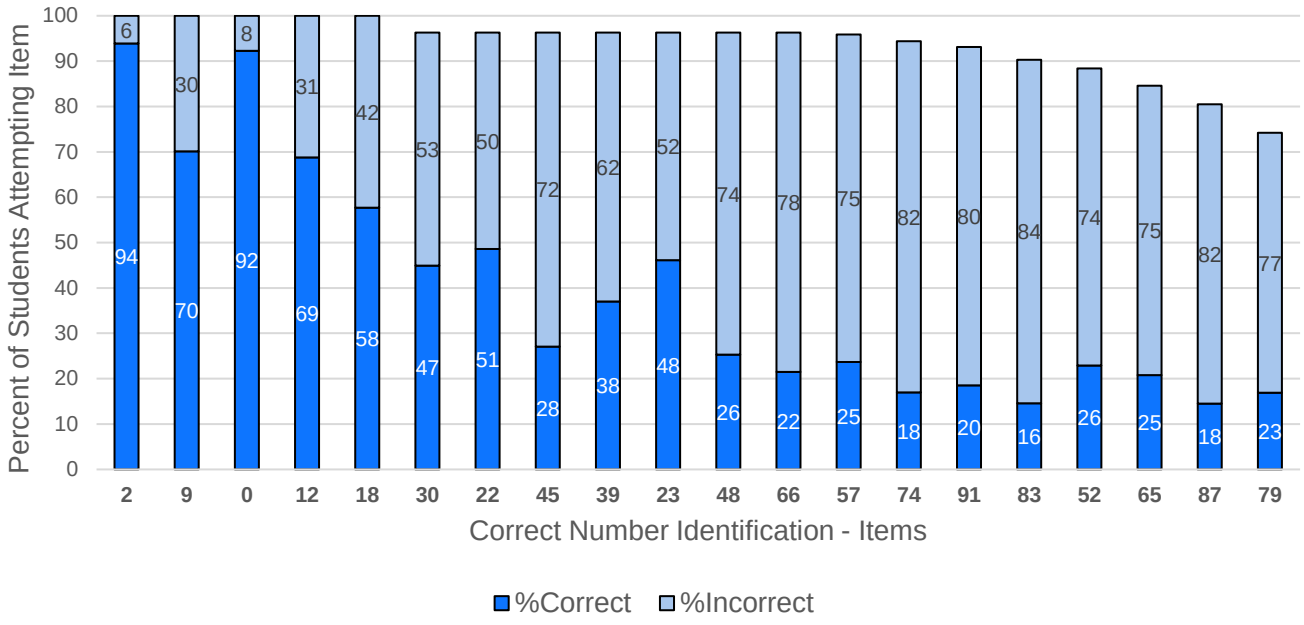
Exhibit 26: Zero Scores and Averages of Grade 1 Students for EGMA Subtasks, Siem Reap and Battambang Provinces

Subtask	Treatment	Percent Scoring Zero	Mean Scores	*Confidence Interval*
Number Identification *(correct items per minute)*	Siem Reap Intervention C	3%	9.6	[±1.1]
	Battambang Control	4%	10.2	[±1.0]
Number Discrimination *(mean correct out of out of 10)*	Siem Reap Intervention C	24%	3.4	[±0.4]
	Battambang Control	23%	3.6	[±0.4]
Addition Level 1 *(correct items per minute)*	Siem Reap Intervention C	45%	3.2	[±0.5]
	Battambang Control	40%	3.7	[±0.5]
Subtraction Level 1 *(correct items per minute)*	Siem Reap Intervention C	60%	1.9	[±0.4]
	Battambang Control	60%	2.3	[±0.4]

Number identification is the simplest of mathematics subtasks, students are given one minute to correctly identify 20 single- and two-digit numbers. On average, students were able to correctly identify 10 numbers, which is about 1 number correctly identified every six seconds, which is quite slow for a skill that should be automatic at the end of grade 1. In **Exhibit 27**, the item scores for number identification show that students started well in correctly identifying single-digit numbers (the first three items), then struggled on two-digit numbers.

For the number discrimination subtask, for each item students had to say which of a pair of numbers was larger. The average number of problems correct out of 10 was about 3.5, indicating students were limited in the ability to compare the quantities represented by different numbers.

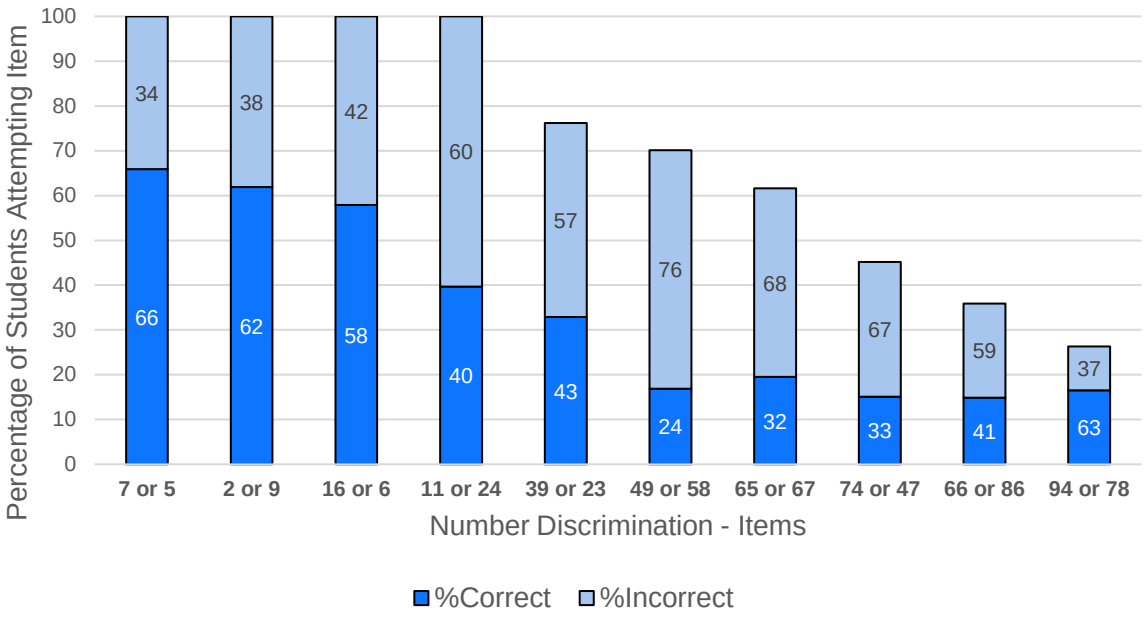
Exhibit 27: Item Scores for Number Identification Subtask—Siem Reap and Battambang Combined, Grade 1



For addition and subtraction subtasks, students were given one minute (for each subtask) to correctly solve up to 20 items. Exhibit 26 shows the percentage of students with zero scores to be a concern: 40% or more were unable to solve a single addition problem, and 60% could not do subtraction.

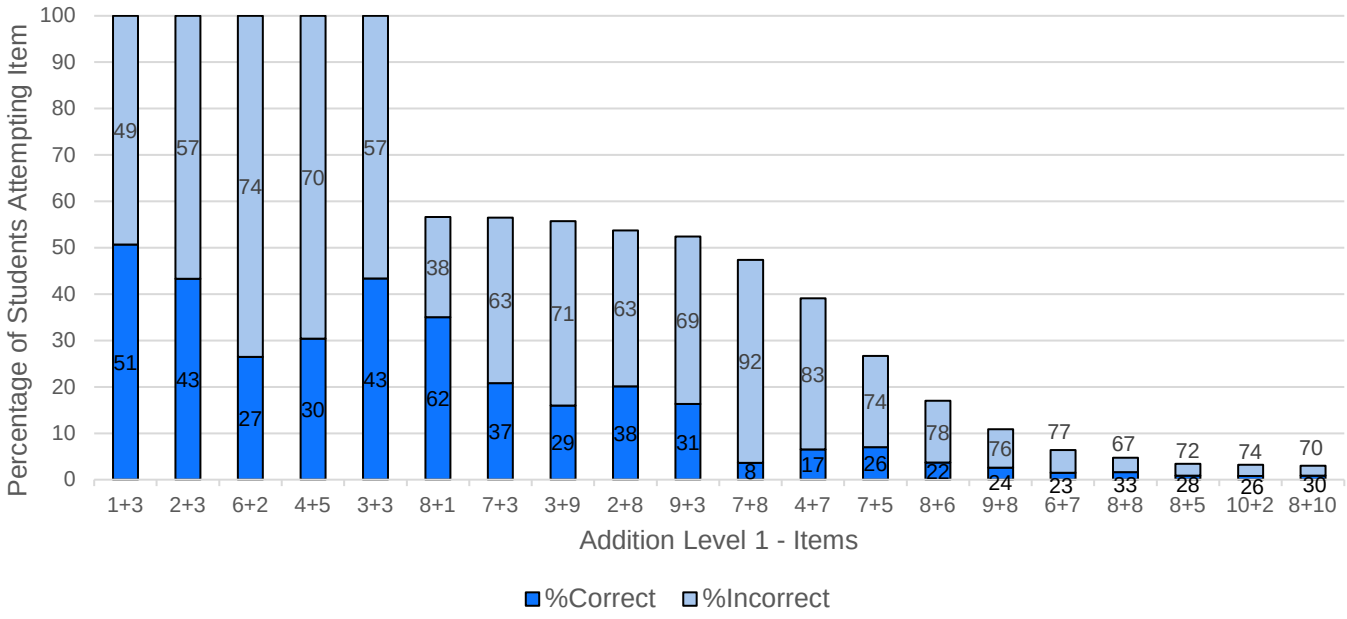
Exhibit 28 shows a pattern similar to that of the previous subtask—students struggling with understanding quantity. While around 60% of students could discriminate between single-digit numbers, they struggled to even attempt discrimination of two-digit numbers. For example, around 76% of students attempted the fourth item (39 or 23) and of them, only 43% correctly identified 39 as a larger number.

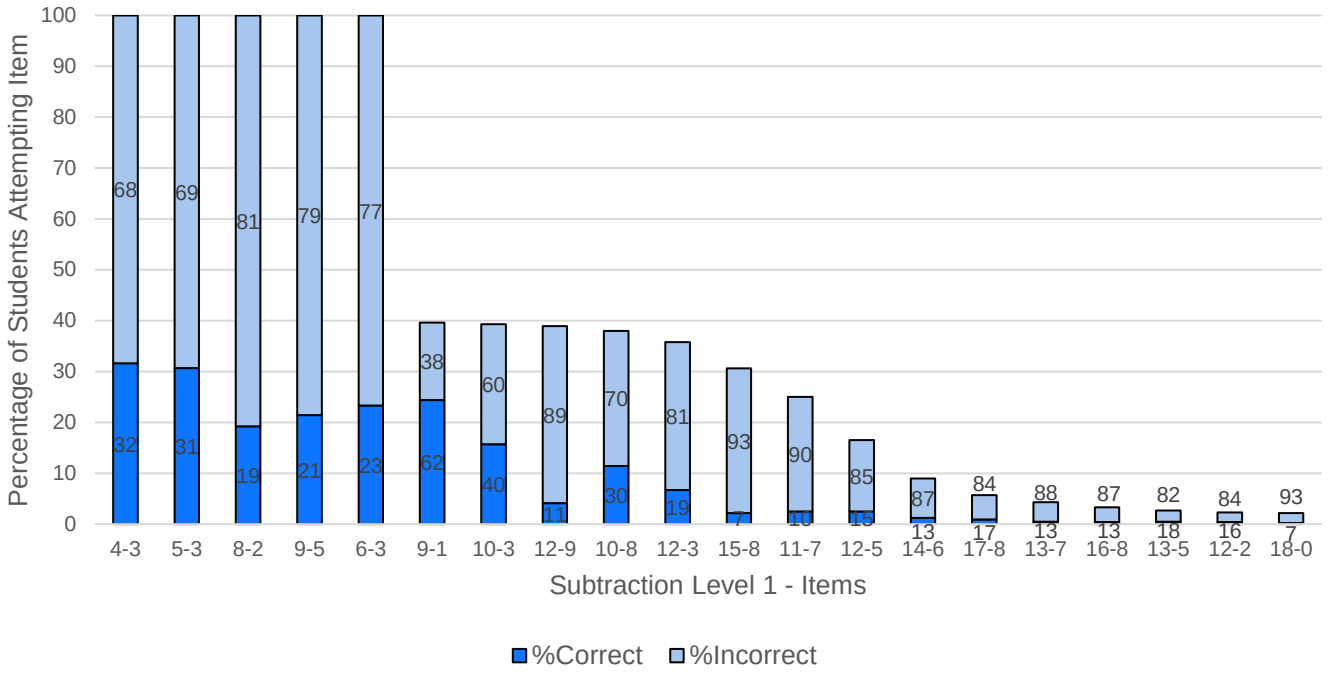
Exhibit 28: Item Scores for Number Discrimination Subtask—Siem Reap and Battambang Combined, Grade 1



Grade 1 students attempting the addition and subtraction subtasks were given one minute to correctly answer as many items as possible. If they had already learned mental techniques of addition and had some of the simple addition and subtraction memorized through practice, students would be able to move through the simple addition tasks quickly. However, this was evidently not frequently the case as almost half the students did not get beyond the fifth item on both subtasks as shown in **Exhibit 29**, below. This indicates that most students were struggling, most likely because their teachers are failing to fully develop their techniques for doing addition and subtraction.

