GLOBAL PROFICIENCY FRAMEWORK FOR MATHEMATICS

Grades 1 to 9

DECEMBER 2020

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This document, the Global Proficiency Framework (GPF or framework) for Mathematics, grades one to nine, was developed by the UNESCO Institute of Statistics (UIS); the U.S. Agency for International Development (USAID); the World Bank Group; the Foreign, Commonwealth and Development Office (FCDO) (formerly the U.K. Department for International Development [DFID]); the Australian Council for Educational Research (ACER); the Bill and Melinda Gates Foundation; and representatives of many other development partner organizations, including several university professors. A complete list of participants who lent their considerable expertise to this initiative can be found in the contributors section of this document.

The GPF for Mathematics defines important mathematics-related knowledge and skills learners should develop in primary and lower secondary school. It also describes the minimum proficiency levels learners are expected to demonstrate, with respect to the defined knowledge and skills, at each grade level, from grades one to nine.

This important resource would not have been developed without the immense contributions of all participants and stakeholders. Without their time and dedication, this framework would not exist.

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ACRONYMS

ACER	Australian Council for Educational Research
DFAT	Australian Department of Foreign Affairs and Trade
DFID	U.K. Department for International Development
GAML	Global Alliance for Monitoring Learning
GCFRM	Global Content Framework of Reference for Mathematics
GPD	Global Proficiency Descriptor
GPE	Global Partnership for Education
GPF	Global Proficiency Framework
GPL	Global Minimum Proficiency Levels
IBE	International Bureau of Education (UNESCO)
PLM	Policy Linking Method to set global benchmarks
PLT	Policy Linking Toolkit to set global benchmarks
SDG	Sustainable Development Goal
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	U.S. Agency for International Development

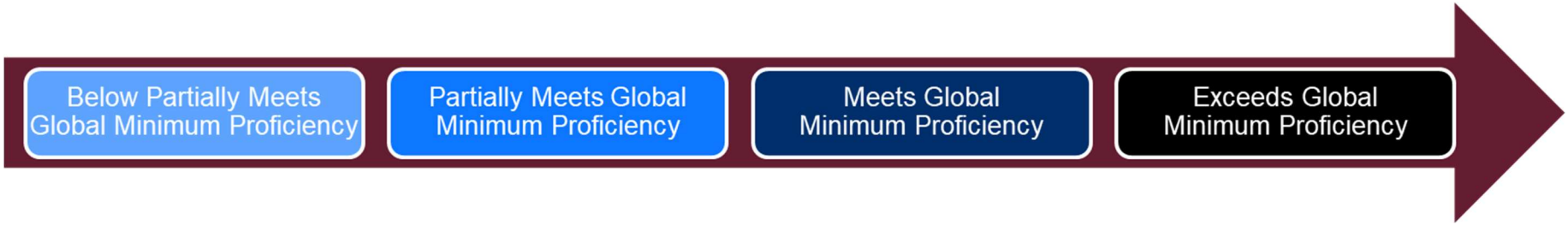
OVERVIEW OF THE DEVELOPMENT PROCESS

The Global Proficiency Framework for Mathematics (also referred to as the GPF or the framework) defines the *global minimum proficiency levels* that learners are expected to demonstrate at the end of each grade level, from grades one to nine. The GPF was developed by mathematics educators, curriculum experts, and psychometricians with extensive experience developing and implementing mathematics programs in a wide range of countries and contexts. Their names and affiliations are listed in the contributors section of this document.

The development process was an extensive one. It began in October 2018 with the development of the Global Content Framework of Reference for Mathematics (GCFRM) by the UNESCO International Bureau for Education (IBE). The GCFRM synthesizes content and assessment framework information from more than 50 countries from around the globe, providing a picture of the common expectations countries have for learners' performance in mathematics.

In April and June 2019, mathematics educators, curriculum specialists, and psychometricians from around the world met in Washington, D.C. to outline a research-based progression of the minimum knowledge and skills learners in grade two (or primary two) to grade six (or primary six) should be able to demonstrate with respect to the key domains of mathematics, based on the GCFRM and other national and regional curriculum and assessment frameworks developed for mathematics. The draft framework outlined learners' performance in four proficiency levels as shown in **Figure 1** below: *Below Partially Meets Global Minimum Proficiency*, *Partially Meets Global Minimum Proficiency*, *Meets Global Minimum Proficiency*, and *Exceeds Global Minimum Proficiency*, for each skill or knowledge item retained.

Figure 1: Global Proficiency Levels (GPLs)



The draft framework was field tested in at least nine countries, including Bangladesh, Djibouti, the Gambia, Ghana, India, Madagascar, Malawi, Nigeria, and Senegal during the 2019–2020 academic year. Beginning in May of 2020, the lessons learned from those field tests informed the organization of a second round of consultations with mathematics educators, curriculum experts, and psychometricians from the global community, many of whom had participated in the first round. During on-line deliberations between May and August 2020, experts revised the initial GPF and added grades one (primary one), seven, eight, and nine. The result is a GPF that covers the entire nine years of basic education.

The GPF is the product of extended discussions and rich, lively debates over an eighteen-month period. This ongoing exchange of expertise has resulted in a comprehensive, evidence-based evaluation framework for mathematics that represents the consensus of the global community about what learners should know and be able to do when it comes to mathematics.

The GPF is also the product of extensive collaboration between donor agencies and assessment organizations committed to developing and implementing common methods for measuring and reporting on progress on Sustainable Development Goal (SDG) 4, including the UNESCO Institute for Statistics (UIS),

the U.S. Agency for International Development (USAID), the Foreign, Commonwealth and Development Office (FCDO) (formerly the U.K. Department for International Development [DFID]), the World Bank Group, the Global Partnership for Education (GPE), the Australian Department of Foreign Affairs and Trade (DFAT), the Australian Council for Educational Research (ACER), and the Bill & Melinda Gates Foundation. These organizations provided critical technical and financial support for the GPF's development and field testing. UIS, as "the official source of cross-nationally comparable data on education" for the SDGs (Education 2030 Framework for Action, 2015), is the lead organization for this collaborative effort, including through its role in organizing the Global Alliance to Monitor Learning (GAML).

PURPOSE OF THE FRAMEWORK

The overarching purpose of the GPF is to provide countries and regional/international assessment organizations with a common reference or scale for reporting progress on indicator 4.1.1 of the SDGs in the form of a common definition of the minimum knowledge and skills learners must demonstrate at key points along their learning trajectory. This indicator commits signatories to tracking the:

> *Proportion of children and young people: (a) in grades 2/3, (b) at the end of primary, and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex.*

The GPF allows the results of different national, regional, or international assessments to be interpreted against a common reference or scale. When countries or jurisdictions link their assessments to the GPF through a process called policy linking, which is outlined in the Policy Linking Toolkit, they are able to set benchmarks for their assessments that allow them to determine the percentage of learners that have partially met, met, or exceeded Global Minimum Proficiency for reporting against SDG 4.1.1.[1] This linking of existing and future mathematics assessments via a common scale (the GPF) allows for the comparison of results from different assessments, within and across countries; aggregation of country and global mathematics outcomes; and outcome tracking over time.

Although the framework's main purpose is to provide a common reference or scale for global reporting and interpretation of the results of national, regional, and international assessments of mathematics, the framework has proven to be a valuable tool for countries and organizations interested in developing new assessments to measure progress against common, global standards, or in critically examining the extent to which existing curricula are developing skills identified by the international community as critical to supporting learning over time. The GPF also offers countries a lens for examining alignment between their standards, curricula, assessments, teacher training programs, instructional materials, and classroom practices and the minimal learner expectations in the GPF. The use of the GPF for these additional purposes has resulted in deep reflections on the quality of teaching and learning and on the nature of robust assessments.

Finally, many of the partner organizations supporting this initiative, including USAID, have adjusted their evaluation indicators to align with those of the Sustainable Development Goals, and in particular SDG 4.1.1. The GPF provides these organizations with a valuable tool for monitoring progress over time.

[1] The Policy Linking Toolkit walks countries and assessment organizations through a step-by-step process for establishing internationally aligned benchmarks or standards for their own assessments. The process uses an internationally recognized methodology called the Modified Angoff.

USING THE FRAMEWORK

The GPF contains five tables:

- **Table 1** outlines the four Global Proficiency Levels (GPLs) and provides brief, general definitions of each of the four levels, as defined by the team of experts (see **Figure 1** above for a depiction of the levels). The four levels apply to all targeted grade levels and to both reading and mathematics (the former of which is detailed under the Global Proficiency Framework for Reading). The Meets Global Minimum Proficiency level describes the knowledge and skills of learners who have met minimum expectations for SDG Indicator 4.1.1, and for USAID reporting requirements. Although SDG reporting only requires countries to report on the percentage of learners who have met or exceeded this minimum level, the GPF describes the performance of learners at three other levels: Exceeds Global Minimum Proficiency, Partially Meets Global Minimum Proficiency, and Below Partially Meets Global Minimum Proficiency. The GPF team established these additional proficiency levels to help countries and assessment organizations build a more nuanced picture of country progress toward all learners meeting, or exceeding, global minimum proficiency. The framework does not, however, include performance descriptors for the Below Partially Meets Global Minimum Proficiency level. Rather, the performance of learners at this level is below benchmarks set for learners in the Partially Meets Global Minimum Proficiency level.
- **Table 2** provides an overview of the Mathematics GPF. It outlines the different domains retained and the specific constructs and subconstructs addressed in each domain as well as the grade levels at which they are addressed.
- **Table 3** provides a second, more detailed overview of the GPF. It lists the key knowledge and/or skills addressed, by grade level, for each domain, construct, and subconstruct.[2] This table allows curriculum and evaluation specialists to quickly identify the items on a given assessment that evaluate the knowledge and skills addressed in the GPF. The resulting analysis provides an indication of the degree of alignment between an assessment and the knowledge and skills in the GPF. This process of alignment is the first task, Task 1, in the policy linking process, described in detail in the Policy Linking Toolkit.
- **Table 4** summarizes a description of what in the Meets Global Minimum Proficiency-level learners can do for each knowledge and skill, at each grade level (this is called a Global Proficiency Descriptor [GPD]). It provides an overview of the progression of knowledge and skills as learners move up the grade levels. The table is particularly useful for governments or assessment organizations interested in establishing a single benchmark for an assessment, namely, the minimum score required to meet global minimum proficiency requirements.
- **Table 5** contains the full GPF, with GPDs describing learners' performance in all four proficiency levels, by grade level for every knowledge and skill. This table is particularly useful for governments or assessment organizations interested in establishing multiple benchmarks, corresponding to the lowest performance in each performance category, to provide a more nuanced picture of the percentage of learners in each category.

Glossary—A glossary of key terms follows the tables.

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[2] Knowledge or skills are sometimes referred to as content standards in countries. However, the authors have deliberately not used this term, as it is expected that countries will have their own national content standards, which may not align directly with this framework. Nonetheless, countries that do not have national content standards or that may wish to revise their standards to better align with global expectations and developmental progressions might use the knowledge or skills presented in this table to guide their discussions and planning. It is also critical to note that well-functioning education systems have content and performance standards that align with one another as well as their curricula, teacher training, materials, classroom instruction, and assessments.

Document key—The tables in the document contain the following color codes:

- Black text designates the main content of a domain, construct, subconstruct, knowledge or skill, or GPD.
- Red, italicized text indicates an example provided to help clarify the GPD.

Vertical alignment—Also, in developing the GPF for Mathematics, the content experts sought to create vertical alignment by having the GPDs for the grade one Exceeds Global Minimum Proficiency level form the basis for the grade two Meets Global Proficiency level and the grade three Partially Meets Global Proficiency level. Thus, users should see this progression in the document. However, it is important to note that while this progression formed the starting place for the assessment, the experts did make adjustments to reflect norms of when certain knowledge and/or skills are taught.

TABLE 1: DEFINITIONS OF THE GLOBAL MINIMUM PROFICIENCY LEVELS

Global Minimum Proficiency Level	Definition
Below Partially Meets Global Minimum Proficiency	Learners lack the most basic knowledge and skills. As a result, they generally cannot complete the most basic grade-level tasks.
Partially Meets Global Minimum Proficiency	Learners have limited knowledge and skills. As a result, they can partially complete basic grade-level tasks.
Meets Global Minimum Proficiency	Learners have developed sufficient knowledge and skills. As a result, they can successfully complete the most basic grade-level tasks.
Exceeds Global Minimum Proficiency	Learners have developed superior knowledge and skills. As a result, they can complete complex grade-level tasks.

TABLE 2: STRUCTURE OF THE GPF

An "x" means there are GPDs for the grade in question. An "a" means there are no GPDs for this grade level. Learners are considered to have developed the knowledge and skills for these subconstructs at earlier grade levels.

Domain	Construct		Subconstruct		Grade								
					1	2	3	4	5	6	7	8	9
N Number and operations	**N1**	Whole numbers	**N1.1**	Identify and count in whole numbers, and identify their relative magnitude	x	x	x	x	x	x	a	a	a
			N1.2	Represent whole numbers in equivalent ways	x	x	x	x	x	x	a	a	a
			N1.3	Solve operations using whole numbers	x	x	x	x	x	x	see integers		
			N1.4	Solve real-world problems involving whole numbers	x	x	x	x	x	x	see integers		
	N2	Fractions	**N2.1**	Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude			x	x	x	x	x	a	a
			N2.2	Solve operations using fractions				x	x	x	x	a	a
			N2.3	Solve real-world problems involving fractions				x	x	x	x	a	a
	N3	Decimals	**N3.1**	Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude					x	x	x	a	a
			N3.2	Represent decimals in equivalent ways (including fractions and percentages)					x	x	x	x	a
			N3.3	Solve operations using decimals					x	x	x	x	a
			N3.4	Solve real-world problems involving decimals						x	x	x	a
	N4	Integers	**N4.1**	Identify and represent integers using objects, pictures, or symbols, and identify relative magnitude							x	a	a
			N4.2	Solve operations using integers							x	x	a
			N4.3	Solve real-world problems involving integers							x	x	a
	N5	Exponents and roots	**N5.1**	Identify and represent quantities using exponents and roots, and identify the relative magnitude							x	x	x
			N5.2	Solve operations involving exponents and roots								x	x
	N6	Operations across number	**N6.1**	Solve operations involving integers, fractions, decimals, percentages, and exponents								x	x
M Measurement	**M1**	Length, weight, capacity, volume, area, and perimeter	**M1.1**	Use non-standard and standard units to measure, compare, and order	x	x	x	x	x	x	x	x	a
			M1.2	Solve problems involving measurement				x	x	x	x	x	x
	M2	Time	**M2.1**	Tell time	x	x	x	x	x	a	a	a	a
			M2.2	Solve problems involving time		x	x	x	x	x	x	x	x
	M3	Currency	**M3.1**	Use different currency units to create amounts	x	x	x	a	a	a	a	a	a

Domain	Construct		Subconstruct		Grade								
					1	2	3	4	5	6	7	8	9
G Geometry	**G1**	Properties of shapes and figures	**G1.1**	Recognize and describe shapes and figures	x	x	x	x	x	x	x	x	x
	G2	Spatial visualizations	**G2.1**	Compose and decompose shapes and figures	x	x	x	x	x	x	x	x	x
	G3	Position and direction	**G3.1**	Describe the position and direction of objects in space	x	x	x	x	x	x	x	x	x
S Statistics and probability	**S1**	Data management	**S1.1**	Retrieve and interpret data presented in displays	x	x	x	x	x	x	x	x	x
			S1.2	Calculate and interpret central tendency							x	x	x
	S2	Chance and probability	**S2.1**	Describe the likelihood of events in different ways					x	x	x	x	x
			S2.2	Identify permutations and combinations								x	x
A Algebra	**A1**	Patterns	**A1.1**	Recognize, describe, extend, and generate patterns	x	x	x	x	x	x	x	a	a
	A2	Expressions	**A2.1**	Evaluate, model, and compute with expressions							x	x	x
	A3	Relations and functions	**A3.1**	Solve problems involving variation (ratio, proportion, and percentage)						x	x	x	x
			A3.2	Demonstrate an understanding of equivalency		x	x	x	x	x	a	a	a
			A3.3	Solve equations and inequalities							x	x	x
			A3.4	Interpret and evaluate functions									x

TABLE 3: KEY KNOWLEDGE AND SKILLS, BY GRADE LEVEL

DOMAIN: N—NUMBER AND OPERATIONS

Construct	Subconstruct	Knowledge or Skill	Grade								
			1	2	3	4	5	6	7	8	9
N1 Whole numbers	**N1.1** Identify and count in whole numbers, and identify their relative magnitude	**N1.1.1** Count, read, and write whole numbers	x	x	x	x	x	x			
		N1.1.2 Compare and order whole numbers	x	x	x	x	x	x			
		N1.1.3 Skip count forwards or backwards		x	x	x	x	x			
	N1.2 Represent whole numbers in equivalent ways	**N1.2.1** Determine or identify the equivalency between whole numbers represented as objects, pictures, and numerals	x	x	x						
		N1.2.2 Use place-value concepts		x	x	x	x	x			
		N1.2.3 Round whole numbers				x	x	x			
	N1.3 Solve operations using whole numbers	**N1.3.1** Add, subtract, multiply and divide whole numbers	x	x	x	x	x	x			
		N1.3.2 Find the double or half of a set of objects	x	x							
		N1.3.3 - Multiply and divide whole numbers			x	x	x	x			
		N1.3.4 Demonstrate fluency with basic addition and subtraction facts			x	x					
		N1.3.5 Demonstrate fluency with basic multiplication and division facts				x					
		N1.3.6 Identify factors and multiples of whole numbers						x			
		N1.3.7 Perform calculations involving two or more operations on whole numbers		x	x	x	x	x			
	N1.4 Solve real-world problems involving whole numbers	**N1.4.1** Solve real-world problems involving the addition and subtraction of whole numbers, including with measurement and currency units	x	x	x	x	x	x			
		N1.4.2 Solve real-world problems involving the multiplication and division of whole numbers, including with measurement and currency units				x	x	x			
N2 Fractions	**N2.1** Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude	**N2.1.1** Express a visual representation of a fraction (picture, objects) in fractional notation			x	x					
		N2.1.2 Identify equivalent fractions				x	x	x	x		
		N2.1.3 - Identify and express equivalences between improper fractions and mixed numbers					x	x	x		
		N2.1.4 - Compare and order fractions and mixed numbers, including when they are positive and negative				x	x	x	x		
	N2.2 Solve operations using fractions	**N2.2.1** Add and subtract fractions and mixed numbers				x	x	x	x		
		N2.2.2 Multiply and divide fractions by whole numbers, fractions, and mixed numbers					x	x	x		
	N2.3 Solve real-world problems involving fractions	**N2.3.1** Solve real-world problems involving the addition and subtraction of fractions (proper and improper), whole numbers, and mixed numbers				x	x	x	x		
		N2.3.2 - Solve real-world problems involving the multiplication and division of fractions (proper and improper), whole numbers, and mixed numbers					x	x	x		

DOMAIN: N—NUMBER AND OPERATIONS

Construct	Subconstruct	Knowledge or Skill	Grade								
			1	2	3	4	5	6	7	8	9
N3 Decimals	**N3.1** Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude	**N3.1.1** Identify and represent quantities using decimal notation					x	x	x		
		N3.1.2 Compare and order decimal numbers, including when they are positive or negative					x	x	x		
	N3.2 Represent decimals in equivalent ways (including fractions and percentages)	**N3.2.1** Round decimal numbers					x	x	x	x	
		N3.2.2 Express fractions as decimals and vice versa					x	x	x	x	
		N3.2.3 Compare and order decimals, fractions, and percentages, including when they are positive and negative						x	x	x	
		N3.2.4 Express percentages as fractions or mixed numbers (and vice versa)							x	x	
	N3.3 Solve operations using decimals	**N3.3.1** Add and subtract decimals, including positive and negative decimals					x	x	x	x	
		N3.3.2 Multiply and divide decimals by whole numbers or decimals; divide whole numbers by decimals							x	x	
	N3.4 Solve real-world problems involving decimals	**N3.4.1** Solve real-world problems involving the addition, subtraction, multiplication, and division of decimals, including currency or money problems						x	x	x	
N4 Integers	**N4.1** Identify and represent integers using objects, pictures, or symbols, and identify relative magnitude	**N4.1.1** Compare and order integers							x		
	N4.2 Solve operations using integers	**N4.2.1** Multiply and divide integers							x	x	
		N4.2.2 Identify factors and multiples, including common factors and common multiples, of whole numbers							x	x	
	N4.3 Solve real-world problems involving integers	**N4.3.1** Solve real-world problems involving the addition, subtraction, multiplication, and division of integers							x	x	
N5 Exponents and roots	**N5.1** Identify and represent quantities using exponents and roots, and identify the relative magnitude	**N5.1.1** Identify the square and cube, and the square and the cube root, of whole numbers							x	x	
		N5.1.2 Identify and represent numbers using scientific notation and exponents							x	x	x
		N5.1.3 Compare and order numbers expressed in scientific notation							x	x	x
	N5.2 Solve operations involving exponents and roots	**N5.2.1** Add, subtract, multiply, and divide quantities expressed in exponential notation, including scientific notation								x	x
N6 Operations across number	**N6.1** Solve operations involving integers, fractions, decimals, percentages, and exponents	**N6.1.1** Perform calculations involving two or more operations on integers, decimals, fractions, and exponents								x	x

DOMAIN: M—MEASUREMENT

Construct	Subconstruct	Knowledge or Skill	Grade								
			1	2	3	4	5	6	7	8	9
M1 Length, weight, capacity, volume, area, and perimeter	**M1.1** Use non-standard and standard units to measure, compare, and order	**M1.1.1** Use non-standard units to estimate, measure, and compare length, weight, volume, and capacity	x	x	x	x					
		M1.1.2 Use standard units to estimate, measure, and compare the length, weight, capacity, and volume of two objects		x	x	x	x				
		M1.1.3 Convert between units of measures of length, weight, volume, and capacity within a standard measurement system or between different systems of measurement					x	x	x	x	
		M1.1.4 Read scales on a variety of measuring tools involving fractions and decimals					x	x	x		
	M1.2 Solve problems involving measurement	**M1.2.1** Solve problems involving the perimeter of polygons				x	x	x	x	x	
		M1.2.2 Solve problems involving the circumference of circles								x	x
		M1.2.3 - Solve problems involving the area of rectangles or of compound shapes composed of rectangles				x	x	x	x		
		M1.2.4 - Solve problems involving the area of triangles or of compound shapes composed of triangles or of triangles and rectangles							x	x	x
		M1.2.5 - Solve problems involving the circumference or area of circles								x	x
		M1.2.6 Solve problems involving the surface area of a familiar polyhedron								x	x
		M1.2.7 Solve problems involving the volume of prisms							x	x	x
		M1.2.8 Solve problems involving the application of Pythagoras' theorem									x
M2 Time	**M2.1** Tell time	**M2.1.1** Distinguish between parts of the day, and sequence and describe events in time, using informal comparisons	x	x							
		M2.1.2 Tell time using an analog clock	x	x	x	x	x				
		M2.1.3 Identify equivalence between analog and digital representations of time				x	x				
		M2.1.4 Identify or solve problems involving equivalences between different units of time				x	x				
	M2.2 Solve problems involving time	**M2.2.1** Solve problems involving the calendar		x	x						
		M2.2.2 Solve problems involving elapsed time, including when times are presented in a schedule				x	x	x	x		
		M2.2.3 Solve problems involving conversions of time: 12-hour and 24-hour time, time zones, and different units of time							x	x	x
M3 Currency	**M3.1** Use different currency units to create amounts	**M3.1.1** Count or create combinations of currency denominations	x	x	x						

DOMAIN: G—GEOMETRY

Construct	Subconstruct	Knowledge or Skill	Grade								
			1	2	3	4	5	6	7	8	9
G1 Properties of shapes and figures	**G1.1** Recognize and describe shapes and figures	**G1.1.1** Recognize and name two-dimensional shapes and three-dimensional figures; distinguish between regular and irregular shapes	x	x	x						
		G1.1.2 Identify the attributes of two-dimensional shapes or three-dimensional figures			x	x	x	x			
		G1.1.3 Classify complex two-dimensional shapes by their defining attributes						x	x	x	
		G1.1.4 Recognize and name different types of lines	x	x	x						
		G1.1.5 Recognize and name types of quadrilaterals					x	x	x		
		G1.1.6 Recognize and name parts of the circle, and identify the relationship between the radius and the diameter							x	x	x
		G1.1.7 Recognize angles and estimate their size						x	x	x	
		G1.1.8 Solve problems involving the angle sum of a triangle, or angles formed by intersecting lines or parallel lines intersected by a transverse line							x	x	x
		G1.1.9 Recognize two-dimensional shapes that have been rotated or reflected	x	x	x						
		G1.1.10 Identify the line of symmetry of two-dimensional shapes		x	x	x					
		G1.1.11 Recognize and describe the congruence and similarity of two-dimensional shapes			x	x	x				
		G1.1.12 Recognize two-dimensional shape transformations that are expressed quantitatively or describe and implement such transformations							x	x	x
G2 Spatial visualizations	**G2.1** Compose and decompose shapes and figures	**G2.1.1** Compose larger two-dimensional shapes from smaller shapes; decompose a larger shape into smaller shapes	x	x	x	x					
		G2.1.2 Identify the net of familiar, three-dimensional shapes or particular sides represented in a net				x	x	x	x	x	x
		G2.1.3 Identify different views of three-dimensional shapes, including cross sections						x	x	x	x
G3 Position and direction	**G3.1** Describe the position and direction of objects in space	**G3.1.1** Use positional terms, including left and right, to describe the location of an object	x	x	x	x					
		G3.1.2 Use maps, including grid maps with compass directions, to describe locations or give directions			x	x	x	x			
		G3.1.3 Use a Cartesian coordinate system to locate and plot points, describe or calculate distances between locations, and draw shapes						x	x	x	x
		G3.1.4 Describe or implement transformations								x	x

DOMAIN: S—STATISTICS AND PROBABILITY

Construct	Subconstruct	Knowledge or Skill	Grade								
			1	2	3	4	5	6	7	8	9
S1 Data management	**S1.1** Retrieve and interpret data presented in displays	**S1.1.1 -** Retrieve information from data displays (i.e., tally charts, bar graphs, or pictographs) with single-unit scales and up to four categories of data	x								
		S1.1.2 - Solve problems involving data displays (i.e., tally charts, bar graphs, or pictographs) with single-unit scales and up to four categories of data		x	x	x					
		S1.1.3 - Solve problems involving data displays (i.e., tally charts, bar graphs, or pictographs) with multi-unit scales and up to four categories of data				x	x				
		S1.1.4 Construct data displays using categories of data and single- or multi-unit scales				x	x	x			
		S1.1.5 Retrieve information from, or solve problems involving, data displays with single- or multi-unit scales and categories and sub-categories of data				x	x	x	x		
		S1.1.6 Retrieve information from or construct pie charts and Venn diagrams (for categorical data) and line graphs and dot plots (for bivariate data) to represent data						x	x	x	x
		S1.1.7 Understand, describe, and use relationships within displays of bivariate data									x
	S1.2 Calculate and interpret central tendency	**S1.2.1** Solve problems involving means, medians, and modes, including the effect of outliers on means and medians							x	x	x
		S1.2.2 Compare key features of the distribution of two different but related sets of data, or the distribution of subcategories within a set of data							x	x	x
		S1.2.3 Identify desirable characteristics of sampling methods								x	x
S2 Chance and probability	**S2.1** Describe the likelihood of events in different ways	**S2.1.1** Use words to describe the likelihood of an event happening or to compare the likelihood of two events happening					x	x	x		
		S2.1.2 Calculate the probability of events happening or place probability values or events on a continuum from 0 (impossible) to 1 (certain)						x	x	x	
		S2.1.3 Identify or calculate the probability of specific outcomes of simple or compound events, experimentally or otherwise								x	x
	S2.2 Identify permutations and combinations	**S2.2.1** Identify all the possible outcomes (sample space) for a situation involving a compound event comprised of two simple events, with and without replacement								x	x

DOMAIN: A—ALGEBRA

Construct	Subconstruct	Knowledge or Skill	Grade								
			1	2	3	4	5	6	7	8	9
A1 Patterns	**A1.1** Recognize, describe, extend, and generate patterns	**A1.1.1** Copy, recognize, describe, or extend repeating patterns, or identify missing elements of such patterns	x	x	x	x	x	x	x		
		A1.1.2 Describe increasing or decreasing numerical patterns, or identify missing elements of such patterns				x	x	x			
		A1.1.3 Generate a pattern from a given rule or match a pattern to a given rule					x	x	x		
		A1.1.4 Recognize and extend non-linear patterns, including squaring patterns, when they are supported, or not, by a visual representation						x	x		
A2 Expressions	**A2.1** Evaluate, model, and compute with expressions	**A2.1.1** Use expressions to represent problem situations with single or multiple variables							x	x	x
		A2.1.2 Add and subtract linear expressions							x	x	
		A2.1.3 Multiply, divide, simplify, and factor linear expressions							x	x	x
		A2.1.4 Evaluate, simplify, and factor exponential expressions								x	x
A3 Relations and functions	**A3.1** Solve problems involving variation (ratio, proportion, and percentage)	**A3.1.1** Reason proportionally to solve problems involving ratio, when the ratio is expressed informally or formally						x	x	x	
		A3.1.2 Solve problems involving equal ratios							x	x	x
		A3.1.3 Solve problems involving percentages							x	x	x
	A3.2 Demonstrate an understanding of equivalency	**A3.2.2** Create numerical expressions to model addition, subtraction, multiplication, or division situations		x	x	x	x				
		A3.2.3 Represent real-world problems by number sentences, with a symbol or blank to represent the missing value			x	x	x	x			
		A3.2.4 Find the missing value in a number sentence		x	x	x	x	x			
	A3.3 Solve equations and inequalities	**A3.3.1** Represent and solve real-world problems involving equations							x	x	x
		A3.3.2 Graph linear equations, and identify the x- and y-intercepts or the slope of a line								x	x
		A3.3.3 Represent and solve real-world problems using two linear equations								x	x
		A3.3.4 Solve inequalities									x
	A3.4 Interpret and evaluate functions	**A3.4.1** Identify a function presented in a graph									x

TABLE 4: “MEETS MINIMUM PROFICIENCY” LEVEL DESCRIPTORS

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N1—Whole numbers

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N1.1 Identify and count in whole numbers, and identify their relative magnitude	Count in whole numbers up to 30.	x								
	Count in whole numbers up to 100.		x							
	Count in whole numbers up to 1,000.			x						
	Count in whole numbers up to 10,000.				x					
	Count in whole numbers up to any whole number.					x				
	Read and write whole numbers up to 30 in numerals.	x								
	Read and write whole numbers up to 100 in words and in numerals.		x							
	Read and write whole numbers up to 1,000 in words and in numerals.			x						
	Read and write whole numbers up to 10,000 in words and numerals.				x					
	Read and write whole numbers greater than 10,000 in words and numerals.					x				
	Compare and order whole numbers up to 30.	x								
	Compare and order whole numbers up to 100.		x							
	Compare and order whole numbers up to 1,000.			x						
	Compare and order whole numbers up to 10,000.				x					
	Compare and order whole numbers up to 100,000.					x				
	Compare and order any whole numbers.						x			
	Skip count forwards by twos or tens.		x							
	Skip count backwards by tens.			x						
	Skip count forwards and backwards by hundreds.				x					
	Skip count forwards and backwards by thousands.					x				
N1.2 Represent whole numbers in equivalent ways	Identify equivalence between whole quantities up to 10 represented as objects, pictures, and numerals *(e.g., when given a picture of 10 objects and other pictures of various numbers of objects, select the picture that has the same number of objects; associate a numeral with the appropriate number of objects).*	x								
	Identify and represent the equivalence between whole quantities up to 30 represented as objects, pictures, and numerals *(e.g., when given a picture of 30 flowers, identify the picture that has the number of butterflies that would be needed for each flower to have a butterfly; given a picture of 19 shapes, draw 19 more shapes).*		x							
	Use place-value concepts for tens and ones *(e.g., compose or decompose a two-digit whole number using a number sentence such as 35 = 3 tens and 5 ones, 35 =30 + 5 or using number bonds; determine the value of a digit in the tens and ones place).*			x						
	Use place-value concepts for hundreds, tens, and ones *(e.g., compose or decompose a three-digit whole number using a number sentence such as 254 = 2 hundreds, 5 tens, and 4 ones; 254 = 200 + 50 + 4; determine the value of a digit in the hundreds place).*				x					
	Use place-value concepts for thousands, hundreds, tens, and ones *(e.g., compose or decompose a four-digit whole number using a number sentence such as 1,383 = 1 thousand, 3 hundreds, 8 tens, and 3 ones; 1,383 = 1,000 + 300 + 80 + 3; determine the value of a digit in the thousands place).*					x				
	Use place-value concepts beyond the thousands *(e.g., compose or decompose a seven-digit whole number using a number sentence such as 1,383,547 = 1 million, 3 hundred thousands, 8 ten thousands, 3 thousands, 5 hundreds, 4 tens, and 7 ones; 1,383,547 = 1,000,000 + 300,000 + 80,000 + 3,000 + 500 + 40 + 7; determine the value of a digit in the millions place).*						x			
	Round whole numbers to the nearest ten.				x					
	Round whole numbers to the nearest hundred.					x				
	Round whole numbers to the nearest thousand.						x			

