Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
1. Concepts and Procedures	Priority Cluster	**B. Understand properties of multiplication and the relationship between multiplication and division.** (Target Description) Whereas Target A focuses more on the practical uses of multiplication and division, Target B focuses more on the mathematical properties of these operations, including the mathematical relationship between multiplication and division. Tasks associated with this target are not intended to be vocabulary exercises along the lines of "Which of these illustrates the Distributive Property?" As indicated by the CCSSM, students need not know the formal names for the properties of operations. Instead, tasks are to probe whether students are able to use the properties to multiply and divide. Note: Tasks that code directly to Target B will be limited to products and dividends within 100. (Evidence Required) 1. The student uses the properties of operations (Commutative Property of Multiplication, Associative Property of Multiplication, and Distributive Property) as strategies to multiply and divide. 2. The student will represent division as an unknown-factor problem. (Range ALDs) **Level 1** No Descriptor **Level 2** Students should be able to apply the Commutative Property of Multiplication to mathematical problems with one-digit factors. **Level 3** Students should be able to apply the Commutative and Associative Properties of Multiplication and the Distributive Property within 100. They should be able to understand the relationship between multiplication and division when solving an unknown factor problem. **Level 4** Students should be able to communicate a deep understanding of the Commutative and Associative Properties of Multiplication, and the relationship between multiplication and division.	1	5-6	0	17-20
		C. Multiply and divide within 100. (Target Description) The primary purpose of tasks associated with this target is to assess fluency and/or memory within 100 using single-digit factors. We note that the standard connotation of the word "fluency" with regard to standards, such as 3.OA.C.7, means "quickly and accurately."	1			

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		An expansion of this concept would be useful to include both the ability to use certain facts and procedures with enough facility that using them does not slow down or derail the problem solver as he or she works on more complex problems, and the notion of conceptual fluency being able to use the relevant ideas or procedures in a wide range of contexts. In an adaptive framework, straight multiplication and division problems that assess students' ability to multiply and divide within 100 using single-digit factors may serve as the assessment floor for the Operations and Algebraic Thinking domain. (Evidence Required) 1. The student accurately multiplies single-digit factors within 100. 2. The student accurately divides within 100 using single-digit divisors and single digit quotients. 3. The student connects multiplication and division to target fluencies. (Range ALDs) **Level 1** Students should be able to multiply a one-digit number by 1, 2, and 5. **Level 2** Students should be able to recall from memory all products of two one-digit numbers. **Level 3** Students should be able to apply relevant strategies to fluently multiply and divide within 100, and recognize division as an unknown factor problem. **Level 4** Students should be able to use relevant procedures to multiply or divide in a wide range of contexts.				
		I. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. (Target Description) Some tasks associated with this target should assess conceptual understanding of area as a measurable attribute of plane figures. All figures in such problems should be rectilinear and coverable without gaps or overlaps by a whole number of unit squares without having to dissect the unit squares (e.g., partition them into two triangles). Tasks in this group will generally involve finding areas by direct counting of unit squares, not by using multiplication or formulas, or otherwise reasoning about areas on this basis.	1, 2			

Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		Other tasks should center on relating area to multiplication and addition. Most of these should involve the use of area models to represent whole-number products and the distributive property. For example, "Draw a picture to show why Amber can add 5 × 5 and 2 × 5 to find 7 × 5." Problems can involve finding areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts. (Evidence Required) 1. The student measures areas by counting unit squares. 2. The student finds areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts. 3. The student finds the area of a rectangle with whole-number side lengths by tiling it, and shows that the area is the same as would be found by multiplying the side lengths. (Range ALDs) **Level 1** Students should be able to recognize area as an attribute of plane figures and recognize that a square with side lengths of one unit is called a unit square. **Level 2** Students should be able to find the area of a rectilinear figure by counting unit squares. **Level 3** Students should be able to find the area of a rectilinear figure by multiplying side lengths and by decomposing a rectilinear figure into non-overlapping rectangles and adding them together. **Level 4** Students should be able to find the area of a rectilinear figure in a word problem.				
		G. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (Target Description) Tasks for this target generally require students to solve straightforward one-step contextual word problems using the four operations in situations involving time intervals in minutes, liquid volume in liters, and mass/weight in grams and kilograms. Situations involving intervals of time are limited to addition and subtraction. Some foundational tasks that assess telling and writing time to the nearest minute may be appropriate for building a range of difficulty in the adaptive item bank. The emphasis for this target is not on cultural aspects of time such as clocks but rather on time as a measurement	1, 2			

