# Early Grade Mathematics in Nepal:
## Steps Toward a Stronger Foundation

This technical brief shares results and lessons learned from World Education's experience developing and piloting an early grade mathematics intervention and assessment in remote disadvantaged districts in West Nepal. Mathematics has been a neglected challenge in the education sector in Nepal, and that neglect shows in children's poor learning outcomes. Yet, while much work remains to be done to ensure that all Nepali children have a chance to learn core mathematical concepts, the project has developed a strong foundation upon which future work can build. The lessons learned and recommendations stemming from this project should be of interest to policy-makers, program designers, and practitioners alike.

### State of Mathematics Learning in Nepal

In Nepal, as in many low-income countries, the past decade has seen intensive effort directed toward improving Early Grade Reading. Yet, far less attention and funding has been dedicated to Early Grade Math. While interest and investment has improved reading scores in recent years, mathematics outcomes have actually decreased. Results from the 2013 National Assessment of Student Achievement (NASA) indicated that grade 8 achievement in mathematics declined from 43% to 35% between 2011 and 2013; declined in each domain area over the same period; and was below international means as measured by items linked to the multi-country Trends in International Mathematics and Science Study (TIMSS). Results were even poorer in community (government) schools. The NASA report also indicated that the poorest outcomes were for tasks requiring problem-solving, analysis, and higher-order thinking.

Recent small-scale pilot assessments such as the Early Grade Mathematics Assessment (EGMA) and Annual Status of Education Report (ASER) similarly found learning outcomes so low as to demand immediate attention. In remote western Nepal, World Education's pilot EGMA found that less than 5% of children in grades 1-3 demonstrated grade-level mastery of both number sense and basic operations tasks. In Buddhanilkanta, the Annual Status of Education Report (ASER) found 30% of students age 5-7 in community schools could not recognize single-digit numbers, and another 21% could recognize single-, but not double-digit numbers (ASER Nepal, 2018). In the ASER conducted in Parsa district, 50% of children in grades 3-5 could not do grade 2-level subtraction (two double-digit numbers) and 70% of grade 3-5 children could not do simple division (e.g. 12 / 3) (ASER Nepal, 2017). In World Education's diagnostic testing of students in grades 4-8 in Banke and Dang, 62% of students had not mastered grade 3 level math concepts and needed remedial support.

Nepal's School Sector Development Plan 2016-2023 aims for improvement in math achievement, with target increases of 8 percentage points for grade 5 and 18.5 percentage points for grade 8. Yet, as the decline in NASA results cautions, improvement over time does not occur naturally. Without special attention given to improve foundational mathematics skills and understanding in the early grades, Nepal is unlikely to make the gains it wants in upper levels of basic education and beyond. A poor grasp of mathematical concepts early on undermines achievements in higher grades when rote learning and use of standard procedures is no longer sufficient.

Why learning outcomes for math are so poor in Nepal is not clear, and many factors could influence low learning achievement. These might include teachers with poor mathematical knowledge; poor student attendance; overly ambitious curriculum design and pacing; language barriers; gender expectations; rural-urban education disparity; lack of appropriateness for cultural and social diversity; and lack of linkage and relevance to daily life, to name just a few.

# Why Learn Math?

We encounter mathematics daily—when managing money, managing time, and navigating the world around us. What is more, as societies become increasingly industrialized, technology-dependent, and linked to one another in the global economy, mathematics skills and reasoning are at a premium. Research confirms what we intuitively know: that children's future life success is connected in many ways to learning mathematics. Early mathematics learning is linked to higher future earning (Hanushek et al, 2015), general decision-making (Cokely et al, 2018), and later academic success (*Hanushek & Woessmann, 2008; Jolliffe, 1998*) including reading abilities (Duncan et al., 2007; Romano et al., 2010)

Children's mathematics skills are not only important for them as individuals, but also for the society of which they are a part. Differences in countries' economic growth can be predicted by achievement on international assessments of mathematics and science (Hanushek, 2017). Further, these tests are much more predictive of economic growth than is the common metric of years of schooling. In other words, *quality* matters and *learning* matters. Thus, improving math learning is critical and urgent—both for each individual student and for Nepal as a whole.