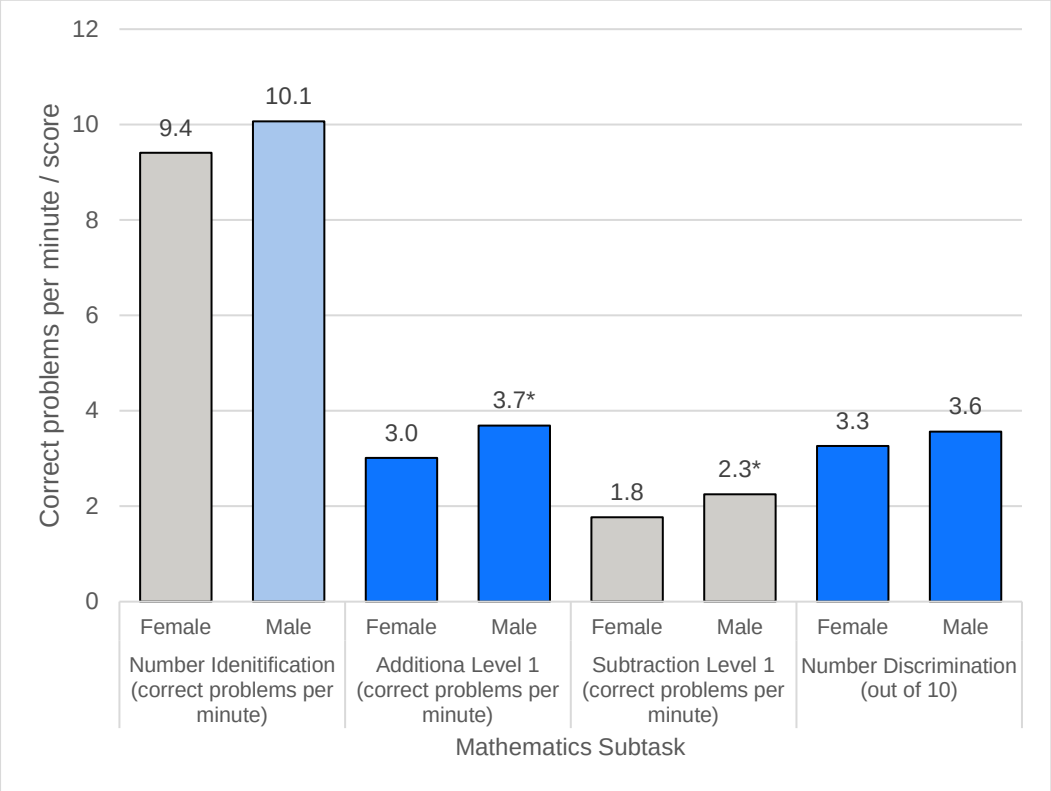
Exhibit 29: Item Scores for Addition and Subtraction Subtasks—Siem Reap and Battambang Combined, Grade 1





Differences by gender for the grade 1 mathematics achievement at baseline are explored here. The findings present a contrast to the literacy skill achievement. In **Exhibit 30**, the average subtask score is shown for grade 1 by gender.

Exhibit 30: Average Math Subtask Score by Gender



*p<0.01

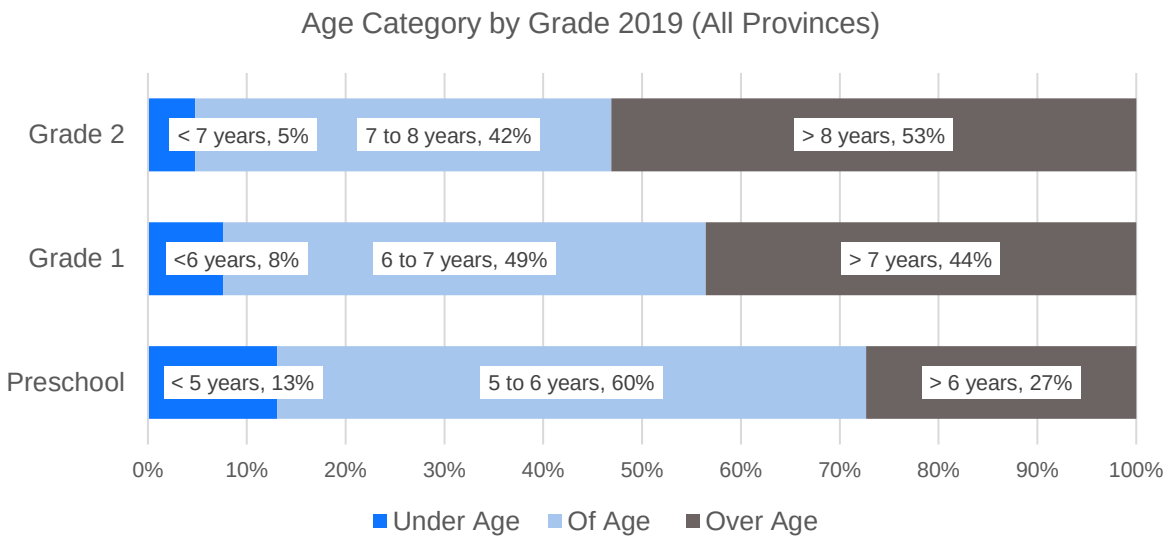
Opposite the gender differences in pre-literacy and literacy skills, gender differences in mathematics show the boys, on average, outperforming the girls in mathematics, significantly so for demonstrating addition and subtraction skills. In literacy, Exhibits 23 and 24 show how the gender gap increased after one year, with girls improving their literacy skills at a greater rate than boys. It will be important to see how this gap between genders changes for mathematics after one year.

3.3 Student Age and School Characteristics

The last set of findings from the midterm survey concerns the student ages and characteristics of the schools in the different comparison groups: Kampong Thom A, Kampong Thom B, Siem Reap, Kampot, and Battambang.

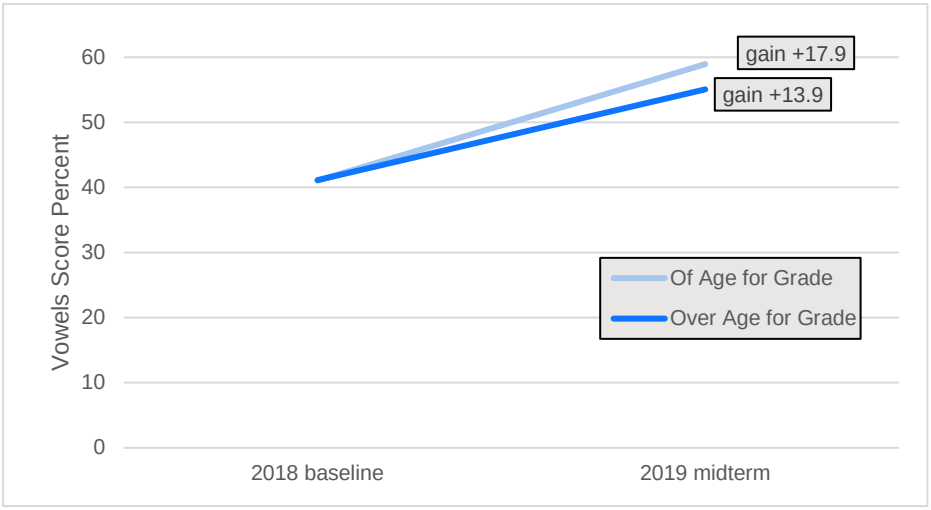
Students were asked their birthdate during the survey. Approximately 79% of students in grades 1 and 2 were able to provide a date. Using this information, it was determined from their response if they were at-age, under-age, or over-age for their grade. This information, presented in **Exhibit 31**, shows an increasing number of students were classified as over-age as they progressed through the grades, starting with 27% in pre-school, rising to 53% by the time they reached grade 2.

Exhibit 31: Student Age Category (Self-Reported), All Grades and Provinces



We did not determine why more and more students were over-age. It would be interesting to find out how many of these students repeated a grade due to absences or poor scores on teacher assessments. The pilot programs were also struggling to help these over-age students keep pace. **Exhibit 32** shows the average vowels score percent for grade 1 students by age classification between baseline and midterm. Note that the under-age students represented a small sample size, not large enough to present reliable estimates.

Exhibit 32: Average Vowels Score Percent for Grade 1, Kampong Thom and Siem Reap for Age Classifications Between Baseline and Midterm



Students who were over-age for their grade, for whatever reason, were struggling to keep up with their at-age peers year on year; Exhibit 32 shows that the at-age students gained 4 percentage points over their over-age peers in just one year. It is possible that the factors that cause students to be over-age may be the same ones that cause them to fall behind in performance.

School Characteristics

This evaluation included a survey of school characteristics to understand the context of schools in each of the treatment groups (**Exhibit 33**). These data are useful in attempting to explain differences that may occur among or between treatment groups, if there are marked differences. Some characteristics that stand out from this analysis include the following:

- Most schools were of moderate size, having an average enrollment in grades 1–3 of 231 among all treatment groups and a range of 132 to 336.
- Over 40% of schools had attached pre-schools in most treatment groups, except in Siem Reap, where 93% of schools had attached pre-schools.
- NGO support for early grade reading was high among all intervention groups at midterm, with a lower percentage of schools receiving support in Battambang, the control province. Interestingly, Kampot at this baseline had very little NGO support, with less than 9% of schools reporting receiving NGO support for early grade reading.
- Most schools had enough Khmer textbooks for grade 1, but the percent of schools with storybooks in the grade 1 classroom varied across treatment groups.
- Most schools had electricity, functioning toilets, and a safe water source, but very few schools across treatment groups had piped water as their water source.

Exhibit 33: Means for School Variables by Comparison Group, 2019

Mean Values	Kampong Thom A	Kampong Thom B	Siem Reap	Kampot	Battam-bang
Average percent schools that are complete primary (1–6)	87.50%	88.75%	100.00%	97.14%	82.09%
Average total enrollment for grades 1–3 (combined)	221.2	132.4	336	232.4	268.1
Average total number of teachers grades 1–3 (combined)	3.7	3.9	3	4.4	4.9
Average pupil-teacher ratio grades 1–3	55.8	40.6	83.1	55	53.9
Average age of grade 1 students (years)	7.1	7.1	7.1	6.9	7.2
Average percent of grade 1–3 teachers with training In Khmer literacy	60.5%	76.1%	64.7%	18.7%	40.3%
Average percent with pre-school	43.8%	46.3%	93.1%	42.86%	47.8%
If yes, average upper pre-school enrollment	37.1	25.1	94.7	21.8	41.9
Average percent of schools receiving NGO support for early grade reading	75.0%	80.0%	77.6%	8.6%	29.9%
Average percent with enough Khmer textbooks for grade 1	75.0%	70.0%	84.5%	57.1%	64.2%
Average percent of schools with storybooks in grade 1 classroom	40.6%	61.3%	43.1%	11.4%	10.5%
Average percent of schools with a library	57.8%	32.5%	86.2%	40.0%	50.8%
If yes, average years the library has been at school:					
More than 7 years	67.7%	80.0%	57.1%	71.4%	66.7%
5 to 7 years	17.7%	16.0%	18.4%	10.7%	9.1%
3 to 5 years	14.7%	4.0%	12.2%	3.6%	9.1%
Less than 3 years	0.0%	0.0%	12.2%	14.3%	15.2%
if yes, average percent receiving support for their library	54.7%	32.5%	79.3%	34.3%	40.3%
if yes, average percent with kids inside the library on day of visit	59.5%	65.4%	88.0%	17.9%	67.7%