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N1—Whole numbers

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
	Add and subtract within 10 (i.e., where the sum or minuend does not surpass 10), and represent these operations with objects, pictures, or symbols *(e.g., 5 + 4 = __; 7 - 5 = __; when presented with a picture of 3 baskets, with the first basket showing 3 bananas and a second basket showing 5 bananas, complete the addition statement 3 + 5 = __ or find an appropriate addition statement from a list. Or, when presented with a picture of 6 whole bananas and 3 banana peels, match to sentence 9 - 3 = 6 or complete statement 9 - 3 = __).*	x								
	Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols *(e.g., 16 - 3= __ ; 12 + 3 =__; when presented with a picture of 12 marbles with 3 more marbles added, complete or match to the number sentence 12 + 3 = __. Or, when presented with a picture of a carton that can hold 20 bottles, 7 of which have been removed, complete or match to the subtraction statement 20 - 7= __).*		x							
	Add and subtract within 1,000 (i.e., where the sum or minuend does not surpass 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 550 + 250; 457 - 129; use hundreds grids, number lines, or multibase arithmetic blocks to reason through or solve addition and subtraction problems).*				x					
	Add and subtract beyond 1,000 (i.e., where the sum or minuend surpasses 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 1457 - 129; use number lines to reason through or solve addition and subtraction problems).*					x				
	Demonstrate fluency with addition and subtraction within 20; and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on hundreds grid to reason through or solve addition and subtraction problems).*			x						
N1.3 Solve operations using whole numbers	Demonstrate fluency with multiplication facts up to 10 x 10 (i.e., 1 × 1 up to 10 × 10) and related division facts, including the relationship between them.				x					
	Find the double of a set of up to five objects, and divide a group of up to 10 objects into two equal sets *(e.g., There are 4 biscuits in a package. There are 2 packages of biscuits. How many biscuits are there in total?; There are 8 biscuits in a package. The biscuits will be shared equally by 2 friends. How many biscuits will each friend get?).*	x								
	Find the double of a set of up to 10 objects, and divide a group of up to 20 objects into two equal sets *(e.g., An octopus has 8 legs. There are 2 octopuses. How many octopus legs are there in total?; There are 16 biscuits. The biscuits will be shared equally by 2 friends. How many biscuits will each friend get?).*		x							
	Identify factors of whole numbers within 100 and multiples of whole numbers within 20 *(e.g., find all factors of 84; find multiples of 15).*						x			
	Multiply and divide within 100 (i.e., up to 10 x 10 and 100 ÷ 10, without a remainder), and represent these operations with objects, pictures, or symbols *(e.g., 72 ÷ 8; 6 x 9; solve multiplication problems by using a rectangular array or by repeating groups of the same number of objects; solve division problems by dividing a group of objects into a given number of equal groupings).*			x						
	Multiply, with and without regrouping, and divide, with no remainder, any number by a one-digit number and multiply two 2-digit numbers, with and without regrouping *(e.g., 342 x 4 = __; 42 x 34 = __; 1,380 ÷ 5 = __).*					x				
	Multiply any number by a two-digit number, with and without regrouping, and divide any number by a one-digit number, with and without a remainder *(e.g., 3,427 x 68; 1,380 ÷ 6 = __).*						x			
	Perform calculations involving two or more additions and subtractions, within the limits for meets expectations described above, when order of operations is not a factor *(e.g., 14 - 5 + 4 = __; 17 - 3 - 7 = __).*		x							
	Perform calculations involving two or more operations, within the limits for meets expectations described above, when order of operations is not a factor *(e.g., 6 x 7 + 19 = __; 6 x 4 ÷ 8 = __).*			x						
	Perform calculations involving two or more operations, within the limits for meets expectations described above, when order of operations is not a factor *(e.g., 6 x 7 + 519 = __; 6 x 4 ÷ 8 = __).*				x					

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N1—Whole numbers

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
	Perform calculations involving two or more operations, within the limits for meets expectations described above, respecting the order of operations *(e.g., 1754 + 53 x 53 = __; 4 x 9 x 8 = __).*					x				
	Perform calculations involving two or more operations, within the limits for meets expectations described above, respecting the order of operations *(e.g., 6,584 + 2,187 x 38 = __; 675 ÷ 9 x 652 = __).*						x			
N1.4 Solve real-world problems involving whole numbers	Solve simple real-world problems using addition and subtraction facts within 10 (i.e., where the sum or minuend does not surpass 10) *(e.g., There are 7 eggs in a carton. 3 more eggs are put in the carton. How many eggs are in the carton now?; 3 eggs in a carton of 10 eggs are cracked. How many eggs are not cracked?).*	x								
	Solve simple real-world problems using addition and subtraction facts within 20 (i.e., where the sum or minuend does not surpass 20) *(e.g., There are 15 sheep in a field. 4 more sheep come into the field. How many sheep are in the field now?; There are 16 sheep in a field. 4 go to the stable. How many sheep are left in the field?).*		x							
	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) without regrouping, including problems involving measurement and currency units *(e.g., There are 33 sheep in a field. 25 more sheep come into the field. How many sheep are in the field now?; There are 54 children in total in grade 3. Thirteen are absent today. How many grade 3 children are at school today?).*			x						
	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with and without regrouping, including problems involving measurement and currency units *(e.g., There are 34 sheep in a field. 29 more sheep come into the field. How many sheep are in the field now?; There are 54 children in total in grade 4. 7 are absent today. How many grade 4 children are at school today?).*				x					
	Solve simple real-world problems involving the multiplication of two whole numbers to 5, and associated division facts *(e.g., Amina is putting fruit into bags. Each bag will contain 4 pieces of fruit. How many bags will Amina need for 20 pieces of fruit?; Amina has 5 bags. Each bag contains 4 pieces of fruit. How many pieces of fruit are there in total?).*				x					
	Solve simple real-world problems involving addition and subtraction of whole numbers within 1,000 (i.e., where the sum or minuend does not surpass 1,000) with and without regrouping, including problems involving measurement and currency units *(e.g., There were 740 people living in a town. 83 more people come to live in the town. What is the total number of people living in the town now?; There are 750 people living in a town. Only 327 of them were born in the town. How many were born outside the town?).*					x				
	Solve simple real-world problems involving the multiplication of two whole numbers to 10, and associated division facts *(e.g., Amina is putting fruit into bags. Each bag will contain 7 pieces of fruit. How many bags will Amina need for 28 pieces of fruit?; Amina has 4 bags. Each bag contains 7 pieces of fruit. How many pieces of fruit are there in total?).*					x				
	Solve real-world problems involving combinations of any **two or more** of the four operations, including problems involving measurement and currency units and: * addition and subtraction of whole numbers beyond 1,000 with and without regrouping * multiplications and divisions of any number by a one-digit number with and without regrouping (multiplication) and with and without a remainder (division) * multiplications of two 2-digit numbers.						x			

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N2—Fractions

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N2.1 Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude	Compare and order everyday unit fractions *(e.g., 1/4; 1/3; 1/2)*.				x					
	Compare and order fractions with different but related denominators up to 12 *(e.g., 2/3 and 5/6)*.					x				
	Compare and order fractions and mixed numbers *(e.g., 9/6, 1 1/3, 5/12, 2 1/2)*.						x			
	Compare and order proper and improper fractions with different, unrelated denominators *(e.g., 1/4; 7/10; 5/6)*.						x			
	Compare and order positive and negative fractions (proper and improper) and mixed numbers *(e.g., -2/3, 1/3, 5/6, -1 1/2, 5/9)*.							x		
	Identify unit fractions with denominators up to 12 *(e.g., 1/5; 1/7; 1/8; 1/10)* represented as objects or pictures (as part of a whole or part of a set) in fractional notation *(e.g., shade 1/5 of this shape; indicate 1/6 of these objects when arranged in a 3 by 6 array)*.			x						
	Identify and express everyday unit fractions *(e.g., 1/2; 1/3; 1/4)* as equivalent fractions when the fractional notations are accompanied by pictures or objects *(e.g., 1/3 = ¨⁄6 when the task is supported by pictures; 1/2 = 3⁄¨)*.				x					
	Identify and express proper fractions as equivalent fractions with denominators up to 12 *(e.g., express a fraction in simplest form 6/9 = □/3; 2/10 = 1/□; express as a multiple of another 4/5 = 8/□)*.					x				
	Identify and express improper fractions as equivalent mixed numbers (or vice versa), with pictures or symbols *(e.g., represent 9/6 as 1 3/6 or 1 1/2; use two arrays or rectangles and coloring to represent 9/6)*.						x			
	Identify and express proper fractions as equivalent fractions (any denominator) *(e.g., 13/25 = 26/50)*.						x			
N2.2 Solve operations using fractions	Add and subtract proper fractions with the same denominator when fractions are represented with symbols, and represent such additions with objects or pictures *(e.g., 2/3 + 1/3; 3/5 - 1/5; add 2/5 and 1/5, or subtract 3/8 from 6/8 using fraction bars)*.				x					
	Add and subtract proper fractions with different but related denominators *(e.g., 2/3 + 1/6; 7/8 - 1/4)*.					x				
	Add and subtract improper fractions or mixed numbers with different but related denominators *(e.g., 2 2/3 + 1 1/6; 25/4 + 5/12)*.						x			
	Add and subtract improper fractions or mixed numbers with different, unrelated denominators *(e.g., 9/4 + 3/9; 3 1/6 - 2/5)*.							x		
	Multiply commonly-used fractions by whole numbers, or divide proper fractions by whole numbers, and represent such operations with objects or pictures *(e.g., represent 3/4 x 12 with a 3 x 4 grid with three of the columns colored in; represent 3/4 divided by 2 as a 1 x 1 grid with one side divided into 4 equal parts and 3 blocks colored in and the other side divided into 2 to produce 8 equal blocks with 6 colored in)*.					x				
	Multiply and divide proper fractions and divide improper fractions by whole numbers, and represent such operations with pictures or symbols *(e.g., 2/5 ÷ 3/5; 3/4 x 2/6; 7/5 ÷ 2; represent 3/4 x 1/2 as a rectangle split into 4 equal parts with 3 parts shaded and each of the 4 equal parts split into 2 equal sections. Note that the smaller shaded sections represent the answer)*.						x			
	Multiply and divide fractions (including proper and improper fractions and mixed numbers) *(e.g., 3/4 x 7/6 = __; 2/3 x 3 1/4 =__; 4/5 ÷ 5/3 =__)*.							x		

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N2—Fractions

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N2.3 Solve real-world problems involving fractions	Solve real-world problems involving addition and subtraction of proper fractions with the same denominators *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 1/5 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola ate 2/5 of a chocolate bar at recess. How much of the chocolate bar is left?).*				x					
	Solve real-world problems involving addition and subtraction of proper fractions with different but related denominators *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 3/10 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola has 2/3 of a chocolate bar left. If she gives her friend Carola 1/6 of what remains, what fraction of the chocolate bar will Paola have left?).*					x				
	Solve real-world problems involving the multiplication and division of a proper fraction and a whole number *(e.g., Misha has half a pizza. If she shares it equally with her brother, what fraction of the original pizza will each receive?).*					x				
	Solve real-world problems involving addition and subtraction of improper fractions and mixed numbers with different but related denominators *(e.g., Maya is cutting some oranges for a picnic. She cuts each orange into 8 equal pieces. She puts 25 pieces of orange onto a large plate and 11 pieces of orange onto a smaller plate. What is the smallest number of whole oranges Maya could have cut?; A tree is now 3 and a half meters tall. When it was planted, it was one and one quarter meters tall. By how many meters has the tree grown since it was planted?).*						x			
	Solve real-world problems involving the multiplication of two proper fractions or the division of an improper fraction or mixed number by a whole number *(e.g., Misha has half a pizza. If she shares it equally with her brother, what fraction of the original pizza will each receive?).*						x			
	Solve real-world problems involving the addition and subtraction of proper and improper fractions and mixed numbers with unrelated denominators *(e.g., A carpenter has a piece of wood that measures 15 and 7/8 ft. She only needs a piece that measures 10 and 5/12 ft. What is the length of the piece of wood she should cut off the long piece?).*							x		
	Solve real-world problems involving the multiplication and division of fractions (including proper and improper fractions and mixed numbers) *(e.g., A cake needs one and a half cups of flour. How much is needed to make half a cake?; Dean has a piece of wood that is 3/4 of a foot in length. He needs to cut it into pieces that are 1/16 of a foot long. How many pieces can he cut?).*							x		

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N3—Decimals

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N3.1 Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude	Identify and represent quantities using decimal notation (i.e., symbols) up to the tenths place *(e.g., identify that 0.8 is 8 tenths).*					x				
	Identify and represent quantities using decimal notation up to the hundredths place *(e.g., identify that 0.65 is 65 hundredths).*						x			
	Identify and represent quantities using decimal notation beyond the hundredths place *(e.g., identify that 0.655 is 655 thousandths).*							x		
	Compare and order decimal numbers up to the tenths place *(e.g., sort the following decimals from high to low: 0.8, 0.3, 0.1).*					x				
	Compare and order decimal numbers up to the hundredths place *(e.g., sort the following decimals from high to low: 0.8, 0.33, 0.08, 0.6).*						x			
	Compare and order decimal numbers beyond the hundredths place *(e.g., sort the following decimals from low to high: 0.821, 0.33, 0.08, 0.698, 0.7).*							x		
	Compare and order positive and negative decimal numbers, including those beyond the thousandths place *(e.g., compare +0.821, -0.33, -0.08, +0.698, +0.7).*							x		

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N3—Decimals

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N3.2 Represent decimals in equivalent ways (including fractions and percentages)	Round decimal numbers to the nearest tenths place *(e.g., round 3.46 to 3.5)*.					x				
	Round decimal numbers to the nearest hundredths place *(e.g., round 3.456 to 3.46)*.						x			
	Round decimal numbers to any place value beyond the hundredths place *(e.g., round 3.45619 to 3.4562)*.							x		
	Identify and express fractions with denominators of 10 using decimal notation *(e.g., 7/10 = 0.7)*.					x				
	Identify and express fractions with denominators of 100 and everyday fractions, using decimal notation, and represent fractions with denominators of 100 as percentages *(e.g., 3/4 = 0.75; 72/100 = 0.72 = 72%)*.						x			
	Identify and express fractions with any denominator using decimal notation and vice versa *(e.g., 752/1000 = 0.752; 7/8 = 0.875)*.							x		
	Identify and express percentages as fractions with denominators of 10 or 100 or as decimals and vice versa *(e.g., 80% = 80/100 or 8/10; 75% = 0.75)*.							x		
	Identify and express percentages less than 1% and greater than 100% as fractions or mixed numbers and vice versa *(e.g., 124% = 1 24/100; 0.2% = 2/1000)*.								x	
	Compare and order decimals (to the hundredths place) and proper fractions *(e.g., place a list of decimals and proper fractions on a number line)*.						x			
	Compare and order fractions, decimals, and percentages *(e.g., place these numbers on a number line: 0.4, 1/2, 0.50%, 4/5, 0.25, 1/3, 0.25%)*.							x		
	Compare and order positive and negative decimals and fractions *(e.g., place these numbers on a number line from -1 to +1: -0.4, +1/2, -4/5, 0.25, -1/3, 3/4)*.								x	
N3.3 Solve operations using decimals	Add and subtract decimal numbers up to the tenths place. Create or identify concrete or picture models to represent such additions *(e.g., 0.5 + 0.2)*.					x				
	Add and subtract decimal numbers up to the hundredths place. Create or identify concrete or picture models to represent such additions *(e.g., 3.41 + 5.3)*.						x			
	Add and subtract any positive and negative decimal numbers.							x		
	Multiply and divide a decimal number by a whole number.							x		
	Multiply and divide two decimal numbers and divide a whole number by a decimal.								x	
N3.4 Solve real-world problems involving decimals	Solve real-world problems involving the addition and subtraction of decimals to the tenths place *(e.g., Diego has 3.2 meters of roof sheeting. If he buys another 1.4 meters, how many meters of roof sheeting will he have altogether? Aminata has 32.5 kg of grout for tiling. If she uses 12.1 kg for a new project, how many kgs of tile grout will she have left?)*.						x			
	Solve real-world problems involving addition and subtraction of decimals beyond the tenths place *(e.g., Aria has a height of 1.55 meters. Her mother has a height of 1.63 meters. How much taller than Aria is her mother? Adwoa has 1.64 meters of roof sheeting and another 1.4 meters. How many meters of roof sheeting does she have?)*.							x		
	Solve real-world problems involving the multiplication or division of a decimal by a whole number *(e.g., Misha buys 4 bags of sugar. Each bag holds 1.5 kg. How many kilos of sugar did he buy? Saira has 2.4 kg of sugar. She wants to separate the sugar into 3 bags of equal size. How many kgs should she put in each bag?)*.							x		
	Solve real-world problems involving the multiplication or division of two decimal numbers *(e.g., Pascal has seven .75-liter containers of olive oil. He sells half of them. How many liters of olive oil did he sell? Sheila buys a 4.5-liter barrel of olive oil. She sells them in 0.75-liter containers. How many containers can she make with the 4.5-liter barrel?)*.								x	

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N4—Integers

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N4.1 Identify and represent integers using objects, pictures, or symbols, and identify relative magnitude	Compare and order integers *(e.g., order the following from smallest to largest: -4, 6, -9, 2).*							x		
N4.2 Solve operations using integers	Multiply any two positive integers, with and without regrouping, and divide any integer by a two-digit number, with and without a remainder *(e.g., 2342 x 1478; 3388 ÷ 15 = __).*							x		
	Perform calculations involving two or more operations with positive integers, within the limits for meets expectations described above, respecting the order of operations *(e.g., (6584 + 2187) x 318 = __; (9675 - 823) ÷ 19 = __).*							x		
	Perform calculations involving operations with negative integers.							x		
	Identify factors of whole numbers beyond 100 and multiples of whole numbers beyond 20 *(e.g., find factors of 125 or find multiples of 25).*							x		
	Identify common factors and common multiples of two numbers *(e.g., find the lowest common multiple and the greatest common factor of 12 and 16).*								x	
N4.3 Solve real-world problems involving integers	Solve real-world problems involving combinations of any two or more of the four operations, including problems involving measurement and currency units and: * addition and subtraction of any integers * multiplication of any positive integers * division of any positive integers by a positive two-digit number with or without a remainder *(e.g., The temperature last night was -3 C. This morning it was +2 C. What was the change in temperature between last night and this morning?).*							x		
	Solve real-world problems involving the multiplication or division of two integers, including at least one negative integer *(e.g., It is -8 degrees Celsius on Tuesday. On Wednesday, it is three times colder. What is the temperature on Wednesday?).*								x	

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N5—Exponents and roots

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N5.1 Identify and represent quantities using exponents and roots, and identify the relative magnitude	Identify the square, cube, square root, and cube root of whole numbers using pictures and symbols, and represent a square or cube number using exponential notation *(e.g., use square arrays or grids to represent square numbers or identify the square of a number; identify the square of 8 or the square root of 81; represent 64 as 82).*							x		
	Identify and represent very large whole numbers using scientific notation and positive exponents *(e.g., 600 = 6 x 10^2).*								x	
	Identify and represent very small numbers using scientific notation and negative exponents *(e.g., 0.065 is 6.5 x 10^{-2}).*									x
	Compare and order large numbers expressed in scientific notation *(e.g., 3.1 x 10^5, 9.2 x 10^5, 2.7 x 10^3; 6.1 x 10^2).*								x	
	Compare and order large and small numbers expressed in scientific notation *(e.g., 3.1 x 10^5, 9.2 x 10^{-5}, 2.7 x 10^3; 6.1 x 10^{-2}).*									x
N5.2 Solve operations involving exponents and roots	Add and subtract quantities expressed in exponential notation *(e.g., $3^2 + 3^5$ = __, including scientific notation).*									x
	Multiply and divide quantities expressed in exponential notation, including scientific notation *(e.g., $3^5 \div 3^2$ or $4^3 \times 4^2$).*									x

DOMAIN: N— NUMBER AND OPERATIONS | Construct: N6—Operations across number

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
N6.1 Solve operations involving integers, fractions, decimals, percentages, and exponents	Perform calculations involving two or more operations of integers, decimals, and fractions, within the limits for meets expectations described above, respecting the order of operations.								x	
	Perform calculations involving two or more operations of integers, decimals, fractions, and exponents, within the limits for meets expectations described above, respecting the order of operations.									x

DOMAIN: M—MEASUREMENT | Construct: M1—Length, weight, capacity, volume, area, and perimeter

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
M1.1 Use non-standard and standard units to measure, compare, and order	Measure the length of objects using non-standard units *(e.g., identify that the pencil is 5 paper clips long).*	x								
	Use non-standard units to estimate and compare the length of objects *(e.g., identify that the red pencil is 4 paper clips long and the black pencil is 6 paper clips long).*		x							
	Use standard units to compare length and weight when provided the unit of measurement *(e.g., identify that the pencil is one centimeter longer than the crayon).*			x						
	Use non-standard units to estimate or measure volume/capacity *(e.g., identify which container would hold the most sand or which box would hold the most balls given pictures of these items).*			x						
	Select and use appropriate standard units to estimate, measure, and compare length and weight when measurements involve whole numbers only *(e.g., choose centimeters instead of meters to measure a pencil; estimate the weight of the apple when given the following choices: a) 5g b) 200g c) 1kg d) 5kg).*				x					
	Select and use appropriate standard units to measure and compare capacity/volume when measurements involve whole numbers only *(e.g., the measuring cups contain 200 ml of water and 100 ml of oil).*				x					
	Identify the relationship between the relative size of adjacent units within a standard system of measurement for length and weight *(e.g., identify the number of millimeters in a centimeter).*					x				
	Identify the relationship between the relative size of adjacent units within a standard system of measurement for capacity/volume *(e.g., identify the number of pints in a quart).*					x				
	Read scales to the nearest marked increment on a variety of measuring tools involving fractions and decimals to the tenths place, containing both labeled and unlabeled scale increments *(e.g., read a kitchen scale containing increments expressed as fractions).*					x				
	Read scales to the nearest marked increment on a variety of measuring tools involving decimals to the hundredths place, containing both labeled and unlabeled scale increments *(e.g., read a depth gauge in a dam with scale increments increasing in 25 centimeter intervals and labels expressed as decimal meters e.g., 1.25, 1.5, 1.75, 2.0, when the needle is pointing directly at a marked increment of the scale).*						x			
	Read scales on a variety of measuring tools by reading between marked scale increments (interpolating) *(e.g., read a kitchen scale marked in grams and kilograms with some unlabeled scale markings and needle pointing between two unlabeled scale markings; measure an angle using a protractor/angle measurer).*							x		
	Make conversions between non-adjacent units of length and weight within a standard system of measurement *(e.g., convert kilometers to millimeters).*							x		
	Make conversions between non-adjacent units of capacity/volume within a standard system of measurement *(e.g., convert pints to gallons).*							x		
	Make conversions between adjacent units of length and weight within a standard system of measurement *(e.g., identify that the 16-centimeter pencil is 160 millimeters long).*						x			
	Make conversions between adjacent units of capacity/volume within a standard system of measurement *(e.g., identify that there are four pints in a two-quart container).*						x			
	Make conversions of units of length and weight between different systems of measurement when the conversion factor is provided *(e.g., convert 12 cm to inches given 1 inch is 2.54 cm, or convert pounds to kilograms given 1 pound is 0.45 kg).*								x	
	Make conversions of units of capacity/volume between different systems of measurement where the conversion factor is provided *(e.g., convert 750 milliliters to pints given 1 pint is 473 mL).*								x	

DOMAIN: M—MEASUREMENT | Construct: M1—Length, weight, capacity, volume, area, and perimeter

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
M1.2 Solve problems involving measurement	Calculate the perimeter of a polygon.				x					
	Solve problems, including real-world problems, involving the area of a rectangle using concrete or pictorial representations of units (e.g., grid squares or tiles).				x					
	Solve problems, including real-world problems, involving the perimeter of a polygon.					x				
	Solve problems, including real-world problems, involving the calculation of the area of a rectangle.					x				
	Solve problems, including real-world problems, involving comparing the perimeters of polygons.						x			
	Solve problems, including real-world problems, involving the area of compound shapes comprised of rectangles using concrete or pictorial representations of units *(e.g., grid squares or tiles)*.						x			
	Solve problems, including real-world problems, involving perimeter in which a length is unknown *(e.g., identify the fifth length in a picture of an irregular pentagon with four sides labeled with length and a given perimeter)*.							x		
	Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprised of rectangles *(e.g., calculate the area of a compound L-shape given a picture with the lengths of all sides provided)*.							x		
	Solve problems, including real-world problems, involving the calculation of the area of a triangle *(e.g., work out the area of a triangle with base length and height given)*.								x	
	Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprising rectangles and triangles *(e.g., calculate the area of a composite shape given a picture of the shape made up of a rectangle connected to a right-angled triangle with the lengths of all sides provided)*.								x	
	Solve problems, including real-world problems, involving the calculation of the volume of a rectangular prism *(e.g., calculate the volume in cubic centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.								x	
	Solve problems, including real-world problems, involving the calculation of the circumference of a circle given the diameter or radius and vice versa.									x
	Solve problems, including real-world problems, involving the calculation of the area of a circle given the diameter or radius and vice versa.									x
	Solve problems, including real-world problems, involving the calculation of the surface area of a familiar polyhedron (i.e., a rectangular prism, square-based pyramid, triangular prism) *(e.g., calculate the surface area in square centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.									x
	Solve problems, including real-world problems, involving calculating the volume of a non-rectangular prism, given its dimensions *(e.g., calculate the volume of a regular triangular prism, with the length of one side of the base and its height provided)*.									x
	Solve problems, including real-world problems, involving application of Pythagoras' theorem.									x

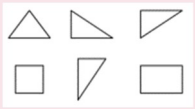
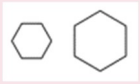
DOMAIN: M—MEASUREMENT | Construct: M2—Time

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
M2.1 Tell time	Identify, sequence, and describe activities/events that take place at different parts of the day *(e.g., morning and afternoon).*	x								
	Tell time using an analog clock to the nearest hour.		x							
	Tell time using an analog clock to the nearest half hour.			x						
	Tell time using an analog clock to the nearest minute.				x					
	Recognize the number of days in a week and months in a year.		x							
	Recognize the number of hours in a day, minutes in an hour, and seconds in a minute.			x						
	Recognize equivalence between representations of time *(e.g., digital, analog, and written; 15 minutes is a quarter of an hour).*					x				
M2.2 Solve problems involving time	Solve problems, including real-world problems, using a calendar *(e.g., given a calendar, answer this question: March 2 falls on what day of the week?).*		x							
	Solve problems, including real-world problems, involving elapsed time in hours and half-hours *(e.g., calculate the difference between 2:00 and 5:30 or the difference between 16:00 and 16:30).*			x						
	Solve problems, including real-world problems, involving elapsed time in minutes within an hour *(e.g., calculate the difference between 3:42 and 3:56 or the difference between 16:35 and 16:52).*				x					
	Solve problems, including real word problems, involving elapsed time in minutes across hours *(e.g., calculate the difference between 3:24 and 5:12 or the difference between 16:35 and 18:22)*, including problems involving schedules (i.e., timetables, agendas, itineraries).					x				
	Solve problems, including real-world problems, involving the number of days in a week, months in a year, hours in a day, minutes in an hour, and seconds in a minute.					x				
	Solve problems, including real-world problems, involving elapsed time across a.m. and p.m. in countries that teach 12-hour time *(e.g., calculate the difference between 10:30 a.m. and 3:15 p.m.)*.						x			
	Solve problems, including real-world problems, involving conversion between 12-hour and 24-hour time *(e.g., A ferry departs at 16:30 hours. It takes 2 hours and 15 minutes to reach its destination. At what time does the ferry arrive at its destination? Give your answer in a.m./p.m. time).*							x		
	Solve problems, including real-world problems, involving time zones *(e.g., When it is 4 p.m. on Tuesday in New York, it is 6 a.m. on Wednesday in Sydney. When it is 11 a.m. on Thursday in Sydney, what time and day will it be in New York?).*								x	
	Solve problems, including real-world problems, involving conversion between years, months, weeks, days, hours, fractions of hours, or minutes *(e.g., Ali spends two hours per week practicing piano. How many days per year does he spend practicing piano?).*									x

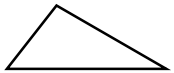
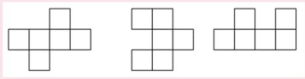
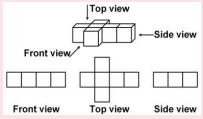
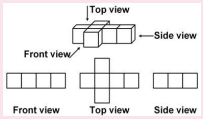
DOMAIN: M—MEASUREMENT | Construct: M3—Currency

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
M3.1 Use different currency units to create amounts	Count simple combinations of two commonly used currency denominations in a country.	x								
	Count combinations of commonly used currency denominations.		x							
	Combine commonly used currency denominations to make a specified amount.		x							
	Combine commonly used currency denominations to make a specified amount in a variety of ways.			x						

DOMAIN: G—GEOMETRY | Construct: G1—Properties of shapes and figures

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
G1.1 Recognize and describe shapes and figures	Recognize and name basic shapes *(e.g., recognize a picture of a square, circle, rectangle, or triangle or name a shape when it is pointed to).*	x								
	Recognize and name shapes that are regular and irregular *(e.g., if shown an irregular triangle, recognize that it is a triangle; name a hexagon).*		x							
	Recognize and name straight and curved lines and attributes of shapes *(e.g., number of sides, number of corners).*		x							
	Recognize when a two-dimensional shape has been rotated or reflected *(e.g., when shown a number of shapes, identify those that are the same, even when some are rotated or reflected).* 		x							
	Recognize and name two-dimensional shapes and familiar three-dimensional figures in everyday life.			x						
	Recognize and name two-dimensional shapes by a written or spoken description of their simple attributes *(e.g., name a shape given a description of the number of sides or corners or the relative length of the sides, etc.).*				x					
	Recognize and describe the congruence and similarity of two-dimensional shapes *(e.g., when shown two shapes, explain how they are similar using mathematical or non-mathematical language: "It got bigger and has been turned" or "It's been enlarged and rotated").* 				x					
	Recognize and name types of triangles *(e.g., isosceles, scalene, equilateral, and right angle).*					x				
	Recognize and name three-dimensional figures by their attributes *(e.g., faces, edges, vertices).*					x				
	Recognize types of angles by their magnitude *(e.g., right, straight, acute, obtuse).*					x				
	Recognize and name types of quadrilaterals *(e.g., parallelogram, trapezium, etc.).*						x			
	Recognize single-step, two-dimensional shape transformations expressed quantitatively (i.e., rotation by a given fraction of a turn, reflection along a given mirror line, or enlargement by a given scale factor).							x		
	Recognize and name parts of the circle (i.e., radius, diameter, circumference) and identify the relationship between the radius and diameter.								x	
	Identify a line of symmetry in two-dimensional shapes.			x						
	Identify parallel and perpendicular sides of shapes.						x			
	Use the defining attributes (i.e., type of angle, parallel and perpendicular lines) of complex two-dimensional shapes to classify them.							x		
	Use the angle relationships associated with intersecting lines, and with parallel lines intersected by a transverse line to solve problems *(e.g., calculate missing angles on a diagram with parallel and intersecting lines).*									x
	Estimate the size of angles by comparing to reference/benchmark angles *(e.g., estimate the size of a given angle with reference to the fact that it is smaller than a right angle and larger than 45°).*							x		
	Use the angle sum of a triangle to solve problems *(e.g., determine the missing angle of a triangle where two angles are given).*								x	
	Describe and implement two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).								x	
	Describe and implement sequential two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).									x

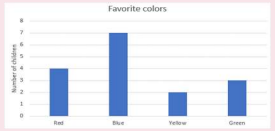
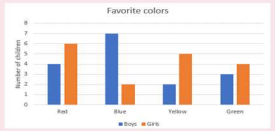
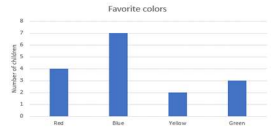
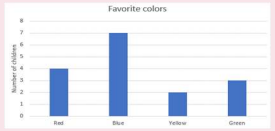
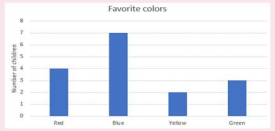
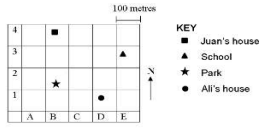
DOMAIN: G—GEOMETRY | Construct: G2—Spatial visualizations

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
G2.1 Compose and decompose shapes and figures	Compose a larger two-dimensional shape from a small number of given shapes when the outlines for the shapes are provided *(e.g., use the smaller shapes to make the larger shape).* 	x								
	Compose/decompose a larger two-dimensional shape from a small number of given shapes without lines showing where the shapes go *(e.g., use the smaller shapes to make the larger shape).* 		x							
	Use a small number of given shapes to compose multiple larger two-dimensional shapes *(e.g., identify which of these larger shapes can be made from the smaller shapes?)* and decompose a larger shape into a given number of smaller shapes *(e.g., draw one line on the triangle below to show how it can be cut into exactly two smaller triangles).* 			x						
	Identify the net of a cube or specific faces on the net of a cube *(e.g., fold mentally to answer the question, which of these is the net of a cube?; identify opposite faces on a net).* 					x				
	Identify front, top, and side views of a familiar three-dimensional figure (i.e., prism, cylinder, cone, or pyramid) *(e.g., identify that the top view of an upright cylinder is a circle).*						x			
	Identify alternate views of the same compound or irregular three-dimensional shape, such as its front, top and side view, a rotated view, or a view of a hidden side *(e.g., label images (i), (ii), and (iii) as the front, top and side view of the three-dimensional shape).* 							x		
	Identify the net of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., fold or unfold mentally to answer the question, "What figure does this make when folded?"; "What figure does this make when unfolded?").* 								x	
	Identify a cross-section of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., identify that the cross section of a cylinder that is not parallel to the base is an ellipse).*									x

DOMAIN: G—GEOMETRY | Construct: G3—Position and direction

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
G3.1 Describe the position and direction of objects in space	Use familiar positional terms *(e.g., answer the question, "Where is the book?" by saying, "The book is next to the pencil.")*.	x								
	Recognize and use positional terms that describe the location of an object with more precision *(e.g., answer the question, "Where is the book?" by saying, "The book is between the pencil and the bag.")*.		x							
	Accurately use the terms left and right, and use simple maps to describe locations using positional terms *(e.g., answer, "Where is the teacher's desk?" "To the [left] of the chalkboard.")*.			x						
	Use different kinds of simple maps (i.e., an alphanumeric map, grid map, or local equivalent) to give and follow two-step directions to a given location *(e.g., Using this map, if you are at the school, you walk towards the tree, and turn left. What would you be facing?; Using this map, how do you get from the school to the green house?)*.				x					
	Use a grid map with compass directions when the grid dimensions are given in terms of the real-world distance *(e.g., Which of these is closest to the distance between the park and Juan's house? a) 100 meters b) 150 meters c) 200 meters d) 250 meters)*.					x				
	Locate and plot points on a plane in the first quadrant of a Cartesian coordinate system.						x			
	Locate and plot points on a plane in all four quadrants of a Cartesian coordinate system.								x	
	Draw shapes in the first quadrant of a Cartesian coordinate system, and find missing points *(e.g., if (1,1), (1,3), and (1,2) are three corners of a rectangle, identify the fourth corner)*.							x		
	Draw shapes in all four quadrants of a Cartesian coordinate system and find missing points *(e.g., If (1,2), (-3,2), and (-3,-2) are three corners of a square, what is the fourth corner?)*.									x
	Identify horizontal and/or vertical distances between two points in the first quadrant of the Cartesian coordinate system *(e.g., using the Cartesian coordinate system, identify how many horizontal and vertical units is (1,1) from (3,4))*.							x		
	Describe and implement a single transformation (i.e., reflection, rotation, translation, enlargement/reduction) of a two-dimensional shape in all four quadrants of a Cartesian coordinate system.									x