# What does it mean to learn mathematics?

We know that children must learn math and that improvement is urgently needed in Nepal. But what does it mean for a child to learn mathematics? Is it sufficient to be able to calculate that "six plus seven is thirteen"? Not necessarily. At its core, mathematics requires a conceptual understanding of the ways that we use symbols to represent real quantities and processes in the world around us. A child must understand that "six" is not just the symbol 6 or the Nepali numeral ६ but something like  —a real quantity in the world; that when counting up to six pencils, only one number is assigned to each; that the final number represents not just that object but the entire set; that "plus" means joining two groups together; and that the base 10 system means that the numeral 1 in 13 really represents a set of 10; etc. All of these are complex ideas for a five- or six-year-old brain and require the child to think abstractly and flexibly. So, if a child can chant "six plus seven is thirteen" or write "13" in response to the problem "6+7 = ?" but cannot draw a picture to represent that fact, he or she may have the "correct" answer but at the same time lack a conceptual understanding of what that answer means, thereby leading to a weak foundation for future mathematics skills.

**Foundational Counting Principles**

Learning to count might seem like a straightforward process, but it requires that children achieve specific developmental milestones. In order to count, children need to work (ideally through play, but it *is* mental work) to develop core understandings.

1. *One-to-one correspondence:* Each number represents one, and only one, object.
2. *Stable order:* The order of numbers never changes.
3. *Cardinality: The* last number in a counted set represents the total quantity of the whole set.
4. *Abstraction:* We can count any group of things, even if they are different or intangible.
5. *Order-Irrelevance:* Changing the order in which we count items does not change the total number in the set.

(Gellman & Gallistel, 1978; Geary, 2000)

### In Focus: Number Sense in the Classroom

In early field visits to classrooms in West Nepal, the World Education team found grade 2 students eagerly counting in chorus from 1 to 100. However, when the team gave students a random number within that range—say, 49—and asked the students to continue counting from that starting point, they could not.

Being able to "count on" from any number forms the basis for learning addition. Similarly, being able to count backwards forms the foundation for learning subtraction.

Thus, even though the second grade curriculum already expects children to be moving well beyond math children can do with their fingers, the classroom experience of these children had failed to provide them with the foundational counting principles upon which further math skills are built.

Instead of thinking of numbers as a string of things to be recited, without much meaning, students like these urgently need help developing a strong understanding that numbers represent real quantities in the world.

# Curriculum Review

To improve children's learning, there must first be a framework for what children *should* know and be able to do. To this end, World Education worked with the Ministry of Education Science and Technology (MOEST)—including the Curriculum Development Center (CDC), Education Review Office (ERO), National Center for Education Development (NCED), and Department of Education (DOE)[1]—and Kathmandu University to form a Math Technical Working Group and review the curriculum with the following guiding questions:

» How do children learn mathematics?
» When are they most likely to learn concepts best, according to developmental progression?
» How do the curricular expectations and context of Nepal compare to those of other countries, such as the United States, Kenya, South Africa, and Jamaica?

The group identified a number of challenges related to the curriculum. The existing framework is quite ambitious in both breadth and depth. It targets the top 5-10% of students instead of presenting reasonable expectations for the average 5, 6, or 7 year old. Furthermore, the curriculum proceeds in linear manner, with minimal revision and reinforcement built in. The division of concepts into nine domains means that each topic is only briefly the focus of instruction before teachers move on, making mastery difficult. An emphasis on procedure and products (correct answers) encourages rote memorization at the expense of conceptual understanding. As a result, students who fail to grasp basic concepts find themselves further and further behind. The curriculum and teacher professional development do not support teachers to conduct formative assessment to identify how well (or whether) students are mastering concepts. Teachers simply proceed according to the textbook topic and hope students can keep up. Equity is also a concern: children with learning disabilities and those who speak a minority language are especially disadvantaged by a curriculum that moves too quickly and covers too much.