Mean Values	Kampong Thom A	Kampong Thom B	Siem Reap	Kampot	Battam-bang
Average percent of schools with electricity	78.1%	77.5%	86.2%	85.7%	91.0%
Average percent of schools with any water source	96.9%	90.0%	94.8%	91.4%	91.0%
Average percent of schools with piped water	12.9%	0.0%	12.7%	12.5%	21.3%
Average percent of schools w/functioning toilets	93.8%	96.3%	98.3%	95.7%	97.0%
Average percent of schools with two shifts	59.4%	27.5%	41.4%	57.1%	80.6%
Average percent of schools with morning session only	21.9%	68.8%	27.6%	37.1%	9.0%
Average percent of schools with full-day session	18.8%	2.5%	31.0%	5.7%	10.5%
Average percent of schools with student-feeding program	37.5%	66.3%	65.5%	0.0%	1.5%
Percent of schools where most children come to school:					
on foot	64.1%	76.3%	51.7%	30.0%	35.8%
by bicycle	20.3%	16.3%	32.8%	34.3%	23.9%
by motorized transport	15.6%	7.5%	15.5%	35.7%	40.3%

4. Conclusions

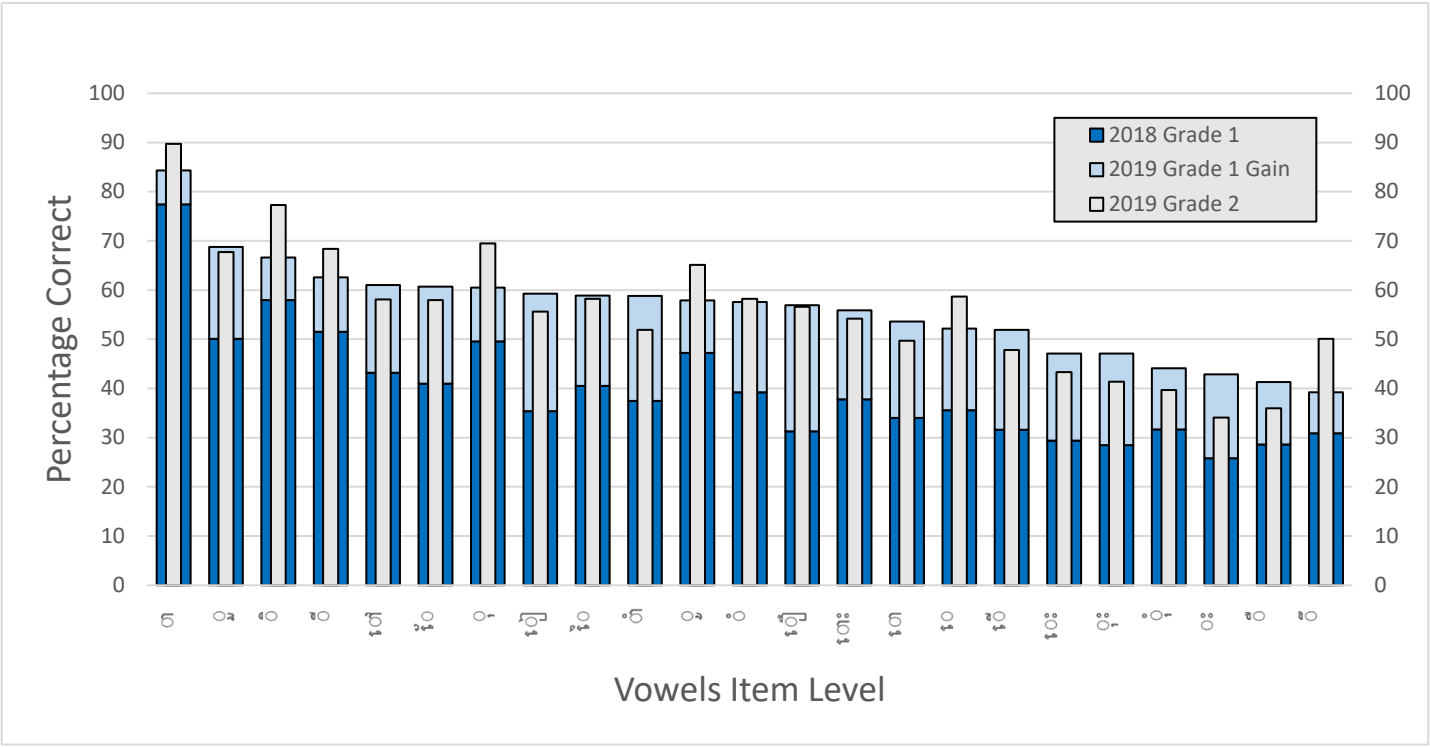
The main purpose of this study was to report the impact of the pilot programs on students' pre-literacy and early literacy performance in upper pre-school and grade 1, respectively.

Analysis of the results of the survey across the comparison groups allowed us to isolate "business as usual" and confidently attribute the impact seen to the teaching and learning enhancements implemented by the pilots.

The study found that the pre-school is not yet demonstrating a positive impact on students' literacy skills. The project should explore ways in which the pre-school intervention can be strengthened, and what lessons can be learned from the grade 1 program design and implementation, which has demonstrated a significant positive impact on students' basic literacy skills.

Impact for grade 1 in Kampong Thom Interventions A and B and Siem Reap was strongest for letter knowledge. As the focus of teaching and learning in grade 1 is on letter knowledge, this was expected. At baseline, only 5 vowel items were correctly identified by at least 50% of students; at midterm this had increased to 18 correctly identified by at least 50% of the students. This helps give students the foundational letter knowledge they need to build on the more advanced word reading skills in grade 2. This survey also presents the proposition that grade 1 students in the reading pilots caught up with their grade 2 peers. This is shown in **Exhibit 34,** which shows the grade 1 baseline and midterm gain alongside the grade 2 baseline percent scores for the vowel items.

Exhibit 34: Percent Correct of Vowel Items—Kampong Thom and Siem Reap Combined, Baseline, and Midterm Grade 1 and Baseline Grade 2



Encouragingly, grade 1 students in pilot schools could on average correctly identify 15 out of the 23 vowel items better than their grade 2 counterparts. For next year's evaluation, as the cohorts move through the pilot programs, it will be interesting to see how students who have received more than one year of the intervention perform compared with this year. Future evaluations should assess the impact on performance among students who have received both pre-school and grade 1 instruction and students who have received grade 1 and 2 instruction from the pilot programs.

Analysis of individual school performance as shown in section 3.1.4 and Exhibit 17 indicates that more schools in the treatment group Kampong Thom A are experiencing above average gains on letter recognition, but that some schools experienced lower gains, if not minimal ones. It will be of particular interest to follow up this statistical analysis of program impacts by a more qualitative appreciation of what schools that are experiencing large gains are doing compared to those that did not.

Annex 1: Instruments Used in the Assessments

Pre-literacy Assessment

Database ID: ______

ACR-Cambodia

វាយតម្លៃអំណានកម្រិតមត្តេយ្យសិក្សានៅកម្ពុជា: ទម្រង់សម្រាប់ចម្លើយរបស់សិស្ស

ការណែនាំទូទៅ ៖

ឯកសារនេះ នឹងអាចឱ្យអ្នកវាស់ស្ទង់ការអភិវឌ្ឍ និងការសិក្សាពីដំបូងរបស់កុមារនៅមត្តេយ្យសិក្សា។ អ្នកនឹងឃើញទម្រង់នេះត្រូវបានសរសេរជាពីររបៀប៖

- **ទម្រង់អក្សរដិតនៅក្នុងប្រអប់ បង្ហាញពីអ្វីដែលអ្នកវាយតម្លៃត្រូវតែនិយាយទៅកាន់កុមារឱ្យឮ ។ សូមអានឮៗក្នុងទម្រង់នេះឱ្យឮទៅកាន់កុមារ ដោយអានឱ្យអស់ខ្លឹមសារ និង ដូចបេះបិទនូវអ្វីដែលបានសរសេរ។ ការធ្វើបែបនេះដើម្បីធានាថា ទិន្នន័យដែលនឹងត្រូវប្រមូលមានលក្ខណៈស្តង់ដាដូចៗគ្នាពីសិស្សទាំងអស់។**
- *ទម្រង់ជាអក្សរទ្រេត បង្ហាញពីការណែនាំសម្រាប់អ្នកផ្ទាល់ ។ អ្នកមិនត្រូវអានការណែនាំនេះឮៗទៅកាន់កុមារនោះទេ ។*

នៅក្នុងដំណើរការនៃការវាយតម្លៃ សូមផ្តល់ការលើកទឹកចិត្តដែលមិនលំអៀងទៅឱ្យកុមារ។ ឧទាហរណ៍ និយាយពាក្យដូចជា «កូនបានប្រឹងប្រែងខ្លាំងណាស់ សូមប្រឹងប្រែងបន្តទៀត!»។ មិនត្រូវបង្ហាញឱ្យកុមារឃើញថា គេបានឆ្លើយត្រូវ ឬខុសនោះទេ លើកលែងតែចំណុចដែលបានបង្ហាញនៅក្នុងការហ្វឹកហាត់សាកល្បង។ សូមផ្តល់ការលើកទឹកចិត្តនៅចន្លោះសំណួរនីមួយៗ ជាជាងនៅពាក់កណ្តាលសំណួរ ។ មិនត្រូវផ្តល់ជាកាយវិការ ឬបង្ហាញទឹកមុខបញ្ជាក់ចំពោះសំណួរ ខណៈដែលសិស្សកំពុងផ្តល់ចម្លើយឡើយ។

បង្កើតបរិយាកាសរីករាយជាមួយកុមារតាមរយៈការសន្ទនាខ្លីៗ (មើលឧទាហរណ៍ប្រធានបទខាងក្រោម)។ ធ្វើឱ្យសិស្សយល់ថាការវាយតម្លៃនេះគឺជាការលេងល្បែងសប្បាយៗ មិនមែនជាការធ្វើតេស្តទេ។ សូមយកពេលវេលានេះដើម្បីកំណត់ភាសាដែលកុមារចូលចិត្តប្រើប្រាស់ក្នុងការធ្វើទំនាក់ទំនង។ អានឮៗនិងយឺតៗ នៅផ្នែកក្នុងប្រអប់តែប៉ុណ្ណោះ។

ការស្វាគមន៍ និងការយល់ព្រមដោយផ្ទាល់មាត់
អរុណសួស្តី។ ខ្ញុំឈ្មោះ..........រស់នៅ ....។ ខ្ញុំសូមធ្វើការណែនាំខ្លួន។ *(សូមប្រាប់សិស្សពីចំនួនកូនរបស់អ្នកនិងអាយុរបស់កូនៗ ប្រភេទកីឡា កម្មវិធីទូរទស្សន៍ ឬវីឡូជាដើមដែលអ្នកចូលចិត្ត)* **១. តើប្អូនចូលចិត្តធ្វើអ្វីខ្លះពេលប្អូនមិនទៅសាលា?** *(រង់ចាំចម្លើយ ប្រសិនបើសិស្សមានការស្ទាក់ស្ទើរសួរសំណួរទី២ ប៉ុន្តែប្រសិនបើកុមារមានទំនុកចិត្តឆ្លើយ សូមបន្តទៅការយល់ព្រមផ្ទាល់មាត់)*។ **២. តើល្បែងអ្វីដែលប្អូនចូលចិត្តលេង?** **ខ្ញុំសូមប្រាប់មូលហេតុដែលខ្ញុំមកទីនេះ។ ពួកយើងមកទីនេះដើម្បីសិក្សាពីរបៀបរៀនរបស់កូន ហើយចង់ដឹងថាតើកូនចេះលេងល្បែងខ្លះដែរឬទេ។ ពូ/មីងនឹងសួរសំណួរកូនមួយចំនួនអំពីរឿង និងអក្សរ។ មានសកម្មភាពខ្លះស្រួលសម្រាប់កូន ហើយសកម្មភាពខ្លះទៀតអាចនឹងពិបាក។ កូនកុំបារម្ភប្រសិនបើកូនមិនអាចធ្វើសកម្មភាពមួយចំនួនបាន។ ពួកយើងគ្រាន់តែចង់ឱ្យកូនសាកល្បង។ កូនអាចឈប់សម្រាកសិនប្រសិនបើកូនចង់។ គ្រាន់តែប្រាប់ពូ/មីងបានហើយ។ ប្រសិនបើកូនលែងចង់ឆ្លើយបន្ត ឬកូនមិនចង់លេងល្បែងណាមួយ អ៊ីចឹងក៏មិនអីដែរ។ កូនយល់ទេ? កូនមានសំណួរឬទេ? កូនត្រៀមខ្លួនរួចហើយឬនៅ?**