DOMAIN: S—STATISTICS AND PROBABILITY | Construct: S1—Data management

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
S1.1 Retrieve and interpret data presented in displays	Retrieve information about a single category from a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale *(e.g., How many children liked red on this bar graph?)* 	x								
	Retrieve information from data displays that arrange data into categories and sub-categories with a single- or multi-unit scale *(e.g., How many girls liked green in this bar chart?).* 						x			
	Retrieve categorical data from pie charts and Venn diagrams and bivariate data from line graphs and dot plots.							x		
	Compare between categories of a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale, using terms such as more than, less than, etc. *(e.g., Which color was chosen less often than green on this bar graph?).* 		x							
	Solve a problem involving the sum of or difference between two specified categories of a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children like red and blue in this bar graph?).* 			x						
	Solve a problem involving more than two pieces of information from a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children were asked about their favorite color in this bar graph?).* 				x					
	Complete missing information in a tally chart, bar graph, or pictograph that arranges data into categories and uses a single-unit scale *(e.g., add a row or column to a partially completed pictograph).*				x					
	Retrieve information from a tally chart, bar graph, or pictograph with a multi-unit scale.				x					
	Organize data and construct a tally chart, bar graph, or pictograph that arranges data into categories and uses a single- or multi-unit scale. 					x				
	Organize data and construct pie charts and Venn diagrams (categorical data) and line graphs and dot plots (bivariate data) when some support is provided *(e.g., construct a line graph when given labeled horizontal and/or vertical axes, or match a table to the correct pie chart given a range of pie chart options).*								x	
	Compare by calculating differences between categories in a tally chart, bar graph, or pictograph with a multi-unit scale.					x				
	Understand, describe, and use relationships within displays of bivariate data *(e.g., describe the strength of association shown in a scatter plot, or a linear relationship between two functionally related variables).*									x

DOMAIN: S—STATISTICS AND PROBABILITY | Construct: S1—Data management

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
S1.2 Calculate and interpret central tendency	Solve problems, including real-world problems, involving calculation of the mean, median, or mode of a set of data.							x		
	Compare key features of the distribution of two different but related sets of data *(e.g., compare the heights of 10 grade four students to the heights of 10 grade seven students with reference to minimum value, maximum value, and spread of the data).*							x		
	Describe the effect of adding or removing a specific data value on the mean, median, or mode of a set of data *(e.g., What would be the effect of removing a score of 20 from the scores 20, 80, 70, and 75 on the mean? The possible answers are: a) it would increase, b) it would decrease, and c) it would stay the same. The same question can be asked about the effect on the median and the mode. Another example is: Juanita plays hockey and aims to achieve a mean of 3 goals per game by the end of the season. Her goals for the first four games are shown: 2, 4, 1, 3. She has one more game to play this season. How many goals must she score in this game to achieve her aim?).*								x	
	Compare the distribution of sub-categories within a set of data *(e.g., compare temperatures in a 24-hour period split into day temperatures and night temperatures).*								x	
	Determine and compare the mean, median, and mode for different sets of data and choose which is most appropriate in a given context *(e.g., determine why the median is more appropriate than the mean as a representation of house prices in a given area).*									x
	Recognize the effect of outliers in a set of data on the mean and median.									x
	Identify desirable characteristics of sampling methods that will enable the mean of a sample to be as close as possible to the mean of a population *(e.g., Anoush wants to determine the mean number of siblings each student in her school has. She decides to ask a sample of students. For which of these samples will the mean of the sample be closest to the mean of the whole school? a) The first 10 students she sees in the corridor, b) All the students on her football team, c) 50 grade 7 students selected randomly, and d) 50 students from various grade levels selected randomly).*									x

DOMAIN: S—STATISTICS AND PROBABILITY | Construct: S2—Chance and probability

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
S2.1 Describe the likelihood of events in different ways	Identify the likelihood of an event happening as likely or unlikely *(e.g., There are 9 blue, 1 red, 1 green, and 1 yellow marbles in a bag. Which color is likely to be selected?).*					x				
	Compare the likelihood of two or more events happening, using descriptive words *(e.g., Given a picture of a spinner with 5 equal colored sections—red, blue, yellow, green, and purple—the question is: "If the spinner is spun two times, what is the chance that it will land on blue both times?" The possible answers are a) impossible, b) unlikely, c) likely, and d) certain).*						x			
	Calculate the probability of a simple event happening, with the answer expressed as a fraction, decimal, or percentage, and place probability values or events on a continuum from 0 (impossible) to 1 (certain), with 0.5 meaning equal chance of occurring or not occurring. *(e.g., What is the probability of rolling a 6 on a standard number die?).*							x		
	Find the expected number of occurrences of a specific independent outcome when a probability experiment is repeated many times *(e.g., calculate the expected number of heads with 50 flips of a fair coin).*								x	
	Calculate probabilities of different outcomes for compound events containing two simple events, when they can be listed as a discrete sample space *(e.g., calculate the chance of rolling a sum of 7 when rolling two standard number dice).*									x
	Use a wide range of representations such as tree diagrams and two-way tables to explore possible outcomes of chance events and experiments involving multiple compound events (containing two or more simple events).									x

DOMAIN: S—STATISTICS AND PROBABILITY | Construct: S2—Chance and probability

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
S2.2 Identify permutations and combinations	Systematically count all the possible outcomes (sample space) for a situation involving a compound event comprised of two simple events with replacement *(e.g., calculate all of the possible outcomes when selecting a marble from a bag containing 5 marbles, then selecting a second marble after putting the first marble back in the bag)* and without replacement *(e.g., calculate all of the possible outcomes when selecting a card randomly from a set containing 1 yellow, 1 blue, 1 red, and 1 green card, then selecting a second card without putting the first card back into the set).*									x

DOMAIN: A—ALGEBRA | Construct: A1—Patterns

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
A1.1 Recognize, describe, extend, and generate patterns	Copy repeating patterns of items such as colors, shapes, and sounds *(e.g., when provided ○□○□○□, select another pattern that is similar to that one, e.g., red, blue, red, blue, red, blue. Or, when someone claps a simple repeated rhythm, "clap; clap clap; clap; clap clap; clap; clap clap," continue the rhythm).*	x								
	Recognize repeating sets in a pattern and use this to identify a missing element and extend the pattern *(e.g., identify that ○□□ is the repeating set in ○□□○□□○□□; identify the missing element in the following set ○□□○□□__□□; when presented with ○□□○□□○□□, add two additional sets to the pattern).*		x							
	Describe repeating patterns *(e.g., explain that ○□□ repeats three times in the following set ○□□○□□○□□; explain that 1, 2, 3, 4 repeats three times in the following set: 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4).*			x						
	Describe numerical patterns that increase or decrease by a constant value with a simple rule, and use this information to identify a missing element or extend the pattern *(e.g., describe the pattern 6, 9, 12, 15 as going up by threes; identify the missing element in the pattern 3, 7, 11, __, 19; extend the pattern 6, 11, 16, 21).*				x					
	Describe numerical patterns that increase or decrease by a constant multiplier, and use this information to identify a missing element or extend the pattern *(e.g., describe that the pattern 2, 4, 8, 16 starts at 2 and doubles or that the pattern 20, 10, 5, 2.5 starts at 20 and halves; identify the missing element in the pattern 3, 6, __, 24, 48; write the next two numbers in the pattern 80, 40, 20, 10).*					x				
	Generate a pattern from a given rule, or match a pattern to a given rule using any operation *(e.g., start at 5 and increase by 3 to generate 5, 8, 11, 14, 17 . . .; match the pattern 3, 6, 12, 24, … to one of these rules a) start at 3 and add 3, b) start at 3 and double, c) start at 3 and add 6, and d) start at 3 and halve).*						x			
	Recognize and extend non-linear patterns, including squaring patterns, which may be supported by a visual representation *(e.g., recognize that 1, 3, 6, 10 increases by 2, then 3, then 4, when accompanied by dots or points arranged into triangles; extend the pattern 2, 4, 16, 25).*							x		

DOMAIN: A—ALGEBRA | Construct: A2—Expressions

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
A2.1 Evaluate, model, and compute with expressions	Use linear expressions to represent problem situations with a single variable *(e.g., The cost of buying cinema tickets online is £12 per ticket plus a £2 booking fee. Write this as an expression where x is the number of tickets purchased).*							x		
	Add and subtract linear expressions *(e.g., (3x + 4y) - (2x + 5y)).*							x		
	Use expressions to represent problem situations with multiple variables *(e.g., Akeelah bought 4 blouses for x dollars and a wristwatch for y dollars. Represent this as an expression).*								x	
	Multiply and divide linear monomials, and simplify linear expressions by using the distributive property *(e.g., multiply (3x)(5y); simplify 2x(3x + 4)).*								x	
	Evaluate and simplify exponential expressions using the Laws of Exponents *(e.g., evaluate $2x^3$ when x = 7; simplify $(2x^3)^2$).*								x	
	Multiply two binomial linear expressions *(e.g., multiply (3x 4y)(2x + 5y)).*									x
	Factor linear and exponential expressions using the greatest common factor algebraically *(e.g., factor 4x2+ 8xy - 6x to 2x(2x + 4y - 3)).*									x

DOMAIN: A—ALGEBRA | Construct: A3—Relations and functions

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
A3.1 Solve problems involving variation (ratio, proportion, and percentage)	Reason proportionally to answer real-world problems involving a unit ratio expressed informally *(e.g., If Tulika needs 3 eggs for 1 cake, how many eggs does Tulika need for 5 cakes?).*						x			
	Reason proportionally to answer real-world problems involving a ratio *(e.g., Purple paint is made from 2 parts blue paint to 3 parts red paint. I have 10 parts of blue paint. How many parts of red paint do I need?; The ratio of teachers to students on a school trip must be 1:9. How many teachers are needed if there are 36 students?).*							x		
	Solve problems, including real-world problems, involving finding the percentages of a known quantity *(e.g., 20% of 70 = __; A stadium holds 3,200 people. If the stadium is 80% full, how many people are in the stadium?).*							x		
	Solve proportions written as two equal ratios *(e.g., solve 2/3 = 10/x).*								x	
	Solve problems, including real-world problems, involving percent increase or decrease *(e.g., A shirt that normally costs 25 euros is on sale for 10% off. How much does it cost now?; A shirt cost 25 euros in November and then 20 euros in December. What is the percent decrease in cost?).*								x	
	Solve problems, including real-world problems, involving percentages where the percentage and final quantity are known, but the initial quantity is not *(e.g., Ana paid $8 for a belt that was on sale. The price had been reduced by 20%. What was the original price of the belt?).*									x
	Write a proportion as two equal ratios to model a proportional relationship *(e.g., write 2/3 = 10/x to represent a problem that says, "Purple paint is made from 2 parts blue paint to 3 parts red paint. If I have 10 parts of blue paint, how many parts of red paint do I need?").*									x

DOMAIN: A—ALGEBRA | Construct: A3—Relations and functions

Subconstruct	Global Proficiency Descriptor for "Meets Global Minimum Proficiency"	Grade								
		1	2	3	4	5	6	7	8	9
A3.2 Demonstrate an understanding of equivalency	Create a numerical expression using + or - to model a situation *(e.g., represent the following in a number sentence: 3 people are on a bus, and 4 more get on).*			x						
	Create a numerical expression using x or ÷ to model a situation *(e.g., represent the following in a number sentence: 3 people get on the bus at each of four stops).*				x					
	Find a missing value in real-world addition and subtraction problems within 20 *(e.g., 3 people are on a bus. More people get on. There are now 7 people on the bus. How many people got on the bus?).*			x						
	Find a missing value in a number sentence using addition and subtraction of numbers within 100 *(e.g., 23 + __ = 59).*				x					
	Find a missing value in a number sentence using multiplication and division within 100 *(e.g., 7 x _ = 35).*					x				
	Find a missing value in a number sentence using any one of the four operations *(e.g., 3 x __ = 18).*						x			
	Represent real-world addition and subtraction problems within 20 using a number sentence with a symbol or blank to represent the missing value *(e.g., 13 people are on a bus. More people get on. There are now 17 people on the bus. How many people got on the bus? Represent this situation with an addition or a subtraction sentence).*				x					
	Represent real-world problems involving the multiplication of two whole numbers to 10 and related division facts, using a number sentence with a symbol or blank to represent the missing value *(e.g. Paul has 3 bags of oranges. There is the same number of oranges in each bag. He has 18 oranges altogether. How many oranges are there in each bag? Represent the situation with a multiplication sentence).*					x				
	Represent real-world problems using a number sentence with one of the four operations *(e.g., Abu has 5 identical water bottles that weigh a total of 15 pounds. Represent the problem as 5 × __ = 15).*						x			
A3.3 Solve equations and inequalities	Represent and solve problems, including real-world problems, using a two-step equation with any of the four operations *(e.g., solve 3x + 4 = 22; Some people got on a bus, doubling the number of passengers. At the next stop, 8 people got off, leaving 16 people on the bus. Represent the situation as an equation, and solve to find the number of people on the bus originally).*							x		
	Represent and solve problems, including real-world problems, using more than two steps, including those that involve the distributive property, combining like terms, etc. *(e.g., solve 3x + 4 (x + 2) = 22; The older children get 2 more cookies than the younger children. If there are 3 younger children and 4 older children and 22 cookies were distributed, how many cookies did the younger children get?; Represent as 3x + 4 (x + 2) = 22) and solve.*								x	
	Represent and solve problems, including real-world problems, using two linear equations *(e.g., If 3x + 4y = 24 and 4x + 3y = 22, solve for x and y; Or, Andre has more money than Bob. If Andre gives Bob $20, they would have the same amount. If Bob gave Andre $22, Andre would then have twice as much as Bob. Represent as two linear equations, and work out how much each of them actually has).*									x
	Interpret equations and their solutions in terms of context *(e.g., given an algebraic graph, such as a distance-time graph, interpret the slope as speed).*								x	
	Graph linear equations, including those of the form y = k and x = k and calculate the slope of a line from a table, equation, graph, or ordered pairs. Identify the x- and y-intercepts of the graphed line of an equation *(e.g., graph y = 5x + 2; graph y = 4; graph x = 4; in the equation y = 3x + 2, identify what the slope is; given a coordinate at (2,4) and a coordinate of (3,7), solve for the slope).*									x
	Solve multi-step inequalities *(e.g., x + 5 (x - 2) > 2).*									x
A3.4 Interpret and evaluate functions	Identify a function presented in a graph, either as a set of points or as a continuous line (curved or straight).									x

TABLE 5: DESCRIPTORS FOR THE THREE HIGHEST PROFICIENCY LEVELS

Grade 1

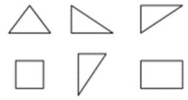
GRADE 1: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N: NUMBER AND OPERATIONS					
N1: WHOLE NUMBERS					
N1.1: Identify and count in whole numbers, and identify their relative magnitude					
N1.1.1_P	Count in whole numbers up to 20.	N1.1.1_M	Count in whole numbers up to 30.	N1.1.1_E	Count in whole numbers up to 100.
N1.1.2_P	Read whole numbers up to 20 in numerals.	N1.1.2_M	Read and write whole numbers up to 30 in numerals.	N1.1.2_E	Read and write whole numbers up to 100 in numerals.
N1.1.3_P	Compare and order whole numbers up to 20.	N1.1.3_M	Compare and order whole numbers up to 30.	N1.1.3_E	Compare and order whole numbers up to 100.
N1.2: Represent whole numbers in equivalent ways					
N1.2.1_P	Identify equivalence between whole quantities up to 5 represented as objects, pictures, and numerals *(e.g., when given a picture of 5 objects and other pictures of various numbers of objects, select the picture that has the same number of objects; associate a numeral with the appropriate number of objects).*	N1.2.1_M	Identify equivalence between whole quantities up to 10 represented as objects, pictures, and numerals *(e.g., when given a picture of 10 objects and other pictures of various numbers of objects, select the picture that has the same number of objects; associate a numeral with the appropriate number of objects).*	N1.2.1_E	Identify equivalence between whole quantities up to 30 represented as objects, pictures, and numerals *(e.g., when given a picture of 30 flowers, identify the picture that has the number of butterflies that would be needed for each flower to have a butterfly).*
N1.3: Solve operations using whole numbers					
N1.3.1_P	Add and subtract within five (i.e., where the sum or minuend does not surpass five), and represent these operations with objects, pictures, or symbols *(e.g., 3 + 2 = __; 5 - 1 = __; when presented with a picture of 3 whole bananas and 1 banana peel, match to the sentence 4 - 1 = 3 or complete the statement 4 - 1 = __).*	N1.3.1_M	Add and subtract within 10 (i.e., where the sum or minuend does not surpass 10), and represent these operations with objects, pictures, or symbols *(e.g., 5 + 4 = __; 7 - 5 = __; when presented with a picture of 3 baskets, with the first basket showing 3 bananas and a second basket showing 5 bananas, complete the addition statement 3 + 5 = __ or find an appropriate addition statement from a list. Or, when presented with a picture of 6 whole bananas and 3 banana peels, match to sentence 9 - 3 = 6 or complete statement 9 - 3 = __).*	N1.3.1_E	Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20) and represent these operations with objects, pictures, or symbols *(e.g., 8 + 6 = __; 15 - 4 = __; when presented with a picture of 12 bananas and 3 more bananas added, complete addition statement 12 + 3 = __ or find a matching addition statement 12 + 3 = 15 from a list. Or, when presented with a picture of 15 whole bananas and 4 banana peels, match to the sentence 19 - 4 = 15 or complete the statement 19 - 4 = __).*
N1.3.2_P	Find the double of a set up to 2 objects, and divide a group of up to 4 objects into two equal sets *(e.g., There are 2 biscuits in a package. There are 2 packages of biscuits. How many biscuits are there in total?; There are 4 biscuits in a package. The biscuits will be shared equally by 2 friends. How many biscuits will each friend get?).*	N1.3.2_M	Find the double of a set of up to 5 objects, and divide a group of up to 10 objects into two equal sets *(e.g., There are 4 biscuits in a package. There are 2 packages of biscuits. How many biscuits are there in total?; There are 8 biscuits in a package. The biscuits will be shared equally by 2 friends. How many biscuits will each friend get?).*	N1.3.2_E	Find the double of a set of up to 10 objects, and divide a group of up to 20 objects into two equal sets *(e.g., An octopus has 8 legs. There are 2 octopuses. How many octopus legs are there in total?; There are 16 biscuits. The biscuits will be shared equally by 2 friends. How many biscuits will each friend get?).*

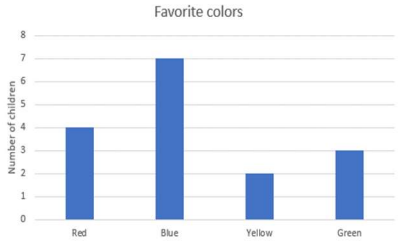
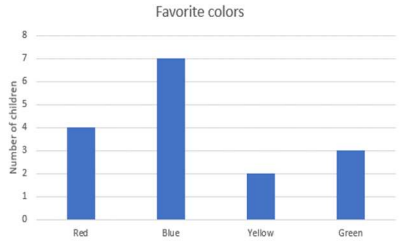
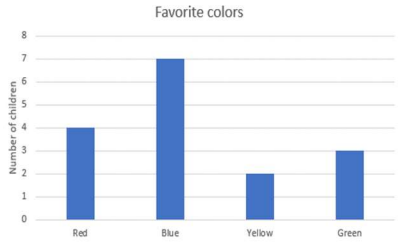
GRADE 1: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N1.4: Solve real-world problems involving whole numbers		
N1.4.1_P Solve simple real-world problems using addition and subtraction facts within 5 (i.e., where the sum or minuend does not surpass 5) *(e.g., There are 2 eggs in a carton. One more egg is put in the carton. How many eggs are in the carton now?; One egg in a carton of 4 eggs is cracked. How many eggs are not cracked?).*	N1.4.1_M Solve simple real-world problems using addition and subtraction facts within 10 (i.e., where the sum or minuend does not surpass 10) *(e.g., There are 7 eggs in a carton. 3 more eggs are put in the carton. How many eggs are in the carton now?; 3 eggs in a carton of 10 eggs are cracked. How many eggs are not cracked?).*	N1.4.1_E Solve simple real-world problems using addition and subtraction facts within 20 (i.e., where the sum or minuend does not surpass 20) *(e.g., There are 14 eggs in a carton. 5 more eggs are added. How many eggs are in the carton now?; 6 eggs in a carton of 12 eggs are cracked. How many eggs are not cracked?).*
N2: FRACTIONS		
Not applicable to grade 1		
N3: DECIMALS		
Not applicable to grade 1		
N4: INTEGERS		
Not applicable to grade 1		
N5: EXPONENTS AND ROOTS		
Not applicable to grade 1		
N6: OPERATIONS ACROSS NUMBER		
Not applicable to grade 1		
M: MEASUREMENT		
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER		
M1.1: Use non-standard and standard units to measure, compare, and order		
M1.1.1_P Visually compare relative lengths *(e.g., longer/shorter; closer/further)* of everyday objects.	M1.1.1_M Measure the length of objects using non-standard units *(e.g., identify that the pencil is 5 paper clips long).*	M1.1.1_E Use non-standard units to estimate and compare the length of objects *(e.g., identify that the red pencil is 4 paper clips long and the black pencil is 6 paper clips long).*
M1.2: Solve problems involving measurement—not applicable to grade 1		
M2: TIME		
M2.1: Tell time		
M2.1.1_P Distinguish between parts of the day by everyday activities *(e.g., eat breakfast in the morning and go to sleep at night).*	M2.1.1_M Identify, sequence, and describe activities/events that take place at different parts of the day *(e.g., morning and afternoon).*	M2.1.1_E Tell time using an analog clock to the nearest hour.
M2.1.2_P N/A	M2.1.2_M N/A	M2.1.2_E Recognize that there are 7 days in a week and 12 months in a year.
M2.2: Solve problems involving time—not applicable to grade 1		

GRADE 1: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M3: CURRENCY					
M3.1: Use different currency units to create amounts					
M3.1.1_P	Know the value of a coin or paper money (banknotes) *(e.g., identify that a dime is worth ten cents).*	M3.1.1_M	Count simple combinations of two currency denominations commonly used in the country.	M3.1.1_E	Count combinations of currency denominations commonly used in the country.
G: GEOMETRY					
G1: PROPERTIES OF SHAPES AND FIGURES					
G1.1: Recognize and describe shapes and figures					
G1.1.1_P	Recognize basic shapes (i.e., circles, squares, triangles) in the environment *(e.g., point to a wheel in a picture when asked to identify the circle in the picture).*	G1.1.1_M	Recognize and name basic shapes *(e.g., recognize a picture of a square, circle, rectangle, or triangle or name a shape when it is pointed to).*	G1.1.1_E	Recognize and name shapes that are regular and irregular *(e.g., if shown an irregular triangle, recognize that it is a triangle; name a hexagon).*
G1.1.2_P	N/A	G1.1.2_M	N/A	G1.1.2_E	Recognize and name straight and curved lines and attributes of shapes *(e.g., number of sides, number of corners).*
G1.1.3_P	N/A	G1.1.3_M	N/A	G1.1.3_E	Recognize when a two-dimensional shape has been rotated or reflected *(e.g., when shown a number of shapes, identify those that are the same, even when some are rotated or reflected).* 
G2: SPATIAL VISUALIZATIONS					
G2.1: Compose and decompose shapes and figures					
G2.1.1_P	Compose a larger two-dimensional shape from two given shapes when the outlines for the shapes are provided.	G2.1.1_M	Compose a larger two-dimensional shape from a small number of given shapes when the outlines for the shapes are provided *(e.g., use the smaller shapes to make the larger shape).* 	G2.1.1_E	Compose/decompose a larger two-dimensional shape from a small number of given shapes without lines showing where the shapes go *(e.g., use the smaller shapes to make the larger shape).*
G3: POSITION AND DIRECTION					
G3.1: Describe the position and direction of objects in space					
G3.1.1_P	Recognize familiar positional terms *(e.g., answer the question, "Which object is next to the book?" by saying, "The book is next to the pencil.").*	G3.1.1_M	Use familiar positional terms *(e.g., answer the question, "Where is the book?" by saying, "The book is next to the pencil.").*	G3.1.1_E	Recognize and use positional terms that describe the location of an object with more precision *(e.g., answer the question, "Where is the book?" by saying, "The book is between the pencil and the bag.").*

GRADE 1: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Retrieve information about a single category from a tally chart, bar graph, or pictograph with up to two categories and a single-unit scale *(e.g., How many children liked red on this bar graph?)*. 	S1.1.1_M Retrieve information about a single category from a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale *(e.g., How many children liked red on this bar graph?)*. 	S1.1.1_E Compare between categories of a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale, using terms such as more than or less than *(e.g., Which color was chosen less often than green on this bar graph?)*. 
S1.2: Calculate and interpret central tendency—not applicable to grade 1		
S2: CHANCE AND PROBABILITY		
Not applicable to grade 1		
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend, and generate patterns		
A1.1.1_P Recognize repeating patterns of items such as colors, shapes, and sounds *(e.g., when provided with several options, ○□○□○□, ○□□○□○, □□□○□○, identify which one is a pattern)*.	A1.1.1_M Copy repeating patterns of items such as colors, shapes, and sounds *(e.g., when provided ○□○□○□, select another pattern that is similar to that one, for example, red, blue, red, blue, red, blue. Or, when someone claps a simple repeated rhythm, "clap; clap clap; clap; clap clap; clap; clap clap," continue the rhythm)*.	A1.1.1_E Recognize repeating sets in a pattern and use this to identify a missing element and extend the pattern *(e.g., identify that ○□□ is the repeating set in ○□□○□□○□□; identify the missing element in the following set ○□□○□□__□□; when presented with ○□□○□□○□□, add two additional sets to the pattern)*.
A2: EXPRESSIONS		
Not applicable to grade 1		
A3: RELATIONS AND FUNCTIONS		
Not applicable to grade 1		

Grade 2

GRADE 2: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N: NUMBER AND OPERATIONS					
N1: WHOLE NUMBERS					
N1.1: Identify and count in whole numbers, and identify their relative magnitude					
N1.1.1_P	Count in whole numbers up to 30.	N1.1.1_M	Count in whole numbers up to 100.	N1.1.1_E	Count backwards from 20.
N1.1.2_P	Read and write whole numbers up to 30 in words and in numerals.	N1.1.2_M	Read and write whole numbers up to 100 in words and in numerals.	N1.1.2_E	N/A
N1.1.3_P	Compare and order whole numbers up to 30.	N1.1.3_M	Compare and order whole numbers up to 100.	N1.1.3_E	N/A
N1.1.4_P	N/A	N1.1.4_M	Skip count forward by twos or tens.	N1.1.4_E	Skip count backwards by tens.
N1.2: Represent whole numbers in equivalent ways					
N1.2.1_P	Identify and represent the equivalence between whole quantities up to 10 represented as objects, pictures, and numerals *(e.g., when given a picture of 10 objects and other pictures of various numbers of objects, select the picture that has the same number of objects; associate a numeral with the appropriate number of objects).*	N1.2.1_M	Identify and represent the equivalence between whole quantities up to 30 represented as objects, pictures, and numerals *(e.g., when given a picture of 30 flowers, identify the picture that has the number of butterflies that would be needed for each flower to have a butterfly; given a picture of 19 shapes, draw 19 more shapes).*	N1.2.1_E	Use place-value concepts for tens and ones *(e.g., compose or decompose a two-digit whole number using a number sentence such as 35 = 3 tens and 5 ones, 35 = 30 + 5, or using number bonds, determine the value of a digit in the tens and ones place).*
N1.3: Solve operations using whole numbers					
N1.3.1_P	Add and subtract within 10 (i.e., where the sum or minuend does not surpass 10), and represent these operations with objects, pictures, or symbols *(e.g., when presented with two pictures of marbles, with the first showing 3 marbles and the second showing 5 marbles, complete or match to the addition statement 3 + 5 = __. Or, when presented with a picture of a carton that can hold 10 bottles, 3 of which have been removed, complete or match to the subtraction statement 10 - 3 = __).*	N1.3.1_M	Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols *(e.g., 16 - 3= __ ; 12 + 3 =__; when presented with a picture of 12 marbles with 3 more marbles added, complete or match to the number sentence 12 + 3 = __. Or, when presented with a picture of a carton that can hold 20 bottles, 7 of which have been removed, complete or match to the subtraction statement 20 - 7= __).*	N1.3.1_E	Add and subtract within 30 (i.e., where the sum or minuend does not surpass 30), and represent these operations with objects, pictures, or symbols *(e.g., when presented with a picture of 22 marbles with 3 more marbles added, complete or match to the number sentence 22 + 3 = __. Or, when presented with a picture of a carton that can hold 30 bottles, 13 of which have been removed, complete or match to the subtraction statement 30 - 13 = __).*
N1.3.2_P	Find the double of a set of up to 5 objects, and divide a group of up to 10 objects into two equal sets *(e.g., There are 4 biscuits in a package. There are 2 packages of biscuits. How many biscuits are there in total?; There are 8 biscuits in a package. The biscuits will be shared equally by two friends. How many biscuits will each friend get?).*	N1.3.2_M	Find the double of a set of up to 10 objects, and divide a group of up to 20 objects into 2 equal sets *(e.g., An octopus has 8 legs. There are 2 octopuses. How many octopus legs are there in total?; There are 16 biscuits. The biscuits will be shared equally by two friends. How many biscuits will each friend get?).*	N1.3.2_E	Find the triple of a set of up to 10 objects, and divide a group of up to 30 objects into 3 equal sets *(e.g., An octopus has 8 legs. There are 3 octopuses. How many octopus legs are there in total?; There are 24 biscuits. The biscuits will be shared equally by three friends. How many biscuits will each friend get?).*

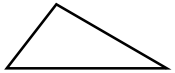
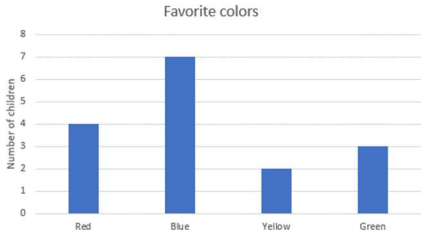
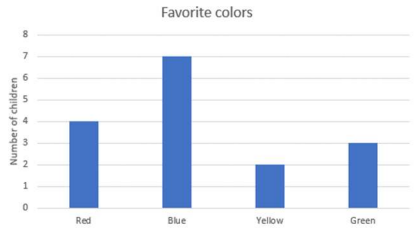
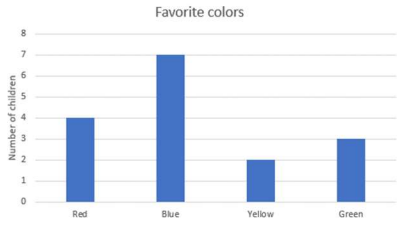
GRADE 2: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N1.3.3_P	Perform calculations involving two or more additions and subtractions, within the limits for partially meets expectations described above, when order of operations is not a factor *(e.g., 4 - 1 + 2 = __; 1 + 2 + 1 = __).*	N1.3.3_M	Perform calculations involving two or more additions and subtractions, within the limits for meets expectations described above, when order of operations is not a factor *(e.g., 14 - 5 + 4 = __; 17 - 3 - 7 = __).*	N1.3.3_E	Perform calculations involving two or more additions and subtractions, within the limits for exceeds expectations described above, when order of operations is not a factor *(e.g., 19 + 5 - 14 = __; 13 + 9 + 5 = __).*
N1.4: Solve real-world problems involving whole numbers					
N1.4.1_P	Solve simple real-world problems using addition and subtraction facts within 10 (i.e., where the sum or minuend does not surpass 10) *(e.g., There are 8 sheep in a field. 2 more sheep come into the field. How many sheep are in the field now?; There are 7 sheep in a field. 3 go to the stable. How many sheep are left in the field?).*	N1.4.1_M	Solve simple real-world problems using addition and subtraction facts within 20 (i.e., where the sum or minuend does not surpass 20) *(e.g., There are 15 sheep in a field. 4 more sheep come into the field. How many sheep are in the field now?; There are 16 sheep in a field. 4 go to the stable. How many sheep are left in the field?).*	N1.4.1_E	Solve simple real-world problems involving addition and subtraction of whole numbers within 30 (i.e., where the sum or minuend does not surpass 30) *(e.g., There are 15 sheep in a field. 12 more sheep come into the field. How many sheep are in the field now?; There are 24 sheep in a field. 12 go to the stable. How many sheep are left in the field?).*
N2: FRACTIONS					
Not applicable to grade 2					
N3: DECIMALS					
Not applicable to grade 2					
N4: INTEGERS					
Not applicable to grade 2					
N5: EXPONENTS AND ROOTS					
Not applicable to grade 2					
N6: OPERATIONS ACROSS NUMBER					
Not applicable to grade 2					
M: MEASUREMENT					
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER					
M1.1: Use non-standard and standard units to measure, compare, and order					
M1.1.1_P	Measure the length of objects using non-standard units *(e.g., identify that the pencil is 5 paper clips long).*	M1.1.1_M	Use non-standard units to estimate and compare the length of objects *(e.g., identify that the red pencil is 4 paper clips long and the black pencil is 6 paper clips long).*	M1.1.1_E	Use standard units to compare length and weight *(e.g., identify that the pencil is one centimeter longer than the crayon).*
M1.1.2_P	N/A	M1.1.2_M	N/A	M1.1.2_E	Use non-standard units to estimate or measure volume/capacity *(e.g., identify which container would hold the most sand or which box would hold the most balls given pictures of these items).*
M1.2: Solve problems involving measurement—not applicable to grade 2					

GRADE 2: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M2: TIME					
M2.1: Tell time					
M2.1.1_P	Identify, sequence, and describe activities/events that take place at different parts of the day *(e.g., morning and afternoon).*	M2.1.1_M	Tell time using an analog clock to the nearest hour.	M2.1.1_E	Tell time using an analog clock to the nearest half hour.
M2.1.2_P	N/A	M2.1.2_M	Recognize the number of days in a week and months in a year.	M2.1.2_E	Recognize the number of hours in a day, minutes in an hour, and seconds in a minute.
M2.2: Solve problems involving time					
M2.2.1_P	N/A	M2.2.1_M	Solve problems, including real-world problems, using a calendar *(e.g., given a calendar, answer the question: March 2 falls on what day of the week?).*	M2.2.1_E	N/A
M3: CURRENCY					
M3.1: Use different currency units to create amounts					
M3.1.1_P	Count simple combinations of two commonly used currency denominations in a country.	M3.1.1_M	Count combinations of commonly used currency denominations.	M3.1.1_E	N/A
M3.1.2_P	N/A	M3.1.2_M	Combine commonly used currency denominations to make a specified amount.	M3.1.2_E	Combine commonly used currency denominations to make a specified amount in a variety of ways.
G: GEOMETRY					
G1: PROPERTIES OF SHAPES AND FIGURES					
G1.1: Recognize and describe shapes and figures					
G1.1.1_P	Recognize and name basic shapes *(e.g., identify circles, squares, and triangles when asked, "What shape is this?").*	G1.1.1_M	Recognize and name shapes that are regular and irregular *(e.g., if shown an irregular triangle, recognize that it is a triangle; name a hexagon).*	G1.1.1_E	Recognize and name two-dimensional shapes and familiar three-dimensional figures in everyday life.
G1.1.2_P	N/A	G1.1.2_M	Recognize and name straight and curved lines and attributes of shapes *(e.g., number of sides, number of corners).*	G1.1.2_E	N/A
G1.1.3_P	N/A	G1.1.3_M	Recognize when a two-dimensional shape has been rotated or reflected *(e.g., when shown a number of shapes, identify those that are the same, even when some are rotated or reflected).*	G1.1.3_E	Identify a line of symmetry in two-dimensional shapes.