Based on this assessment, World Education and the Technical Working Group developed a new set of recommended "Minimum Learning Targets." The recommendation includes a reduction in both the number of learning domains and the complexity of the targets. As the name suggests, these are meant to be the *minimum* that all children should learn. While the outcomes do not reflect the entirety of mathematics content, they embody the recommendation that the majority of instructional time ought to focus on these areas to ensure a strong understanding of the most critical concepts and a solid foundation for future learning. A second reason for the smaller number of domains was a consideration of the most meaningful way to communicate targets to teachers to inspire change in the classroom.

### In Focus: Number Sense in the Curriculum

- *Current curricular expectation:* Quantity, symbol and place value **up to six digits** (in both Devanagari and Arabic numerals, and in words)
- *Recommended target:* Quantity, symbol and place value **up to 1000** (in both Devanagari and Arabic numerals, and in words)

**Rationale:** While some students may be able to learn numbers and quantities up to six digits by the end of grade 3, letting this ambitious target set the pace for the curriculum is likely to leave many behind. Many children enter grade 1 with minimal counting abilities and understanding of number as quantity. The revised target promote spending more time to build the foundations of understanding number as quantity, symbols, and the challenging concept of place value with smaller numbers before moving on to larger figures. Investment of time initially will pay off as a strong conceptual foundation will accelerate learning later on as the same concepts are applied to larger numbers.

### Recommended Revised Minimum Learning Targets (Grade 3)

| Domain | Competencies |
|---|---|
| Number Sense | 1. Quantity, Symbols, and Place Value to 1000<br>2. Comparison of numbers up to 1000<br>3. Identifying patterns and skip counting 2-5, 10, and 100 |
| Operations | 1. Conceptual foundations for addition, subtraction, multiplication, division, and fractions.<br>2. Fluency for addition and subtraction 1-20 and adding 100<br>3. Use addition and subtraction with regrouping through 1000<br>4. Multiplication by one-digit numbers and 10 and division by one-digit numbers. |
| Geometry | 1. Recognizing and comparing properties across shapes, including number of sides/angles<br>2. Drawing lines using scale measurement |
| Measurement | 1. Measuring length in standard units with conversion<br>2. Weight in standard units with conversion<br>3. Area and volume in standard units with conversion<br>4. Tell time with hour-minute conversion and read a calendar.<br>5. Identify and use money |
| Data | 1. Represent and interpret data in several categories with bar graphs<br>2. Make a list of elements in a set and write them in set notation. |

[1] Since the time of the review, NCED and DOE have been merged under the Centre for Education and Human Resource Development.

# Teacher Preparation & Support

Research has shown that teaching quality in mathematics has a significant impact on student learning (Ball, 1993; Clements & Sarama, 2008; Hill, Rowan & Ball, 2005). Mathematics learning outcomes in Nepal are unlikely to improve without concerted efforts to improve how teachers teach math. Many primary teachers in Nepal have only completed lower secondary school and have had little formal pedagogical education. While permanent teachers receive regular training opportunities, many early grade teachers are not permanent and are left out.

Currently, teachers tend to focus only on whether students can produce the correct answer. Instead, teachers need to learn to encourage students to learn concepts through exploration, play, using manipulatives, and explaining their thinking. World Education collaborated with CDC and NCED to design a training to complement and build on the EGR training already familiar to teachers and trainers and already delivering results in students' literacy outcomes. In 40 schools, the project piloted a four-day training focused on mathematics and practical approaches to improving student learning, while building on concepts such as student-centered methodologies, continuous assessment, and leveled materials that teachers had already encountered in EGR trainings. Sessions highlighted specific domains and their underlying competencies while providing teachers with practical instructional techniques, including activities and materials to support learning. By leading teachers through hands-on practice organized by domains and learning targets, the training simultaneously improved teachers' instructional techniques and increased their own comfort level with mathematical concepts, as low confidence in their own mathematical abilities is a barrier for many teachers. The workshop especially emphasized use of materials, many of which contain inherent educative properties; methods to connect formal and informal mathematics; use of continuous assessment and differentiated instructions; and fostering student creativity and reasoning.