គូស √ ក្នុងប្រអប់ បើទទួលបានចម្លើយផ្ទាល់ពីកុមារ ☐ បាទ-ចាស ______

(ប្រសិនបើមិនទទួលបានចម្លើយទេ អរគុណកុមារហើយផ្លាស់ទៅកុមារបន្ទាប់ទៀត)

A. កាលបរិច្ឆេទវាយតម្លៃ៖ (ឧ. 5 ឧសភា 2013 = 5/03/2013)	ថ្ងៃ៖______ ខែ៖______ ឆ្នាំ៖______	H. ថ្នាក់៖	
B.ឈ្មោះខេត្ត៖			
C.ឈ្មោះស្រុក៖		I. លេខសិស្ស៖	
D. ឈ្មោះអ្នកសម្ភាសន៍៖		J. ខែឆ្នាំកំណើតសិស្ស៖	ខែ____ ឆ្នាំ____
E. ឈ្មោះសាលា៖		K. ភេទ៖	☐ប្រុស ☐ស្រី
F.កូដសាលាក្នុង EMIS ៖			
G: វេនសិក្សា៖			
	☐ = ពេញមួយថ្ងៃ ☐ = ពេលព្រឹក ☐ = ពេលរសៀល	ម៉ោងចាប់ផ្តើម	____ : ____ ☐ ព្រឹក[ជ្រើសរើសមួយ] ☐ រសៀល

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កិច្ចការទី # ១. និយាយពាក្យសព្ទ	📖 ទំព័រ ១	⏱ មិនកំណត់ម៉ោង
សម្ភារៈ៖ គ្មាន 🗣 *និយាយថា៖* **ឥឡូវនេះយើងនឹងសាកល្បងលេងល្បែងអំពីអ្វីដែលយើងអាចហូបបាន។ សូមក្មួនព្យាយាមរាប់ឈ្មោះអ្វីៗដែលអាចហូបបានឱ្យបានច្រើនតាមដែលអាចរាប់បាន។** ***ច្បាប់បញ្ឈប់៖*** *អ្វីដែលអាចហូបបាន៖ នៅពេលក្មេងមិនអាចគិតឃើញថែមទៀត ឬរាប់អ្វីដែលអាចហូបបានចំនួន២០ សូមបន្តទៅសំណួរអំពីការរាប់ឈ្មោះសត្វ។* *ឈ្មោះសត្វ៖ នៅពេលក្មេងមិនអាចគិតឃើញថែមទៀត ឬរាប់ឈ្មោះសត្វបានចំនួន២០ សូមបន្តទៅកិច្ចការបន្ទាប់ទៀត។*		កិច្ចការនេះ មិនកំណត់ម៉ោងទេ។ ➲ *នៅពេលដែលក្មេងឈប់រាប់ឈ្មោះវត្ថុញ៉ាំ/សត្វ សូមបញ្ជាក់សំណួរដោយនិយាយថា៖* **ក្មួនអាចគិតឃើញអ្វីបន្ថែមទៀត?** ➲ *ប្រសិនបើសិស្សស្ងាត់ស្ងៀមមិនឆ្លើយក្នុងរយៈពេល១០វិនាទី បន្ទាប់ពីសំណួរបំផុសលើកទីមួយ (ឧទាហរណ៍ បន្ទាប់ពីរាប់បានវត្ថុញ៉ាំ/សត្វ) សូមនិយាយថា* ***"អរគុណ!"*** *ហើយបញ្ចប់កិច្ចការនេះ។*

		បង្ហាញពីចំនួនវត្ថុញ៉ាំបាន/សត្វច្រើនបំផុតដែលក្មេងបានរាប់	
	ការណែនាំ	ចំនួនវត្ថុញ៉ាំ/សត្វច្រើនបំផុតដែលក្មេងរាប់បាន (បើសិនជាក្មេងមិនបាននិយាយអ្វី ឬនិយាយថា "ខ្ញុំមិនដឹង"/មិនដឹង សូមសរសេរលេខ 0)	មិនឆ្លើយ (99)
	និយាយថា៖ **ឥឡូវយើងលេងល្បែងពាក្យ តើក្មួនអាចរាប់ឈ្មោះអ្វីដែលក្មួនអាចញ៉ាំបានឬទេ? សូមប្រាប់ពូ/មីងឱ្យបានច្រើនតាមដែលក្មួនអាចរាប់បាន ។** *បញ្ឈប់ក្មេងនៅពេលរាប់បាន២០។*		
	ឥឡូវ ពូ/មីងចង់ដឹងថាតើសត្វអ្វីខ្លះដែលក្មួនស្គាល់។ សូមប្រាប់ពូ/មីងឱ្យបានច្រើនតាមដែលក្មួនអាចរាប់បាន។ *បញ្ឈប់ក្មេងនៅពេលរាប់បាន២០។*		
☐ សំណួរនេះមិនត្រូវបានបន្ត ដោយសារសិស្សស្ងៀមស្ងាត់។			

អរគុណ តោះយើងបន្តទៅផ្នែកមួយទៀត!

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កិច្ចការទី #២ ចំណេះដឹងពីតួអក្សរ ការស្គាល់តួអក្សរ	📖 ទំព័រ ២	⏱ ១៨០ វិនាទី

សម្ភារៈ តារាងតួអក្សរ និងក្រដាសមួយសន្លឹកសម្រាប់គ្របពីលើ ។
សម្គាល់ផ្សេងទៀត ៖ អនុញ្ញាតឱ្យមានស្វ័យកែតម្រូវ។

ដាក់តារាងតួអក្សរនៅពីមុខកុមារ។

និយាយថា ៖ **ឥឡូវនេះ យើងនឹងលេងល្បែងតួអក្សរ។**
នេះជាតួអក្សរខ្មែរ។ ពូ/មីងនឹងចង្អុលតួអក្សរណាមួយ ហើយក្មួយហៅឈ្មោះតួអក្សរនោះ ។
ឧទាហរណ៍៖ អក្សរនេះ *[ចង្អុលទៅអក្សរជ]* **គឺ "ជ"**
តោះសាកល្បង៖ តើនេះជាអក្សរអ្វី? [ដោយចង្អុលតួអក្សរ ឆ]
ប្រសិនបើកុមារឆ្លើយត្រូវ និយាយថា៖ **ត្រឹមត្រូវនេះជាអក្សរ ឆ**
ប្រសិនបើកុមារឆ្លើយមិនត្រឹមត្រូវ និយាយថា៖ **នេះជាអក្សរ ឆ**

គ្របក្រដាសលើអក្សរនៅជួរផ្សេងៗ ដោយទុកតែអក្សរនៅជួរទី១។ ចាប់ផ្តើមពីតួអក្សរទី១ នៃជួរទី១ ដោយចង្អុលតួអក្សរ ហើយសួរកុមារ។ និយាយថា៖ **ពូ/មីងនឹងចង្អុលតួអក្សរណាមួយ ហើយក្មួយហៅឈ្មោះតួអក្សរនោះបើក្មួយមិនដឹងទាំងអស់ក៏មិនអីដែរ សូមក្មួយឆ្លើយឱ្យបានល្អណា។**
ចង្អុលទៅតួអក្សរទី១ នៃជួរទី១ ហើយសួរកុមារ៖ **តើនេះជាអក្សរអ្វី?**

ចាប់បន្តសួរកុមារពីអក្សរមួយទៅអក្សរមួយ ដោយប្រើចង្អុលដៃរហូតដល់ចប់តួអក្សរក្នុងជួរទាំងអស់ បើកុមារអានបានពាក្យណាមួយបានក្នុងជួរទី១។ ហើយនិយាយ៖ **សូមមើលអក្សរក្នុងជួរផ្សេងទៀត ពូ/មីងចង់ដឹងថាក្មួយស្គាល់អក្សរណាខ្លះទៀត។**

១៨០ វិនាទី

⊃ ប្រសិនបើសិស្សម្នាក់ស្ទើរ ឬឈប់នៅតួអក្សរណាមួយក្នុង រយៈពេល ៥ វិនាទី សូមចង្អុលទៅតួអក្សរផ្សេងហើយនិយាយ៖ **ចុះតួអក្សរនេះវិញ?**

✋ ប្រសិនបើសិស្សមិនឆ្លើយបានត្រឹមត្រូវចំនួន ១០ តួអក្សរ ដំបូង សូមនិយាយថា "**អរគុណ**" បញ្ឈប់ត្រឹមហ្នឹងហើយគូសសញ្ញា √ នៅក្នុងប្រអប់ខាងក្រោម ហើយបន្តកិច្ចការបន្ទាប់ទៀត។

✎ (/) ប្រសិនបើសិស្សអានពាក្យណាមួយមិនបានត្រឹមត្រូវ សូមគូសសញ្ញា (/) នេះនៅលើពាក្យនោះ។
(Ø) ប្រសិនបើសិស្សបានអានពាក្យណាមួយខុស ប៉ុន្តែបើភ្លាមៗនោះ សិស្សកែតម្រូវ ដោយអានពាក្យនោះមកត្រូវវិញ សូមគូសរង្វង់ជុំវិញសញ្ញា (/) នេះ។ ដូច្នេះ យើងនឹងឃើញមានសញ្ញា (Ø) នៅលើពាក្យដែលបានកែតម្រូវនោះ។
ឧទាហរណ៍៖ ជ ឆ

១	២	៣	៤	៥
ច	ស	ក	គ	ន
រ	ង	ប	ម	ល
ខ	ដ	ណ	ញ	ព
ទ	យ	អ	ក	ជ

✎ លំហាត់នេះមិនត្រូវបានបន្ត ដោយសារសិស្សឆ្លើយមិនបានត្រឹមត្រូវក្នុងជួរទី១។
✎ លំហាត់នេះមិនត្រូវបានបន្ត បើសិនកុមារសុំឈប់។
✎ ពេលម៉ោងក្នុងនាឡិកាដែលនៅសល់ (ចំនួនវិនាទីដែលនៅសល់)

អរគុណ! យើងបន្តទៅផ្នែកមួយទៀត!

2

កិច្ចការរង #៣ ការស្តាប់ដោយយល់ន័យ	ទំព័រ ៣	⏱ មិនកំណត់ម៉ោង

រឿង៖

និយាយថា ៖ ឥឡូវពូ/មីងនឹងប្រាប់កូនពីរឿងមួយដ៏គួរឱ្យចាប់អារម្មណ៍ ។ បន្ទាប់ពីស្តាប់រឿងចប់ ពូ/មីងនឹងសួរសំណួរខ្លះដល់កូន ។ តើកូនយល់ព្រមទេ?

និយាយថា រឿងនេះមានចំណងជើងថា ឆ្មានិងកណ្តុរ ។
កាលពីយូរលង់ណាស់មកហើយ មានឆ្មាចាស់មួយ។ វាតែងតែពាក់មួកពណ៌ក្រហម។ នៅពេលវាកំពុងដេក មានកណ្តុរតូចមួយរត់មកជិតវាដោយស្ងៀមស្ងាត់ ហើយបានលួចមួករបស់វា។ ឆ្មាភ្ញាក់ឡើងហើយបាត់មួកវា។ វាខឹងខ្លាំងណាស់ ហើយចាប់ផ្តើមរត់ដេញតាមកណ្តុរ។ មួយសន្ទុះក្រោយមក ឆ្មាចាប់កណ្តុរបាននៅក្រោមគុម្ពោត ហើយវាមិនអាចរត់ទៅណារួចឡើយ។ ដូច្នេះ កណ្តុរក៏និយាយទៅកាន់ឆ្មាថា «សូមកុំស៊ីខ្ញុំអី បងឆ្មា»។ បើបងទុកជីវិតឱ្យខ្ញុំ នោះខ្ញុំនឹងសងមួកបងវិញ។ បន្ទាប់ពីបានមួកត្រឡប់មកវិញ ឆ្មានិយាយថា «សូមកុំលួចមួកយើងទៀត» ហើយបន្ទាប់មក ឆ្មាក៏ត្រឡប់ទៅដេកវិញ ដោយអារម្មណ៍រីករាយ ។

ឥឡូវពូ/មីងនឹងសួរសំណួរខ្លះៗទាក់ទងនឹងសាច់រឿងនេះ ។
សួរសំណួរម្តងមួយៗ ហើយចាំស្តាប់។

➲ ប្រសិនបើសិស្សពាក់ព័ន្ធឈប់នៅសំណួរណាមួយ អាចនិយាយសំណួរឡើងវិញបើចាំបាច់ (បានតែម្តងគត់ក្នុងមួយសំណួរ)