GRADE 2: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G2: SPATIAL VISUALIZATIONS		
G2.1: Compose and decompose shapes and figures		
G2.1.1_P Compose a larger two-dimensional shape from a small number of given shapes when the outlines for the shapes are provided *(e.g., use the smaller shapes to make the larger shape).* 	G2.1.1_M Compose/decompose a larger two-dimensional shape from a small number of given shapes without lines showing where the shapes go *(e.g., use the smaller shapes to make the larger shape).* 	G2.1.1_E Use a small number of given shapes to compose multiple larger two-dimensional shapes *(e.g., identify which of these larger shapes can be made from the smaller shapes)* and decompose a larger shape into a given number of smaller shapes *(e.g., draw one line on the triangle below to show how it can be cut into exactly two smaller triangles).* 
G3: POSITION AND DIRECTION		
G3.1: Describe the position and direction of objects in space		
G3.1.1_P Use familiar positional terms *(e.g., answer the question, "Where is the book?" by saying, "The book is next to the pencil.").*	G3.1.1_M Recognize and use positional terms that describe the location of an object with more precision *(e.g., answer the question, "Where is the book?" by saying, "The book is between the pencil and the bag.").*	G3.1.1_E Recognize that a map represents a physical space, and use simple maps to recognize the position of objects *(e.g., using a map of the classroom, identify which object is between the desk and the door).*
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Retrieve information about a single category from a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale *(e.g., How many children liked red on this bar graph?).* 	S1.1.1_M Compare between categories of a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale, using terms such as more than or less than *(e.g., Which color was chosen less often than green on this bar graph?).* 	S1.1.1_E Solve a problem involving the sum of or difference between two specified categories of a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children like red and blue in this bar graph?).* 
S1.2: Calculate and interpret central tendency—not applicable to grade 2		

GRADE 2: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
S2: CHANCE AND PROBABILITY					
Not applicable to grade 2					
A: ALGEBRA					
A1: PATTERNS					
A1.1: Recognize, describe, extend, and generate patterns					
A1.1.1_P	Copy repeating patterns of items such as colors, shapes, and sounds *(e.g., when provided ○□○□○□, select another pattern that is similar to that one, for example, red, blue, red, blue, red, blue. Or, when someone claps a simple repeated rhythm, "clap; clap clap; clap; clap clap; clap; clap clap," can continue the rhythm).*	A1.1.1_M	Recognize repeating sets in a pattern and use this to identify a missing element and extend the pattern *(e.g., identify that ○□□ is the repeating set in ○□□○□□○□□; identify the missing element in the following set ○□□○□□__□□; when presented with ○□□○□□○□□, add two additional sets to the pattern).*	A1.1.1_E	Describe repeating patterns *(e.g., explain that ○□□ repeats three times in the following set ○□□○□□○□□; explain that 1, 2, 3, 4 repeats three times in the following set 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4).*
A2: EXPRESSIONS					
Not applicable to grade 2					
A3: RELATIONS AND FUNCTIONS					
A3.1: Variation (ratio, proportion, and percentage)—not applicable to grade 2					
A3.2: Demonstrate an understanding of equivalency					
A3.2.1_P	N/A	A3.2.1_M	N/A	A3.2.1_E	Create a numerical expression using + or - to model a situation *(e.g., represent the following in a number sentence: 3 people are on a bus, and 4 more get on: 3 + 4).*
A3.2.2_P	N/A	A3.2.2_M	N/A	A3.2.2_E	Find a missing value in real-world addition and subtraction problems within 20 *(e.g., 3 people are on a bus. More people get on. Now there are 7. How many people got on the bus?).*
A3.3: Solve equations and inequalities—not applicable to grade 2					
A3.4: Interpret and evaluate functions—not applicable to grade 2					

Grade 3

GRADE 3: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude		
N1.1.1_P Count in whole numbers up to 100.	N1.1.1_M Count in whole numbers up to 1,000.	N1.1.1_E Count in whole numbers up to 10,000.
N1.1.2_P Read and write whole numbers up to 100 in words and in numerals.	N1.1.2_M Read and write whole numbers up to 1,000 in words and numerals.	N1.1.2_E Read and write whole numbers up to 10,000 in words and in numerals.
N1.1.3_P Compare and order whole numbers up to 100.	N1.1.3_M Compare and order whole numbers up to 1,000.	N1.1.3_E Compare and order whole numbers up to 10,000.
N1.1.4_P Skip count forwards by twos or tens.	N1.1.4_M Skip count backwards by tens.	N1.1.4_E Skip count forwards and backwards by hundreds.
N1.2: Represent whole numbers in equivalent ways		
N1.2.1_P Identify and represent the equivalence between whole quantities up to 30 represented as objects, pictures, and numerals *(e.g., when given a picture of 30 flowers, identify the picture that has the number of butterflies that would be needed for each flower to have a butterfly; given a picture of 19 shapes, draw 19 more shapes).*	N1.2.1_M Use place-value concepts for tens and ones *(e.g., compose or decompose a two-digit whole number using a number sentence such as 35 = 3 tens and 5 ones, 35 =30 + 5, or using number bonds; determine the value of a digit in the tens and ones place).*	N1.2.1_E Use place-value concepts for hundreds, tens, and ones *(e.g., compose or decompose a three-digit whole number using a number sentence such as 254 = 2 hundreds, 5 tens, and 4 ones; 254 = 200 + 50 + 4; determine the value of a digit in the hundreds place, etc.).*
N1.3: Solve operations using whole numbers		
N1.3.1_P Add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 65 + 23; solve an addition or subtraction problem presented by images of bundles of tens and ones; use skips on a hundreds grids or a number line or multibase arithmetic blocks to solve addition and subtraction problems).*	N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).*	N1.3.1_E Add and subtract within 1,000 (i.e., where the sum or minuend does not surpass 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 550 + 250; 457 - 129; use hundreds grids, number lines, or multibase arithmetic blocks to reason through or solve addition and subtraction problems).*
N1.3.2_P Multiply and divide within 25 (i.e., up to 5 x 5 and 25 ÷ 5, no remainder), and represent these operations with objects, pictures, or symbols *(e.g., 15 ÷ 3; 3 x 4; solve multiplication problems by using a rectangular array or by repeating groups of the same number of objects; solve division problems by dividing a group of objects into a given number of equal groupings).*	N1.3.2_M Multiply and divide within 100 (i.e., up to 10 x 10 and 100 ÷ 10, without a remainder), and represent these operations with objects, pictures, or symbols *(e.g., 72 ÷ 8; 6 x 9; solve multiplication problems by using a rectangular array or by repeating groups of the same number of objects; solve division problems by dividing a group of objects into a given number of equal groupings).*	N1.3.2_E Multiply and divide within 144 (i.e., up to 12 x 12 and 144 ÷ 12, without a remainder), and represent these operations with objects, pictures or symbols *(e.g., 120 ÷ 10; 6 x 12; solve multiplication problems by using a rectangular array or by repeating groups of the same number of objects; solve division problems by dividing a group of objects into a given number of equal groupings).*

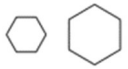
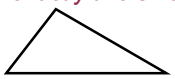
GRADE 3: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N1.3.3_P	Perform calculations involving two or more operations, within the limits for partially meets expectations described above, when order of operations is not a factor *(e.g., 5 x 3 + 62 = __; 4 x 4 ÷ 2 = __)*.	N1.3.3_M	Perform calculations involving two or more operations, within the limits for meets expectations described above, when order of operations is not a factor *(e.g., 6 x 7 + 19 = __; 6 x 4 ÷ 8 = __)*.	N1.3.3_E	Perform calculations involving two or more operations, within the limits for exceeds expectations described above, when order of operations is not a factor *(e.g., 452 + 369 + 78 = __; 64 ÷ 8 ÷ 2 = __)*.
N1.4: Solve real-world problems involving whole numbers					
N1.4.1_P	Solve simple real-world problems involving addition and subtraction of whole numbers within 30 (i.e., where the sum or minuend does not surpass 30), including problems involving measurement and currency units, without regrouping *(e.g., There are 15 sheep in a field. 12 more sheep come into the field. How many sheep are in the field now?; There are 24 sheep in a field. 12 go to the stable. How many sheep are left in the field?)*.	N1.4.1_M	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) without regrouping, including problems involving measurement and currency units *(e.g., There are 33 sheep in a field. 25 more sheep come into the field. How many sheep are in the field now?; There are 54 children in total in grade 3. 13 are absent today. How many grade 3 children are at school today?)*.	N1.4.1_E	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with and without regrouping, including problems involving measurement and currency units *(e.g., There are 33 sheep in a field. 28 more sheep come into the field. How many sheep are in the field now?; There are 81 children in total in grade 3. 13 are absent today. How many grade 3 children are at school today?)*.
N2: FRACTIONS					
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude					
N2.1.1_P	Identify everyday unit fractions *(e.g., 1/2; 1/3; 1/4)* represented as objects or pictures (as part of a whole or part of a set) in fractional notation *(e.g., shade half of this shape; indicate 1/4 of these objects)*.	N2.1.1_M	Identify unit fractions with denominators up to 12 *(e.g., 1/5; 1/7; 1/8; 1/10)* represented as objects or pictures (as part of a whole or part of a set) in fractional notation *(e.g., shade 1/5 of this shape; indicate 1/6 of these objects when arranged in a 3 x 6 array)*.	N2.1.1_E	Identify non-unit fractions with denominators up to 12 *(e.g., 2/5; 4/7; 3/8; 5/10)* represented as objects or pictures (as part of a whole or part of a set) in fractional notation *(e.g., shade 2/3 of this shape)*.
N3: DECIMALS					
Not applicable to grade 3					
N4: INTEGERS					
Not applicable to grade 3					
N5: EXPONENTS AND ROOTS					
Not applicable to grade 3					
N6: OPERATIONS ACROSS NUMBER					
Not applicable to grade 3					

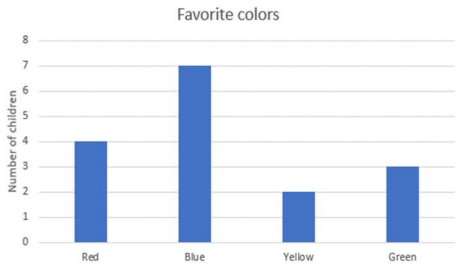
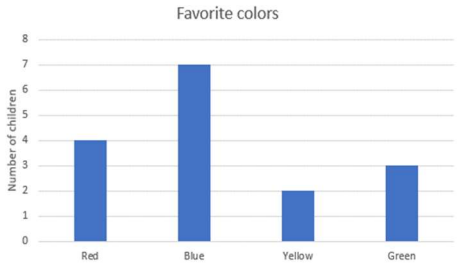
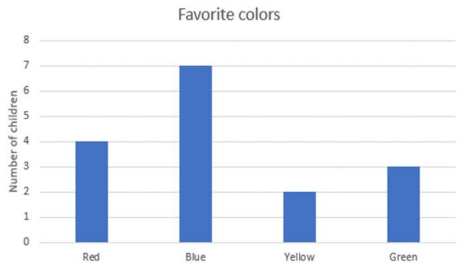
GRADE 3: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
M: MEASUREMENT		
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER		
M1.1: Use non-standard and standard units to measure, compare, and order		
M1.1.1_P Use non-standard units to measure or estimate and compare the length of two objects *(e.g., identify that the red pencil is 4 paper clips long, and the black pencil is 6 paper clips long).*	M1.1.1_M Use standard units to compare length and weight when provided the unit of measurement *(e.g., identify that the pencil is one centimeter longer than the crayon).*	M1.1.1_E Select and use appropriate standard units to estimate, measure, and compare length and weight *(e.g., choose centimeters instead of meters to measure a pencil; estimate the weight of the apple when given the following choices: a) 5g b) 200g c) 1kg d) 5kg).*
M1.1.2_P N/A	M1.1.2_M Use non-standard units to estimate or measure volume/capacity *(e.g., identify which container would hold the most sand or which box would hold the most balls given pictures of these items).*	M1.1.2_E Select and use appropriate standard units to measure and compare capacity/volume *(e.g., the measuring cups contain 200 ml of water and 100 ml of oil).*
M1.2: Solve problems involving measurement—not applicable to grade 3		
M2: TIME		
M2.1: Tell time		
M2.1.1_P Tell time using an analog clock to the nearest hour.	M2.1.1_M Tell time using an analog clock to the nearest half hour.	M2.1.1_E Tell time using an analog clock to the nearest minute.
M2.1.2_P Recognize the number of days in a week and months in a year.	M2.1.2_M Recognize the number of hours in a day, minutes in an hour, and seconds in a minute.	M2.1.2_E N/A
M2.2: Solve problems involving time		
M2.2.1_P Solve problems, including real-world problems, using a calendar *(e.g., given a calendar, answer the question: March 2 falls on what day of the week?).*	M2.2.1_M Solve problems, including real-world problems, involving elapsed time in hours and half-hours *(e.g., calculate the difference between 2:00 and 5:30 or the difference between 16:00 and 16:30).*	M2.2.1_E Solve problems, including real-world problems, involving elapsed time in minutes within an hour *(e.g., calculate the difference between 3:42 and 3:56 or the difference between 16:35 and 16:52).*
M3: CURRENCY		
M3.1: Use different currency units to create amounts		
M3.1.1_P Count combinations of commonly used currency denominations.	M3.1.1_M N/A	M3.1.1_E N/A
M3.1.2_P Combine commonly used currency denominations to make a specified amount.	M3.1.2_M Combine commonly used currency denominations to make a specified amount in a variety of ways.	M3.1.2_E Solve problems, including real-world problems, involving combining commonly used currency denominations.

GRADE 3: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
G: GEOMETRY					
G1: PROPERTIES OF SHAPES AND FIGURES					
G1.1: Recognize and describe shapes and figures					
G1.1.1_P	Recognize and name shapes that are regular ; *shown an irregular triangle, recognize that it is hexagon).*	G1.1.1_M	Recognize and name two-dimensional shapes and familiar three-dimensional figures in everyday life.	G1.1.1_E	Recognize and name two-dimensional shapes by a written or spoken description of their simple attributes *(e.g., name a shape given a description of its number of sides, number of corners, relative lengths of sides, etc.).*
G1.1.2_P	Recognize and name straight and curved lines and attributes of shapes *(e.g., number of sides, number of corners).*	G1.1.2_M	N/A	G1.1.2_E	N/A
G1.1.3_P	Recognize when a two-dimensional shape has been rotated or reflected *(e.g., when shown a number of shapes, identify those that are the same, even when some are rotated or reflected).*	G1.1.3_M	Identify a line of symmetry in two-dimensional shapes.	G1.1.3_E	Recognize and describe the congruence and similarity of two-dimensional shapes *(e.g., when shown two shapes, explain how they are similar using mathematical or non-mathematical language, such as, "It got bigger and has been turned" or "It's been enlarged and rotated.").* 
G2: SPATIAL VISUALIZATIONS					
G2.1: Compose and decompose shapes and figures					
G2.1.1_P	Compose/decompose a larger two-dimensional shape from a small number of given shapes *(e.g., use the smaller shapes to make the larger shape).* 	G2.1.1_M	Use a small number of given shapes to compose multiple, larger, two-dimensional shapes *(e.g., identify which of these larger shapes can be made from the smaller shapes?)* and decompose a larger shape into a given number of smaller shapes *(e.g., draw one line on the triangle below to show how it can be cut into exactly two smaller triangles).* 	G2.1.1_E	N/A
G3: POSITION AND DIRECTION					
G3.1: Describe the position and direction of objects in space					
G3.1.1_P	Recognize that a map represents a physical space, and use simple maps to recognize the position of objects *(e.g., using a map of the classroom, identify which object is between the desk and the door).*	G3.1.1_M	Accurately use the terms left and right, and use simple maps to describe locations using positional terms *(e.g., answer, "Where is the teacher's desk?" with "To the [left] of the chalkboard.").*	G3.1.1_E	Using a simple map, follow directions and/or give directions to a given location *(e.g., using this map, if you are at the school, and you walk towards the tree and turn left, and walk forward again, where would you be?; Using this map, how do you get from the school to the green house?).*

GRADE 3: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Compare between categories of a tally chart, bar graph, or pictograph with up to four categories and a single-unit scale, using terms such as more than or less than *(e.g., Which color was chosen less often than green on this bar graph?)*. 	S1.1.1_M Solve a problem involving the sum of or difference between two specified categories of a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children like red and blue in this bar graph?)*. 	S1.1.1_E Solve a problem involving more than two pieces of information from a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children were asked about their favorite color in this bar graph?)*. 
S1.1.2_P N/A	S1.1.2_M N/A	S1.1.2_E Complete missing information in a tally chart, bar graph, or pictograph that arranges data into categories and uses a single-unit scale *(e.g., add a row or column to a partially completed pictograph)*.
S1.1.3_P N/A	S1.1.3_M N/A	S1.1.3_E Retrieve information from a tally chart, bar graph, or pictograph with a multi-unit scale.
S1.2: Calculate and interpret central tendency—not applicable to grade 3		
S2: CHANCE AND PROBABILITY		
Not applicable to grade 3		
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend, and generate patterns		
A1.1.1_P Recognize repeating sets in a pattern and use this to identify a missing element and extend the pattern *(e.g., identify that ○□□ is the repeating set in ○□□○□□○□□; identify the missing element in the following set ○□□○□□__□□; when presented with ○□□○□□○□□, add two additional sets to the pattern)*.	A1.1.1_M Describe repeating patterns *(e.g., explain that ○□□ repeats three times in the following set ○□□○□□○□□; explain that 1, 2, 3, 4 repeats three times in the following set 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4)*.	A1.1.1_E Describe numerical patterns that increase or decrease by a constant value with a simple rule, and use this information to identify a missing element or extend the pattern *(e.g., describe the pattern 6, 9, 12, 15 as going up by threes; identify the missing element in the pattern 3, 7, 11, __, 19; extend the pattern 6, 11, 16, 21)*.

GRADE 3: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
A2: EXPRESSIONS		
Not applicable to grade 3		
A3: RELATIONS AND FUNCTIONS		
A3.1: Variation (ratio, proportion, and percentage)—not applicable to grade 3		
A3.2: Demonstrate an understanding of equivalency		
A3.2.1_P N/A	A3.2.1_M Create a numerical expression using + or - to model a situation *(e.g., represent the following in a number sentence: 3 people are on a bus, and 4 more get on)*.	A3.2.1_E Create a numerical expression using x or ÷ to model a situation *(e.g., represent the following in a number sentence: 3 people get on the bus at each of 4 stops)*.
A3.2.2_P N/A	A3.2.2_M Find a missing value in real-world addition and subtraction problems within 20 *(e.g., 3 people are on a bus. More people get on. There are now 7 people on the bus. How many people got on the bus?)*.	A3.2.2_E Find a missing value in a number sentence using addition and subtraction of numbers within 100 *(e.g., 23 + __ = 59)*.
A3.2.3_P N/A	A3.2.3_M N/A	A3.2.3_E Represent real-world addition and subtraction problems within 20 using a number sentence with a symbol or blank to represent the missing value *(e.g., 13 people are on a bus. More people get on. There are now 17 people on the bus. How many people got on the bus? Represent this situation with an addition or a subtraction sentence with a symbol or blank to represent the missing value)*.
A3.3: Solve equations and inequalities—not applicable to grade 3		
A3.4: Interpret and evaluate functions—not applicable to grade 3		

Grade 4

GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude		
N1.1.1_P Count in whole numbers up to 1,000.	N1.1.1_M Count in whole numbers up to 10,000.	N1.1.1_E Count in whole numbers greater than 10,000.
N1.1.2_P Read and write whole numbers up to 1,000 in words and numerals.	N1.1.2_M Read and write whole numbers up to 10,000 in words and numerals.	N1.1.2_E Read and write whole numbers greater than 10,000 in words and numerals.
N1.1.3_P Compare and order whole numbers up to 1,000.	N1.1.3_M Compare and order whole numbers up to 10,000.	N1.1.3_E Compare and order whole numbers up to 100,000.
N1.1.4_P Skip count backwards by tens.	N1.1.4_M Skip count forwards and backwards by hundreds.	N1.1.4_E Skip count forwards and backwards by thousands.
N1.2: Represent whole numbers in equivalent ways		
N1.2.1_P Use place-value concepts for tens and ones *(e.g., compose or decompose a two-digit whole number using a number sentence such as 35 = 3 tens and 5 ones, 35 =30 + 5, or using number bonds, determine the value of a digit in the tens and ones place).*	N1.2.1_M Use place-value concepts for hundreds, tens, and ones *(e.g., compose or decompose a three-digit whole number using a number sentence such as 254 = 2 hundreds, 5 tens, and 4 ones; 254 = 200 + 50 + 4; determine the value of a digit in the hundreds place).*	N1.2.1_E Use place-value concepts for thousands, hundreds, tens, and ones *(e.g., compose or decompose a four-digit whole number using a number sentence such as 1383 = 1 thousand, 3 hundreds, 8 tens, and 3 ones; 1383 = 1000 + 300 + 80 + 3; determine the value of a digit in the thousands place).*
N1.2.2_P N/A	N1.2.2_M Round whole numbers to the nearest ten.	N1.2.2_E Round whole numbers to the nearest hundred.
N1.3: Solve operations using whole numbers		
N1.3.1_P Add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use skips on a number line or on a hundreds grid to reason through or solve addition and subtraction problems).*	N1.3.1_M Add and subtract within 1,000 (i.e., where the sum or minuend does not surpass 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 550 + 250; 457 - 129; use hundreds grids, number lines, or multibase arithmetic blocks to reason through or solve addition and subtraction problems).*	N1.3.1_E Add and subtract beyond 1,000 (i.e., where the sum or minuend surpasses 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 1457 - 129; use number lines to reason through or solve addition and subtraction problems).*
N1.3.2_P Demonstrate fluency with multiplication facts up to 5 x 5 (i.e., 1 × 1 up to 5 × 5) and related division facts, including the relationship between them.	N1.3.2_M Demonstrate fluency with multiplication facts up to 10 x 10 (i.e., 1 × 1 up to 10 × 10) and related division facts, including the relationship between them.	N1.3.2_E Demonstrate fluency with multiplication facts up to 12 x 12 (i.e., 1 × 1 up to 12 × 12) and related division facts, including the relationship between them.
N1.3.3_P Perform calculations involving two or more operations, within the limits for partially meets expectations described above, when order of operations is not a factor *(e.g., 5 x 5 + 19 = __; 72 - 9 - 15 = __).*	N1.3.3_M Perform calculations involving two or more operations, within the limits for meets expectations described above, when order of operations is not a factor *(e.g., 6 x 7 + 519 = __; 6 x 4 ÷ 8 = __).*	N1.3.3_E Perform calculations involving two or more operations, within the limits for exceeds expectations described above, when order of operations is not a factor *(e.g., 6 x 12 + 1542 = __; 12 x 9 - 19 = __).*

GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N1.4: Solve real-world problems involving whole numbers					
N1.4.1_P	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) without regrouping, including problems involving measurement and currency units *(e.g., There are 33 sheep in a field. 25 more sheep come into the field. How many sheep are in the field now?; There are 54 children in total in grade 3. Thirteen are absent today. How many grade 3 children are at school today?)*.	N1.4.1_M	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with and without regrouping, including problems involving measurement and currency units *(e.g., There are 34 sheep in a field. 29 more sheep come into the field. How many sheep are in the field now?; There are 54 children in total in grade 4. 7 are absent today. How many grade 4 children are at school today?)*.	N1.4.1_E	Solve simple real-world problems involving addition and subtraction of whole numbers within 1,000 (i.e., where the sum or minuend does not surpass 1,000) with and without regrouping, including problems involving measurement and currency units *(e.g., There were 740 people living in a town. 83 more people come to live in the town. What is the total number of people living in the town now?; There are 750 people living in a town. Only 327 of them were born in the town. How many were born outside the town?)*.
N1.4.2_P	N/A	N1.4.2_M	Solve simple real-world problems involving the multiplication of two whole numbers to 5, and associated division facts *(e.g., Amina is putting fruit into bags. Each bag will contain 4 pieces of fruit. How many bags will Amina need for 20 pieces of fruit?; Amina has 5 bags. Each bag contains 4 pieces of fruit. How many pieces of fruit are there in total?)*.	N1.4.2_E	Solve simple real-world problems involving the multiplication of two whole numbers to 10, and associated division facts *(e.g., Amina is putting fruit into bags. Each bag will contain 7 pieces of fruit. How many bags will Amina need for 28 pieces of fruit?; Amina has 4 bags. Each bag contains 7 pieces of fruit. How many pieces of fruit are there in total?)*.
N2: FRACTIONS					
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude					
N2.1.1_P	Identify unit and non-unit fractions with denominators up to 12 *(e.g., 1/5; 4/7; 1/8; 9/10)* represented as objects or pictures (as part of a whole or part of a set) and express them in fractional notation *(e.g., shade 1/5 of this shape; indicate 5/6 of these objects when arranged in a 5 x 6 array)*.	N2.1.1_M	Identify and express everyday unit fractions *(e.g., 1/2; 1/3; 1/4)* as equivalent fractions when the fractional notations are accompanied by pictures or objects *(e.g., 1/3 = ¨⁄6 when the task is supported by pictures; 1/2 = 3/¨)*.	N2.1.1_E	Identify and express proper fractions as equivalent fractions with denominators up to 12 *(e.g., express a fraction in simplest form 6/9 = ¨⁄3; 2/10 = 1/¨; express a fraction as a multiple of another 4/5 = 8/¨)*.
N2.1.2_P	Compare and order fractions with the same denominators *(e.g., 1/8; 3/8; 5/8)*.	N2.1.2_M	Compare and order everyday unit fractions *(e.g., 1/4; 1/3; 1/2)*.	N2.1.2_E	Compare and order fractions with different but related denominators up to 12 *(e.g., 2/3 and 5/6)*.
N2.2: Solve operations using fractions					
N2.2.1_P	Add and subtract proper fractions with the same denominator when fractions are represented with pictures *(e.g., given an image of a rectangle divided into 5 equal parts, with 3 parts shaded one color and 1 part shaded another color, calculate the fraction of the rectangle that is shaded. Or, when presented with an image of an orange with 6 equal pieces, 2 of which are shaded, calculate the fraction that is not shaded)*.	N2.2.1_M	Add and subtract proper fractions with the same denominator when fractions are represented with symbols, and represent such additions with objects or pictures *(e.g., 2/3 + 1/3; 3/5 - 1/5; add 2/5 and 1/5, or subtract 3/8 from 6/8 using fraction bars)*.	N2.2.1_E	Add and subtract proper fractions with different but related denominators when fractions are represented with symbols, and represent such additions with objects or pictures *(e.g., 2/3 + 1/6; 7/8 - 1/4; add 1/6 and 1/3, or subtract 1/3 from 7/9 using fraction bars)*.

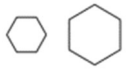
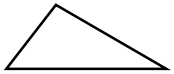
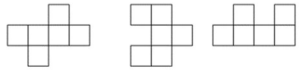
GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N2.2.2_P N/A	N2.2.2_M N/A	N2.2.2_E Represent the multiplication of a commonly used fraction and a whole number with objects or pictures *(e.g., represent 3/4 x 12 by drawing 12 objects, dividing them into 4 equal groups, and coloring 3 of the groups).*
N2.3: Solve real-world problems involving fractions		
N2.3.1_P N/A	N2.3.1_M Solve real-world problems involving addition and subtraction of proper fractions with the same denominators *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 1/5 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola ate 2/5 of a chocolate bar at recess. How much of the chocolate bar is left?).*	N2.3.1_E Solve real-world problems involving addition and subtraction of proper fractions with different but related denominators *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 3/10 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola has 2/3 of a chocolate bar left. If she gives her friend Carola 1/6 of what remains, what fraction of the chocolate bar will Paola have left?).*
N3: DECIMALS		
Not applicable to grade 4		
N4: INTEGERS		
Not applicable to grade 4		
N5: EXPONENTS AND ROOTS		
Not applicable to grade 4		
N6: OPERATIONS ACROSS NUMBER		
Not applicable to grade 4		
M: MEASUREMENT		
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER		
M1.1: Use non-standard and standard units to measure, compare, and order		
M1.1.1_P Use standard units to compare length and weight when provided the unit of measurement *(e.g., identify that the pencil is one centimeter longer than the crayon).*	M1.1.1_M Select and use appropriate standard units to estimate, measure, and compare length and weight when measurements involve whole numbers only *(e.g., choose centimeters instead of meters to measure a pencil; estimate the weight of the apple when given the following choices: a) 5g b) 200g c) 1kg d) 5kg).*	M1.1.1_E Identify the relationship between the relative size of adjacent units within a standard system of measurement for length and weight *(e.g., identify the number of millimeters in a centimeter).*
M1.1.2_P Use non-standard units to estimate or measure volume/capacity *(e.g., fill a container with scoops of sand; which box would hold the most balls?).*	M1.1.2_M Select and use appropriate standard units to measure and compare capacity/volume when measurements involve whole numbers only *(e.g., the measuring cups contain 200 ml of water and 100 ml of oil).*	M1.1.2_E Identify the relationship between the relative size of adjacent units within a standard system of measurement for capacity/volume *(e.g., identify the number of pints in a quart).*

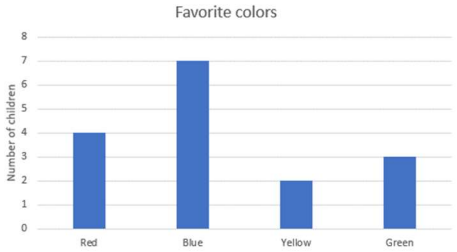
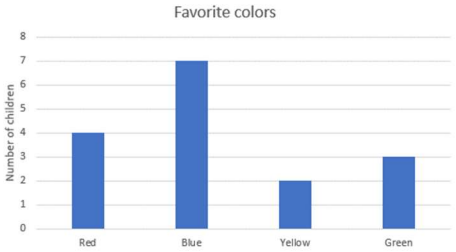
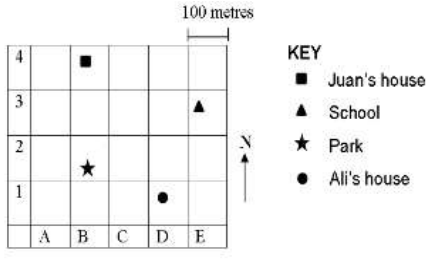
GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M1.2: Solve problems involving measurement					
M1.2.1_P	Solve problems, including real-world problems, involving the perimeter of a rectangle using concrete or pictorial representations of units *(e.g., grid squares).*	M1.2.1_M	Calculate the perimeter of a polygon.	M1.2.1_E	Solve problems, including real-world problems, involving the perimeter of a polygon.
M1.2.2_P	N/A	M1.2.2_M	Solve problems, including real-world problems, involving the area of a rectangle using concrete or pictorial representations of units *(e.g., grid squares or tiles).*	M1.2.2_E	Solve problems, including real-world problems, involving the calculation of the area of a rectangle.
M2: TIME					
M2.1: Tell time					
M2.1.1_P	Tell time using an analog clock to the nearest half hour.	M2.1.1_M	Tell time using an analog clock to the nearest minute.	M2.1.1_E	Recognize equivalence between representations of time *(e.g., digital, analog, and written; 15 minutes is a quarter of an hour).*
M2.1.2_P	Recognize the number of hours in a day, minutes in an hour, and seconds in a minute.	M2.1.2_M	N/A	M2.1.2_E	N/A
M2.2: Solve problems involving time					
M2.2.1_P	Solve problems, including real-world problems, involving elapsed time in hours and half-hours *(e.g., calculate the difference between 2:00 and 5:30 or the difference between 16:00 and 16:30).*	M2.2.1_M	Solve problems, including real-world problems, involving elapsed time in minutes within an hour *(e.g., calculate the difference between 3:42 and 3:56 or the difference between 16:35 and 16:52).*	M2.2.1_E	Solve problems, including real word problems, involving elapsed time in minutes across hours *(e.g., calculate the difference between 3:24 and 5:12 or the difference between 16:35 and 18:22), including problems involving schedules (i.e., timetables, agendas, itineraries).*
M2.2.2_P	N/A	M2.2.2_M	N/A	M2.2.2_E	Solve problems, including real-world problems, involving the number of days in a week, months in a year, hours in a day, minutes in an hour, and seconds in a minute.
M3: CURRENCY					
M3.1: Use different currency units to create amounts—subconstruct fully covered in grades 1-3. Questions involving currency are covered under the relevant real-world problem subconstructs (e.g., N1.4 for whole numbers, etc.)					
G: GEOMETRY					
G1: PROPERTIES OF SHAPES AND FIGURES					
G1.1: Recognize and describe shapes and figures					
G1.1.1_P	Recognize and name two-dimensional shapes and familiar three-dimensional figures in everyday life.	G1.1.1_M	Recognize and name two-dimensional shapes by a written or spoken description of their simple attributes *(e.g., name a shape given a description of the number of sides or corners or the relative length of the sides, etc.).*	G1.1.1_E	Recognize and name types of triangles *(e.g., isosceles, scalene, equilateral, and right angle).*

GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G1.1.2_P N/A	G1.1.2_M N/A	G1.1.2_E Recognize and name three-dimensional figures by their attributes *(e.g., faces, edges, vertices)*.
G1.1.3_P N/A	G1.1.3_M N/A	G1.1.3_E Recognize types of angles by their magnitude *(e.g., right, straight, acute, obtuse)*.
G1.1.4_P Identify a line of symmetry in two-dimensional shapes.	G1.1.4_M Recognize and describe the congruence and similarity of two-dimensional shapes *(e.g., when shown two shapes, explain how they are similar using mathematical or non-mathematical language: "It got bigger and has been turned" or "It's been enlarged and rotated.")*. 	G1.1.4_E N/A
G2: SPATIAL VISUALIZATIONS		
G2.1: Compose and decompose shapes and figures		
G2.1.1_P Use a small number of given shapes to compose multiple larger two-dimensional shapes *(e.g., identify which of these larger shapes can be made from the smaller shapes?)* and decompose a larger shape into a given number of smaller shapes *(e.g., draw one line on the triangle below to show how it can be cut into exactly two smaller triangles)*. 	G2.1.1_M N/A	G2.1.1_E Identify the net of a cube or specific faces on the net of a cube *(e.g., fold mentally to answer the question, which of these is the net of a cube?; identify opposite faces on a net)*. 
G3: POSITION AND DIRECTION		
G3.1: Describe the position and direction of objects in space		
G3.1.1_P Accurately use the terms left and right, and use simple maps to describe locations using positional terms *(e.g., answer, "Where is the teacher's desk?" with "To the [left] of the chalkboard.")*.	G3.1.1_M Use different kinds of simple maps (i.e., an alphanumeric map, grid map, or local equivalent) to give and follow 2-step directions to a given location *(e.g., Using this map, if you are at the school, you walk towards the tree, and turn left. What would you be facing?; Using this map, how do you get from the school to the green house?)*.	G3.1.1_E Use a grid map with compass directions when the grid dimensions are given in terms of the real-world distance *(e.g., Which of these is closest to the distance between the park and Juan's house? a) 100 meters b) 150 meters c) 200 meters d) 250 meters)*.

GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Solve a problem involving the sum of or difference between two specified categories of a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children like red and blue in this bar graph?)*. 	S1.1.1_M Solve a problem involving more than two pieces of information from a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children were asked about their favorite color in this bar graph?)*. 	S1.1.1_E Organize data and construct a tally chart, bar graph, or pictograph that arranges data into categories and uses a single- or multi-unit scale. 
S1.1.2_P N/A	S1.1.2_M Complete missing information in a tally chart, bar graph, or pictograph that arranges data into categories and uses a single-unit scale *(e.g., add a row or column to a partially completed pictograph)*.	S1.1.2_E Compare by calculating differences between categories in a tally chart, bar graph, or pictograph with a multi-unit scale.
S1.1.3_P N/A	S1.1.3_M Retrieve information from a tally chart, bar graph, or pictograph with a multi-unit scale.	S1.1.3_E N/A
S1.2: Calculate and interpret central tendency—not applicable to grade 4		
S2: CHANCE AND PROBABILITY		
Not applicable to grade 4		
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend, and generate patterns		
A1.1.1_P Describe repeating patterns *(e.g., explain that ○□□ repeats three times in the following set ○□□○□□○□□; explain that 1, 2, 3, 4 repeats three times in the following set 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4)*.	A1.1.1_M Describe numerical patterns that increase or decrease by a constant value with a simple rule, and use this information to identify a missing element or extend the pattern *(e.g., describe the pattern 6, 9, 12, 15 as going up by threes; identify the missing element in the pattern 3, 7, 11, __, 19; extend the pattern 6, 11, 16, 21)*.	A1.1.1_E Describe numerical patterns that increase or decrease by a constant multiplier, and use this information to identify a missing element or extend the pattern *(e.g., describe that the pattern 2, 4, 8, 16 starts at 2 and doubles or that the pattern 20, 10, 5, 2.5 starts at 20 and halves; identify the missing element in the pattern 3, 6, __, 24, 48; write the next 2 numbers in the pattern 80, 40, 20, 10)*.

GRADE 4: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
A2: EXPRESSIONS					
Not applicable to grade 4					
A3: RELATIONS AND FUNCTIONS					
A3.1: Variation (ratio, proportion, and percentage)—not applicable to grade 4					
A3.2: Demonstrate an understanding of equivalency					
A3.2.1_P	Create a numerical expression using + or - to model a situation *(e.g., represent the following in a number sentence: 3 people are on a bus, and 4 more get on).*	A3.2.1_M	Create a numerical expression using x or ÷ to model a situation *(e.g., represent the following in a number sentence: 3 people get on the bus at each of 4 stops).*	A3.2.1_E	N/A
A3.2.2_P	Find a missing value in real-world addition and subtraction problems within 20 *(e.g., 3 people are on a bus. More people get on. There are now 7 people on the bus. How many people got on the bus?).*	A3.2.2_M	Find a missing value in a number sentence using addition and subtraction of numbers within 100 *(e.g., 23 + __ = 59).*	A3.2.2_E	N/A
A3.2.3_P	N/A	A3.2.2_M	Represent real-world addition and subtraction problems within 20 using a number sentence with a symbol or blank to represent the missing value *(e.g., 13 people are on a bus. More people get on. There are now 17 people on the bus. How many people got on the bus? Represent this situation with an addition or a subtraction sentence).*	A3.2.2_E	Represent real-world problems involving the multiplication of two whole numbers to 10 and related division facts, using a number sentence with a symbol or blank to represent the missing value *(e.g. Paul has 3 bags of oranges. There are the same number of oranges in each bag. He has 18 oranges altogether. How many oranges are there in each bag? Represent the situation with a multiplication sentence).*
A3.3: Solve equations and inequalities—not applicable to grade 4					
A3.4: Interpret and evaluate functions—not applicable to grade 4					

Grade 5

GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude		
N1.1.1_P Count in whole numbers up to 10,000.	N1.1.1_M Count in whole numbers up to any whole number.	N1.1.1_E N/A
N1.1.2_P Read and write whole numbers up to 10,000 in words and numerals.	N1.1.2_M Read and write whole numbers greater than 10,000 in words and numerals.	N1.1.2_E N/A
N1.1.3_P Compare and order whole numbers up to 10,000.	N1.1.3_M Compare and order whole numbers up to 100,000.	N1.1.3_E Compare and order whole numbers greater than 100,000.
N1.1.4_P Skip count forwards and backwards by hundreds.	N1.1.4_M Skip count forwards and backwards by thousands.	N1.1.4_E N/A
N1.2: Represent whole numbers in equivalent ways		
N1.2.1_P Use place-value concepts for hundreds, tens, and ones *(e.g., compose or decompose a three-digit whole number using a number sentence such as 254 = 2 hundreds, 5 tens, and 4 ones; 254 = 200 + 50 + 4; determine the value of a digit in the hundreds place)*.	N1.2.1_M Use place-value concepts for thousands, hundreds, tens, and ones *(e.g., compose or decompose a four-digit whole number using a number sentence such as 1,383 = 1 thousand, 3 hundreds, 8 tens, and 3 ones; 1383 = 1,000 + 300 + 80 + 3; determine the value of a digit in the thousands place)*.	N1.2.1_E Use place-value concepts beyond the thousands *(e.g., compose or decompose a 7-digit whole number using a number sentence such as 1,383,547 = 1 million, 3 hundred thousands, 8 ten thousands, 3 thousands, 5 hundreds, 4 tens and 7 ones; 1,383,547 = 1,000,000 + 300,000 + 80,000 + 3000 + 500 + 40 + 7; determine the value of a digit in the millions place)*.
N1.2.2_P Round whole numbers to the nearest ten.	N1.2.2_M Round whole numbers to the nearest hundred.	N1.2.2_E Round whole numbers to the nearest thousand.
N1.3: Solve operations using whole numbers		
N1.3.1_P Add and subtract within 1,000 (i.e., where the sum or minuend does not surpass 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 550 - 250; 457 - 129; use hundreds grids, number lines, or multibase arithmetic blocks to reason through or solve addition and subtraction problems)*.	N1.3.1_M Add and subtract beyond 1,000 (i.e., where the sum or minuend surpasses 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 1457 - 129; use number lines to reason through or solve addition and subtraction problems)*.	N1.3.1_E N/A
N1.3.2_P Multiply, with and without regrouping, and divide, with no remainder, a two-digit number by a one-digit number *(e.g., 42 x 4 = __; 42 x 6 = __; 80 ÷ 5 = __)*.	N1.3.2_M Multiply, with and without regrouping, and divide, with no remainder, any number by a one-digit number and multiply two, 2-digit numbers, with and without regrouping *(e.g., 342 x 4 = __; 42 x 34 = __; 1380 ÷ 5 = __)*.	N1.3.2_E Multiply any number by a two-digit number, with and without regrouping, and divide any number by a one-digit number, with remainder *(e.g., 3427 x 68; 1380 ÷ 6 = __)*.
N1.3.3_P Perform calculations involving two or more operations, within the limits for partially meets expectations described above, respecting the order of operations *(e.g., 6 + 7 x 57 = __; 996 - 440 ÷ 8 = __)*.	N1.3.3_M Perform calculations involving two or more operations, within the limits for meets expectations described above, respecting the order of operations *(e.g., 1754 + 53 x 53 = __; 4 x 9 x 8 = __)*.	N1.3.3_E Perform calculations involving two or more operations, within the limits for exceeds expectations described above, respecting the order of operations *(e.g., 6584 + 2187 x 38 = __; 675 ÷ 9 x 652 = __)*.

GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N1.4: Solve real-world problems involving whole numbers					
N1.4.1_P	Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with regrouping, including problems involving measurement and currency units *(e.g., There are 34 sheep in a field. 29 more sheep come into the field. How many sheep are in the field now?; There are 54 children in total in grade 5. 7 are absent today. How many grade 5 children are at school today?)*.	N1.4.1_M	Solve simple real-world problems involving addition and subtraction of whole numbers within 1,000 (i.e., where the sum or minuend does not surpass 1,000) with and without regrouping, including problems involving measurement and currency units *(e.g., There were 740 people living in a town. 83 more people come to live in the town. What is the total number of people living in the town now?; There are 750 people living in a town. Only 327 of them were born in the town. How many were born outside the town?)*.	N1.4.1_E	Solve real-world problems involving combinations of any **two or more** of the four operations, including problems involving measurement and currency units and: ∗ the addition and subtraction of whole numbers beyond 1,000, with and without regrouping ∗ the multiplication and division of any number by a one-digit number, with and without regrouping (multiplication), and with and without a remainder (division) ∗ the multiplication of two, 2-digit numbers.
N1.4.2_P	Solve simple real-world problems involving the multiplication of 2 whole numbers to 5, and associated division facts *(e.g., Amina is putting fruit into bags. Each bag will contain 4 pieces of fruit. How many bags will Amina need for 20 pieces of fruit?; Amina has 5 bags. Each bag contains 4 pieces of fruit. How many pieces of fruit are there in total?)*.	N1.4.2_M	Solve simple real-world problems involving the multiplication of two whole numbers to 10, and associated division facts *(e.g., Amina is putting fruit into bags. Each bag will contain 7 pieces of fruit. How many bags will Amina need for 28 pieces of fruit?; Amina has 4 bags. Each bag contains 7 pieces of fruit. How many pieces of fruit are there in total?)*.	N1.4.2_E	N/A
N2: FRACTIONS					
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude					
N2.1.1_P	Identify and express everyday unit fractions (i.e., 1/2; 1/3; 1/4) as equivalent fractions represented as objects or pictures *(e.g., 1/3 = ☐/6 when the task is supported by pictures; 1/2 = 3/☐)*.	N2.1.1_M	Identify and express proper fractions as equivalent fractions with denominators up to 12 *(e.g., express a fraction in simplest form 6/9 = ☐/3; 2/10 = 1/☐; express as a multiple of another 4/5 = 8/☐)*.	N2.1.1_E	Identify and express proper fractions as equivalent fractions (any denominator) *(e.g., 13/25 = 26/50)*.
N2.1.2_P	N/A	N2.1.2_M	N/A	N2.1.2_E	Identify and express improper fractions as equivalent mixed numbers (or vice versa), with pictures or symbols *(e.g., represent 9/6 as 1 3/6 or 1 1/2; use two arrays or rectangles and coloring to represent 9/6)*.
N2.1.3_P	Compare and order everyday unit fractions *(e.g., 1/4; 1/3; 1/2)*.	N2.1.3_M	Compare and order fractions with different but related denominators up to 12 *(e.g., 2/3 and 5/6)*.	N2.1.3_E	Compare and order proper fractions with different denominators *(e.g., 1/4; 7/10; 5/6)*.
N2.2: Solve operations using fractions					
N2.2.1_P	Add and subtract proper fractions with the same denominator *(e.g., 2/3 + 1/3; 3/5 - 1/5)*.	N2.2.1_M	Add and subtract proper fractions with different but related denominators *(e.g., 2/3 + 1/6; 7/8 - 1/4)*.	N2.2.1_E	Add and subtract improper fractions or mixed numbers with different but related denominators *(e.g., 2 2/3 + 1 1/6; 25/4 + 5/12)*.

GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N2.2.2_P	N/A	N2.2.2_M	Multiply commonly-used fractions by whole numbers, or divide proper fractions by whole numbers, and represent such operations with objects or pictures *(e.g., represent 3/4 x 12 with 3 by 4 grid with 3 of the columns colored in; or represent 3/4 divided by 2 as a 1 x 1 grid with one side divided into 4 equal parts and 3 blocks colored in and then other side divided into 2 to produce 8 equal blocks with 6 colored in)*.	N2.2.2_E	Multiply and divide proper fractions and divide improper fractions by whole numbers, and represent such operations with pictures or symbols *(e.g., 2/5 ÷ 3/5; 3/4 x 2/6; 7/5 ÷ 2; represent 3/4 x 1/2 as a rectangle split into 4 equal parts with 3 parts shaded and each of the 4 equal parts split into 2 equal sections. Note that the smaller shaded sections represent the answer)*.
N2.3: Solve real-world problems involving fractions					
N2.3.1_P	Solve real-world problems involving addition and subtraction of proper fractions with the same denominator *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 1/5 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola ate 2/5 of a chocolate bar at recess. How much of the chocolate bar is left?)*.	N2.3.1_M	Solve real-world problems involving addition and subtraction of proper fractions with different but related denominators *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 3/10 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola has 2/3 of a chocolate bar left. If she gives her friend Carola 1/6 of what remains, what fraction of the chocolate bar will Paola have left?)*.	N2.3.1_E	Solve real-world problems involving addition and subtraction of improper fractions and mixed numbers with different but related denominators *(e.g., Maya is cutting some oranges for a picnic. She cuts each orange into 8 equal pieces. She puts 25 pieces of orange onto a large plate and 11 pieces of orange onto a smaller plate. What is the smallest number of whole oranges Maya could have cut?; A tree is now 3 and a half meters tall. When it was planted, it was 1 and one quarter meters tall. By how many meters has the tree grown since it was planted?)*.
N2.3.2_P	N/A	N2.3.2_M	Solve real-world problems involving the multiplication and division of a proper fraction and a whole number *(e.g., Misha has half a pizza. If she shares it with her brother, what fraction of the original pizza will each receive?)*.	N2.3.2_E	Solve real-world problems involving the multiplication of two proper fractions or the division of an improper fraction or mixed number by a whole number *(e.g., Misha has half a pizza. If she shares it equally with her brother, what fraction of the original pizza will each receive?)*.
N3: DECIMALS					
N3.1: Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude					
N3.1.1_P	Identify and represent decimal quantities to the tenths using objects or pictures *(e.g., represent 0.8 by coloring 8 of 10 equal parts of a rectangle)*.	N3.1.1_M	Identify and represent quantities using decimal notation (i.e., symbols) up to the tenths place *(e.g., identify that 0.8 is 8 tenths)*.	N3.1.1_E	Identify and represent quantities using decimal notation up to the hundredths place *(e.g., identify 0.65 is 65 hundredths)*.
N3.1.2_P	N/A	N3.1.2_M	Compare and order decimal numbers up to the tenths place *(e.g., sort the following decimals from high to low: 0.8, 0.3, 0.1)*.	N3.1.2_E	Compare and order decimal numbers up to the hundredths place *(e.g., sort the following decimals from high to low: 0.8, 0.33, 0.08, 0.6)*.
N3.2: Represent decimals in equivalent ways (including fractions and percentages)					
N3.2.1_P	Round decimal numbers to the nearest whole number *(e.g., round 3.4 to 3)*.	N3.2.1_M	Round decimal numbers to the nearest tenths place *(e.g., round 3.46 to 3.5)*.	N3.2.1_E	Round decimal numbers to the nearest hundredths place *(e.g., round 3.456 to 3.46)*.

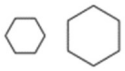
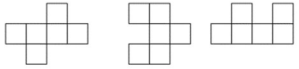
GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N3.2.2_P	N/A	N3.2.2_M	Identify and express fractions with denominators of 10 using decimal notation *(e.g., 7/10 = 0.7)*.	N3.2.2_E	Identify and express fractions with denominators of 100 and everyday fractions, using decimal notation, and represent fractions with denominators of 100 as percentages *(e.g., 3/4 = 0.75; 72/100 = 0.72 = 72%)*.
N3.3: Solve operations using decimals					
N3.3_P	N/A	N3.3_M	Add and subtract decimal numbers up to the tenths place. Create or identify concrete or picture models to represent such additions *(e.g., 0.5 + 0.2)*.	N3.3_E	Add and subtract decimal numbers up to the hundredths place. Create or identify concrete or picture models to represent such additions *(e.g., 3.41 + 5.3)*.
N3.4: Solve real-world problems involving decimals—not applicable to grade 5					
N4: INTEGERS					
Not applicable to grade 5					
N5: EXPONENTS AND ROOTS					
Not applicable to grade 5					
N6: OPERATIONS ACROSS NUMBER					
Not applicable to grade 5					
M: MEASUREMENT					
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER					
M1.1: Use non-standard and standard units to measure, compare, and order					
M1.1.1_P	Select and use appropriate standard units to estimate, measure, and compare length and weight when measurements involve whole numbers only *(e.g., choose centimeters instead of meters to measure a pencil; estimate the weight of the apple when given the following choices: a) 5g b) 200g c) 1kg d) 5kg)*.	M1.1.1_M	Identify the relationship between the relative size of adjacent units within a standard system of measurement for length and weight *(e.g., identify the number of millimeters in a centimeter)*.	M1.1.1_E	Make conversions between adjacent units of length and weight within a standard system of measurement *(e.g., identify that the 16-centimeter pencil is 160 millimeters long)*.
M1.1.2_P	Select and use appropriate standard units to measure and compare capacity/volume when measurements involve whole numbers only *(e.g., identify that the measuring cups contain 200 ml of water and 100 ml of oil)*.	M1.1.2_M	Identify the relationship between the relative size of adjacent units within a standard system of measurement for capacity/volume *(e.g., identify the number of pints in a quart)*.	M1.1.2_E	Make conversions between adjacent units of capacity/volume within a standard system of measurement *(e.g., identify that there are four pints in a two-quart container)*.

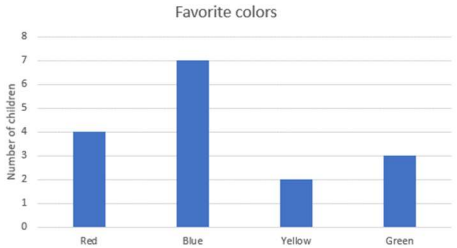
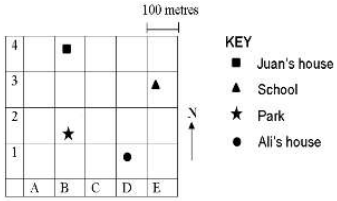
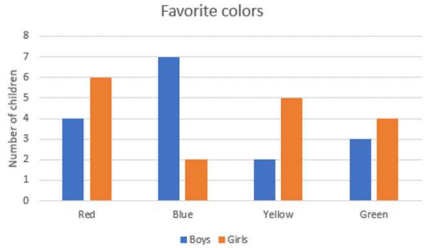
GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M1.1.3_P	N/A	M1.1.3_M	Read scales to the nearest marked increment on a variety of measuring tools involving fractions and decimals to the tenths place, containing both labeled and unlabeled scale increments *(e.g., read a kitchen scale containing increments expressed as fractions)*.	M1.1.3_E	Read scales to the nearest marked increment on a variety of measuring tools involving decimals to the hundredths place, containing both labeled and unlabeled scale increments *(e.g., read a depth gauge in a dam with scale increments increasing in 25-centimeter intervals and labels expressed as decimal meters (e.g., 1.25, 1.5, 1.75, 2.0) when the needle is pointing directly at a marked increment of the scale)*.
M1.2: Solve problems involving measurement					
M1.2.1_P	Calculate the perimeter of a polygon.	M1.2.1_M	Solve problems, including real-world problems, involving the perimeter of a polygon.	M1.2.1_E	Solve problems, including real-world problems, involving comparing the perimeters of polygons.
M1.2.2_P	Solve problems, including real-world problems, involving the area of a rectangle using concrete or pictorial representations of units *(e.g., grid squares or tiles)*.	M1.2.2_M	Solve problems, including real-world problems, involving the calculation of the area of a rectangle.	M1.2.2_E	Solve problems, including real-world problems, involving the area of compound shapes comprised of rectangles using concrete or pictorial representations of units *(e.g., grid squares or tiles)*.
M2: TIME					
M2.1: Tell time					
M2.1.1_P	Tell time using an analog clock to the nearest minute.	M2.1.1_M	Recognize equivalence between representations of time *(e.g., digital, analog, and written; 15 minutes is a quarter of an hour)*.	M2.1.1_E	N/A
M2.2: Solve problems involving time					
M2.2.1_P	Solve problems, including real-world problems, involving elapsed time in minutes within an hour *(e.g., calculate the difference between 3:42 and 3:56 or the difference between 16:35 and 16:52)*.	M2.2.1_M	Solve problems, including real word problems, involving elapsed time in minutes across hours *(e.g., calculate the difference between 3:24 and 5:12 or the difference between 16:35 and 18:22), including problems involving schedules (i.e., timetables, agendas, itineraries)*.	M2.2.1_E	Solve problems, including real-world problems, involving elapsed time across a.m. and p.m. in countries that teach 12-hour time *(e.g., calculate the difference between 10:30 a.m. and 3:15 p.m.)*.
M2.2.2_P	N/A	M2.2.2_M	Solve problems, including real-world problems, involving the number of days in a week, months in a year, hours in a day, minutes in an hour, and seconds in a minute.	M2.2.2_E	N/A
M3: CURRENCY					
M3.1: Use different currency units to create amounts—subconstruct fully covered in grades 1-3. Questions involving currency are covered under the relevant real-world problem subconstructs (e.g., N1.4 for whole numbers, etc.)					

GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G: GEOMETRY		
G1: PROPERTIES OF SHAPES AND FIGURES		
G1.1: Differentiate shapes and figures by their attributes		
G1.1.1_P Recognize and name two-dimensional shapes by a written or spoken description of their simple attributes *(e.g., name a shape given a description of the number of sides or corners or the relative length of the sides, etc.)*.	G1.1.1_M Recognize and name types of triangles *(e.g., isosceles, scalene, equilateral, and right angle)*.	G1.1.1_E Recognize and name types of quadrilaterals *(e.g., parallelogram; trapezium, etc.)*.
G1.1.2_P N/A	G1.1.2_M Recognize and name three-dimensional figures by their attributes *(e.g., faces, edges, vertices)*.	G1.1.2_E Identify parallel and perpendicular sides of shapes.
G1.1.3_P N/A	G1.1.3_M Recognize types of angles by their magnitude *(e.g., right, straight, acute, obtuse)*.	G1.1.3_E N/A
G1.1.4_P Recognize and describe the congruence and similarity of two-dimensional shapes *(e.g., when shown two shapes, explain how they are similar using mathematical or non-mathematical language: "It got bigger and has been turned" or "It's been enlarged and rotated.")*. 	G1.1.4_M N/A	G1.1.4_E N/A
G2: SPATIAL VISUALIZATIONS		
G2.1: Compose and decompose shapes and figures		
G2.1.1_P N/A	G2.1.1_M Identify the net of a cube or specific faces on the net of a cube *(e.g., fold mentally to answer the question, which of these is the net of a cube?; identify opposite faces on a net)*. 	G2.1.1_E Identify front, top, and side views of a familiar three-dimensional figure (i.e. prism, cylinder, cone or pyramid) *(e.g., identify that the top view of an upright cylinder is a circle)*.
G3: POSITION AND DIRECTION		
G3.1: Describe the position and direction of objects in space		
G3.1.1_P Use different kinds of simple maps (i.e., an alphanumeric map, grid map, or local equivalent) to give and follow 2-step directions to a given location *(e.g., Using this map, if you are at the school, you walk towards the tree, and turn left. What would you be facing?; Using this map, how do you get from the school to the green house?)*.	G3.1.1_M Use a grid map with compass directions when the grid dimensions are given in terms of the real-world distance *(e.g., Which of these is closest to the distance between the park and Juan's house? a) 100 meters b) 150 meters c) 200 meters d) 250 meters)*.	G3.1.1_E Locate and plot points on a plane in the first quadrant of a Cartesian coordinate system.

GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Solve a problem involving more than two pieces of information from a tally chart, bar graph, or pictograph with a single-unit scale *(e.g., How many children were asked about their favorite color in this bar graph?).* 	S1.1.1_M Organize data and construct a tally chart, bar graph, or pictograph that arranges data into categories and uses a single- or multi-unit scale. 	S1.1.1_E Retrieve information from data displays that arrange data into categories and sub-categories with a single- or multi-unit scale *(e.g., How many girls liked green in this bar chart?).* 
S1.1.2_P Complete missing information in a tally chart, bar graph, or pictograph that arranges data into categories and uses a single-unit scale *(e.g., add a row or column to a partially completed pictograph).*	S1.1.2_M Compare by calculating differences between categories in a tally chart, bar graph, or pictograph with a multi-unit scale.	S1.1.2_E N/A
S1.1.3_P Retrieve information from a tally chart, bar graph, or pictograph with a multi-unit scale.	S1.1.3_M N/A	S1.1.3_E N/A
S1.2: Calculate and interpret central tendency—not applicable to grade 5		
S2: CHANCE AND PROBABILITY		
S2.1: Describe the likelihood of events in different ways		
S2.1.1_P Identify the likelihood of an event happening as certain or impossible *(e.g., There are blue, green, red, and yellow marbles in a bag. Which color is impossible to choose? and the choices are a) blue b) green c) purple d) yellow e) red.).*	S2.1.1_M Identify the likelihood of an event happening as likely or unlikely *(e.g., There are 9 blue, 1 red, 1 green, and 1 yellow marbles in a bag. Which color is likely to be selected?).*	S2.1.1_E Compare the likelihoods of two or more events happening, using descriptive words *(e.g., Given a picture of a spinner with five equal colored sections—red, blue, yellow, green and purple—"If the spinner is spun 2 times, what is the chance that it will land on blue both times?" with answers a) impossible b) unlikely c) likely d) certain).*
S2.2: Identify permutations and combinations—not applicable to grade 5		

GRADE 5: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend, and generate patterns		
A1.1.1_P Describe numerical patterns that increase or decrease by a constant value with a simple rule, and use this information to identify a missing element or extend the pattern *(e.g., describe the pattern 6, 9, 12, 15 as going up by threes; identify the missing element in the pattern 3, 7, 11, __, 19; extend the pattern 6, 11, 16, 21).*	A1.1.1_M Describe numerical patterns that increase or decrease by a constant multiplier, and use this information to identify a missing element or extend the pattern *(e.g., describe that the pattern 2, 4, 8, 16 starts at 2 and doubles or that the pattern 20, 10, 5, 2.5 starts at 20 and halves; identify the missing element in the pattern 3, 6, __, 24, 48; write the next two numbers in the pattern 80, 40, 20, 10).*	A1.1.1_E Generate a pattern from a given rule, or match a pattern to a given rule using any operation *(e.g., start at 5 and increase by 3 to generate 5, 8, 11, 14, 17 . . .; match the pattern 3, 6, 12, 24, … to one of these rules a) start at 3 and add 3, b) start at 3 and double, c) start at 3 and add 6, and d) start at 3 and halve).*
A2: EXPRESSIONS		
Not applicable to grade 5		
A3: RELATIONS AND FUNCTIONS		
A3.1: Variation (ratio, proportion, and percentage) - not applicable to grade 5		
A3.2: Demonstrate an understanding of equivalency		
A3.2.1_P Create a numerical expression using x or ÷ to model a situation *(e.g., represent the following in a number sentence: 3 people get on the bus at each of 4 stops).*	A3.2.1_M N/A	A3.2.1_E N/A
A3.2.2_P Find a missing value in a number sentence using addition and subtraction of numbers within 100 *(e.g., 23 + __ = 59).*	A3.2.1_M Find a missing value in a number sentence using multiplication and division within 100 *(e.g., 7 x _ = 35).*	A3.2.1_E Find a missing value in a number sentence using any one of the four operations *(e.g., 3 x __ = 18).*
A3.2.3_P Represent real-world addition and subtraction problems within 20 using a number sentence with a symbol or blank to represent the missing value *(e.g., 13 people are on a bus. More people get on. There are now 17 people on the bus. How many people got on the bus? Represent this situation with an addition or a subtraction sentence).*	A3.2.3_M Represent real-world problems involving the multiplication of two whole numbers to 10 and related division facts, using a number sentence with a symbol or blank to represent the missing value *(e.g., Paul has 3 bags of oranges. There are the same number of oranges in each bag. He has 18 oranges altogether. How many oranges are there in each bag? Represent the situation with a multiplication sentence).*	A3.2.3_E Represent real-world problems using a number sentence with one of the four operations *(e.g., Abu has 5 identical water bottles that weigh a total of 15 pounds. Represent the problem with 5 × __ = 15).*
A3.3: Solve equations and inequalities—not applicable to grade 5		
A3.4: Interpret and evaluate functions—not applicable to grade 5		

Grade 6

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude		
N1.1.1_P Count in whole numbers up to any whole number.	N1.1.1_M N/A	N1.1.1_E N/A
N1.1.2_P Read and write any whole number.	N1.1.2_M N/A	N1.1.2_E N/A
N1.1.3_P Compare and order whole numbers up to 100,000.	N1.1.3_M Compare and order any whole numbers.	N1.1.3_E N/A
N1.1.4_P Skip count forwards and backwards by thousands.	N1.1.4_M N/A	N1.1.4_E N/A
N1.2: Represent whole numbers in equivalent ways		
N1.2.1_P Use place-value concepts for thousands, hundreds, tens, and ones *(e.g., compose or decompose a 4-digit whole number using a number sentence such as 1,383 = 1 thousand, 3 hundreds, 8 tens, and 3 ones; 1,383 = 1,000 + 300 + 80 + 3; determine the value of a digit in the thousands place).*	N1.2.1_M Use place-value concepts beyond the thousands *(e.g., compose or decompose a seven-digit whole number using a number sentence such as 1,383,547 = 1 million, 3 hundred thousands, 8 ten thousands, 3 thousands, 5 hundreds, 4 tens, and 7 ones; 1,383,547 = 1,000,000 + 300,000 + 80,000 + 3000 + 500 + 40 + 7; determine the value of a digit in the millions place).*	N1.2.1_E N/A
N1.2.2_P Round whole numbers to the nearest hundred.	N1.2.2_M Round whole numbers to the nearest thousand.	N1.2.2_E Round whole numbers to any place value beyond the thousands place.
N1.3: Solve operations using whole numbers		
N1.3.1_P Add and subtract beyond 1,000 (i.e., where the sum or minuend surpasses 1,000), with and without regrouping, and represent these operations with objects, pictures, or symbols *(e.g., 1457 - 129; use number lines to reason through or solve addition and subtraction problems).*	N1.3.1_M N/A	N1.3.1_E N/A
N1.3.2_P Multiply, with and without regrouping, and divide, with no remainder, any number by a one-digit number and multiply two 2-digit numbers, with and without regrouping *(e.g., 342 x 4 = __; 42 x 34 = __; 1380 ÷ 5 = __).*	N1.3.2_M Multiply any number by a 2-digit number, with and without regrouping, and divide any number by a 1-digit number, with and without a remainder *(e.g., 3427 x 68; 1380 ÷ 6 = __).*	N1.3.2_E Multiply any 2 numbers, with and without regrouping, and divide any number by a 2-digit number, with and without a remainder *(e.g., 2342 x 1478; 3388 ÷ 15 = __).*
N1.3.3_P Identify factors of whole numbers within 25 and multiples of whole numbers within 10 *(e.g., find all factors of 24; find multiples of 8).*	N1.3.3_M Identify factors of whole numbers within 100 and multiples of whole numbers within 20 *(e.g., find all factors of 84; find multiples of 15).*	N1.3.3_E Identify factors of whole numbers beyond 100 and multiples of whole numbers beyond 20 *(e.g., find factors of 125 or find multiples of 25).*
N1.3.4_P Perform calculations involving two or more operations, within the limits for partially meets expectations described above, respecting the order of operations *(e.g., 1754 + 53 x 53 = __; 4 x 9 x 8 = __).*	N1.3.4_M Perform calculations involving two or more operations, within the limits for meets expectations described above, respecting the order of operations *(e.g., 6584 + 2187 x 38 = __; 675 ÷ 9 x 652 = __).*	N1.3.4_E Perform calculations involving two or more operations, within the limits for exceeds expectations described above, respecting the order of operations *(e.g., (6584 + 2187) x 318 = __; (9675 - 823) ÷ 19 = __).*

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N1.4: Solve real-world problems involving whole numbers					
N1.4.1_P	Solve simple real-world problems involving any **one** of the four operations, including problems involving measurement and currency units and: * addition and subtraction of whole numbers within 1,000 with and without regrouping * multiplications up to 10 × 10 and related divisions without remainders.	N1.4.1_M	Solve real-world problems involving combinations of any **2 or more** of the 4 operations, including problems involving measurement and currency units and: * addition and subtraction of whole numbers beyond 1,000 with and without regrouping * multiplications and divisions of any number by a 1-digit number with and without regrouping (multiplication) and with and without a remainder (division) * multiplications of two 2-digit numbers.	N1.4.1_E	Solve real-world problems involving combinations of any **2 or more** of the 4 operations, including problems involving measurement and currency units and: * addition and subtraction of any whole numbers * multiplication of any whole numbers * division of any whole number by a 2-digit number with and without a remainder.
N2: FRACTIONS					
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude					
N2.1.1_P	Identify and express proper fractions as equivalent fractions with denominators up to 12 *(e.g., express a fraction in simplest form 6/9 = ¨/3; 2/10 = 1/¨; express as a multiple of another 4/5 = 8/¨).*	N2.1.1_M	Identify and express proper fractions as equivalent fractions (any denominator) *(e.g., 13/25 = 26/50).*	N2.1.1_E	N/A
N2.1.2_P	N/A	N2.1.2_M	Identify and express improper fractions as equivalent mixed numbers (or vice versa), with pictures or symbols *(e.g., represent 9/6 as 1 3/6 or 1 1/2; use two arrays or rectangles and coloring to represent 9/6).*	N2.1.2_E	N/A
N2.1.3_P	Compare and order fractions with different but related denominators up to 12 *(e.g., 2/3 and 5/6).*	N2.1.3_M	Compare and order proper and improper fractions with different, unrelated denominators *(e.g., 1/4; 7/10; 5/6).*	N2.1.3_E	N/A
N2.1.4_P		N2.1.4_M	Compare and order fractions and mixed numbers *(e.g., 9/6, 1 1/3, 5/12, 2 1/2).*	N2.1.4_E	N/A
N2.2: Solve operations using fractions					
N2.2.1_P	Add and subtract proper fractions with different but related denominators *(e.g., 2/3 + 1/6; 7/8 - 1/4).*	N2.2.1_M	Add and subtract improper fractions or mixed numbers with different but related denominators *(e.g., 2 2/3 + 1 1/6; 25/4 + 5/12).*	N2.2.1_E	Add and subtract improper fractions or mixed numbers with different, unrelated denominators *(e.g., 9/4 + 3/9; 3 1/6 - 2/5).*
N2.2.2_P	Multiply commonly-used fractions by whole numbers, or divide proper fractions by whole numbers, and represent such operations with objects or pictures *(e.g., represent 3/4 x 12 with a 3 x 4 grid with 3 of the columns colored in; represent 3/4 divided by 2 as a 1 x 1 grid with 1 side divided into 4 equal parts and 3 blocks colored in and the other side divided into 2 to produce 8 equal blocks with 6 colored in).*	N2.2.2_M	Multiply and divide proper fractions and divide improper fractions by whole numbers, and represent such operations with pictures or symbols *(e.g., 2/5 ÷ 3/5; 3/4 x 2/6; 7/5 ÷ 2; represent 3/4 x 1/2 as a rectangle split into 4 equal parts with 3 parts shaded and each of the 4 equal parts split into 2 equal sections. Note that the smaller shaded sections represent the answer).*	N2.2.2_E	Multiply and divide fractions (including proper and improper fractions and mixed numbers) *(e.g., 3/4 x 7/6 = __; 2/3 x 3 1/4 =__; 4/5 ÷ 5/3 =__).*