# Materials Review & Development

World Education's experience in early grade reading suggests that the combining teacher training and provision of materials that facilitate new pedagogical techniques is key to effecting change in teacher behavior and children's learning experiences in the classroom. The goal of World Education's efforts in materials development was thus not only to provide materials for children to fully engage in learning experiences that emphasized process over product and aligned with the new revised learning targets, but also to create tangible reminders for teachers of desired pedagogical methods.

World Education worked closely with Government of Nepal stakeholders, an international expert on Early Grade Mathematics from the University of Massachusetts, and UNICEF representatives to design a comprehensive package of EGM materials. Along with the curriculum review, World Education and these stakeholders reviewed existing EGM materials and assessed their usefulness and cost-efficiency. Where possible, effective existing materials were included or adapted. For example, base 10 blocks are expensive and heavy to transport—a challenge in mountainous Nepal—so this material was adapted into a printable form. The team also looked for gaps to ensure all learning domains had supporting materials. In collaboration with government stakeholders, World Education developed new materials to support learning across all domains from the beginning of grade 1 to the end of grade 3. Feedback from UNICEF, School Supervisors and Resource Persons, and partner NGOs informed further revisions.

The final set of materials included charts, games and manipulatives. Manipulatives, both three-dimensional and printable materials that can be moved, are critical for students to learn to connect mathematical concepts to the world around them. Without objects to touch, move, and explore, mathematics becomes a set of rules to memorize without meaning. Meaningless memorization in early grades sets children up for failure later. Instead, with manipulatives, children learn that mathematics is a way of using symbols to represent real quantities and ideas, and has been identified as a productive instructional strategy in low- and middle-income countries (Sitabkhan & Platas, 2018). Many materials, especially manipulatives for counting, can be developed locally, and the package is intended to be supplemented by locally made materials to further help children connect mathematics to their everyday life.

### Early Grade Math Materials

<u>Manipulatives</u>

- Clock
- Number dice in a box
- Cuisenaire rods
- Ruler, measuring tape
- Measuring jugs
- Weighing scale
- Jar for counting beans
- Basic shapes

<u>Printed materials & posters</u>

- Base 10 picture cards
- Domino cards
- Fraction wheels
- Place value table (with pockets); place value bulls-eye mat
- Number cards and card games
- 1-100 number charts (Devanagari & Arabic)
- Illustrated number chart 1-9
- Magic ball
- EGM activity book for teachers

# Tracking Progress Toward Learning Targets

A core component in the World Education Early Grade Mathematics materials package and a bridge between materials and teacher professional development is a set of continuous assessment cards. The curriculum review, observations of math instruction in West Nepal, and remedial diagnostic testing for struggling students in upper primary grades in Banke and Dang all revealed that teachers and the curriculum often continue ahead even when a majority of students have not mastered the basic concepts upon which the next topics depend. For example, the concept of base 10 is one of the most challenging for primary school students to learn. This should be mastered well first with 10s before it is applied to 100s. Without fully understanding this concept, a student will continue to struggle with larger numbers and arithmetic, for example when carrying in addition and borrowing in subtraction, and later with decimals.

How can teachers know when children have grasped a concept and are ready to move on? There is a range of learners in any one grade or class. A third grade classroom, for example, will have learners that are on track, a few that are more advanced, and some or many children that are behind grade level. The existing curriculum includes a Continuous Assessment System (CAS), which teachers are supposed to use; however, there is no guidance for teachers on *how* to do assessment and track progress. As a result, in reality, very few teachers use the existing system effectively, and they are often unaware of what students know and don't know.

To address this gap between intention and implementation, World Education built on the success of the milestone system for tracking reading skill development that is a core part of the Read-Learn-Know package developed by World Education and Rato Bangala Foundation. Teachers have found the use of learning milestones helpful for ensuring students master concepts in a way that builds step by step to target learning outcomes.