✇ មិនមានកោយការបញ្ឈប់ទេ

	ការណែនាំ	ចម្លើយដែលត្រឹមត្រូវ	ត្រឹមត្រូវ (1)	មិនត្រឹមត្រូវ / មិនដឹង / គ្មានចម្លើយ (0)	មិនឆ្លើយ (99)
៣ក	**នរណាលួចមួករបស់ឆ្មា?**	កណ្តុរ			
៣ខ	**តើមួកមានពណ៌អ្វី?**	ក្រហម			
៣គ	**ហេតុអ្វីឆ្មាដេញចាប់កណ្តុរ ?**	ព្រោះកណ្តុរលួច/យកមួកវា			
៣ឃ	**តើកណ្តុរត្រូវចាប់បាននៅត្រង់កន្លែងណា?**	ក្រោមគុម្ព			
៣ង	**ហេតុអ្វីឆ្មាមិនស៊ីកណ្តុរ?**	ព្រោះកណ្តុរឱ្យមួកមកវាវិញ			

➘ ពិបាកនេះមិនត្រូវបានបន្ត ដោយសារសិស្សស្ងាត់។

នេះជាចុងបញ្ចប់នៃការវាយតម្លៃនេះ ។
ពេលចប់ការវាយតម្លៃ និយាយថា ៖ **នេះជាសំណួរចុងក្រោយរបស់ពូ/មីងហើយ ។ អរគុណកូនដែលចូលរួម!**

3

Adapted Early Grade Reading Assessment

ការវាយតម្លៃផលជៈអំណានថ្នាក់ទី១៖ ទម្រង់សម្រាប់ចម្លើយរបស់សិស្ស

<u>ការណែនាំទូទៅ</u>

បង្កើតបរិយាកាសលេងជាមួយសិស្សតាមរយៈការសន្ទនាងាយៗ (មើលឧទាហរណ៍ ខាងក្រោម)។ សិស្សគួរតែអាចទទួលបានការវាស់ស្ទង់សមត្ថភាពជាលក្ខណៈកំសាន្ត ជាជាងការធ្វើតេស្ត ឬប្រលងជាក់ពិន្ទុ។ សូមយកពេលវេលានេះដើម្បីកំណត់ភាសាដែលកុមារចូលចិត្តប្រើប្រាស់ក្នុងការទាក់ទង។ សូមអានឱ្យឮៗ យឺតៗ និងច្បាស់ៗ នៅផ្អែកក្នុងប្រអប់តែប៉ុណ្ណោះ។

អរុណសួស្តី។ ខ្ញុំឈ្មោះ ____ និងរស់នៅ _____។ ខ្ញុំសូមធ្វើការណែនាំខ្លួន។ [សូមប្រាប់សិស្សពីចំនួនកូនរបស់អ្នកនិងអាយុរបស់កូនៗ ប្រភេទកីឡា កម្មវិធីទូរទស្សន៍ ឬវិទ្យុដាដើមដែលអ្នកចូលចិត្ត] **១. តើប្អូនចូលចិត្តធ្វើអ្វីខ្លះពេលប្អូនចេញលេង?** [រង់ចាំចម្លើយ ប្រសិនបើសិស្សមានការស្ទាក់ស្ទើរសួរសំណួរទី២ ប៉ុន្តែប្រសិនបើពួកគាត់មានទំនុកចិត្តឆ្លើយ សូមបន្តទៅកិច្ច ព្រមព្រៀងថ្នាល់មាត់។] **២. តើល្បែងអ្វីដែលប្អូនៗចូលចិត្តលេង?**

<u>កិច្ចព្រមព្រៀងដោយថ្នាល់មាត់</u> ៖ អានអត្ថបទនៅក្នុងប្រអប់ខាងក្រោមឱ្យច្បាស់ៗទៅកាន់សិស្ស។

- **ខ្ញុំសូមប្រាប់មូលហេតុដែលខ្ញុំមកទីនេះ។ ខ្ញុំធ្វើការជាមួយសាលារៀនប្អូន និងក្រសួងអប់រំ ហើយពួកខ្ញុំកំពុងព្យាយាមស្វែងយល់ពីរបៀបដែលសិស្សរៀនអាន។ ពួកខ្ញុំបានជ្រើសរើសប្អូនៗដោយចៃដន្យ។**
- **ខ្ញុំចង់ឱ្យប្អូន ចូលរួមជាមួយខ្ញុំ ប៉ុន្តែប្រសិនបើប្អូនមិនចង់ចូលរួមក៏បានដែរ។**
- **យើងនឹងលេងល្បែងដែលទាក់ទងនឹងការអាន។ ខ្ញុំនឹងឱ្យប្អូនអានអក្សរ ពាក្យ និងអានរឿងខ្លីៗឮៗ។**
- **នេះមិនមែនជាការធ្វើតេស្តនោះទេ ហើយវានឹងមិនប៉ះពាល់ដល់ពិន្ទុក្នុងថ្នាក់រៀនរបស់ប្អូនឡើយ។**
- **ខ្ញុំសូមបញ្ជាក់ប្រាប់ម្តងទៀតថា ប្រសិនបើប្អូនណាមិនចង់ចូលរួមក៏បានដែរ។ នៅពេលដែលយើងចាប់ផ្តើម ប្រសិនបើប្អូនណាមិនចង់ឆ្លើយសំណួរណាមួយក៏បានដែរ។**
- **តើប្អូនមានសំណួរអ្វីដែរឬទេ? តើប្អូនត្រៀមខ្លួនហើយឬនៅ?**

គូសក្នុងប្រអប់ ប្រសិនជាមានការយល់ព្រមទៅលើការព្រមព្រៀងដោយថ្នាល់មាត់៖ ☐ *ចាស/ចាស*

A. កាលបរិច្ឆេទវាយតម្លៃ (ឧ. 5 ឧសភា 2013 = 5/03/2013)	ថ្ងៃ៖_____ ខែ៖_____ ឆ្នាំ៖_____	H. កម្រិតថ្នាក់៖	☐ *ថ្នាក់ទី១*
B.ខេត្ត៖			
C.ស្រុក៖		I. លេខសិស្ស៖	
D. ឈ្មោះអ្នកសម្ភាសន៍៖		J. ខែឆ្នាំកំណើតសិស្ស៖	ខែ____ ឆ្នាំ____
E: ឈ្មោះសាលា៖		K. ភេទ៖	☐ប្រុស ☐ស្រី
F: កូដសាលាក្នុង EMIS ៖		**ម៉ោងចាប់ផ្តើម**	
G. វេនសិក្សា៖	☐ = ពេញមួយថ្ងៃ(៨ ម៉ោង) ☐ = ពេលព្រឹក (៤ម៉ោង)		____ : ____ ☐ ព្រឹក [ជ្រើសមើលមួយ] ☐ រសៀល

	□ =ពេលរសៀល(៤ ម៉ោង)		

កិច្ចការរង # ១. ការកំណត់ឈ្មោះតួអក្សរ(ព្យញ្ជនៈ)	**🕮 ចំណុច ១**	**⏱ ១៨០វិនាទី**
●ឥឡូវនេះយើងនឹងលេងល្បែងតួអក្សរ។ក្នុងឯកសារនេះជាបញ្ជីតួអក្សរដែលមានព្យញ្ជនៈ។ សូមប្អូនអានតួអក្សរនេះឱ្យឮៗ ច្បាស់ៗ និងឱ្យបានច្រើន តាមដែលអាចធ្វើទៅបាន។ **ឧទាហរណ៍ អក្សរនេះ**[ចង្អុលទៅអក្សរ]**គឺ «ធ»** **ចាប់ផ្តើមសាកល្បង ៖ តើនេះជាអក្សរអ្វី?** [ចង្អុលទៅអក្សរ«ម»] [ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! អក្សរនេះគឺ «ម»។** [ប្រសិនបើសិស្សឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **អក្សរនេះគឺ «ម»។** **ឥឡូវសាកល្បងអក្សរមួយផ្សេងទៀត ៖ តើនេះជាអក្សរអ្វី?** [ចង្អុលទៅអក្សរ «ស»] [ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! អក្សរនេះគឺ «ស»។** [ប្រសិនបើសិស្សឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **អក្សរនេះគឺ «ស»។** **នៅពេលខ្ញុំនិយាយថា "ចាប់ផ្តើម" ត្រូវអានដោយចាប់ផ្តើមពីនេះ**[ចង្អុលទៅអក្សរដំបូងនៅលើជួរដេកបន្ទាប់ពីឧទាហរណ៍] **ហើយបន្តតាមរបៀបនេះ** [បន្តចង្អុលតួអក្សរបន្តបន្ទាប់ដល់ចុងនៃបន្ទាត់ដំបូង]។ **ចង្អុលតួអក្សរនីមួយៗ ហើយប្រាប់ខ្ញុំពីអក្សរទាំងនោះឱ្យបានឮៗ។ ចូរអានឱ្យបានលឿន និងយកចិត្តទុកដាក់បំផុតតាមដែលអាចធ្វើបាន។** **ប្រសិនបើតួអក្សរណាដែលប្អូនមិនស្គាល់ សូមបន្តទៅកាន់តួអក្សរបន្ទាប់។ សូមប្អូនចង្អុលអក្សរដំបូងគេ។ ត្រៀមខ្លួនរួចរាល់ហើយឬនៅ? គោះចាប់ផ្តើម!**	**➲**ប្រសិនបើសិស្សស្ងាក់ស្មើរ ឬឈប់នៅតួអក្សរណាមួយក្នុងរយៈពេល<u>៣វិនាទី</u> សូមចង្អុលតួអក្សរបន្ទាប់ ហើយនិយាយថា "**ទៅមុខទៀត**"	

✍ (/) ប្រសិនបើសិស្សអានពាក្យណាមួយមិនបានត្រឹមត្រូវ សូមគូសសញ្ញា (/) នេះនៅលើពាក្យនោះ។
✍ (ø) ប្រសិនបើសិស្សកែពីអានខុសមកត្រូវវិញ សូមគូសរង្វង់ជុំវិញសញ្ញា (/) នេះ។ ដូច្នេះយើងនឹងឃើញមានសញ្ញា (ø) *នៅលើពាក្យដែលបានកែកម្រូវនោះ។*

ឧទាហរណ៍: ធ ម ស

១	២	៣	៤	៥	៦	៧	៨	៩	១០	១១	
ប	ស	ក	រ	ង	ម	ន	ត	ច	ល	ព	(១១)
ទ	យ	ជ	ខ	ញ	ដ	អ	គ	ណ	វ	ផ	(២២)
ភ	ហ	ថ	ធ	ឆ	ឃ	ឡ	ឈ	ឋ	ឌ	ឍ	(៣៣)

✍ ពេលវេលាដែលនៅសល់ (ចំនួនវិនាទី)	

អរគុណ! តោះបន្តទៅកិច្ចការមួយទៀត!

កិច្ចការរង # ២. ការកំណត់ឈ្មោះតួអក្សរ(ស្រៈ) | **🕮 ទំព័រ ២** | **⏲ ១៨០វិនាទី**

ឥឡូវនេះយើងនឹងលេងល្បែងតួអក្សរ។ ក្នុងទំព័រនេះជាបញ្ជីតួអក្សរដែលមានស្រៈ។ សូមប្អូនអានតួអក្សរនេះឱ្យឮៗ ច្បាស់ៗ និងឱ្យបានច្រើន តាមដែលអាចធ្វើទៅបាន។

ឧទាហរណ៍ អក្សរនេះ[ចង្អុលទៅអក្សរ ◌ៅ]**គឺ «◌ៅ»**
ចាប់ផ្តើមសាកល្បង ៖ តើនេះជាអក្សរអ្វី? [ចង្អុលទៅអក្សរ«◌ា»]
[ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! អក្សរនេះគឺ «◌ា»។**
[ប្រសិនបើសិស្សឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **អក្សរនេះគឺ «◌ា»។**
ឥឡូវសាកល្បងអក្សរមួយផ្សេងទៀត ៖ តើនេះជាអក្សរអ្វី? [ចង្អុលទៅអក្សរ «◌ួ»]
[ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! អក្សរនេះគឺ « ◌ួ »។**
[ប្រសិនបើសិស្សឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **អក្សរនេះគឺ « ◌ួ »។**

នៅពេលខ្ញុំនិយាយថា "ចាប់ផ្តើម" ត្រូវអានដោយចាប់ផ្តើមពីនេះ[ចង្អុលទៅអក្សរដំបូងនៅលើជួរដេកបន្ទាប់ពីឧទាហរណ៍] **ហើយបន្តតាមរបៀបនេះ** [បន្តចង្អុលតួអក្សរបន្តបន្ទាប់ដល់ចុងនៃបន្ទាត់ដំបូង]។ **ចង្អុលតួអក្សរនីមួយៗ ហើយប្រាប់ខ្ញុំពីអក្សរទាំងនោះឱ្យបានឮៗ។ ចូរអានឱ្យបានលឿន និងយកចិត្តទុកដាក់បំផុតតាមដែលអាចធ្វើបាន។**

ប្រសិនបើតួអក្សរណាដែលប្អូនមិនស្គាល់ សូមបន្តទៅកាន់តួអក្សរបន្ទាប់។ សូមប្អូនចង្អុលអក្សរដំបូងគេ។ ត្រៀមខ្លួនរួចរាល់ហើយឬនៅ? តោះចាប់ផ្តើម!