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N2.3: Solve real-world problems involving fractions		
N2.3.1_P Solve real-world problems involving addition and subtraction of proper fractions with different but related denominators *(e.g., Paola has 2/5 of a chocolate bar left. Her friend Carola has 3/10 of the same chocolate bar. Together, they have what fraction of the chocolate bar?; Paola has 2/3 of a chocolate bar left. If she gives her friend Carola 1/6 of what remains, what fraction of the chocolate bar will Paola have left?)*.	N2.3.1_M Solve real-world problems involving addition and subtraction of improper fractions and mixed numbers with different but related denominators *(e.g., Maya is cutting some oranges for a picnic. She cuts each orange into 8 equal pieces. She puts 25 pieces of orange onto a large plate and 11 pieces of orange onto a smaller plate. What is the smallest number of whole oranges Maya could have cut?; A tree is now 3 and a half meters tall. When it was planted, it was 1 and one quarter meters tall. By how many meters has the tree grown since it was planted?)*.	N2.3.1_E Solve real-world problems involving the addition and subtraction of proper and improper fractions and mixed numbers with unrelated denominators *(e.g., A carpenter has a piece of wood that measures 15 and 7/8 ft. She only needs a piece that measures 10 and 5/12 ft. What is the length of the piece of wood she should cut off the long piece?)*.
N2.3.2_P Solve real-world problems involving the multiplication and division of a proper fraction and a whole number *(e.g., Misha has half a pizza. If she shares it equally with her brother, what fraction of the original pizza will each receive?)*.	N2.3.2_M Solve real-world problems involving the multiplication of two proper fractions or the division of an improper fraction or mixed number by a whole number *(e.g., Misha has half a pizza. If she shares it equally with her brother, what fraction of the original pizza will each receive?)*.	N2.3.2_E Solve real-world problems involving the multiplication and division of fractions (including proper and improper fractions and mixed numbers) *(e.g., A cake needs 1 and a half cups of flour. How much is needed to make half a cake?; Dean has a piece of wood that is 3/4 of a foot in length. He needs to cut it into pieces that are 1/16th of a foot long. How many pieces can he cut?)*.
N3: DECIMALS		
N3.1: Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude		
N3.1.1_P Identify and represent quantities using decimal notation (i.e., symbols) up to the tenths place *(e.g., identify that 0.8 is 8 tenths)*.	N3.1.1_M Identify and represent quantities using decimal notation up to the hundredths place *(e.g., identify that 0.65 is 65 hundredths)*.	N3.1.1_E Identify and represent quantities using decimal notation beyond the hundredths place *(e.g., identify that 0.655 is 655 thousandths)*.
N3.1.2_P Compare and order decimal numbers up to the tenths place *(e.g., sort the following decimals from high to low: 0.8, 0.3, 0.1)*.	N3.1.2_M Compare and order decimal numbers up to the hundredths place *(e.g., sort the following decimals from high to low: 0.8, 0.33, 0.08, 0.6)*.	N3.1.2_E Compare and order decimal numbers beyond the hundredths place *(e.g., sort the following decimals from low to high: 0.821, 0.33, 0.08, 0.698, 0.7)*.
N3.2: Represent decimals in equivalent ways (including fractions and percentages)		
N3.2.1_P Round decimal numbers to the nearest tenths place *(e.g., round 3.46 to 3.5)*.	N3.2.1_M Round decimal numbers to the nearest hundredths place *(e.g., round 3.456 to 3.46)*.	N3.2.1_E Round decimal numbers to any place value beyond the hundredths place *(e.g., round 3.45619 to 3.4562)*.
N3.2.2_P Identify and express fractions with denominators of 10 using decimal notation *(e.g., 7/10 = 0.7)*.	N3.2.2_M Identify and express fractions with denominators of 100 and everyday fractions, using decimal notation, and represent fractions with denominators of 100 as percentages *(e.g., 3/4 = 0.75; 72/100 = 0.72 = 72%)*.	N3.2.2_E Identify and express fractions with any denominator using decimal notation and vice versa *(e.g., 752/1000 = 0.752; 7/8 = 0.875)*.

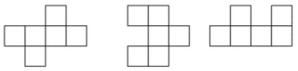
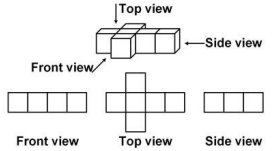
GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N3.2.3_P	Compare and order decimals and proper fractions with denominators of 10 *(e.g., place a list of decimals and fractions on a number line)*.	N3.2.3_M	Compare and order decimals (to the hundredths place) and proper fractions *(e.g., place a list of decimals and proper fractions on a number line)*.	N3.2.3_E	Compare and order fractions, decimals, and percentages *(e.g., place these numbers on a number line: 0.4, 1/2, 0.50%, 4/5, 0.25, 1/3, 0.25%)*.
N3.3: Solve operations using decimals					
N3.3.1_P	Add and subtract decimal numbers up to the tenths place. Create or identify concrete or picture models to represent such additions *(e.g., 0.5 + 0.2)*.	N3.3.1_M	Add and subtract decimal numbers up to the hundredths place. Create or identify concrete or picture models to represent such additions *(e.g., 3.41 + 5.3)*.	N3.3.1_E	Add and subtract any positive decimal numbers.
N3.4: Solve real-world problems involving decimals					
N3.4.1_P	N/A	N3.4.1_M	Solve real-world problems involving the addition and subtraction of decimals to the tenths place *(e.g., Diego has 3.2 meters of roof sheeting. If he buys another 1.4 meters, how many meters of roof sheeting will he have altogether? Aminata has 32.5 kg of grout for tiling. If she uses 12.1 kg for a new project, how many kgs of tile grout will she have left?)*.	N3.4.1_E	Solve real-world problems involving addition and subtraction of decimals beyond the tenths place *(e.g., Aria has a height of 1.55 meters. Her mother has a height of 1.63 meters. How much taller than Aria is her mother? Adwoa has 1.64 meters of roof sheeting and another 1.4 meters. How many meters of roof sheeting does she have?)*.
N4: INTEGERS					
Not applicable to grade 6					
N5: EXPONENTS AND ROOTS					
Not applicable to grade 6					
N6: OPERATIONS ACROSS NUMBER					
Not applicable to grade 6					
M: MEASUREMENT					
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER					
M1.1: Use non-standard and standard units to measure, compare, and order					
M1.1.1_P	Identify the relationship between the relative size of adjacent units within a standard system of measurement for length and weight *(e.g., identify the number of millimeters in a centimeter)*.	M1.1.1_M	Make conversions between adjacent units of length and weight within a standard system of measurement *(e.g., identify that the 16-centimeter pencil is 160 millimeters long)*.	M1.1.1_E	Make conversions between non-adjacent units of length and weight within a standard system of measurement *(e.g., convert kilometers to millimeters)*.
M1.1.2_P	Identify the relationship between the relative size of adjacent units within a standard system of measurement for capacity/volume *(e.g., identify the number of pints in a quart)*.	M1.1.2_M	Make conversions between adjacent units of capacity/volume within a standard system of measurement *(e.g., identify that there are 4 pints in a 2-quart container)*.	M1.1.2_E	Make conversions between non-adjacent units of capacity/volume within a standard system of measurement *(e.g., convert pints to gallons)*.

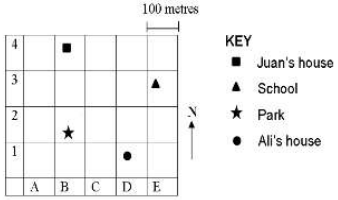
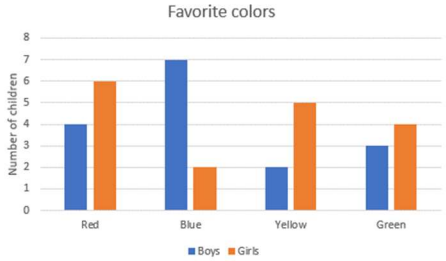
GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M1.1.3_P	Read scales to the nearest marked increment on a variety of measuring tools involving fractions and decimals to the tenths place, containing both labeled and unlabeled scale increments *(e.g., kitchen scale containing increments expressed as fractions)*.	M1.1.3_M	Read scales to the nearest marked increment on a variety of measuring tools involving decimals to the hundredths place, containing both labeled and unlabeled scale increments *(e.g., read a depth gauge in a dam with scale increments increasing in 25-centimeter intervals and labels expressed as decimal meters (e.g., 1.25, 1.5, 1.75, 2.0) when the needle is pointing directly at a marked increment of the scale)*.	M1.1.3_E	Read scales on a variety of measuring tools by reading between marked scale increments (interpolating) *(e.g., read a kitchen scale marked in grams and kilograms with some unlabeled scale markings and needle pointing between two unlabeled scale markings; measure an angle using a protractor/angle measurer)*.
M1.2: Solve problems involving measurement					
M1.2.1_P	Solve problems, including real-world problems, involving the perimeter of a polygon.	M1.2.1_M	Solve problems, including real-world problems, involving comparing the perimeters of polygons.	M1.2.1_E	Solve problems, including real-world problems, involving perimeter in which the unknown is a length *(e.g., identify the fifth length in a picture of an irregular pentagon with 4 sides labeled with length and a given perimeter)*.
M1.2.2_P	Solve problems, including real-world problems, involving the calculation of the area of a rectangle.	M1.2.2_M	Solve problems, including real-world problems, involving the area of compound shapes comprised of rectangles using concrete or pictorial representations of units *(e.g., grid squares or tiles)*.	M1.2.2_E	Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprised of rectangles *(e.g., calculate the area of a compound L-shape given a picture with the lengths of all sides provided)*.
M2: TIME					
M2.1: Tell time—subconstruct covered in grades 1-5 and is, therefore, assumed knowledge for grade 6					
M2.2: Solve problems involving time					
M2.2.1_P	Solve problems, including real-world problems, involving elapsed time in minutes across hours *(e.g., calculate the difference between 3:24 and 5:12 or the difference between 16:35 and 18:22)*, including problems involving schedules (i.e., timetables, agendas, itineraries).	M2.2.1_M	Solve problems, including real-world problems, involving elapsed time across a.m. and p.m. in countries that teach 12-hour time *(e.g., calculate the difference between 10:30 a.m. and 3:15 p.m.)*.	M2.2.1_E	N/A
M2.2.2_P	Solve problems, including real-world problems, involving the number of days in a week, months in a year, hours in a day, minutes in an hour, and seconds in a minute.	M2.2.2_M	N/A	M2.2.2_E	N/A

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
M3: CURRENCY		
M3.1: Use different currency units to create amounts—subconstruct fully covered in grades 1-3. Questions involving currency are covered under the relevant real-world problem subconstructs (e.g., N1.4 for whole numbers, etc.)		
G: GEOMETRY		
G1: PROPERTIES OF SHAPES AND FIGURES		
G1.1: Differentiate shapes and figures by their attributes		
G1.1.1_P Recognize and name types of triangles *(e.g., isosceles, scalene, equilateral, and right angle)*.	G1.1.1_M Recognize and name types of quadrilaterals *(e.g., parallelogram; trapezium, etc.)*.	G1.1.1_E N/A
G1.1.2_P Recognize and name three-dimensional figures by their attributes *(e.g., faces, edges, vertices)*.	G1.1.2_M Identify parallel and perpendicular sides of shapes.	G1.1.2_E Use the defining attributes (i.e., type of angle, parallel and perpendicular lines) of complex two-dimensional shapes to classify them.
G1.1.3_P Recognize types of angles by their magnitude *(e.g., right, straight, acute, obtuse)*.	G1.1.3_M N/A	G1.1.3_E Estimate the size of angles by comparing to reference/benchmark angles *(e.g., estimate the size of a given angle with reference to the fact that it is smaller than a right angle and larger than 45°)*.
G1.1.4_P N/A	G1.1.4_M N/A	G1.1.4_E N/A
G2: SPATIAL VISUALIZATIONS		
G2.1: Compose and decompose shapes and figures		
G2.1.1_P Identify the net of a cube *(e.g., fold mentally to answer the question, which of these is the net of a cube?; identify opposite faces on a net)*. 	G2.1.1_M Identify front, top, and side views of a familiar three-dimensional figure (i.e., prism, cylinder, cone or pyramid) *(e.g., identify that the top view of an upright cylinder is a circle)*.	G2.1.1_E Identify alternate views of the same compound or irregular three-dimensional shape, such as its front, top, and side view, a rotated view, or a view of a hidden side *(e.g., label images (i), (ii), and (iii) as the front, top, and side view of the three-dimensional shape)*. 

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G3: POSITION AND DIRECTION		
G3.1: Describe the position and direction of objects in space		
G3.1.1_P Use a grid map with compass directions when the grid dimensions are given in terms of the real-world distance *(e.g., Which of these is closest to the distance between the park and Juan's house? a) 100 meters b) 150 meters c) 200 meters d) 250 meters).* 	G3.1.1_M Locate and plot points on a plane in the first quadrant of a Cartesian coordinate system.	G3.1.1_E Draw shapes in the first quadrant of a Cartesian coordinate system, and find missing points *(e.g., if (1,1), (1,3) and (1,2) are three corners of a rectangle, identify the fourth corner.).*
G3.1.2_P N/A	G3.1.2_M N/A	G3.1.2_E Identify horizontal and/or vertical distances between two points in the first quadrant of the Cartesian coordinate system *(e.g., using the Cartesian coordinate system, identify how many horizontal and vertical units is (1,1) from (3,4)).*
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Organize data and construct a tally chart, bar graph, or pictograph that arranges data into categories and uses a single- or multi-unit scale.	S1.1.1_M Retrieve information from data displays that arrange data into categories and sub-categories with a single- or multi-unit scale *(e.g., How many girls liked green in this bar chart?).* 	S1.1.1_E Retrieve categorical data from pie charts and Venn diagrams and bivariate data from line graphs and dot plots.
S1.1.2_P Compare by calculating differences between categories in a tally chart, bar graph, or pictograph with a multi-unit scale.	S1.1.2_M N/A	S1.1.2_E N/A
S1.2: Calculate and interpret central tendency—not applicable to grade 6		

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S2: CHANCE AND PROBABILITY		
S2.1: Describe the likelihood of events in different ways		
S2.1.1_P Identify the likelihood of an event happening as likely or unlikely *(e.g., There are 9 blue, 1 red, 1 green, and 1 yellow marbles in a bag. Which color is likely to be selected?)*.	S2.1.1_M Compare the likelihoods of two or more events happening, using descriptive words *(e.g., Given a picture of a spinner with 5 equal colored sections—red, blue, yellow, green, and purple—the question is: "If the spinner is spun two times, what is the chance that it will land on blue both times?," and the possible answers are a) impossible b) unlikely c) likely d) certain)*.	S2.1.1_E Calculate the probability of a simple event happening, with the answer expressed as a fraction, decimal, or percentage *(e.g., What is the probability of rolling a 6 on a standard number die?)*.
S2.2: Identify permutations and combinations—not applicable to grade 6		
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend, and generate patterns		
A1.1.1_P Describe numerical patterns that increase or decrease by a constant multiplier, and use this to identify a missing element or extend the pattern *(e.g., describe that the pattern 2, 4, 8, 16 starts at 2 and doubles or that the pattern 20, 10, 5, 2.5 starts at 20 and halves; identify the missing element in the pattern 3, 6, __, 24, 48; write the next two numbers in the pattern 80, 40, 20, 10)*.	A1.1.1_M Generate a pattern from a given rule, or match a pattern to a given rule using any operation *(e.g., start at 5 and increase by 3 to generate 5, 8, 11, 14, 17 . . .; match the pattern 3, 6, 12, 24, … to one of these rules a) start at 3 and add 3, b) start at 3 and double, c) start at 3 and add 6, and d) start at 3 and halve)*.	A1.1.1_E Recognize and extend non-linear patterns, including squaring patterns, which may be supported by a visual representation *(e.g., recognize that 1, 3, 6, 10 increases by 2, then 3, then 4, when accompanied by dots or points arranged into triangles; extend the pattern 2, 4, 16, 25)*.
A2: EXPRESSIONS		
Not applicable to grade 6		
A3: RELATIONS AND FUNCTIONS		
A3.1: Solve problems involving variation (ratio, proportion, and percentage)		
A3.1.1_P Represent real-world situations with a ratio *(e.g., There are 15 boys and 20 girls in the class. What is the ratio of boys to girls?)*	A3.1.1_M Reason proportionally to answer real-world problems involving a unit ratio expressed informally *(e.g., If Tulika needs 3 eggs for 1 cake, how many eggs does Tulika need for 5 cakes?)*.	A3.1.1_E Reason proportionally to answer real-world problems involving a ratio *(e.g., Purple paint is made from 2 parts blue paint to 3 parts red paint. I have 10 parts of blue paint. How many parts of red paint do I need?; or the ratio of teachers to students on a school trip must be 1:9. How many teachers are needed if there are 36 students?)*.
A3.2: Demonstrate an understanding of equivalency		
A3.2.1_P Find a missing value in a number sentence using addition and subtraction of numbers within 100 *(e.g., 23 + __ = 59)*.	A3.2.1_M Find a missing value in a number sentence using any one of the four operations *(e.g., 3 x __ = 18)*.	A3.2.1_E Find a missing value in a two-step number sentence using the four operations *(e.g. 3 x __ + 4 = 22)*.

GRADE 6: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
A3.2.2_P N/A	A3.2.2_M Represent real-world problems using a number sentence with one of the four operations *(e.g., Abu has 5 identical water bottles that weigh a total of 15 pounds. Represent the problem as 5 × __ = 15)*.	A3.2.2_E Represent real-world problems using a two-step number sentence with any of the four operations *(e.g., Some people got on a bus, doubling the number of passengers. At the next stop, 8 people got off, leaving 16 people on the bus. Represent the problem as 2x - 8 = 16)*.
A3.3: Solve equations and inequalities—not applicable to grade 6		
A3.4: Interpret and evaluate functions—not applicable to grade 6		

Grade 7

GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS—in grades 7 and 8, this construct is covered in N4: INTEGERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 7		
N1.2: Represent whole numbers in equivalent ways—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 7		
N1.3: Solve operations using whole numbers—see N4.2		
N1.4: Solve real-world problems involving whole numbers—see N4.3		
N2: FRACTIONS		
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude		
N2.1.1_P Identify and express proper fractions as equivalent fractions (any denominator) *(e.g., 13/25 = 26/50)*.	N2.1.1_M N/A	N2.1.1_E N/A
N2.1.2_P Identify and express improper fractions as equivalent mixed numbers (or vice versa), with pictures or symbols *(e.g., represent 9/6 as 1 3/6 or 1 1/2; use two arrays or rectangles and coloring to represent 9/6)*.	N2.1.2_M N/A	N2.1.2_E N/A
N2.1.3_P Compare and order proper and improper fractions with different, unrelated denominators *(e.g., 1/4; 7/10; 5/6)*.	N2.1.3_M Compare and order positive and negative fractions (proper and improper) and mixed numbers *(e.g., -2/3, 1/3, 5/6, -1 1/2, 5/9)*.	N2.1.3_E N/A
N2.1.4_P Compare and order fractions and mixed numbers *(e.g., 9/6, 1 1/3, 5/12, 2 1/2)*.	N2.1.4_M N/A	N2.1.4_E N/A
N2.2: Solve operations using fractions		
N2.2.1_P Add and subtract improper fractions or mixed numbers with different but related denominators *(e.g., 2 2/3 + 1 1/6; 25/4 + 5/12)*.	N2.2.1_M Add and subtract improper fractions or mixed numbers with different, unrelated denominators *(e.g., 9/4 + 3/9; 3 1/6 - 2/5)*.	N2.2.1_E N/A
N2.2.2_P Multiply and divide proper fractions and divide improper fractions by whole numbers, and represent such operations with pictures or symbols *(e.g., 2/5 ÷ 3/5; 3/4 x 2/6; 7/5 ÷ 2; represent 3/4 x 1/2 as a rectangle split into 4 equal parts with 3 parts shaded and each of the 4 equal parts split into 2 equal sections. Note that the smaller shaded sections represent the answer)*.	N2.2.2_M Multiply and divide fractions (including proper and improper fractions and mixed numbers) *(e.g., 3/4 x 7/6 = __; 2/3 x 3 1/4 =__; 4/5 ÷ 5/3 =__)*.	N2.2.2_E N/A

GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N2.3: Solve real-world problems involving fractions					
N2.3.1_P	Solve real-world problems involving addition and subtraction of improper fractions and mixed numbers with different but related denominators *(e.g., Maya is cutting some oranges for a picnic. She cuts each orange into 8 equal pieces. She puts 25 pieces of orange onto a large plate and 11 pieces of orange onto a smaller plate. What is the smallest number of whole oranges Maya could have cut?; A tree is now 3 and a half meters tall. When it was planted, it was 1 and one quarter meters tall. By how many meters has the tree grown since it was planted?)*.	N2.3.1_M	Solve real-world problems involving the addition and subtraction of proper and improper fractions and mixed numbers with unrelated denominators *(e.g., A carpenter has a piece of wood that measures 15 and 7/8 ft. She only needs a piece that measures 10 and 5/12 ft. What is the length of the piece of wood she should cut off the long piece?)*.	N2.3.1_E	N/A
N2.3.2_P	Solve real-world problems involving the multiplication of two proper fractions or the division of an improper fraction or mixed number by a whole number *(e.g., Misha has half a pizza. If she shares it equally with her brother, what fraction of the original pizza will each receive?)*.	N2.3.2_M	Solve real-world problems involving the multiplication and division of fractions (including proper and improper fractions and mixed numbers) *(e.g., A cake needs 1 and a half cups of flour. How much is needed to make half a cake?; Dean has a piece of wood that is 3/4 of a foot in length. He needs to cut it into pieces that are 1/16th of a foot long. How many pieces can he cut?)*.	N2.3.2_E	N/A
N3: DECIMALS					
N3.1: Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude					
N3.1.1_P	Identify and represent quantities using decimal notation up to the hundredths place *(e.g., identify that 0.65 is 65 hundredths)*.	N3.1.1_M	Identify and represent quantities using decimal notation beyond the hundredths place *(e.g., identify that 0.655 is 655 thousandths)*.	N3.1.1_E	N/A
N3.1.2_P	Compare and order decimal numbers up to the hundredths place *(e.g., sort the following decimals from high to low: 0.8, 0.33, 0.08, 0.6)*.	N3.1.2_M	Compare and order decimal numbers beyond the hundredths place *(e.g., sort the following decimals from low to high: 0.821, 0.33, 0.08, 0.698, 0.7)*.	N3.1.2_E	N/A
N3.1.3_P	N/A	N3.1.3_M	Compare and order positive and negative decimal numbers, including those beyond the thousandths place *(e.g., compare +0.821, -0.33, -0.08, +0.698, +0.7)*.	N3.1.3_E	N/A
N3.2: Represent decimals in equivalent ways (including fractions and percentages)					
N3.2.1_P	Round decimal numbers to the nearest hundredths place *(e.g., round 3.456 to 3.46)*.	N3.2.1_M	Round decimal numbers to any place value beyond the hundredths place *(e.g., round 3.45619 to 3.4562)*.	N3.2.1_E	N/A

GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
N3.2.2_P	Identify and express fractions with denominators of 100 and everyday fractions, using decimal notation, and represent fractions with denominators of 100 as percentages *(e.g., 3/4 = 0.75; 72/100 = 0.72 = 72%)*.	N3.2.2_M	Identify and express fractions with any denominator using decimal notation and vice versa *(e.g., 752/1000 = 0.752; 7/8 = 0.875)*.	N3.2.2_E	N/A
N3.2.3_P	Compare and order decimals (to the hundredths place) and proper fractions *(e.g., place a list of decimals and proper fractions on a number line)*.	N3.2.3_M	Compare and order fractions, decimals, and percentages *(e.g., place these numbers on a number line: 0.4, 1/2, 0.50%, 4/5, 0.25, 1/3, 0.25%)*.	N3.2.3_E	Compare and order positive and negative decimals and fractions *(e.g., place these numbers on a number line from -1 to +1: -0.4, +1/2, -4/5, 0.25, -1/3, 3/4)*.
N3.2.4_P	N/A	N3.2.4_M	Identify and express percentages as fractions with denominators of 10 or 100 or as decimals and vice versa *(e.g., 80% = 80/100 or 8/10; 75% = 0.75)*.	N3.2.4_E	Identify and express percentages less than 1% and greater than 100% as fractions or mixed numbers and vice versa *(e.g., 124% = 124/100; 0.2% = 2/1000)*.
N3.3: Solve operations using decimals					
N3.3.1_P	Add and subtract decimal numbers up to the hundredths place. Create or identify concrete or picture models to represent such additions *(e.g., 3.41 + 5.3)*.	N3.3.1_M	Add and subtract any positive and negative decimal numbers.	N3.3.1_E	N/A
N3.3.2_P	N/A	N3.3.2_M	Multiply and divide a decimal number by a whole number.	N3.3.2_E	Multiply and divide two decimal numbers and divide a whole number by a decimal.
N3.4: Solve real-world problems involving decimals					
N3.4.1_P	Solve real-world problems involving the addition and subtraction of decimals to the tenths place *(e.g., Diego has 3.2 meters of roof sheeting. If he buys another 1.4 meters, how many meters of roof sheeting will he have altogether? Aminata has 32.5 kg of grout for tiling. If she uses 12.1 kg for a new project, how many kgs of tile grout will she have left?)*.	N3.4.1_M	Solve real-world problems involving addition and subtraction of decimals beyond the tenths place *(e.g., Aria has a height of 1.55 meters. Her mother has a height of 1.63 meters. How much taller than Aria is her mother? Adwoa has 1.64 meters of roof sheeting and another 1.4 meters. How many meters of roof sheeting does she have?)*.	N3.4.1_E	N/A
N3.4.2_P	N/A	N3.4.2_M	Solve real-world problems involving the multiplication or division of a decimal by a whole number *(e.g., Misha buys 4 bags of sugar. Each bag holds 1.5 kg. How many kilos of sugar did he buy? Saira has 2.4 kg of sugar. She wants to separate the sugar into 3 bags of equal size. How many kgs should she put in each bag?)*.	N3.4.2_E	Solve real-world problems involving the multiplication or division of two decimal numbers *(e.g., Pascal has seven .75-liter containers of olive oil. He sells half of them. How many liters of olive oil did he sell? Or Sheila buys a 4.5-liter barrel of olive oil. She sells them in 0.75-liter containers. How many containers can she make with the 4.5-liter barrel?)*.

GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N4: INTEGERS		
N4.1: Identify and represent integers using objects, pictures, or symbols, and identify relative magnitude		
N4.1.1_P N/A	N4.1.1_M Compare and order integers *(e.g., order the following from smallest to largest: -4, 6, -9, 2).*	N4.1.1_E N/A
N4.2: Solve operations using integers		
N4.2.1_P Multiply any positive integer by a two-digit number, with and without regrouping, and divide any positive integer by a one-digit number, with and without a remainder *(e.g., 3427 x 68; 1380 ÷ 6 = __).*	N4.2.1_M Multiply any two positive integers, with and without regrouping, and divide any integer by a two-digit number, with and without a remainder *(e.g., 2342 x 1478; 3388 ÷ 15 = __).*	N4.2.1_E N/A
N4.2.2_P Perform calculations involving two or more operations with positive integers, within the limits for partially meets expectations described above, respecting the order of operations *(e.g., 6584 + 2187 x 38 = __; 675 ÷ 9 x 652 = __).*	N4.2.2_M Perform calculations involving two or more operations with positive integers, within the limits for meets expectations described above, respecting the order of operations *(e.g., (6584 + 2187) x 318 = __; (9675 - 823) ÷ 19 = __).*	N4.2.2_E N/A
N4.2.3_P Identify factors of whole numbers within 100 and multiples of whole numbers within 20 *(e.g., find all factors of 84; find multiples of 15).*	N4.2.3_M Identify factors of whole numbers beyond 100 and multiples of whole numbers beyond 20 *(e.g., find factors of 125 or find multiples of 25).*	N4.2.3_E Identify common factors and common multiples of two numbers *(e.g., find the lowest common multiple and the greatest common factor of 12 and 16).*
N4.2.4_P N/A	N4.2.4_M Perform calculations involving operations with negative integers.	N4.2.4_E N/A
N4.3: Solve real-world problems involving integers		
N4.3.1_P N/A	N4.3.1_M Solve real-world problems involving combinations of any 2 or more of the 4 operations, including problems involving measurement and currency units and: * addition and subtraction of any integers * multiplication of any positive integers * division of any positive integers by a positive 2-digit number with or without a remainder *(e.g., The temperature last night was -3 C. This morning it was +2 C. What was the change in temperature between last night and this morning?).*	N4.3.1_E Solve real-world problems involving the multiplication or division of two integers, including at least one negative integer *(e.g., It is -8 degrees Celsius on Tuesday. On Wednesday, it is 3 times colder. What is the temperature on Wednesday?).*

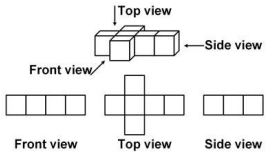
GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N5: EXPONENTS AND ROOTS		
N5.1: Identify and represent exponents and roots using objects, pictures, or symbols, and identify relative magnitude		
N5.1.1_P N/A	N5.1.1_M Identify the square, cube, square root, and cube root of whole numbers using pictures and symbols, and represent a square or cube number using exponential notation *(e.g., use square arrays or grids to represent square numbers or identify the square of a number; identify the square of 8 or the square root of 81; represent 64 as 8^2).*	N5.1.1_E N/A
N5.1.2_P N/A	N5.1.2_M N/A	N5.1.2_E Identify and represent very large whole numbers using scientific notation and positive exponents *(e.g., 600 = 6 x 10^2).*
N5.1.3_P N/A	N5.1.3_M N/A	N5.1.3_E Compare and order large numbers expressed in scientific notation *(e.g., 3.1 x 10^5, 9.2 x 10^5, 2.7 x 10^3, 6.1 x 10^2).*
N6: OPERATIONS ACROSS NUMBER		
Not applicable to grade 7		
M: MEASUREMENT		
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER		
M1.1: Use non-standard and standard units to measure, compare, and order		
M1.1.1_P Make conversions between adjacent units of length and weight within a standard system of measurement *(e.g., identify that the 16-centimeter pencil is 160 millimeters long).*	M1.1.1_M Make conversions between non-adjacent units of length and weight within a standard system of measurement *(e.g., convert kilometers to millimeters).*	M1.1.1_E Make conversions of units of length and weight between different systems of measurement where the conversion factor is provided *(e.g., convert 12 cm to inches given 1 inch is 2.54 cm, convert pounds to kilograms given 1 pound is 0.45 kg).*
M1.1.2_P Make conversions between adjacent units of capacity/volume within a standard system of measurement *(e.g., identify that there are 4 pints in a 2-quart container).*	M1.1.2_M Make conversions between non-adjacent units of capacity/volume within a standard system of measurement *(e.g., convert pints to gallons).*	M1.1.2_E Make conversions of units of capacity/volume between different systems of measurement where the conversion factor is provided *(e.g., convert 750 milliliters to pints given 1 pint is 473 mL).*
M1.1.3_P Read scales to the nearest marked increment on a variety of measuring tools involving decimals to the hundredths place, containing both labeled and unlabeled scale increments *(e.g., read a depth gauge in a dam with scale increments increasing in 25-centimeter intervals and labels expressed as decimal meters (e.g., 1.25, 1.5, 1.75, 2.0) when the needle is pointing directly at a marked increment of the scale).*	M1.1.3_M Read scales on a variety of measuring tools by reading between marked scale increments (interpolating) *(e.g., read a kitchen scale marked in grams and kilograms with some unlabeled scale markings and needle pointing between two unlabeled scale markings; measure an angle using a protractor/angle measurer).*	M1.1.3_E N/A

GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
M1.2: Solve problems involving measurement		
M1.2.1_P Solve problems, including real-world problems, involving comparing the perimeters of polygons.	M1.2.1_M Solve problems, including real-world problems, involving perimeter in which a length is unknown *(e.g., identify the fifth length in a picture of an irregular pentagon with 4 sides labeled with length and a given perimeter)*.	M1.2.1_E N/A
M1.2.2_P Solve problems, including real-world problems, involving the area of compound shapes comprised of rectangles using concrete or pictorial representations of units *(e.g., grid squares or tiles)*.	M1.2.2_M Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprised of rectangles *(e.g., calculate the area of a compound L-shape given a picture with the lengths of all sides provided)*.	M1.2.2_E Solve problems, including real-world problems, involving the calculation of the area of a triangle *(e.g., work out the area of a triangle with base length and height given)*.
M1.2.3_P N/A	M1.2.3_M N/A	M1.2.3_E Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprising rectangles and triangles *(e.g., calculate the area of a composite shape given a picture of the shape made up of a rectangle connected to a right-angled triangle with the lengths of all sides provided)*.
M1.2.4_P N/A	M1.2.4_M N/A	M1.2.4_E Solve problems, including real-world problems, involving the calculation of the volume of a rectangular prism *(e.g., calculate the volume in cubic centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.
M2: TIME		
M2.1: Tell time—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 7		
M2.2: Solve problems involving time		
M2.2.1_P Solve problems, including real-world problems, involving elapsed time across a.m. and a.m. in countries that teach 12-hour time *(e.g., calculate the difference between 10:30 a.m. and 3:15 p.m.)*.	M2.2.1_M Solve problems, including real-world problems, involving conversion between 12-hour and 24-hour time *(e.g., A ferry departs at 16:30 hours. It takes 2 hours and 15 minutes to reach its destination. At what time does the ferry arrive at its destination? Give your answer in a.m./p.m. time.)*.	M2.2.1_E Solve problems, including real-world problems, involving time zones *(e.g., When it is 4 p.m. on Tuesday in New York, it is 6 a.m. on Wednesday in Sydney. When it is 11 a.m. on Thursday in Sydney, what time and day is it in New York?)*.
M3: CURRENCY		
M3.1: Use different currency units to create amounts—subconstruct fully covered in grades 1-3. Questions involving currency are covered under the relevant real-world problem subconstructs (e.g., N4.3 for integers, etc.)		