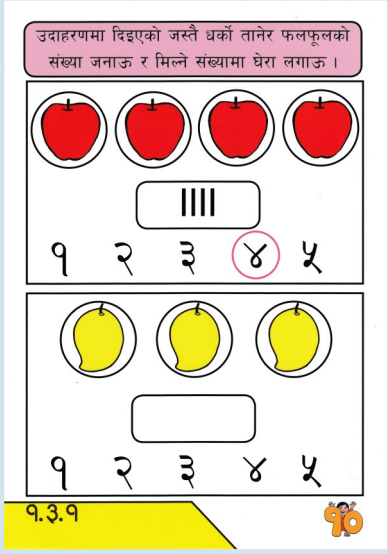
The milestone system for math follows a similar pattern to that of the reading system to make it easy for teachers to adopt. A unique icon represents each domain. Within each domain, the system divides the minimum learning outcomes into six color-coded levels and further divides each level into several milestones. Teachers use different cards to assess student progress toward each milestone.

Not only do the assessment cards help teachers measure student learning, they also help teachers learn how to teach better. The cards provide insight for the teacher about how different mathematical ideas are connected and the order in which they ought to be taught. They enable a teacher to observe and consider the logic of how content increases in difficulty and how. For example, for materials focusing on number and place value, materials at the easiest levels involve counting particular objects (consistent with the foundational counting principles) and, eventually, cards focusing on the same mathematical ideas involve cubes arranged in groups of tens or loose ones, thereby modeling the base-10 numbers system as well as the base-10 block manipulatives. A teacher in Grade 2, for example, would thereby be empowered to differentiate instruction for her students according to their needs and, at the same time, receive support on a trajectory of mathematical ideas.

Further, there are two public accountability measures designed to build enthusiasm and community around learning and involve families in the discussion of early grades mathematics. Teachers track student progress on the milestones on a chart posted in the classroom that serves to motivate students as they see visual representation of their learning trajectory. When a student completes a level, he/she receive a certificate (designed like a traditional road milestone, or "Khosh Dhunga") as recognition. These certificates keep parents apprised of progress and committed to helping children achieve their next learning goal. They also provide a common framework for parents and teachers to discuss student learning.

### In Focus: Number Sense and Formative Assessment

The two cards below are examples of early assessment cards in the number sense domain. Both help teachers know whether students grasp the idea that number representations—whether a numeral or a written number word or tick marks—represent real quantities.





In this card, students must match the written description (e.g. "four fingers") to the corresponding picture.

### In Focus: Teaching and Learning Number Sense with Materials

***Grade 3 Competency 1**: Quantity, Symbols, and Place Value to 1000*
***Level 3 learning outcome:** Identify place value 0-20 plus multiples of 10 to 100 (e.g., how many tens?)*

***Relevant materials:*** Sticks or other physical materials, domino cards, hundreds chart, base 10 cards, place value chart

Consider the counting principles mentioned earlier—one-to-one correspondence, cardinality, abstraction. Such concepts, although they are developmental and individual, can be supported through working with actual objects such that numbers that children are learning reflect countable quantities in the world. Going beyond this very early content, manipulatives serve as models for complicated mathematical ideas to learn. For example, place value in standard algorithms is supported through the use of base-10 blocks, cards, or bundles of 10 sticks and stones.

*Right: Students practice placing number cards in a place value chart with pockets for "thousands," "hundreds," "tens," and "ones."*

# EGMA Development

While the Early Grade Reading Assessment (EGRA) is well established internationally and has become so in Nepal over the last few years, no analogous tool exists in Nepal to measure basic mathematics skills and understanding of early grade students. World Education, with support from Dr. Darrell Earnest from the University of Massachusetts, developed first Nepali version of the EGMA assessment tool to measure the mathematics skills of the early grade students in Nepal. Initially, the project trialed a different assessment tool developed by Kathmandu University based on the grade 3 curriculum to measure mathematics achievement among children in Grades 4-8. However, this test took younger children in an early pilot up to 2 hours to complete, and it was difficult for them to concentrate for such a long period. The current EGMA tool for Nepal was based on the toolkit developed by RTI International (Platas, Ketterlin-Gellar, Brombacher & Sitabkhan, 2014) and takes around 15-20 minutes for each child to complete.