➲ប្រសិនបើសិស្សស្ទាក់ស្ទើរ ឬឈប់នៅតួអក្សរណាមួយក្នុងរយៈពេល៣វិនាទី សូមចង្អុលតួអក្សរបន្ទាប់ ហើយនិយាយថា "**ទៅមុខទៀត**"

✍ (/) ប្រសិនបើសិស្សអានពាក្យណាមួយមិនបានត្រឹមត្រូវ សូមគូសសញ្ញា (/) នេះនៅលើពាក្យនោះ។
✍ (ø) ប្រសិនបើសិស្សកែពីអានខុសមកត្រូវវិញ សូមគូសរង្វង់ជុំវិញសញ្ញា (/) នេះ។ ដូច្នេះយើងនឹងឃើញមានសញ្ញា (ø) *នៅលើពាក្យដែលបានកែកម្រងនោះ។*

ឧទាហរណ៍: ◌ោ ◌ា ◌ួ

១	២	៣	៤	៥	៦	
◌ុ	◌ះ	◌ាំ	◌ិ	◌ា	◌ែ	(៦)
◌ៃ	◌ោះ	◌េះ	◌ី	◌ើ	◌្រើ	(១២)
◌ុះ	◌ោ	◌ៃ	◌ៈ	◌ី	◌ៀ	(១៨)
◌ៅ	◌ំ	◌ំ◌ៈ	◌ឹ	◌ូ		(២៤)

✍ ពេលវេលាដែលនៅសល់ (ចំនួនវិនាទី)	

អរគុណ! តោះបន្តទៅកិច្ចការមួយទៀត!

កិច្ចការទី # ២. ការកំណត់ឈ្មោះតួអក្សរ(កំណត់ឈ្មោះតួអក្សរកម្រិតខ្ពស់)	**📖 ចំណាំ ៣**	**⏱ ៦០វិនាទី**
✱ ក្នុងចំណាំនេះមានជាបញ្ជីតួអក្សរដែលមានព្យញ្ជនៈ ស្រៈនិស្ស័យ ស្រៈពេញតួ និងជើងព្យញ្ជនៈ។ សូមប្អូនអានតួអក្សរនេះឱ្យឮៗ ច្បាស់ៗ និងឱ្យបានច្រើន តាមដែលអាចធ្វើទៅបាន។ **ឧទាហរណ៍ អក្សរនេះ**ចង្អុលទៅអក្សរ ឧ]គឺ «ឧ» **ចាប់ផ្តើមសាកល្បង ៖ តើនេះជាអក្សរអ្វី?** [ចង្អុលទៅអក្សរ« ឧ »] [ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! អក្សរនេះគឺ « ឧ »។** [ប្រសិនបើសិស្សឆ្លើយពុំបានត្រឹមត្រូវ សូមនិយាយថា] **អក្សរនេះគឺ « ឧ »។** **ពីខ្សែសាកល្បងអក្សរមួយផ្សេងទៀត ៖ តើនេះជាអក្សរអ្វី?** [ចង្អុលទៅអក្សរ « ញ »] [ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! អក្សរនេះគឺ « ញ »។** [ប្រសិនបើសិស្សឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **អក្សរនេះគឺ « ញ »។** **នៅពេលខ្ញុំនិយាយថា "ចាប់ផ្តើម" ត្រូវអានដោយចាប់ផ្តើមពីនេះ** [ចង្អុលទៅអក្សរដំបូងទៅតួអក្សរដំបូងនៅលើជួរដេកបន្ទាប់ពីឧទាហរណ៍] **ហើយបន្តតាមរបៀបនេះ** [បន្តចង្អុលតួអក្សរបន្តបន្ទាប់ដល់ចុងនៃបន្ទាត់ដំបូង]**។ ចង្អុលតួអក្សរនីមួយៗ ហើយប្រាប់ខ្ញុំពីអក្សរទាំងនោះឱ្យបានឮៗ។ ចូរអានឱ្យបានលឿន និងយកចិត្តទុកដាក់បំផុតតាមដែលអាចធ្វើបាន។** **ប្រសិនបើតួអក្សរណាដែលប្អូនមិនស្គាល់ សូមបន្តទៅកាន់តួអក្សរបន្ទាប់។ សូមប្អូនចង្អុលអក្សរដំបូងគេ។ ត្រៀមខ្លួនរួចរាល់ហើយឬនៅ? តោះចាប់ផ្តើម!**	ចាប់ផ្តើមកំណត់ពេលវេលានៅលើនាឡិការពេលសិស្សអានតួអក្សរដំបូង។ ➲ប្រសិនបើសិស្សស្នាក់ស្ងើរ ពុះពេប៉ នៅតួអក្សរណាមួយក្នុងរយៈពេល៣វិនាទី សូមចង្អុលបន្ថែមតួអក្សរបន្ទាប់ ហើយនិយាយថា "**ទៅមុខទៀត**" ✱នៅពេលដែលនាឡិការលោតដល់លេខសូន្យត្រូវនិយាយថា"**ឈប់**" ✱ប្រសិនបើសិស្សមិនអាចអានបានត្រឹមត្រូវនៃបន្ទាត់ទី១ដែលមាន(១០តួអក្សរ)ត្រូវនិយាយថា"**អរគុណ**!"សូមបញ្ចប់ផ្នែកនេះ ហើយគូសក្នុងប្រអប់ខាងក្រោមរួចបន្តទៅផ្នែកបន្ទាប់។
✱ (/) ប្រសិនបើសិស្សអានពាក្យណាមួយមិនបានត្រឹមត្រូវ សូមគូសសញ្ញា (/) នេះនៅលើពាក្យនោះ។ ✱ (ø) ប្រសិនបើសិស្សកែពីរអានខុសមកត្រូវវិញ សូមគូសរង្វង់ជុំវិញសញ្ញា (/) នេះ។ ដូច្នេះហើយនឹងបើញមានសញ្ញា (ø) *នៅលើពាក្យដែលបានកែពាត្រូវនោះ។* ✱ ( ]) សូមគូសសញ្ញា ( ]) នេះ នៅខាងក្រោយពាក្យដែលសិស្សបានអាន ចុងក្រោយគេពេលអស់នាទី *ឧទាហរណ៍:* ឧ ឆ ា	

១	២	៣	៤	៥	៦	៧	៨	៩	១០	
ដ៏	ៀ	វ៌	ោ	ថ	្ឋ	ឪ	ក	ព	ឿ	(១០)
ញ	្ឆ	ើ	អ	រ	្ត	ល	ឍ	ៅ	្ឃ	(២០)
ះ	ត	ធ	ី	ឬ	ឯ	ទ	្យ	ឩ	ឡ	(៣០)
ស	្ក	ខ	ឆ	គ	្ឈ	េ	ច	ឃ	្ថ	(៤០)
ជ	ិះ	ហ	ំ	ត	ឈ	ុ	ន	ឥ	ោះ	(៥០)
្ម	ប	ឹ	យ	ឺ	ផ	្ស	ឫ	ភ	ី	(៦០)
ម	ណ	ុំ	េះ	ំ	ង	្វ	រ	ឋ	ុះ	(៧០)
្ល	ា	្ភ	្រ	អ	្ឈ	ក	្ង	ម	ឱ	(៨០)
ឃ	្ខ	ប	ង	ស	្ន	្ឃ	ច	្ជ	្ព	(៩០)
្ទ	្យ	្ហ	ខ	ា	ិ	ែ	ៃ	ព	ាំ	(១០០)

ពេលវេលាដែលនៅសល់ (ចំនួនវិនាទី)

លំហាត់នេះត្រូវបញ្ឈប់ ដោយសារសិស្សមិនអាចអានបានត្រឹមត្រូវនូវតួអក្សរណាមួយនៅក្នុងបន្ទាត់ទីមួយ

កិច្ចការរង #២. ការអានពាក្យដែលស្គាល់	**ចំណាំ 3**	⏱ ៦០វិនាទី
• នេះគឺជាបញ្ជីពាក្យខ្លះៗ។ សូមប្អូនអានពាក្យនេះឱ្យឮៗ ច្បាស់ៗ និងឱ្យបានច្រើន តាមដែលអាចធ្វើទៅបាន។ មិនត្រូវប្រកបទេ ប៉ុន្តែត្រូវអានពាក្យតែម្តង។ **ឧទាហរណ៍ពាក្យនេះគឺ "ឆ្នា" ។** **ចាប់ផ្តើមសាកល្បង ៖ សូមអានពាក្យនេះ**[ចង្អុលទៅអក្សរ "ឈើ"]៖ ប្រសិនបើសិស្សឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! ពាក្យនេះគឺ "ឈើ" ។** ប្រសិនសិស្សឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **ពាក្យនេះគឺ "ឈើ" ។** **ឥឡូវចាប់ផ្តើមសាកល្បងពាក្យមួយទៀត៖សូមអានពាក្យនេះ**[ចង្អុលពាក្យ "បង្កើត"]: ប្រសិនបើឆ្លើយបានត្រឹមត្រូវ សូមនិយាយថា] **ល្អ! ពាក្យនេះគឺ "បង្កើត" ។** ប្រសិនបើឆ្លើយមិនបានត្រឹមត្រូវ សូមនិយាយថា] **ពាក្យនេះគឺ "បង្កើត" ។** **នៅពេលខ្ញុំនិយាយថា "ចាប់ផ្តើម" ត្រូវអានដោយចាប់ផ្តើមពីនេះ**[ចង្អុលទៅពាក្យដំបូងនៅលើជួរដេកបន្ទាប់ពីឧទាហរណ៍] **ហើយបន្តតាមរបៀបនេះ** [បន្តចង្អុលពាក្យបន្តបន្ទាប់ដល់ចុងនៃបន្ទាត់ដំបូង]**។ អានឱ្យបានលឿន និងយកចិត្តទុកដាក់បំផុតតាមដែលអ្នកអាចធ្វើបាន។ ប្រសិនបើពាក្យដែលប្អូនមិនចេះ សូមបន្តទៅពាក្យបន្ទាប់។ សូមប្អូនចង្អុលពាក្យដំបូងគេ។ ត្រៀមខ្លួនរួចរាល់ហើយឬនៅ? គោះចាប់ផ្តើម!**	ចាប់ផ្តើមកំណត់ពេលវេលានៅលើនាឡិកាពេលសិស្សចាប់ផ្តើមអានពាក្យដំបូងគេ។ ➲ប្រសិនបើសិស្សស្ទាក់ស្ទើរ ឬឈប់នៅពាក្យណាមួយ ក្នុងរយៈពេល ៣វិនាទី សូមចង្អុលពាក្យបន្ទាប់ ហើយនិយាយថា៖**ទៅមុខទៀត**៖ ➲នៅពេលដែលនាឡិកាលោតដល់លេខសូន្យត្រូវនិយាយថា "**ឈប់**" ➲ប្រសិនបើសិស្សមិនអាចអានបានត្រឹមត្រូវនូវពាក្យបន្ទាត់ទី១ដែលមាន(៥ពាក្យ)ត្រូវនិយាយថា"**អរគុណ!**" សូមបញ្ចាប់ផ្នែកនេះ ហើយគូសក្នុងប្រអប់ខាងក្រោម រួចបន្តទៅផ្នែកបន្ទាប់។
➲ (/) ប្រសិនបើសិស្សអានពាក្យណាមួយមិនបានត្រឹមត្រូវ សូមគូសសញ្ញា (/) នេះនៅលើពាក្យនោះ។ ➲ (ø) ប្រសិនបើសិស្សកែពីអានខុសមកត្រូវវិញ សូមគូសរង្វង់ជុំវិញសញ្ញា (/) នេះ។ ដូច្នេះបើឯងនឹងឃើញមានសញ្ញា (ø) *នៅលើពាក្យដែលបានកែតម្រូវនោះ។* ➲ (]) សូមគូសសញ្ញា (]) នេះ នៅខាងក្រោយពាក្យដែលសិស្សបានអាន ចុងក្រោយគេពេលអស់នាទី។ ឧទាហរណ៍៖ ឆ្នា ឈើ បង្កើត	