GRADE 7: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G: GEOMETRY		
G1: PROPERTIES OF SHAPES AND FIGURES		
G1.1: Differentiate shapes and figures by their attributes		
G1.1.1_P Recognize and name types of quadrilaterals *(e.g., parallelogram; trapezium, etc.)*.	G1.1.1_M N/A	G1.1.1_E N/A
G1.1.2_P Identify parallel and perpendicular sides of shapes.	G1.1.2_M Use the defining attributes (i.e., type of angle, parallel and perpendicular lines) of complex two-dimensional shapes to classify them.	G1.1.2_E Recognize and name parts of the circle (i.e., radius, diameter, circumference) and identify the relationship between the radius and diameter.
G1.1.3_P N/A	G1.1.3_M Estimate the size of angles by comparing to reference/benchmark angles *(e.g., estimate the size of a given angle with reference to the fact that it is smaller than a right angle and larger than 45°)*.	G1.1.3_E Know the angle sum of a triangle *(e.g., determine the missing angle of a triangle where two angles are given)*.
G1.1.4_P N/A	G1.1.4_M Recognize single-step two-dimensional shape transformations expressed quantitatively (i.e., rotation by a given fraction of a turn, reflection along a given mirror line, or enlargement by a given scale factor).	G1.1.4_E Describe and implement two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).
G2: SPATIAL VISUALIZATIONS		
G2.1: Compose and decompose shapes and figures		
G2.1.1_P Identify front, top, and side views of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., identify that the top view of an upright cylinder is a circle)*.	G2.1.1_M Identify alternate views of the same compound or irregular three-dimensional shape, such as its front, top, and side view, a rotated view, or a view of a hidden side *(e.g., label images (i), (ii), and (iii) as the front, top, and side view of the three-dimensional shape)*. 	G2.1.1_E Identify the net of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., fold or unfold mentally to answer the question, "What figure does this make when folded?"; "What figure does this make when unfolded?")*.
G3: POSITION AND DIRECTION		
G3.1: Describe the position and direction of objects in space		
G3.1.1_P Locate and plot points on a plane in the first quadrant of a Cartesian coordinate system.	G3.1.1_M Draw shapes in the first quadrant of a Cartesian coordinate system, and find missing points *(e.g., if (1,1), (1,3), and (1,2) are three corners of a rectangle, identify the fourth corner)*.	G3.1.1_E Locate and plot points on a plane in all four quadrants of a Cartesian coordinate system.

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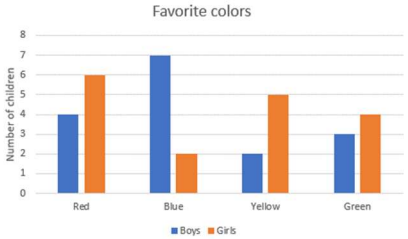
Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G3.1.2_P N/A	G3.1.2_M Identify horizontal and/or vertical distances between two points in the first quadrant of the Cartesian coordinate system *(e.g., using the Cartesian coordinate system, identify how many horizontal and vertical units is (1,1) from (3,4))*.	G3.1.2_E N/A
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Retrieve information from data displays that arrange data into categories and sub-categories with a single- or multi-unit scale *(e.g., How many girls liked green in this bar chart?)*. 	S1.1.1_M Retrieve categorical data from pie charts and Venn diagrams and bivariate data from line graphs and dot plots.	S1.1.1_E Organize data and construct pie charts and Venn diagrams (categorical data), and line graphs and dot plots (bivariate data) when some support is provided *(e.g., construct a line graph when given labeled horizontal and/or vertical axes, or match a table to the correct pie chart given a range of pie chart options)*.
S1.2: Calculate and interpret central tendency		
S1.2.1_P Calculate the range for a set of data.	S1.2.1_M Solve problems, including real-world problems, involving calculation of the mean, median, or mode of a set of data.	S1.2.1_E Describe the effect of adding or removing a specific data value on the mean, median, or mode of a set of data *(e.g., "What would be the effect of removing a score of 20 from the scores 20, 80, 70, and 75 on the mean?" with the possible answers being: a) it would increase; b) it would decrease; c) it would stay the same. The same question can be asked about the effect on the median and the mode. Another example is: Juanita plays hockey and aims to achieve a mean of 3 goals per game by the end of the season. Her goals for the first 4 games are shown: 2, 4, 1, 3. She has one more game to play this season. How many goals must she score in this game to achieve her aim?)*.

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Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
S1.2.2_P	N/A	S1.2.2_M	Compare key features of the distribution of two different but related sets of data *(e.g., compare the heights of 10 grade 4 students to the heights of 10 grade 7 students with reference to minimum value, maximum value, and spread of the data)*.	S1.2.2_E	Compare the distribution of sub-categories within a set of data *(e.g., compare temperatures in a 24-hour period split into day temperatures and night temperatures)*.
S2: CHANCE AND PROBABILITY					
S2.1: Describe the likelihood of events in different ways					
S2.1.1_P	Compare the likelihoods of two or more events happening, using descriptive words *(e.g., Given a picture of a spinner with 5 equal colored sections—red, blue, yellow, green, and purple—the question is: "If the spinner is spun two times, what is the chance that it will land on blue both times?," and the possible answers are a) impossible, b) unlikely, c) likely, and d) certain)*.	S2.1.1_M	Calculate the probability of a simple event happening, with the answer expressed as a fraction, decimal, or percentage, and place probability values or events on a continuum from 0 (impossible) to 1 (certain), with 0.5 meaning equal chance of occurring or not occurring. *(e.g., What is the probability of rolling a 6 on a standard number die?)*.	S2.1.1_E	Find the expected number of occurrences of a specific independent outcome when a probability experiment is repeated many times *(e.g., calculate the expected number of heads with 50 flips of a fair coin)*.
S2.2: Identify permutations and combinations—not applicable to grade 7					
A: ALGEBRA					
A1: PATTERNS					
A1.1: Recognize, describe, extend, and generate patterns					
A1.1.1_P	Generate a pattern from a given rule, or match a pattern to a given rule using any operation *(e.g., start at 5 and increase by 3 to generate 5, 8, 11, 14, 17 . . .; match the pattern 3, 6, 12, 24, … to one of these rules a) start at 3 and add 3, b) start at 3 and double, c) start at 3 and add 6, and d) start at 3 and halve)*.	A1.1.1_M	Recognize and extend non-linear patterns, including squaring patterns, which may be supported by a visual representation *(e.g., recognize that 1, 3, 6, 10 increases by 2, then 3, then 4, when accompanied by dots or points arranged into triangles; extend the pattern 2, 4, 16, 25)*.	A1.1.1_E	Generate a non-linear pattern from a given rule using any operation *(e.g., start at 1 and then increase by 1, 2, 3, 4 . . . to generate 1, 2, 4, 7, 11 or extend to 16, 22, 29)*.
A2: EXPRESSIONS					
A2.1: Evaluate, model, and compute with expressions					
A2.1.1_P	N/A	A2.1.1_M	Use linear expressions to represent problem situations with a single variable *(e.g., The cost of buying cinema tickets online is £12 per ticket plus a £2 booking fee. Write this as an expression where x is the number of tickets purchased)*.	A2.1.1_E	Use expressions to represent problem situations with multiple variables *(e.g., Akeelah bought 4 blouses for x dollars and a wristwatch for y dollars. Represent this as an expression)*.
A2.1.2_P	N/A	A2.1.2_M	Add and subtract linear expressions *(e.g., (3x + 4y) - (2x + 5y))*.	A2.1.2_E	Multiply and divide linear monomials, and simplify linear expressions by using the distributive property *(e.g., multiply (3x)(5y); simplify 2x(3x + 4))*.

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Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
A3: RELATIONS AND FUNCTIONS					
A3.1: Solve problems involving variation (ratio, proportion, and percentage)					
A3.1.1_P	Reason proportionally to answer real-world problems involving a unit ratio expressed informally *(e.g., If Tulika needs 3 eggs for 1 cake, how many eggs does Tulika need for 5 cakes?)*.	A3.1.1_M	Reason proportionally to answer real-world problems involving a ratio *(e.g., Purple paint is made from 2 parts blue paint to 3 parts red paint. I have 10 parts of blue paint. How many parts of red paint do I need?; The ratio of teachers to students on a school trip must be 1:9. How many teachers are needed if there are 36 students?)*.	A3.1.1_E	Solve proportions written as two equal ratios *(e.g., solve 2/3 = 10/x)*.
A3.1.2_P	N/A	A3.1.2_M	Solve problems, including real-world problems, involving finding the percentages of a known quantity *(e.g., 20% of 70 = __; A stadium holds 3,200 people. If the stadium is 80% full, how many people are in the stadium?)*.	A3.1.2_E	Solve problems, including real-world problems, involving percent increase or decrease *(e.g., A shirt that normally costs 25 euros is on sale for 10% off. How much does it cost now?; A shirt cost 25 euros in November and then 20 euros in December. What is the percent decrease in cost?)*.
A3.2: Demonstrate an understanding of equivalency—subconstruct fully covered in grades 1-6 and is assumed knowledge for grade 7					
A3.3: Solve equations and inequalities					
A3.3.1_P	Represent and solve problems, including real-world problems, using an equation with one of the four operations *(e.g., solve 3x = 18; Abu has 5 water bottles that weigh a total of 15 pounds. How much does each water bottle weigh? Represent the problem using an equation)*.	A3.3.1_M	Represent and solve problems, including real-world problems, using a two-step equation with any of the four operations *(e.g., solve 3x + 4 = 22; Some people got on a bus, doubling the number of passengers. At the next stop, 8 people got off, leaving 16 people on the bus. Represent the situation as an equation, and solve to find the number of people on the bus originally)*.	A3.3.1_E	Represent and solve problems, including real-world problems, using more than two steps, including those that involve the distributive property, combining like terms, etc. *(e.g., solve 3x + 4 (x + 2) = 22; The older children get two more cookies than the younger children. If there are three younger children and four older children and 22 cookies were distributed, how many cookies did the younger children get?; Represent the situation as an equation and solve)*.
A3.3.2_P	N/A	A3.3.2_M	N/A	A3.3.2_E	Interpret equations and their solutions in terms of context *(e.g., given an algebraic graph, such as a distance-time graph, interpret the slope as speed)*.
A3.4: Interpret and evaluate functions—not applicable to grade 7					

Grade 8

GRADE 8: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS - in grades 7 and 8, this construct is covered in N4: INTEGERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 8		
N1.2: Represent whole numbers in equivalent ways—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 8		
N1.3: Solve operations using whole numbers—see N4.2		
N1.4: Solve real-world problems involving whole numbers—see N4.3		
N2: FRACTIONS		
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 8		
N2.2: Solve operations using fractions—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 8		
N2.3: Solve real-world problems involving fractions—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 8		
N3: DECIMALS		
N3.1: Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 8		
N3.2: Represent decimals in equivalent ways (including fractions and percentages)		
N3.2.1_P Round decimal numbers to any place value beyond the hundredths place *(e.g., round 3.45619 to 3.4562)*.	N3.2.1_M N/A	N3.2.1_E N/A
N3.2.2_P Identify and express fractions with any denominator using decimal notation and vice versa *(e.g., 752/1000 = 0.752; 7/8 = 0.875)*.	N3.2.2_M N/A	N3.2.2_E N/A
N3.2.3_P Compare and order fractions, decimals, and percentages *(e.g., place these numbers on a number line: 0.4, 1/2, 0.50%, 4/5, 0.25, 1/3, 0.25%)*.	N3.2.3_M Compare and order positive and negative decimals and fractions *(e.g., place these numbers on a number line from -1 to +1: -0.4, +1/2, -4/5, 0.25, -1/3, 3/4)*.	N3.2.3_E N/A
N3.2.4_P Identify and express percentages as fractions with denominators of 10 or 100 or as decimals and vice versa *(e.g., 80% = 80/100 or 8/10; 75% = 0.75)*.	N3.2.4_M Identify and express percentages less than 1% and greater than 100% as fractions or mixed numbers and vice versa *(e.g., 124% = 1 24/100; 0.2% = 2/1000)*.	N3.2.4_E N/A
N3.3: Solve operations using decimals		
N3.3.1_P Add and subtract any positive and negative decimal numbers.	N3.3.1_M N/A	N3.3.1_E N/A
N3.3.2_P Multiply and divide a decimal number by a whole number.	N3.3.2_M Multiply and divide two decimal numbers and divide a whole number by a decimal.	N3.3.2_E N/A

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Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N3.4: Solve real-world problems involving decimals		
N3.4.1_P Solve real-world problems involving addition and subtraction of decimals beyond the tenths place *(e.g., Aria has a height of 1.55 meters. Her mother has a height of 1.63 meters. How much taller than Aria is her mother? Adwoa has 1.64 meters of roof sheeting and another 1.4 meters. How many meters of roof sheeting does she have?)*.	N3.4.1_M N/A	N3.4.1_E N/A
N3.4.2_P Solve real-world problems involving the multiplication or division of a decimal by a whole number *(e.g., Misha buys 4 bags of sugar. Each bag holds 1.5 kg. How many kilos of sugar did he buy? Saira has 2.4 kg of sugar. She wants to separate it into three bags of equal size. How many kgs should she put in each bag?)*.	N3.4.2_M Solve real-world problems involving the multiplication or division of two decimal numbers *(e.g., Pascal has seven .75-liter containers of olive oil. He sells half of them. How many liters of olive oil did he sell?; Sheila buys a 4.5-liter barrel of olive oil. She sells it in 0.75-liter containers. How many containers can she make with the 4.5-liter barrel?)*.	N3.4.2_E N/A
N4: INTEGERS		
N4.1: Identify and represent integers using objects, pictures, or symbols, and identify relative magnitude—subconstruct fully covered in grade 7 and is, therefore, assumed knowledge for grade 8		
N4.2: Solve operations using integers—subconstruct fully covered in grade 7 and is, therefore, assumed knowledge for grade 8		
N4.2.1_P Multiply any two positive integers, with and without regrouping, and divide any integer by a two-digit number, with and without a remainder *(e.g., 2342 x 1478; 3388 ÷ 15 = __)*.	N4.2.1_M N/A	N4.2.1_E N/A
N4.2.2_P Perform calculations involving two or more operations with positive integers, within the limits for meets expectations described above, respecting the order of operations *(e.g., (6584 + 2187) x 318 = __; (9675 - 823) ÷ 19 = __)*.	N4.2.2_M N/A	N4.2.2_E N/A
N4.2.3_P Identify factors of whole numbers beyond 100 and multiples of whole numbers beyond 20 *(e.g., find factors of 125 or find multiples of 25)*.	N4.2.3_M Identify common factors and common multiples of two numbers *(e.g., find the lowest common multiple and the greatest common factor of 12 and 16)*.	N4.2.3_E N/A
N4.2.4_P Perform calculations involving operations with negative integers.	N4.2.4_M N/A	N4.2.4_E N/A

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Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N4.3: Solve real-world problems involving integers		
N4.3.1_P Solve real-world problems involving combinations of any two or more of the four operations, including problems involving measurement and currency units and: * addition and subtraction of any integers * multiplication of any positive integers * division of any positive integers by a positive two-digit number with or without a remainder *(e.g., The temperature last night was -3 C. This morning it was +2 C. What was the change in temperature between last night and this morning?)*.	N4.3.1_M Solve real-world problems involving the multiplication or division of two integers, including at least one negative integer *(e.g., It is -8 degrees Celsius on Tuesday. On Wednesday, it is three times colder. What is the temperature on Wednesday?)*.	N4.3.1_E N/A
N5: EXPONENTS AND ROOTS		
N5.1: Identify and represent exponents and roots using objects, pictures, or symbols, and identify relative magnitude		
N5.1.1_P Identify the square, cube, square root, and cube root of whole numbers using pictures and symbols, and represent a square or cube number using exponential notation *(e.g., use square arrays or grids to represent square numbers or identify the square of a number; identify the square of 8 or the square root of 81; represent 64 as 8^2)*.	N5.1.1_M N/A	N5.1.1_E N/A
N5.1.2_P N/A	N5.1.2_M Identify and represent very large whole numbers using scientific notation and positive exponents *(e.g., $600 = 6 \times 10^2$)*.	N5.1.2_E Identify and represent very small numbers using scientific notation and negative exponents *(e.g., 0.065 is 6.5×10^{-2})*.
N5.1.3_P N/A	N5.1.3_M Compare and order large numbers expressed in scientific notation *(e.g., 3.1×10^5, 9.2×10^5, 2.7×10^3, 6.1×10^2)*.	N5.1.3_E Compare and order large and small numbers expressed in scientific notation *(e.g., 3.1×10^5, 9.2×10^{-5}, 2.7×10^3; 6.1×10^{-2})*.
N5.2: Solve operations involving exponents and roots		
N5.2.1_P N/A	N5.2.1_M N/A	N5.2.1_E Multiply and divide quantities expressed in exponential notation, including scientific notation *(e.g., $3^5 \div 3^2$ or $4^3 \times 4^2$)*.
N6: OPERATIONS ACROSS NUMBER		
N6.1: Solve operations involving integers, fractions, decimals, percentages, and exponents		
N6.1.1_P Perform calculations involving two or more operations with integers, decimals, and fractions, within the limits for partially meets expectations described above, respecting the order of operations.	N6.1.1_M Perform calculations involving two or more operations of integers, decimals, and fractions, within the limits for meets expectations described above, respecting the order of operations.	N6.1.1_E Perform calculations involving two or more operations of integers, decimals, and fractions and exponents, within the limits for exceeds expectations described above, respecting the order of operations.

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Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M: MEASUREMENT					
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER					
M1.1: Use non-standard and standard units to measure, compare, and order					
M1.1.1_P	Make conversions between non-adjacent units of length and weight within a standard system of measurement *(e.g., convert kilometers to millimeters)*.	M1.1.1_M	Make conversions of units of length and weight between different systems of measurement when the conversion factor is provided *(e.g., convert 12 cm to inches given 1 inch is 2.54 cm, or convert pounds to kilograms given 1 pound is 0.45 kg)*.	M1.1.1_E	N/A
M1.1.2_P	Make conversions between non-adjacent units of capacity/volume within a standard system of measurement *(e.g., convert pints to gallons)*.	M1.1.2_M	Make conversions of units of capacity/volume between different systems of measurement where the conversion factor is provided *(e.g., convert 750 milliliters to pints given 1 pint is 473 mL)*.	M1.1.2_E	N/A
M1.2: Solve problems involving measurement					
M1.2.1_P	Solve problems, including real-world problems, involving perimeter in which the unknown is a length *(e.g., identify the fifth length in a picture of an irregular pentagon with four sides labeled with length and a given perimeter)*.	M1.2.1_M	N/A	M1.2.1_E	Solve problems, including real-world problems, involving the calculation of the circumference of a circle given the diameter or radius and vice versa.
M1.2.2_P	Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprised of rectangles *(e.g., calculate the area of a compound L-shape given a picture with the lengths of all sides provided)*.	M1.2.2_M	Solve problems, including real-world problems, involving the calculation of the area of a triangle *(e.g., work out the area of a triangle with base length and height given)*.	M1.2.2_E	Solve problems, including real-world problems, involving the calculation of the area of a circle given the diameter or radius and vice versa.
M1.2.3_P	N/A	M1.2.3_M	Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprising rectangles and triangles *(e.g., calculate the area of a composite shape given a picture of the shape made up of a rectangle connected to a right-angled triangle with the lengths of all sides provided)*.	M1.2.3_E	Solve problems, including real-world problems, involving the calculation of the surface area of a familiar polyhedron (i.e., a rectangular prism, square-based pyramid, triangular prism) *(e.g., calculate the surface area in square centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.
M1.2.4_P	N/A	M1.2.4_M	Solve problems, including real-world problems, involving the calculation of the volume of a rectangular prism *(e.g., calculate the volume in cubic centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.	M1.2.4_E	Solve problems, including real-world problems, involving calculating the volume of a non-rectangular prism, given its dimensions *(e.g., calculate the volume of a regular triangular prism, with the length of one side of the base and its height provided)*.

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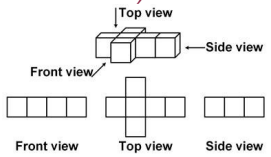
Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
M2: TIME		
M2.1: Tell time—subconstruct fully covered in grades 1-5 and is, therefore, assumed knowledge for grade 8		
M2.2: Solve problems involving time		
M2.2.1_P Solve problems, including real-world problems, involving conversion between 12-hour and 24-hour time *(e.g., A ferry departs at 1630 hours. It takes 2 hours and 15 minutes to reach its destination. At what time does the ferry arrive at its destination? Give your answer in am/pm time)*.	M2.2.1_M Solve problems, including real-world problems, involving time zones *(e.g., When it is 4 p.m. on Tuesday in New York, it is 6 a.m. on Wednesday in Sydney. When it is 11 a.m. on Thursday in Sydney, what time and day will it be in New York?)*.	M2.2.1_E Solve problems, including real-world problems, involving conversion between years, months, weeks, days, hours, fractions of hours or minutes *(e.g., Ali spends 2 hours per week practicing piano. How many days per year does he spend practicing piano?)*.
M3: CURRENCY		
M3.1: Use different currency units to create amounts—subconstruct fully covered in grades 1-3. Questions involving currency are covered under the relevant real-world problem subconstructs (e.g., N4.3 for integers, etc.)		
G: GEOMETRY		
G1: PROPERTIES OF SHAPES AND FIGURES		
G1.1: Differentiate shapes and figures by their attributes		
G1.1.1_P Use the defining attributes (i.e., type of angle, parallel and perpendicular lines) of complex two-dimensional shapes to classify them.	G1.1.1_M Recognize and name parts of the circle (i.e., radius, diameter, circumference) and identify the relationship between the radius and diameter.	G1.1.1_E N/A
G1.1.2_P Estimate the size of angles by comparing to reference/benchmark angles *(e.g., estimate the size of a given angle with reference to the fact that it is smaller than a right angle and larger than 45°)*.	G1.1.2_M Use the angle sum of a triangle to solve problems *(e.g., determine the missing angle of a triangle where two angles are given)*.	G1.1.2_E Use the angle relationships associated with intersecting lines, and with parallel lines intersected by a transverse line to solve problems *(e.g., calculate missing angles on a diagram with parallel and intersecting lines)*.
G1.1.3_P Recognize single-step, two-dimensional shape transformations expressed quantitatively (i.e., rotation by a given fraction of a turn, reflection along a given mirror line, or enlargement by a given scale factor).	G1.1.3_M Describe and implement two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).	G1.1.3_E Describe and implement sequential two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).

GRADE 8: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
G2: SPATIAL VISUALIZATIONS		
G2.1: Compose and decompose shapes and figures		
G2.1.1_P Identify alternate views of the same compound or irregular three-dimensional shape, such as its front, top, and side view, a rotated view, or a view of a hidden side *(e.g., label images (i), (ii), and (iii) as the front, top, and side view of the three-dimensional shape)*.	G2.1.1_M Identify the net of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., fold or unfold mentally to answer the question, "What figure does this make when folded?"; "What figure does this make when unfolded?")*. 	G2.1.1_E Identify a cross-section of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., identify that the cross section of a cylinder that is not parallel to the base is an ellipse)*.
G3: POSITION AND DIRECTION		
G3.1: Describe the position and direction of objects in space		
G3.1.1_P Draw shapes in the first quadrant of a Cartesian coordinate system, and find missing points *(e.g., if (1,1), (1,3), and (1,2) are three corners of a rectangle, identify the fourth corner)*.	G3.1.1_M Locate and plot points on a plane in all four quadrants of a Cartesian coordinate system.	G3.1.1_E Draw shapes in all four quadrants of a Cartesian coordinate system, and find missing points *(e.g., If (1,2), (-3,2), and (-3,-2) are three corners of a square, what is the fourth corner?)*.
G3.1.2_P Identify horizontal and/or vertical distances between two points in the first quadrant of the Cartesian coordinate system *(e.g., using the Cartesian coordinate system, identify how many horizontal and vertical units is (1,1) from (3,4))*.	G3.1.2_M N/A	G3.1.2_E Describe and implement a single transformation (i.e., reflection, rotation, translation, enlargement/reduction) of a two-dimensional shape in all four quadrants of a Cartesian coordinate system.
S: STATISTICS AND PROBABILITY		
S1: DATA MANAGEMENT		
S1.1: Retrieve and interpret data presented in displays		
S1.1.1_P Retrieve categorical data from pie charts and Venn diagrams and bivariate data from line graphs and dot plots.	S1.1.1_M Organize data and construct pie charts and Venn diagrams (categorical data), and line graphs and dot plots (bivariate data) when some support is provided *(e.g., construct a line graph when given labeled horizontal and/or vertical axes, or match a table to the correct pie chart given a range of pie chart options)*.	S1.1.1_E N/A

GRADE 8: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
S1.2: Calculate and interpret central tendency					
S1.2.1_P	Solve problems, including real-world problems, involving calculation of the mean, median, or mode of a set of data.	S1.2.1_M	Describe the effect of adding or removing a specific data value on the mean, median, or mode of a set of data *(e.g., "What would be the effect of removing a score of 20 from the scores 20, 80, 70, and 75 on the mean?" with the possible answers being: a) it would increase, b) it would decrease, c) it would stay the same. The same question can be asked about the effect on the median and the mode. Another example is: Juanita plays hockey and aims to achieve a mean of 3 goals per game by the end of the season. Her goals for the first four games are shown: 2, 4, 1, 3. She has one more game to play this season. How many goals must she score in this game to achieve her aim?)*.	S1.2.1_E	Determine and compare the mean, median, and mode for different sets of data and choose which is most appropriate in a given context *(e.g., determine why the median is more appropriate than the mean as a representation of house prices in a given area)*.
S1.2.2_P	Compare key features of the distribution of two different but related sets of data *(e.g., compare the heights of 10 grade 4 students to the heights of 10 grade 7 students with reference to minimum value, maximum value, and spread of the data)*.	S1.2.2_M	Compare the distribution of sub-categories within a set of data *(e.g., compare temperatures in a 24-hour period split into day temperatures and night temperatures)*.	S1.2.2_E	Recognize the effect of outliers in a set of data on the mean and median.
S1.2.3_P	N/A	S1.2.3_M	N/A	S1.2.3_E	Identify desirable characteristics of sampling methods that will enable the mean of a sample to be as close as possible to the mean of a population *(e.g., Anoush wants to determine the mean number of siblings each student in her school has. She decides to ask a sample of students. For which of these samples will the mean of the sample be closest to the mean of the whole school: a) The first 10 students she sees in the corridor, b) All the students on her football team, c) 50 grade 7 students selected randomly, or d) 50 students from various grade levels selected randomly?)*.

GRADE 8: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S2: CHANCE AND PROBABILITY		
S2.1: Describe the likelihood of events in different ways		
S2.1.1_P Calculate the probability of a simple event happening, with the answer expressed as a fraction, decimal, or percentage, and place probability values or events on a continuum from 0 (impossible) to 1 (certain), with 0.5 meaning equal chance of occurring or not occurring. *(e.g., What is the probability of rolling a 6 on a standard number die?)*.	S2.1.1_M Find the expected number of occurrences of a specific independent outcome when a probability experiment is repeated many times *(e.g., calculate the expected number of heads with 50 flips of a fair coin)*.	S2.1.1_E Calculate probabilities of different outcomes for compound events containing two simple events when they can be listed as a discrete sample space *(e.g., calculate the chance of rolling a sum of 7 when rolling two standard number dice)*.
S2.2: Identify permutations and combinations		
S2.2.1_P N/A	S2.2.1_M N/A	S2.2.1_E Systematically count all the possible outcomes (sample space) for a situation involving a compound event comprised of two simple events with replacement *(e.g., calculate all of the possible outcomes when selecting a marble from a bag containing 5 marbles, then selecting a second marble after putting the first marble back in the bag)* and without replacement *(e.g., calculate all of the possible outcomes when selecting a card randomly from a set containing 1 yellow, 1 blue, 1 red, and 1 green card, then selecting a second card without putting the first card back into the set)*.
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend and generate patterns—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 8		
A2: EXPRESSIONS		
A2.1: Evaluate, model, and compute with expressions		
A2.1.1_P Use linear expressions to represent problem situations with a single variable *(e.g., The cost of buying cinema tickets online is £12 per ticket plus a £2 booking fee. Write this as an expression where x is the number of tickets purchased)*.	A2.1.1_M Use expressions to represent problem situations with multiple variables *(e.g., Akeelah bought 4 blouses for x dollars and a wristwatch for y dollars. Represent this as an expression)*.	A2.1.1_E N/A
A2.1.2_P Add and subtract linear expressions *(e.g., (3x + 4y) - (2x + 5y))*.	A2.1.2_M Multiply and divide linear monomials, and simplify linear expressions by using the distributive property *(e.g., multiply (3x)(5y); simplify 2x(3x + 4))*.	A2.1.2_E Multiply two binomial linear expressions *(e.g., multiply (3x 4y)(2x + 5y))*.
A2.1.3_P N/A	A2.1.3_M Evaluate and simplify exponential expressions using the Laws of Exponents *(e.g., evaluate $2x^3$ when x = 7; simplify $(2x^3)^2$)*.	A2.1.3_E Factor linear and exponential expressions using the greatest common factor *(e.g., factor 4x2+ 8xy - 6x to 2x(2x + 4y - 3))*.