Throughout the tool development process, World Education coordinated with Government of Nepal stakeholders, including mathematics experts of National Centre for Educational Development, the Curriculum Development Center, and Education Review Office, and Department of Education. World Education field tested an initial version of the test in community schools in Kathmandu Valley, and then incorporated feedback from government stakeholders and lessons from the field testing in to the revised version. World Education then used the revised tool for assessment at a larger scale Early Grade Learning districts of the UNICEF-funded Equity in Education in Disadvantaged Districts project.

EGMA Tasks:

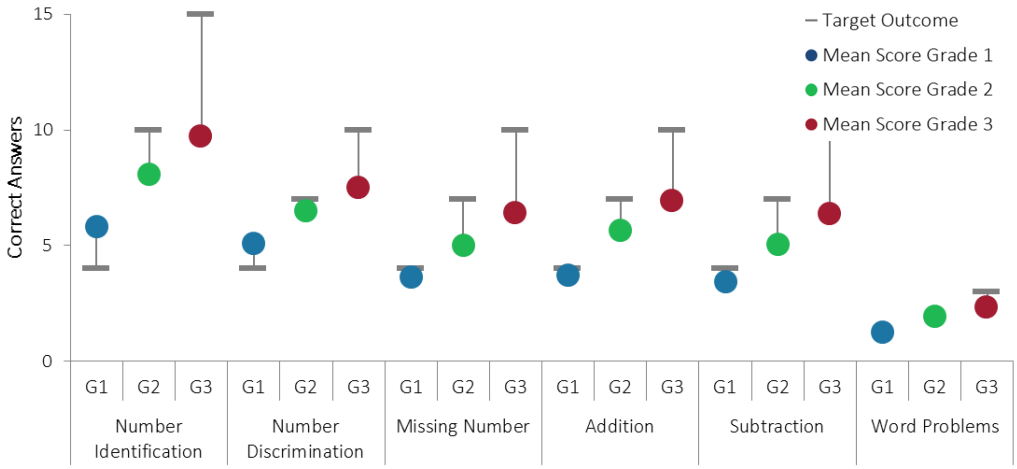
- Number identification: Say out loud the number given in numerals
- Number discrimination: Identify the larger of two numbers
- Missing number: Fill in missing number in a 5-number pattern
- Addition
- Subtraction
- Word Problems (expected for grade 3 only)

In each sub-domain section, questions progress from easiest to hardest, with expectations for achievement varying by grade level according to the difficulty of the questions. Grade 3 should be able to correctly answer all questions: easy, medium, and hard; grade 2 students are only expected to show mastery of easy and medium questions; and grade 1 students only need to answer the easy questions correctly to demonstrate mastery (although they may go beyond those if able). In this way, the same assessment tool provides insights calibrated to expectations for three grades.

# Pilot EGMA Results: Diagnostic Snapshot

While the team may make some small refinements to the tool based on insights gleaned from the results with the larger sample, the pilot EGMA survey in the Equity in Education project provides a valuable snapshot of the current state of mathematics learning among early grade students in these areas. The sample included 1,709 children who had recently completed grades 1-3 in 35 schools in Achham, Bajura, Kalikot and Mugu. Because the tool is new, the purpose of the assessment should be considered diagnostic rather than evaluative. There was no control group for the EGMA, and the project duration did not allow for testing at multiple points in time. While the project provided mathematics materials to all schools and a brief orientation to some (but not all) early grade teachers in project schools, time and budget limitations prevented a rigorous mathematics intervention. As the reading (EGRA) results from the project show, control schools did not improve reading outcomes even though they received materials (but no other intervention). Thus, we expect that provision of materials alone is not enough to improve learning. The results should be interpreted as diagnostic of the current state of mathematics learning after minimal or no intervention rather than an evaluation of intervention.

The average grade 1 student does fairly well compared to expectations, but grade 2 and grade 3 students fall increasingly behind as the expected number of correct answers and the difficulty of the questions increase with each grade level.




### In Focus: Number Sense on the EGMA

In the Number Identification task, students had to read the 15 numbers. Based on the minimum learning targets, we expect grade 1 students to recognize numbers up to 20; grade 2 students numbers up to 100, and grade 3 students to recognize numbers up to 1000. As the results show, most grade 1 students performed quite well against expectations, but significant portions of grade 2 and grade 3 students struggled to identify larger numbers. Correct identification of three-digit numbers was less than 50% for each number among grade 3 students, and two numbers were each correctly identified by less than 30% of grade 3 students.