១	២	៣	៤	៥	
ទឹក	ធ្វើ	កុំ	ថ្ងៃ	អាហារ	(៥)
មក	នៅ	នេះ	សរសេរ	កង្កែប	(១០)
ជា	ប្រកបា	ទៅ	អាន	ពេច	(១៥)
បង	ខ្មែរ	គាត់	ខោ	ស្រះ	(២០)
តាម	ណា	នឹង	សៀវភៅ	រៀន	(២៥)
បាន	ចិញ្ចឹម	ដោយ	ការ	គោរព	(៣០)
ចាំ	ចូរ	មាន	រំណាន	ព្យញ្ជនៈ	(៣៥)
ជាក់	សំណាង	កំហុស	ត្រូវ	សំណួរ	(៤០)
ព្រោន	ផ្ទះ	ថា	ឃើង	ពេល	(៤៥)
រក	ទៅ	ល្អហាត់	ចង្ហាន់	ល្បុះ	(៥០)

➲ ពេលវេលាដែលនៅសល់ (ចំនួនវិនាទី)	
➲ លំហាត់នេះត្រូវបញ្ឈប់ ដោយសារសិស្សមិនអាចអានបានត្រឹមត្រូវនូវពាក្យណាមួយនៅក្នុងបន្ទាត់ទីមួយ	

កិច្ចការទី #៣A. ការអានអត្ថបទ 📖 ទំព័រ 4	⏱ ១៨០វិនាទី
● នេះគឺជារឿងខ្លី។ ខ្ញុំចង់ឱ្យប្អូនអានឱ្យឮ លឿន ហើយយកចិត្តទុកដាក់។ បន្ទាប់ពីប្អូនអានចប់ ខ្ញុំនឹងសួរសំណួរមួយចំនួនអំពីអ្វីដែលប្អូនបានអាន។ នៅពេលដែលខ្ញុំនិយាយថា «ចាប់ផ្តើម» ចូរអានរឿងនេះឱ្យបានល្អបំផុតតាមដែលអាចធ្វើបាន។ ប្រសិនបើប្អូនមិនចេះអានពាក្យណាមួយ សូមបន្តទៅពាក្យបន្ទាប់។ សូមប្អូនចង្អុលពាក្យដំបូងគេ។ ត្រៀមខ្លួនរួចរាល់ហើយឬនៅ? សូមចាប់ផ្តើម។ *បន្ទាប់ពីសិស្សបញ្ចប់ការអានរបស់គេមិនត្រូវដកអត្ថបទរឿងចេញពីមុខសិស្សទេ។*	ចាប់ផ្តើមកំណត់ពេលវេលានៅពេលដែលសិស្សចាប់ផ្តើមអានពាក្យដំបូងគេ។ ➲ប្រសិនបើសិស្សស្ទាក់ស្ទើរ ឬឈប់នៅពាក្យណាមួយ ក្នុងរយៈពេល ៣វិនាទី សូមចង្អុលពាក្យបន្ទាប់ហើយនិយាយថា «**ទៅមុខទៀត**» ⏱នៅពេលដែលនាឡិការោទ៍ដល់ពេលសូមត្រូវនិយាយថា "**ឈប់**" ※ប្រសិនបើសិស្សមិនអាចអានបានត្រឹមត្រូវនៅក្នុងល្បះដំបូងដែលមាន៤ពាក្យត្រូវនិយាយថា "**អរគុណ**" សូមបញ្ចប់ផ្នែកនេះ ហើយគូសក្នុងប្រអប់ខាងក្រោម ។

↘ (/) ប្រសិនបើសិស្សអានពាក្យណាមួយមិនបានត្រឹមត្រូវ សូមគូសសញ្ញា (/) នេះនៅលើពាក្យនោះ។ ↘ (Ø) ប្រសិនបើសិស្សកែពីអានខុសមកត្រូវវិញ សូមគូសរង្វង់ជុំវិញសញ្ញា (/) នេះ។ ដូច្នេះហើយនឹងឃើញមានសញ្ញា (Ø) *នៅលើពាក្យដែលបានកែត្រូវនោះ។* ↘ (]) សូមគូសសញ្ញា (]) នេះ នៅខាងក្រោយពាក្យដែលសិស្សបានអានបានរយៈពេល ៦០វិនាទី ហើយអនុញ្ញាតឱ្យសិស្សអានអត្ថបទរហូតដល់ចប់។ សូមបញ្ឈប់នាឡិកានៅពេលសិស្សអានចប់មុន ៦០វិនាទី ឬ ១៨០វិនាទី។	**កិច្ចការទី #៣B. ការយល់អត្ថន័យ** ➲ ប្រសិនបើសិស្សមិនឆ្លើយសំណួរ ក្នុងរយៈពេល១០ វិនាទី ចូរកត់ត្រាថា «គ្មានចម្លើយ» ហើយបន្តទៅសំណួរបន្ទាប់។ មិនត្រូវសួរសំណួរនោះឡើងវិញម្តងទៀតទេ។ ※ ប្រសិនបើសិស្សនិយាយថា «ខ្ញុំមិនចេះ/មិនដឹង» ត្រូវគូសសញ្ញា (✓) នៅខាងក្រោម «មិនត្រឹមត្រូវ» **ឥឡូវ ខ្ញុំនឹងសួរប្អូនអំពីសំណួរមួយចំនួនពីអត្ថបទរឿងដែលប្អូនទើបតែអានអម្បាញ់មិញ។ សូមប្អូនព្យាយាមឆ្លើយសំណួរតាមតែអាចធ្វើបាន។**

	ចំនួន ពាក្យ	សំណួរ (ចម្លើយ)	ត្រឹមត្រូវ	មិនត្រឹមត្រូវ	គ្មានចម្លើយ
រឿង៖ សណ្តានចិត្តរបស់សុខា *(Autostop: 7)*	សរុបចំនួនពាក្យ	សំនួរ (ចម្លើយ)			
រៀងរាល់ ថ្ងៃ សុខា តែងតែ ដើរ ទៅ សាលារៀន។	៧ អង្គុស ៧ ខ្មែរ	***១. តើសុខាធ្វើដំណើរទៅណាជារៀងរាល់ថ្ងៃ?*** *(សាលារៀន)*			
ថ្ងៃមួយ សុខា បាន ជួប នឹង អ៊ំ ពិការ ជើង ដែល ត្រូវការ ជំនួយ។	១៧ អង្គុស ១៨ ខ្មែរ	***២.តើសុខាបានជួបនរណា?*** *(អ៊ំពិការ / អ៊ំ / អ៊ំប្រុស)*			
សុខា បាន ជូន អ៊ំ នោះ ទៅ ដល់ ផ្ទះ ដែល នៅ ជិត សាលារៀន របស់ សុខា។	៣០ អង្គុស ៣២ ខ្មែរ	***៣.តើសុខាបានធ្វើអ្វីជាមួយនឹងម្នាក់នោះ?*** *(ជូនអ៊ំពិការទៅផ្ទះ)*			
អ៊ំ បាន កោតសរសើរ នូវ ទឹកចិត្ត ដ៏ល្អ របស់ សុខា ដែល បាន ជូន គាត់ មក ដល់ ផ្ទះ។	៤០ អង្គុស ៤៧ ខ្មែរ	***៤.តើអ៊ំសំដែងអារម្មណ៍យ៉ាងដូចម្តេច ចំពោះសុខា?*** *(កោតសរសើរ)*			
សុខា មាន អារម្មណ៍ រីករាយ យ៉ាង ខ្លាំង ដែល បាន ធ្វើ នូវ អំពើ ល្អ បែប នេះ។	៥០ អង្គុស ៦១ ខ្មែរ	***៥.តើសុខាជាក្មេងដែលមានចរិកដូចម្តេច?*** *(ចិត្តល្អ / ចេះជួយ / ក្មេងល្អ / **ចម្លើយ ផ្សេងទៀតដែលសមស្រប**)*			
➢ ពេលវេលាដែលនៅសល់ (ចំនួនវិនាទី)					
➢ លំហាត់នេះត្រូវបានបញ្ឈប់ ដោយសារសិស្សមិនអាចអានពាក្យណាមួយត្រឹមត្រូវនៅក្នុងឈ្នះទីមួយ					

សូមអរគុណ! ប្អូនអាចស្រលាំងទៅវិញបានហើយ!

Subtask # 6 DICTATION	✍ ទំព័រ 6	✓ X

● នេះជាការសរសេរតាមដាន ខ្ញុំនឹងអានល្បះពីរដើម្បីឱ្យប្អូនសរសេរលើក្រដាស។ សូមស្តាប់ដោយយកចិត្តទុកដាក់ ខ្ញុំនឹងអានល្បះទាំងមូលម្តងឱ្យប្អូនស្តាប់ បន្ទាប់មកខ្ញុំនឹងអានម្តងមួយពាក្យៗ ដើម្បីឱ្យប្អូនសរសេរតាមអាន ហើយខ្ញុំនឹងអានម្តងទៀតដើម្បីឱ្យប្អូនពិនិត្យផ្ទៀងផ្ទាត់។ តើប្អូនយល់ពីអ្វីដែលត្រូវធ្វើហើយឬនៅ?

សន្លឹកនេះមានបន្ទាត់ចំនួន២។ តើប្អូនឃើញទេ? សូមសរសេរល្បះទី១ នៅបន្ទាត់ទី១ លើសន្លឹកកិច្ចការរបស់ប្អូន។ រួចរាល់ ល្បះទី១គឺ

ត្រូ ពូកែ ពន្យល់ មេរៀន

[អានល្បះលើកទី១ ក្នុងល្បឿនសមស្រប បន្ទាប់មកអានមួយពាក្យៗក្នុងពីរវិនាទី ដោយរង់ចាំ១០វិនាទីមុននឹងអានល្បះជាលើកទី៣ ក្នុងល្បឿនសមស្រប បន្ទាប់មករង់ចាំរយៈពេល ១៥វិនាទីមុនបន្តទៅកាន់ល្បះទី២]

ធ្វើបានល្អ! ឥឡូវយើងនឹងបន្តទៅល្បះទី២។ សូមសរសេរល្បះទី២ នៅបន្ទាត់ទី២ លើសន្លឹកកិច្ចការរបស់ប្អូន។ រួចរាល់ ល្បះទី២គឺ

កសិករ ស្លូង ស្រូវ នៅ រដូវ វស្សា

[អានល្បះលើកទី១ ក្នុងល្បឿនសមស្រប បន្ទាប់មកអានមួយពាក្យៗក្នុងពីរវិនាទី ដោយរង់ចាំ១០វិនាទីមុននឹងអានល្បះជាលើកទី៣ ក្នុងល្បឿនសមស្រប បន្ទាប់មករង់ចាំរយៈពេល ១៥វិនាទីមុននឹងបញ្ចប់កិច្ចការ]

ធ្វើបានល្អ!

ពាក្យ	ពិន្ទុ	ត្រូវ(២)	ត្រូវខ្លះ (១)	មិនត្រូវ (០)	ពាក្យ	ពិន្ទុ	ត្រូវ(២)	ត្រូវខ្លះ(១)	មិនត្រូវ(០)
1. ត្រូ			ត្រ		6. ស្លូង			ស្ល	
2. ពូកែ			ពកែ, ពូ, កែ		7. ស្រូវ			ស្រ	
3. ពន្យល់			ពន		8. នៅ			ន	
4. មេរៀន			មេ		9. រដូវ			រដូ	
5. កសិករ			កសិក, កសិ		10. វស្សា			វស្ស, ស្សា	

សូមអរគុណ! ប្អូនអាចត្រលប់ទៅវិញបានហើយ!	