GRADE 8: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
A3: RELATIONS AND FUNCTIONS		
A3.1: Solve problems involving variation (ratio, proportion, and percentage)		
A3.1.1_P Reason proportionally to answer real-world problems involving a ratio *(e.g., Purple paint is made from 2 parts blue paint to 3 parts red paint. I have 10 parts of blue paint. How many parts of red paint do I need?; The ratio of teachers to students on a school trip must be 1:9. How many teachers are needed if there are 36 students?)*.	A3.1.1_M Solve proportions written as two equal ratios *(e.g., solve 2/3 = 10/x)*.	A3.1.1_E Write a proportion as two equal ratios to model a proportional relationship *(e.g., write 2/3 = 10/x to represent a problem that says, "Purple paint is made from 2 parts blue paint to 3 parts red paint. If I have 10 parts of blue paint. How many parts of red paint do I need?")*.
A3.1.2_P Solve problems, including real-world problems, involving finding the percentages of a known quantity *(e.g., 20% of 70 = __; A stadium holds 3,200 people. If the stadium is 80% full, how many people are in the stadium?)*.	A3.1.2_M Solve problems, including real-world problems, involving percent increase or decrease *(e.g., A shirt that normally costs 25 euros is on sale for 10% off. How much does it cost now?; A shirt cost 25 euros in November and then 20 euros in December. What is the percent decrease in cost?)*.	A3.1.2_E Solve problems, including real-world problems, involving percentages where the percentage and final quantity are known, but the initial quantity is not *(e.g., Ana paid $8 for a belt that was on sale. The price had been reduced by 20%. What was the original price of the belt?)*.
A3.2: Demonstrate an understanding of equivalency—subconstruct fully covered in grades 1-6 and is assumed knowledge for grade 8		
A3.3: Solve equations and inequalities		
A3.3.1_P Represent and solve problems, including real-world problems, using a two-step equation with any of the four operations *(e.g., solve 3x + 4 = 22; Some people got on a bus, doubling the number of passengers. At the next stop, 8 people got off, leaving 16 people on the bus. Represent as an equation, and solve to find the number of people on the bus originally)*.	A3.3.1_M Represent and solve problems, including real-world problems, using more than two steps, including those that involve the distributive property, combining like terms, etc. *(e.g., solve 3x + 4 (x + 2) = 22; The older children get two more cookies than the younger children. If there are three younger children and four older children and 22 cookies were distributed, how many cookies did the younger children get?; Represent as 3x + 4 (x + 2) = 22) and solve)*.	A3.3.1_E Represent and solve problems, including real-world problems, using two linear equations *(e.g., If 3x + 4y = 24 and 4x + 3y = 22, solve for x and y; Or, Andre has more money than Bob. If Andre gives Bob $20, they would have the same amount. If Bob gave Andre $22, Andre would then have twice as much as Bob. Represent as two linear equations, and work out how much each of them actually has.)*.
A3.3.2_P N/A	A3.3.2_M Interpret equations and their solutions in terms of context *(e.g., given an algebraic graph, such as a distance-time graph, interpret the slope as speed)*.	A3.3.2_E Graph linear equations, including those of the form y = k and x = k and calculate the slope of a line from a table, equation, graph, or ordered pairs. Identify the x- and y-intercepts of the graphed line of an equation *(e.g., graph y = 5x + 2; graph y = 4; graph x = 4; in the equation y = 3x + 2, identify what the slope is; given a coordinate at (2,4) and a coordinate of (3,7), solve for the slope)*.
A3.4: Interpret and evaluate functions—not applicable to grade 8		

Grade 9

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N: NUMBER AND OPERATIONS		
N1: WHOLE NUMBERS		
N1.1: Identify and count in whole numbers, and identify their relative magnitude—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 9		
N1.2: Represent whole numbers in equivalent ways—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 9		
N1.3: Solve operations using whole numbers—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 9		
N1.4: Solve real-world problems involving whole numbers—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 9		
N2: FRACTIONS		
N2.1: Identify and represent fractions using objects, pictures, and symbols, and identify relative magnitude—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 9		
N2.2: Solve operations using fractions—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 9		
N2.3: Solve real-world problems involving fractions—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 9		
N3: DECIMALS		
N3.1: Identify and represent decimals using objects, pictures, and symbols, and identify relative magnitude—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 9		
N3.2: Represent decimals in equivalent ways (including fractions and percentages)—subconstruct fully covered in grades 1-8 and is, therefore, assumed knowledge for grade 9		
N3.3: Solve operations using decimals—subconstruct fully covered in grades 1-8 and is, therefore, assumed knowledge for grade 9		
N3.4: Solve real-world problems involving decimals—subconstruct fully covered in grades 1-8 and is, therefore, assumed knowledge for grade 9		
N4: INTEGERS		
N4.1: Identify and represent integers using objects, pictures, or symbols, and identify relative magnitude—subconstruct fully covered in grade 7 and is, therefore, assumed knowledge for grade 9		
N4.2: Solve operations using integers—subconstruct fully covered in grades 7-8 and is, therefore, assumed knowledge for grade 9		
N4.3: Solve real-world problems involving integers—subconstruct fully covered in grades 7-8 and is, therefore, assumed knowledge for grade 9		
N5: EXPONENTS AND ROOTS		
N5.1: Identify and represent exponents and roots using objects, pictures, or symbols, and identify relative magnitude		
N5.1.1_P Identify and represent very large whole numbers using scientific notation and positive exponents *(e.g., 600 = 6 x 10^2)*.	N5.1.1_M Identify and represent very small numbers using scientific notation and negative exponents *(e.g., 0.065 is 6.5 x 10^{-2})*.	N5.1.1_E N/A
N5.1.2_P Compare and order large numbers expressed in scientific notation *(e.g., 3.1 x 10^5, 9.2 x 10^5, 2.7 x 10^3, 6.1 x 10^2)*.	N5.1.2_M Compare and order large and small numbers expressed in scientific notation *(e.g., 3.1 x 10^5, 9.2 x 10^{-5}, 2.7 x 10^3, 6.1 x 10^{-2})*.	N5.1.2_E N/A

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
N5.2: Solve operations involving exponents and roots		
N5.2.1_P N/A	N5.2.1_M Add and subtract quantities expressed in exponential notation *(e.g., $3^2 + 3^5 =$ __, including scientific notation)*.	N5.2.1_E N/A
N5.2.2_P N/A	N5.2.2_M Multiply and divide quantities expressed in exponential notation, including scientific notation *(e.g., $3^5 \div 3^2$ or $4^3 \times 4^2$)*.	N5.2.2_E N/A
N6: OPERATIONS ACROSS NUMBER		
N6.1: Solve operations involving integers, fractions, decimals, percentages, and exponents		
N6.1.1_P Perform calculations involving two or more operations of integers, decimals, and fractions, within the limits for partially meets expectations described above, respecting the order of operations.	N6.1.1_M Perform calculations involving two or more operations of integers, decimals, fractions, and exponents, within the limits for meets expectations described above, respecting the order of operations.	N6.1.1_E N/A
M: MEASUREMENT		
M1: LENGTH, WEIGHT, CAPACITY, VOLUME, AREA, AND PERIMETER		
M1.1: Use non-standard and standard units to measure, compare, and order—subconstruct fully covered in grades 1-8 and is, therefore, assumed knowledge for grade 9		
M1.2: Solve problems involving measurement		
M1.2.1_P N/A	M1.2.1_M Solve problems, including real-world problems, involving the calculation of the circumference of a circle given the diameter or radius and vice versa.	M1.2.1_E Use the trigonometric ratios sine, cosine, and tangent to calculate an unknown angle of a right-angled triangle given two side lengths, or an unknown side length given an angle and one side length.
M1.2.2_P Solve problems, including real-world problems, involving the calculation of the area of a triangle *(e.g., work out the area of a triangle with base length and height given)*.	M1.2.2_M Solve problems, including real-world problems, involving the calculation of the area of a circle given the diameter or radius and vice versa.	M1.2.2_E N/A
M1.2.3_P Solve problems, including real-world problems, involving the calculation of the area of compound shapes comprising rectangles and triangles *(e.g., calculate the area of a composite shape given a picture of the shape made up of a rectangle connected to a right-angled triangle with the lengths of all sides provided)*.	M1.2.3_M Solve problems, including real-world problems, involving the calculation of the surface area of a familiar polyhedron (i.e., a rectangular prism, square-based pyramid, triangular prism) *(e.g., calculate the surface area in square centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.	M1.2.3_E N/A
M1.2.4_P Solve problems, including real-world problems, involving the calculation of the volume of a rectangular prism *(e.g., calculate the volume in cubic centimeters of a box with a length of 10 cm, width of 10 cm, and height of 15 cm)*.	M1.2.4_M Solve problems, including real-world problems, involving calculating the volume of a non-rectangular prism, given its dimensions *(e.g., calculate the volume of a regular triangular prism, with the length of one side of the base and its height provided)*.	M1.2.4_E N/A

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
M1.2.5_P	N/A	M1.2.5_M	Solve problems, including real-world problems, involving application of Pythagoras' theorem.	M1.2.5_E	N/A
M2: TIME					
M2.1: Tell time—subconstruct fully covered in grades 1-5 and is, therefore, assumed knowledge for grade 9					
M2.2: Solve problems involving time					
M2.2.1_P	Solve problems, including real-world problems, involving time zones *(e.g., When it is 4 p.m. on Tuesday in New York, it is 6 a.m. on Wednesday in Sydney. When it is 11 a.m. on Thursday in Sydney, what time and day will it be in New York?).*	M2.2.1_M	Solve problems, including real-world problems, involving conversion between years, months, weeks, days, hours, fractions of hours or minutes *(e.g., Ali spends 2 hours per week practicing piano. How many days per year does he spend practicing piano?).*	M2.2.1_E	N/A
M3: CURRENCY					
M3.1: Use different currency units to create amounts—subconstruct fully covered in grades 1-3. Questions involving currency are covered under the relevant real-world problem subconstructs (e.g., N4.3 for integers, etc.)					
G: GEOMETRY					
G1: PROPERTIES OF SHAPES AND FIGURES					
G1.1: Differentiate shapes and figures by their attributes					
G1.1.1_P	Recognize and name parts of the circle (i.e., radius, diameter, circumference) and identify the relationship between the radius and diameter.	G1.1.1_M	N/A	G1.1.1_E	N/A
G1.1.2_P	Use the angle sum of a triangle to solve problems *(e.g., determine the missing angle of a triangle where two angles are given).*	G1.1.2_M	Use the angle relationships associated with intersecting lines, and with parallel lines intersected by a transverse line to solve problems *(e.g., calculate missing angles on a diagram with parallel and intersecting lines).*	G1.1.2_E	Use congruence and similarity criteria to prove relationships in geometric figures and/or prove theorems about triangles.
G1.1.3_P	Describe and implement two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).	G1.1.3_M	Describe and implement sequential two-dimensional shape transformations (i.e., reflection, rotation, translation, enlargement/reduction).	G1.1.3_E	N/A
G2: SPATIAL VISUALIZATIONS					
G2.1: Compose and decompose shapes and figures					
G2.1.1_P	Identify the net of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., fold or unfold mentally to answer the question, "What figure does this make when folded?"; "What figure does this make when unfolded?").*	G2.1.1_M	Identify a cross-section of a familiar three-dimensional figure (i.e. prism, cylinder, cone, or pyramid) *(e.g., identify that the cross section of a cylinder that is not parallel to the base is an ellipse).*	G2.1.1_E	N/A

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
G3: POSITION AND DIRECTION					
G3.1: Describe the position and direction of objects in space					
G3.1.1_P	Locate and plot points on a plane in all four quadrants of a Cartesian coordinate system.	G3.1.1_M	Draw shapes in all four quadrants of a Cartesian coordinate system, and find missing points *(e.g., If (1,2), (-3,2), and (-3,-2) are three corners of a square, what is the fourth corner?)*.	G3.1.1_E	N/A
G3.1.2_P	N/A	G3.1.2_M	Describe and implement a single transformation (i.e., reflection, rotation, translation, enlargement/reduction) of a two-dimensional shape in all four quadrants of a Cartesian coordinate system.	G3.1.2_E	Describe and implement sequential transformations (i.e., reflection, rotation, translation, enlargement/reduction) of a two-dimensional shape in all four quadrants of a Cartesian coordinate system.
S: STATISTICS AND PROBABILITY					
S1: DATA MANAGEMENT					
S1.1: Retrieve and interpret data presented in displays					
S1.1.1_P	Organize data and construct pie charts and Venn diagrams (categorical data), and line graphs and dot plots (bivariate data) when some support is provided *(e.g., construct a line graph when given labeled horizontal and/or vertical axes, or match a table to the correct pie chart given a range of pie chart options)*.	S1.1.1_M	Understand, describe, and use relationships within displays of bivariate data *(e.g., describe the strength of association shown in a scatter plot, or a linear relationship between two functionally related variables)*.	S1.1.1_E	Retrieve and interpret data represented in different ways, including in box plots, stem-and-leaf plots, and frequency tables of grouped data.
S1.2: Calculate and interpret central tendency					
S1.2.1_P	Describe the effect of adding or removing a specific data value on the mean, median, or mode of a set of data *(e.g., "What would be the effect of removing a score of 20 from the scores 20, 80, 70, and 75 on the mean?" with the possible answers being: a) it would increase, b) it would decrease, c) it would stay the same. The same question can be asked about the effect on the median and the mode. Another example is: Juanita plays hockey and aims to achieve a mean of 3 goals per game by the end of the season. Her goals for the first four games are shown: 2, 4, 1, 3. She has one more game to play this season. How many goals must she score in this game to achieve her aim?)*.	S1.2.1_M	Determine and compare the mean, median, and mode for different sets of data and choose which is most appropriate in a given context *(e.g., determine why the median is more appropriate than the mean as a representation of house prices in a given area)*.	S1.2.1_E	Determine the mean, median, or mode of grouped data *(e.g., a frequency table with heights arranged into ranges 151cm to 155 cm, 156 cm to 160 cm, 161 cm to 165 cm, 166 cm to 170 cm)*.
S1.2.2_P	Compare the distribution of sub-categories within a set of data *(e.g., compare temperatures in a 24-hour period split into day temperatures and night temperatures)*.	S1.2.2_M	Recognize the effect of outliers in a set of data on the mean and median.	S1.2.2_E	

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
S1.2.3_P	S1.2.3_M Identify desirable characteristics of sampling methods that will enable the mean of a sample to be as close as possible to the mean of a population *(e.g., Anoush wants to determine the mean number of siblings each student in her school has. She decides to ask a sample of students. For which of these samples will the mean of the sample be closest to the mean of the whole school: a) The first 10 students she sees in the corridor, b) All the students on her football team, c) 50 grade 7 students selected randomly, or d) 50 students from various grade levels selected randomly?)*.	S1.2.3_E Determine the median, quartiles, range, and interquartile range from a box plot or stem-and-leaf plot, and construct a box plot from a stem-and-leaf plot.
S2: CHANCE AND PROBABILITY		
S2.1: Describe the likelihood of events in different ways		
S2.1.1_P Find the expected number of occurrences of a specific independent outcome when a probability experiment is repeated many times *(e.g., calculate the expected number of heads with 50 flips of a fair coin)*.	S2.1.1_M Calculate probabilities of different outcomes for compound events containing two simple events, when they can be listed as a discrete sample space *(e.g., calculate the chance of rolling a sum of 7 when rolling two standard number dice)*.	S2.1.1_E Solve real-world problems associated with compound events *(e.g., solve problems that require analyzing multi-player games of chance to determine fairness, i.e., whether all players have an equal chance of winning)*.
S2.1.2_P	S2.1.2_M Use a wide range of representations such as tree diagrams and two-way tables to explore possible outcomes of chance events and experiments involving multiple compound events (containing 2 or more simple events).	S2.1.2_E N/A
S2.2: Identify permutations and combinations		
S2.2.1_P N/A	S2.2.1_M Systematically count all the possible outcomes (sample space) for a situation involving a compound event comprised of two simple events with replacement *(e.g., calculate all of the possible outcomes when selecting a marble from a bag containing 5 marbles, then selecting a second marble after putting the first marble back in the bag)* and without replacement *(e.g., calculate all of the possible outcomes when selecting a card randomly from a set containing one yellow, one blue, one red, and one green card, then selecting a second card without putting the first card back into the set)*.	S2.2.1_E Distinguish between situations involving permutations, where order of selection matters *(e.g., codes or personal identification numbers)* and situations involving combinations, where order of selection does not matter *(e.g., possible sums from rolling two six-sided dice)*, and enumerate all possibilities systematically in contexts involving a limited number of outcomes.

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency	Meets Global Minimum Proficiency	Exceeds Global Minimum Proficiency
A: ALGEBRA		
A1: PATTERNS		
A1.1: Recognize, describe, extend, and generate patterns—subconstruct fully covered in grades 1-7 and is, therefore, assumed knowledge for grade 9		
A2: EXPRESSIONS		
A2.1: Evaluate, model, and compute with expressions		
A2.1.1_P Use expressions to represent problem situations with multiple variables *(e.g., Akeelah bought 4 blouses for x dollars and a wristwatch for y dollars. Represent this as an expression)*.	A2.1.1_M N/A	A2.1.1_E N/A
A2.1.2_P Multiply and divide linear monomials, and simplify linear expressions by using the distributive property *(e.g., multiply (3x)(5y); simplify 2x(3x + 4))*.	A2.1.2_M Multiply two binomial linear expressions *(e.g., multiply (3x 4y)(2x + 5y))*.	A2.1.2_E Factor quadratic trinomial expressions into two binomial linear expressions *(e.g., factor x^2 - 3x - 18 to (x - 6)(x + 3))*.
A2.1.3_P Evaluate and simplify exponential expressions using the Laws of Exponents *(e.g., evaluate $2x^3$ when x = 7; simplify $(2x^3)^2$)*.	A2.1.3_M Factor linear and exponential expressions using the greatest common factor algebraically *(e.g., factor 4x2+ 8xy - 6x to 2x(2x + 4y - 3))*.	A2.1.3_E Add and subtract monomial and polynomial expressions with exponents, and evaluate polynomial expressions *(e.g., add $(3x^2$ 4x - 7) + $(-6x^2$ + 5x - 1); evaluate $3x^2$ $4y^3$ - 7) when x = -2 and y = 2)*.
A3: RELATIONS AND FUNCTIONS		
A3.1: Solve problems involving variation (ratio, proportion, and percentage)		
A3.1.1_P Solve proportions written as two equal ratios *(e.g., solve 2/3 = 10/x)*.	A3.1.1_M Write a proportion as two equal ratios to model a proportional relationship *(e.g., write 2/3 = 10/x to represent a problem that says, "Purple paint is made from 2 parts blue paint to 3 parts red paint. If I have 10 parts of blue paint. How many parts of red paint do I need?")*.	A3.1.1_E N/A
A3.1.2_P Solve problems, including real-world problems, involving percent increase or decrease *(e.g., A shirt that normally costs 25 euros is on sale for 10% off. How much does it cost now?; A shirt cost 25 euros in November and then 20 euros in December. What is the percent decrease in cost?)*.	A3.1.2_M Solve problems, including real-world problems, involving percentages where the percentage and final quantity are known, but the initial quantity is not *(e.g., Ana paid $8 for a belt that was on sale. The price had been reduced by 20%. What was the original price of the belt?)*.	A3.1.2_E N/A
A3.2: Demonstrate an understanding of equivalency—subconstruct fully covered in grades 1-6 and is, therefore, assumed knowledge for grade 9		

GRADE 9: MATHEMATICS – DESCRIPTORS FOR THE THREE HIGHEST GLOBAL MINIMUM PROFICIENCY LEVELS

Partially Meets Global Minimum Proficiency		Meets Global Minimum Proficiency		Exceeds Global Minimum Proficiency	
A3.3: Solve equations and inequalities					
A3.3.1_P	Represent and solve problems, including real-world problems, using more than two steps, including those that involve the distributive property, combining like terms, etc. *(e.g., solve 3x + 4 (x + 2) = 22; The older children get 2 more cookies than the younger children. If there are 3 younger children and 4 older children and 22 cookies were distributed, how many cookies did the younger children get?; Represent as 3x + 4 (x + 2) = 22) and solve*.	A3.3.1_M	Represent and solve problems, including real-world problems, using two linear equations *(e.g., If 3x + 4y = 24 and 4x + 3y = 22, solve for x and y; Or, Andre has more money than Bob. If Andre gives Bob $20, they would have the same amount. If Bob gave Andre $22, Andre would then have twice as much as Bob. Represent as two linear equations, and work out how much each of them actually has)*.	A3.3.1_E	Solve quadratic equations that have one or two rational solutions, and graph quadratic equations where the quadratic coefficient is positive *(e.g., solve x2 + 5x + 6 = 0; graph y = 3x2 + 5x - 2)*.
A3.3.2_P	Interpret equations and their solutions in terms of context *(e.g., given an algebraic graph, such as a distance-time graph, interpret the slope as speed)*.	A3.3.2_M	Graph linear equations, including those of the form y = k and x = k and calculate the slope of a line from a table, equation, graph, or ordered pairs. Identify the x- and y-intercepts of the graphed line of an equation *(e.g., graph y = 5x + 2; graph y = 4; graph x = 4; in the equation y = 3x + 2, identify what the slope is; given a coordinate at (2,4) and a coordinate of (3,7), solve for the slope)*.	A3.3.2_E	Construct equations when given two points or the slope and a point *(e.g., construct the equation when given the points (1, 5) and (3, 9); construct the equation when given the point (1, 5) and the slope of 2)*.
A3.3.3_P	Solve one-step inequalities *(e.g., x + 5 < 12)*.	A3.3.3_M	Solve multi-step inequalities *(e.g., x + 5 (x - 2) > 2)*.	A3.3.3_E	Graph the solution of an inequality on a number line *(e.g., graph the solution to x + 5 (x - 2) > 2 on a number line)*.
A3.3.4_P	N/A	A3.3.4_M	N/A	A3.3.4_E	Interpret solutions of inequalities in context *(e.g., A girl went to the store with $20 to buy sacks of flour and beans. Each sack of flour cost $3. She spent $4 on beans. What is the maximum number of sacks of flour she could buy?)*.
A3.4: Interpret and evaluate functions					
A3.4.1_P	Identify a function presented as ordered pairs or in an x-y table *(e.g., when presented with the following ordered pairs: (-1, 0), (2, 6), (3, 8), (4, 10), identify the function)*.	A3.4.1_M	Identify a function presented in a graph, either as a set of points or as a continuous line (curved or straight).	A3.4.1_E	Evaluate linear functions *(e.g., f(x) = 2x + 5; find f(2))*.
A3.4.2_P	N/A	A3.4.2_M	N/A	A3.4.2_E	Identify or describe characteristics, such as the rate of change, outputs, intercepts, and maxima/minima of a functional relationship between two quantities *(e.g., when presented with the following ordered pairs: (-1, 0), (2, 6), (3, 8), (4, 10), identify the rate of change and intercepts)*.

GLOSSARY

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Term	Definition
24-hour time	A standard way of expressing time, based on a 24-hour clock, where 0000 is midnight, 1200 is midday and 2359 is one minute to midnight.
Adjacent units	Units within a measurement system that vary by one degree of magnitude. If all the units within that measurement system were to be listed in order of magnitude (e.g. mm, cm, m, km), adjacent units would sit next to each other. For example, centimeters to millimeters are adjacent units; but centimeters to kilometers are not adjacent units.
Area	A measure of the space within a two-dimensional shape, measured in square units (e.g., square millimeters, square centimeters, square meters, square kilometers).
Attributes	A characteristic of an object or geometric shape; for example, sides, edges, vertices, angles, faces.
Binomial linear expressions	A mathematical expression that has two terms and no exponents; for example, 3x + 5 or 6x + 13y. When graphed, these expressions make straight lines rather than arcs.
Bivariate data	Data consisting of two sets of values (variables) where each variable from one set is paired with a variable from the other set. For example, age in years graphed against height in centimeters.
Box plot	A data display showing the values for median, first quartile, and third quartile of a data set, plotted along a number line. These three values are enclosed within a rectangle or box. Two horizontal lines then extend out from the box, often called "whiskers," with the line on the left stopping at the minimum value in the data set, and the line on the right stopping at the maximum value for number set.
Cartesian coordinate system	A system in which the location of a point is given by coordinates that represent its distances from perpendicular lines that intersect at a point called the origin.
Categorical data	Data that are arranged into categories.
Combination	A listing or count of all the possible selections from a set of options, where order does not matter. For example, how many different combinations of ice cream flavors are possible when selecting two scoops from a choice of chocolate, strawberry, vanilla, banana, and mint?
Commonly used fractions	Fractions that are used frequently in everyday life; for example, halves, quarters, and thirds.
Composite shapes	Composite shapes can be visualized as being comprised of multiple simple shapes in varying orientations, e.g., an "L-shaped" irregular hexagon comprised of a rectangle oriented horizontally joined to a rectangle oriented vertically or a "house shaped" irregular pentagon comprised of a square with a triangle sitting on top of the square.
Compound event	A combination of two or more simple events involving probability, for example, flipping two coins or rolling a standard number cube then turning a spinner.
Compound shapes/figures	A compound shape/figure is a complex shape/figure made up of two or more simple shapes/figures.
Congruence	Two shapes are said to be congruent if it is possible to superimpose one of them on the other so that they coincide.
Curved line	A smooth, gradually bending line, for example part of the edge of a circle. Curved lines can be open or closed.
Diameter	The distance of a line joining two points on the boundary of a circle and passing through the center of the circle.
Different but related denominators	When one denominator is a multiple of the other. For example the fractions 1/4 and 1/12 have different but related denominators.
Distributive property	The idea that multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together. For example, if given 4(x+5), you can distribute the 4 to both the x and the 5 to get 4x+20, and this will be the same result as if you were to add x+5 and then multiply the sum by 4.
Enlargement/reduction	A type of transformation that changes the size of an object.
Everyday fractions	Fractions used commonly in daily life, including 1/2, 1/3, 2/3, 1/4, and 3/4. Everyday unit fractions include 1/4, 1/3, and 1/2.
Exponential expressions	A mathematical expression consisting of a constant raised to some power (exponent).
Extrapolating	Deducing the value of a point beyond a given scale or pattern by continuing the pattern or scale.
Fluency	The ability to retrieve information quickly and accurately.

GLOSSARY

Term	Definition
Fraction bars	A mathematical manipulative that provides a visual illustration of the relative size of different unit fractions and their relationship to each other and to a common whole, denoted by a bar representing 1.
Function	A relation from a set of inputs to a set of possible outputs where each input is related to exactly one output.
Functionally related variables	Variables that are related to each other by a rule or function, such that, when we know the value of one variable, we can calculate or determine the value of the other variable. For example, number of weeks and number of days are functionally related to each other by the rule "one week is equal to seven days." So if a data set gives number of weeks, e.g., 1, 2, 3, 4, 5, another functionally related data set can be generated showing corresponding number of days, e.g., 7, 14, 21, 28, 35.
Greatest common factor	The greatest number that is a factor of two (or more) other numbers, meaning the number (factor) can be divided into the two or more other numbers evenly, without a remainder. For example, the greatest common factor of 24, 48, and 60 is 12.
Grid map	A map on which a network of horizontal and vertical lines are superimposed, for locating points.
Grouped data	When raw numerical data are sorted and put into groups of similar measurements in a frequency table, they are called grouped data; for example, arranging the ages of survey respondents into age ranges such as 0-4 years, 5-9 years, 10-14 years, and 15-19 years and placing these in the first column of a frequency table, with a count of the number of individual responses that fall into each age range, called "frequency," in the second column of the table.
Improper fractions	A fraction that is great than one, with the numerator greater than the denominator; for example, 5/4 or 10/8.
Integers	Whole numbers and negative numbers, but not fractions.
Interpolating	Deducing the value of a point on a scale between two labelled points by using the relative distance between the labelled points and that point.
Interquartile range	The difference between the upper quartile and the lower quartile in an ordered data set.
Labelled scale increments	Increments or markings on a measurement scale that are accompanied by a number label, e.g., a major mark on a kitchen scale with the label "1 kg" directly beneath it.
Laws of Exponents	The laws that govern how to solve problems containing exponents. For example, when multiplying like bases, the base stays the same and the exponents get added together. When raising a base with a power to another power, the base stays the same and the exponents are multiplied. When dividing like bases, the base stays the same and the denominator exponent is subtracted from the numerator exponent.
Line graph	A type of graph that is used to present bivariate data, where both sets of data are continuous variables (variables that are measured, not counted, e.g., height, length, mass, temperature, and time). A line is plotted on a pair of axes, with any given point on the plotted line having a horizontal component representing the value of a variable from one set and a vertical component representing the value of a variable from the other set.
Line of symmetry	A line that can be drawn on a shape to divide it into two equal halves (where one is the mirror image of the other).
Linear expressions	A mathematical expression that only has one variable in it and no exponents; for example, mx + b. When graphed, these expressions make straight lines rather than arcs.
Linear monomial	A mathematical expression with only one term and no exponents; for example, 3x or 7y. When graphed, these expressions make straight lines rather than arcs.
Lower quartile	The value midway between the minimum value and the median in an ordered data set.
Lowest common multiple	The lowest number that is a multiple of two or more given numbers. For example, the lowest common multiple of 3, 6, and 12 is 24.
Map	A diagrammatic representation of a physical space.
Mean	A measure of central tendency in statistics, calculated by adding all values in a data set and dividing by the number of values in the data set.
Median	A measure of central tendency in statistics, determined by ordering all values in a data set from smallest to largest, then finding the value that lies in the middle of the ordered set.
Minuend	The minuend is the first number in a subtraction. It is the number from which another number (the subtrahend) is subtracted. Minuend − subtrahend = difference.

GLOSSARY

Term	Definition
Mixed numbers	A whole number and a proper fraction represented together; for example, 1 3/4 or 2 1/6.
Mode	A measure of central tendency in statistics, determined by identifying the most frequently occurring value in a set of data.
Monomial	A mathematical expression with only one term; for example, 12y or $3x^2$.
Multi-unit scale	A scale where each unit represents a multiple value; for example, each unit on the scale represents 10 items or 20 items.
Multibase arithmetic blocks	Wooden or plastic blocks used to help promote an understanding of the number system. They give a concrete representation of numbers, emphasizing the place-value aspect.
Multiplicand	The number to be multiplied is the "multiplicand." In 8 × 32, the multiplicand is 32.
Multiplier	The number by which another number is multiplied. In 8 × 32, the multiplier is 8.
Net	A two-dimensional pattern of a three-dimensional figure that can be folded to form the figure.
Non-adjacent units	Units within a measurement system that vary by **more** than one degree of magnitude. If all the units within that measurement system were to be listed in order of magnitude (e.g. mm, cm, m, km or mg, g, kg, tons), non-adjacent units would have other intermediate units between them. For example, centimeter and kilometer are non-adjacent units, as are grams and tons.
Non-linear patterns	An increasing or decreasing number pattern where the relationship between terms in the pattern is not a constant value. The Fibonacci sequence of 1, 2, 3, 5, 8, 13, 21... is an example of a non-linear pattern. It increases according to a set rule (i.e., each term is the sum of the two previous terms), but not by a constant value. In contrast, a pattern like 2, 4, 6, 8, 10... is a linear pattern. The difference between the terms is a constant value: 2.
Non-unit fractions	Fractions with a numerator of greater than one.
Number bond	The pairs of numbers, that when added, give a particular number. For example, the number bonds for 6 are 5 and 1, 6 and 0, 2 and 4, and 3 and 3.
Ordered pairs	A composition of the x-coordinate and the y-coordinate on a graph, usually written as (x, y).
Outlier	A point in a set of data that varies significantly from the other points in the data set.
Parallel lines	Two straight lines in a plane that do not intersect at any point.
Perimeter	The distance around the boundary of a two-dimensional shape, calculated by adding the length of all sides.
Permutation	A listing or count of all the possible arrangements of a set of items, where sequence of the items in the set matters; for example, the number of different 4-digit codes that can be made using only the digits 0, 1, 2, 3, 4, 5, and 6 without repeating any digits.
Perpendicular lines	Two straight lines at right angles to each other.
Pie chart	A diagram used to present data arranged into categories, showing a circle is divided into sections, with each section representing a category as a proportion of the entire set of data.
Plane	A two-dimensional surface.
Polygon	A two-dimensional closed shape with sides that are all straight lines and an equal number of angles as there are sides; for example, a square, triangle, or rectangle.
Polygon (regular and irregular)	A two-dimensional shape bounded by three or more straight lines. A regular polygon has equal side lengths and angles. All other polygons are irregular.
Polyhedron	A three-dimensional shape comprised of multiple faces that are all polygons.
Polynomial expressions	An expression that is a monomial or the sum (or difference) of two or more monomials.
Prism	A three-dimensional shape (polyhedron) comprised of faces that are polygons, with two of these faces (called bases) that are identical and all other faces being parallelograms.
Proper fractions	A fraction that is less than one, with the numerator less than the denominator; for example, 1/2 or 4/5

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Term	Definition
Pythagoras' Theorem	A theorem stating that the square of the length of the hypotenuse of a right triangle is equal to the sum of the squares of the lengths of the other sides.
Quadrant	The four regions into which a plane is divided by the axes of a Cartesian coordinate system.
Quadratic equations	An equation containing a single variable of degree 2 (the square of the variable). Its general form is $ax^2 + bx + c = 0$, where x is the variable and a, b, and c are constants ($a \neq 0$).
Quadratic trinomial expressions	A mathematical expression of the form: a x 2 + b x + c, where x is a variable and a, b and c are non-zero constants. The constant a is called the leading coefficient, b is called the linear coefficient, and c is called the additive constant.
Quadrilaterals	A four-sided polygon.
Quartiles	In an ordered list of data, the data values that separate the data into quarters. The lower quartile is the value of the middle point between the minimum value and the median and the upper quartile is the value midway between the median and the maximum value.
Radius	The distance from a point on the boundary of a circle to the center of the circle.
Range	The difference between the minimum and maximum values in a dataset.
Rate of change	A rate that describes how one quantity changes in relation to another quantity. For example, if x is the independent variable and y is the dependent variable, then the rate of change = change in y / (change in x).
Rectangular array	An arrangement of objects into rows and columns that form a rectangle. Each row has the same number of objects. Each column has the same number of objects. The number of objects in each row is different from the number of objects in each column.
Reflection	A type of transformation where each point in a shape appears at an equal distance on the opposite side of a given line—the line of reflection.
Repeating patterns	Patterns made up of a core set of terms that repeat themselves. The pattern "circle square circle circle square circle circle square circle…" is a repeating pattern. The core elements that repeat are "circle square circle."
Rotation	A type of transformation where each point in a shape is turned around a center or axis but remains the same distance from the center or axis.
Scatter plot	A type of graph that is used to present bivariate data, showing a series of points plotted on a pair of axes. Each point on the graph represents a pair of values, with the horizontal component of the point showing the value of a variable from one set of data and the vertical component of the point showing the value of a variable from the other set of data (e.g., a scatter plot graphing ages of children along the horizontal axis against heights of children along the vertical axis).
Similarity	Two shapes are said to be similar if they are the same shape but different sizes.
Single-unit scale	A scale where each unit represents one of something; e.g., 1, 2, 3, 4, 5, 6.
Slope	The ratio of the vertical changes between two points, often called the rise, to the horizontal change between the same two points, often called the run.
Square array	An arrangement of objects into rows and columns that form a square. Each row has the same number of objects. Each column has the same number of objects. The number of objects in each row is the same as the number of objects in each column.
Stem-and-leaf plot	A diagram used to order and summarize multi-digit data, where the first column (called the stem) contains all digits in the number apart from the last digit, and the second column (the "leaf") contains the last digits of each number, and each leaf is placed next its corresponding "stem" and ordered from smallest to largest. Stem-and-leaf plots are useful for efficiently determining median, quartiles, and interquartile range of multi-digit data.
Straight line	The path of shortest distance between two points.
Strength of association	The degree to which the values of two variables vary or change together.
Subtrahend	The subtrahend is the second number in a subtraction. It is the number subtracted from another number (the minuend). Minuend − subtrahend = difference.

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<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td>Sum</td><td>The aggregate of two or more numbers, magnitudes, or quantities, as determined by the process of addition. For example, the sum of 6 and 8 is 14.</td></tr>
<tr><td>Surface area</td><td>The total area of the surface of a 3D shape, e.g., the area of all the faces on a polyhedron added together.</td></tr>
<tr><td>Time zones</td><td>Variations in standard time, which vary based on geographical regions.</td></tr>
<tr><td>Translation</td><td>A type of transformation where each point in a shape moves by a set distance horizontally and vertically.</td></tr>
<tr><td>Transverse lines</td><td>A straight line that cuts across two or more (usually parallel) lines.</td></tr>
<tr><td>Tree diagram</td><td>A tool used in mathematics to help calculate the number of possible outcomes in a series of events or a problem, and to list these possible outcomes in a systematic way. In probability, tree diagrams are used to represent a sequence of events, with each possible outcome in each event represented as a branch on a tree, and the probability of each outcome written as a probability along each branch.</td></tr>
<tr><td>Two-way table</td><td>A type of frequency table used to depict the relationships between two categorical variables, with each cell in a two-way table representing a count that is an intersection of the two categorical variables. For example, when trying to depict the favorite music type out of pop, country, and rock for children in grade 7 and grade 8, music type will be listed in row headers and grade level in columns, with counts of each in the remaining cells. The last column and the last row in two-way tables often give total counts (frequencies); for example, the total of the first row would be total number of students from grade 7 who answered the question and the first column total would be total students in both grades 7 and grade 8 who chose pop (see attached image of two-way table example).
<table>
<tr><th></th><th>Prefer pop music</th><th>Prefer country music</th><th>Prefer rock music</th><th>Total</th></tr>
<tr><td>Grade 7</td><td>12</td><td>5</td><td>8</td><td>25</td></tr>
<tr><td>Grade 8</td><td>10</td><td>4</td><td>12</td><td>26</td></tr>
<tr><td>Total</td><td>22</td><td>9</td><td>20</td><td>51</td></tr>
</table>
</td></tr>
<tr><td>Unit fractions</td><td>A fraction with a numerator of 1.</td></tr>
<tr><td>Unit ratio</td><td>A two-term ratio expressed with a second term of one.</td></tr>
<tr><td>Unlabeled scale increments</td><td>Increments or markings on a measurement scale that are not accompanied by a number label, but whose label can be deduced by other labelled increments on the scale, e.g., an unlabeled increment between 1 centimeter and 2 centimeters on a ruler is known to be 1.5 without needing the associated number label.</td></tr>
<tr><td>Upper quartile</td><td>The value midway between the median and the maximum value in an ordered data set.</td></tr>
<tr><td>Venn diagram</td><td>A diagram that uses counts within circles (often overlapping circles) to represent the relationships between different sets of data (e.g., the results of a survey about two different sports, with one circle representing each sport, circles overlapping with numbers in the overlap showing students that play both sports, numbers outside circles showing students playing neither sport, and numbers in one circle but not another showing students that play only one of the two sports).</td></tr>
<tr><td>X-intercept</td><td>The point at which the graph crosses the x-axis.</td></tr>
<tr><td>Y-intercept</td><td>The point at which the graph crosses the y-axis.</td></tr>
</table>