In the number discrimination task, students had to choose the larger of two numbers. The sample tasks and results again show that students struggled as the numbers increased.

How and why might these results occur? One explanation is that students may be better able to rely on memorization or superficial knowledge when they are expected to know fewer numbers. Another is that understanding of place value is extremely weak. This could happen, for instance if the teacher and curriculum race ahead to larger numbers (e.g. six-digit figures) before students grasp the concept that a "10 block" or bundle of 10 sticks can be exchanged for 10 single blocks or sticks, and 100 for ten 10s.

**Sample questions and results:**

| Number Identification Task | | Percent of students who correctly identified given number | | |
|---|---|---|---|---|
| Question | Number | Grade 1 | Grade 2 | Grade 3 |
| Question 1 | 6 | 85% | 93% | 98% |
| Question 3 | 9 | 84% | 93% | 98% |
| Question 7 | 55 | 39% | 58% | 70% |
| Question 8 | 68 | 31% | 49% | 62% |
| Question 14 | 967 | 3% | 14% | 27% |
| Question 15 | 720 | 7% | 23% | 39% |

| Number Discrimination Task | | | Percent of students who correctly identified larger number | | |
|---|---|---|---|---|---|
| Question 3 | 9 | 13 | 78% | 88% | 96% |
| Question 7 | 87 | 84 | 29% | 49% | 65% |
| Question 8 | 105 | 150 | 27% | 45% | 56% |

# Recommendations

**1. Expand math-focused efforts alongside reading initiatives.**

It is clear the mathematics skills are important and that many children in Nepal do not have adequate opportunity to develop these skills. As there has already been substantial investment and intervention in early grade reading, early mathematics programs that capitalize on existing resources, systems, and processes will be most cost effective and easiest for teachers and stakeholders to incorporate into existing practice.

**2. Improve teaching via both pre-service and in-service initiatives.**

In order for learning outcomes to improve, teaching must be a critical focus of any EGM effort. However, in-service teacher professional development alone cannot effect lasting change. While in-service support is necessary to improve learning for today's students, it should be coupled with foresightful attention to changing the way future teachers prepare for the classroom. In both cases, a greater focus on practice as opposed to theory is necessary.

**3. Empower teachers to track student progress through continuous assessment.**

Many of the teachers in these remote districts either have poor mathematics skills themselves or lack confidence teaching math. In addition to these external sample assessments a much bigger focus is needed under CAS (Continuous Assessment System) that enables teachers to measure progress against math milestones more clearly.

**4. Refine and continue use of EGMA.**

There are still areas for potential refinement of the EGMA, including specific tasks and the interpretation of results. However, this initial development of the EGMA serves as a foundation: the first round of testing can provide an important baseline against which to measure future gains, and a tested tool now exists which others can use and which the Education Review Office has expressed interest in.

**5. Focus on process not product.**

Efforts to improve math teaching and learning should support a shift away from rote memorization toward student-centered learning that encourages exploration, questioning, problem-solving, and explanation of mathematical thinking. These skills, coupled with guided instruction on mathematical procedures and concepts, translate into real-world skills and future mathematics success.

**6. Attend to equity issues.**

With new early grade math initiatives on the horizon, there is tremendous opportunity to design in equity considerations in a number of areas from the outset. Key areas of concern include girls (pilot results show a clear gender difference; inclusion of children with disabilities; and minority language speakers. For example, results from a World Education project in Banke and Dang found higher math scores when children were tested in their mother tongue (Tharu), when their teacher used Tharu, and when they used Tharu-language materials.

**7. Collaborate to accelerate progress.**

Because math outcomes are actually declining nationwide, it is critical that stakeholders work together to share knowledge, build on existing successes and resources, and avoid duplicative efforts. Doing so will help accelerate and scale impact on children's learning. The establishment of the Math Technical Working Group, and the lessons learned and materials developed in this pilot project are important steps that can form a foundation for future work.

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