Adapted Early Grade Mathematics Assessment

ឧបករណ៍សម្ភាសន៍សិស្សថ្នាក់ទី ១

គណិតវិទ្យា

កច្ចការទី១: ការកំណត់ចំនួន	◷ ៦០ នាទី
យើងមានលេខមួយចំនួន គ្រូចង់ឱ្យអ្នកចង្អុលចំនួននីមួយៗ រួចប្រាប់គ្រូថា ជាចំនួនប៉ុន្មាន។ គ្រូនឹងប្រាប់អ្នកថាពេលណាចាប់ផ្តើម ពេលណាឈប់។ • [ចង្អុលលេខទី១]: ចាប់ផ្តើម តើអ្នកត្រៀមហើយនៅ? ..... • តើនេះ ជាលេខប៉ុន្មាន?	• អានពីឆ្វេងទៅស្តាំ ពីលើចុះក្រោមតាមលំដាប់ • ប្រសិនបើពេលនៅលើនាឡិកាកំណត់ម៉ោងអស់ (៦០វិនាទី)ត្រូវដាក់សញ្ញា(/)នេះនៅត្រឹមលេខចុងក្រោយដែលសិស្សបានអាន។
✍(/) មិនត្រឹមត្រូវ ឬគ្មានចម្លើយ (/)បន្ទាប់ពីបានលេខចុងក្រោយ	• បញ្ឈប់សិស្សប្រសិនបើមិនអាចឆ្លើយត្រូវក្នុង៥លេខជាប់ៗគ្នាដំបូង។ • ប្រសិនបើសិស្សមិនអាចអានបានក្នុងកំឡុងពេល៣វិនាទី សូមឱ្យសិស្សបន្តទៅលេខមួយទៀត។

២	៩	០	១២	១៨
៣០	២២	៤៥	៣៩	២៣
៤៨	៦៦	៥៧	៧៤	៩១
៨៣	៥២	៦៥	៨៧	៧៩

ចំនួនត្រឹមត្រូវ	**ចំនួនមិនត្រឹមត្រូវ**	**លេខចុងក្រោយដែលសិស្សបានអាន**	**ពេលវេលានៅសល់**
			..... វិនាទី

កច្ចការទី២: ការកំណត់ចំនួនខុសគ្នា -ការណែនាំ	
ការអនុវត្ត១ ✓ ពិនិត្យមើលចំនួនទាំងនេះ ហើយប្រាប់គ្រូ តើចំនួនណាធំជាងគេ? ៨ ៤ ✓ ត្រឹមត្រូវហើយ ៨ធំជាងគេ។ ហើយបន្តទៅលំហាត់មួយទៀត ✓ ចំនួនធំជាងគេ គឺលេខ ៨[ចង្អុលលេខ៨] នេះ គឺលេខ ៨។ [ចង្អុលលេខ៤] នេះ គឺលេខ ៤។ លេខ៨ ធំជាងលេខ ៤ ហើយបន្តទៅលំហាត់មួយទៀត ។	
ការអនុវត្ត២ ✓ ពិនិត្យមើលចំនួនទាំងនេះ ហើយប្រាប់គ្រូមើល តើចំនួនមួយណាធំជាងគេ? ១០ ១២ ✓ ត្រឹមត្រូវហើយ ១២ធំជាងគេ។ ហើយបន្តទៅលំហាត់មួយទៀត ✓ ចំនួនធំជាងគេ គឺលេខ ១២។ [ចង្អុលលេខ១០] នេះ គឺលេខ១០។ [ចង្អុលលេខ១២] នេះ គឺលេខ១២ ។ លេខ១២ ធំជាងលេខ ១០។ ហើយបន្តទៅលំហាត់មួយទៀត ។	

កច្ចការទី២: ការកំណត់ចំនួនខុសគ្នា

➨ពិនិត្យមើលចំនួនទាំងនេះ ហើយប្រាប់គ្រូ តើចំនួនមួយណាធំជាងគេ? (អានចំនួននីមួយៗឡើងវិញ)

✎ ! = ត្រឹមត្រូវ
0 = មិនត្រឹមត្រូវ ឬគ្មានចម្លើយ

			ត្រឹមត្រូវ	មិនត្រឹមត្រូវ				ត្រឹមត្រូវ	មិនត្រឹមត្រូវ
៧	៥	**៧**			៤៩	៥៨	**៥៨**		
២	៩	**៩**			៦៥	៦៧	**៦៧**		
១៦	៦	**១៦**			៧៤	៤៧	**៧៤**		
១១	២៤	**២៤**			៦៦	៨៦	**៨៦**		
៣៩	២៣	**៣៩**			៩៤	៧៨	**៩៤**		

ចំនួនត្រឹមត្រូវ	ចំនួនមិនត្រឹមត្រូវ	កំហុស៤ដងជាប់គ្នា	
		☐ មាន	☐ គ្មាន

បើសិន សិស្សផ្តល់ចម្លើយខុស៤ដង ជាប់ៗគ្នា ត្រូវបញ្ឈប់ ហើយបន្តទៅកិច្ចការផ្សេងទៀត។

ប្រសិនបើសិស្សមិនអាចឆ្លើយបានក្នុងកំឡុងពេល៥វិនាទី សូមឱ្យសិស្សបន្តទៅលេខមួយទៀត។

កច្ចការទី៣: វិធីបូក : កម្រិតទី១

◷ ៦០វិនាទី

➨នេះ ជាការគណនាលេខបូកមួយចំនួន (ចាប់ពីលើចុះមកក្រោម) គ្រូនឹងប្រាប់អ្នក ពេលណាត្រូវចាប់ផ្តើម ពេលណាត្រូវបញ្ចប់។ ប្រាប់នូវចម្លើយសម្រាប់លំហាត់នីមួយៗ។ ប្រសិនបើ អ្នកមិនដឹងចម្លើយលំហាត់ណាមួយ អ្នកអាចធ្វើលំហាត់មួយទៀត។ តើអ្នកបានត្រៀមខ្លួនហើយនៅ? សូមចាប់ផ្តើម [ចង្អុលលំហាត់ពីទី១]

✎ (/) មិនត្រឹមត្រូវ ឬគ្មានចម្លើយ
(|) បន្ទាប់ពីបានព្យាយាមគិតលំហាត់ចុងក្រោយ

១ + ៣ = **(៤)**	៧ + ៨ = **(១៥)**
២ + ៣ = **(៥)**	៤ + ៧ = **(១១)**
៦ + ២ = **(៨)**	៧ + ៥ = **(១២)**
៤ + ៥ = **(៩)**	៨ + ៦= **(១៤)**
៣ + ៣ = **(៦)**	៩ + ៨ = **(១៧)**
៨ + ១ = **(៩)**	៦ + ៧ = **(១៣)**
៧ + ៣ = **(១០)**	៨ + ៨ = **(១៦)**
៣ + ៩ = **(១២)**	៨ + ៥ = **(១៣)**
២ + ៨ = **(១០)**	១០ + ២ = **(១២)**
៩ + ៣ = **(១២)**	៨ + ១០ = **(១៨)**

- ប្រសិនបើពេលនៅលើនាឡិកាកំណត់ម៉ោងអស់ (៦០វិនាទី)ត្រូវដាក់សញ្ញា(|)នេះនៅត្រឹមលេខចុងក្រោយដែលសិស្សបានអាន។
- បើសិស្សមិនអាចឆ្លើយក្នុងរយៈពេល ៥វិនាទីត្រូវបន្តទៅ អាយតឹមមួយទៀត។
- បើសិស្សផ្តល់ចម្លើយខុស៥ដងជាប់ៗគ្នាជំបូងត្រូវបញ្ឈប់ ហើយបន្តទៅកិច្ចការផ្សេងទៀត។

ចំនួនត្រឹមត្រូវ	ចំនួនមិនត្រឹមត្រូវ	លេខចុងក្រោយដែលសិស្សបានអាន	ពេលវេលានៅសល់
			..... វិនាទី

កច្ចការទី៤: វិធីដក : កម្រិតទី១ | **◷ ៦០វិនាទី**

➨នេះ ជាការគេណនាលេខដកមួយចំនួន (ចាប់ពីលើចុះមកក្រោម) គ្រូនឹងប្រាប់អ្នក ពេលណាត្រូវចាប់ផ្តើម ពេលណាត្រូវបញ្ចប់។ ប្រាប់នូវចម្លើយសម្រាប់លំហាត់នីមួយៗ។ ប្រសិនបើ អ្នកមិនដឹងចម្លើយលំហាត់ណាមួយ អ្នកអាចធ្វើចំណោទមួយទៀត។ តើអ្នកបានត្រៀមខ្លួនហើយនៅ?

សូមចាប់ផ្តើម [ចង្អុលលំហាត់ពីទី១]

- (/) មិនត្រឹមត្រូវ ឬគ្មានចម្លើយ
- (]) បន្ទាប់ពីបានព្យាយាមគិតចំណោទចុងក្រោយ

៤ - ៣ = **(១)**	១៥ - ៨ = **(៧)**
៥- ៣ = **(២)**	១១ - ៧ = **(៤)**
៨ - ២ = **(៦)**	១២ - ៥ = **(៧)**
៩ - ៥ = **(៤)**	១៤ - ៦= **(៨)**
៦ - ៣ = **(៣)**	១៧ - ៨ = **(៩)**
៩ - ១ = **(៨)**	១៣ - ៧ = **(៦)**
១០ - ៣ = **(៧)**	១៦ - ៨ = **(៨)**
១២ - ៩ = **(៣)**	១៣ - ៥ = **(៨)**
១០ - ៨ = **(២)**	១២ - ២ = **(១០)**
១២ -៣ = **(៩)**	១៨ - ០ = **(១៨)**

ចំនួនត្រឹមត្រូវ	ចំនួនមិនត្រឹមត្រូវ	លេខចុងក្រោយដែលសិស្សបានអាន	ពេលវេលានៅសល់
			..... វិនាទី

- ប្រសិនបើពេលនៅលើនាឡិកាកំណត់ម៉ោងអស់ (៦០វិនាទី)ត្រូវដាក់សញ្ញា(])នេះនៅត្រឹមលេខចុងក្រោយដែលសិស្សបានអាន។
- បើសិស្សផ្តល់ចម្លើយខុស៥ដងជាប់ៗគ្នាត្រូវបញ្ឈប់ ហើយបន្តទៅកិច្ចការផ្សេងទៀត។
- បើសិស្សមិនអាចឆ្លើយក្នុងរយៈពេល ៥វិនាទីត្រូវបន្តទៅ អាយតឹមមួយទៀត

Annex 2: Reliability and Validity

The research team conducted an assessment of internal consistency to evaluate reliability. Internal consistency is an appropriate and standard classical evaluation approach for cross-sectional data, and when combined with item-level evaluative psychometric methods, provides insight on item and/or subtask functioning. Internal consistency is the average correlation of all possible half-scale divisions and is frequently provided in published assessment psychometrics.[6] The range of the internal consistency statistic is from zero to one, where higher values are desired and a value of zero indicates inconsistency of measurement. As a general guideline, Cronbach's alpha should be at least 0.70 for adequacy and coefficients closer to one indicate a good assessment.[7]

The Cronbach's alpha coefficient was computed using the STATA analytic software, which produced **Exhibits A2-1** and **A2-2**, below, showing results of the reading and mathematics subtasks for grade 1. The first three columns of these tables provide general subtask information including the subtask name and the number of students accounted for within the subtask. The next three columns provide interrelationship information, including item-test correlations (the correlation between a subtask and the entire scale), item-rest correlations (the correlation between a subtask and the scale that is formed by all other subtasks), and the Cronbach's alpha (discussed above). Overall, the subtask scores show good reliability statistics (Cronbach's alpha of at least 0.80) with alpha scores of 0.84 and 0.89 for the grade 1 Early Grade Reading Assessment and Early Grade Mathematics Assessment, respectively.

Exhibit A2-1: Grade 1 Early Grade Reading Assessment

Grade 1 Reading Subtask	Number of students	Item-Test Correlation	Item-Rest Correlation	Alpha
Letter Identification Score Percent	2692	0.90	0.87	0.82
Familiar Words Score Percent	2692	0.78	0.73	0.82
Extended Time Oral Reading Score Percent	2692	0.74	0.65	0.82
Reading Comprehension Score Percent	2692	0.70	0.61	0.83
Vowels Identification Score Percent	2692	0.89	0.76	0.81
Consonants Identification Score Percent	2692	0.90	0.80	0.79
Overall Test Cronbach's Alpha				**0.84**

Exhibit A2-2: Grade 1 Early Grade Mathematics Assessment

Grade 1 Mathematics Subtask	Number of students	Item-Test Correlation	Item-Rest Correlation	Alpha
Number Identification Score Percent	995	0.94	0.87	0.82
Quantitative Comparison Score Percent	995	0.94	0.87	0.82
Addition Score Percent	995	0.85	0.76	0.87
Subtraction Score Percent	995	0.78	0.69	0.90
Overall Test Cronbach's Alpha				**0.89**

[6] Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 15(3), 297–334.
[7] Aron, A., & Aron, E. (1999). *Statistics for psychology* (2nd ed.). Saddle River, NJ: Prentice Hall.