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items CAT	Items PT	Total Items
		quantity that can be operated on arithmetically like other more tangible measurement quantities. (Evidence Required) 1. The student tells and writes time to the nearest minute. 2. The student solves one-step word problems with addition and subtraction including time intervals in minutes. 3. The student solves one-step word problems involving liquid volume (liters) and mass (grams, kilograms) using the four operations. (Range ALDs) **Level 1** Students should be able to tell and write time to the nearest five-minute interval and solve addition and subtraction problems involving fifteen-minute time intervals. **Level 2** Students should be able to tell and write time to the nearest minute and solve one-step addition problems involving five-minute time intervals. They should be able to measure liquid volumes using liters and masses of objects using grams and kilograms and add or subtract to solve one-step word problems involving masses or liquid volumes that are given in the same units. **Level 3** Students should be able to solve one-step addition and subtraction problems involving time intervals in minutes. They should be able to multiply or divide to solve one-step problems involving masses or volumes that are given in the same units. **Level 4** Students should be able to solve one-step addition or subtraction problems involving all time intervals from hours to minutes.				
		D. Solve problems involving the four operations, and identify and explain patterns in arithmetic. (Target Description) These tasks will primarily consist of contextual word problems requiring more than a single operation or step. Most of these will be straightforward two-step contextual word problems coding straightforwardly to 3.OA.D.8. These problems serve an important purpose in showing that students have solidified addition and subtraction problem solving from previous grades and integrated it correctly alongside their new understandings of multiplication and division. Multiplication and division steps should be within 100. Addition and	2	5-6		

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		subtraction steps should often involve numbers larger than 100 with solution within 1000 (cf. 3.NBT.A.2). In some tasks associated with this target, the representation of the problem with equations and/or the judgment of the reasonableness of an answer should be the explicit target for the task (cf. 3.OA.D.8). (Evidence Required) 1. The student identifies arithmetic patterns including input/output models, number lines, addition tables, and multiplication tables. 2. The student solves one-step, real-world contextual problems using addition and subtraction within 1000. (Range ALDs) **Level 1** Students should be able to represent and solve one-step problems using addition and subtraction within 100 and multiplication and division within 100. **Level 2** Students should be able to solve two-step problems using addition and subtraction with numbers larger than 100 and solutions within 1000, assess the reasonableness of an answer, and identify patterns in the addition table. **Level 3** Students should be able to solve two-step problems using multiplication and division within 100. They should be able to represent the problem using equations with a letter or symbol to represent an unknown quantity. They should also be able to explain patterns in the multiplication table. **Level 4** Students should be able to use the properties of operations to explain arithmetic patterns (including patterns in the addition and multiplication tables).				
		F. Develop understanding of fractions as numbers. (Target Description) Some of these tasks should assess conceptual understanding of unit fractions and other fractions as detailed in 3.NF.A.1 and 3.NF.A.2. Other tasks for this cluster should involve equivalence of fractions as detailed in 3.NF.A.3. Tasks should attempt to cover the range of expectations in the standard, such as understanding, recognizing, generating, and expressing, although explanations and justifications may also be assessed under Claim 3. Tasks for this target should include fractions greater than 1 as well as	1, 2			

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		fractions less than or equal to 1; and tasks should not handle fractions differently based on whether they are greater than, less than, or equal to 1. Fractions equal to whole numbers (such as 3/1) should also commonly appear in these tasks. Two equal fractions may be referred to as equal, without need for the term "equivalent" (e.g., "which fraction equals 3?"), and fractions may be referred to simply as numbers (e.g., "which number is greatest?" with fractions among the answer choices). (Evidence Required) 1. The student identifies a fraction $1/b$ as 1 part of a whole that is partitioned into b equal parts, and a fraction a/b as the quantity formed by a parts of size $1/b$ using a model. For this evidence statement, a/b may be greater than, less than, or equal to 1. 2. The student identifies and represents fractions on a number line using the interval 0-1 as the whole with or without partitioning. 3. The student identifies two fractions as equal if they are the same size or the same point on a number line. 4. The student generates simple equal fractions using a visual fraction model. 5. The student expresses whole numbers as fractions and recognizes fractions equal to whole numbers. 6. The student compares two fractions with the same numerator or the same denominator using the symbols <, =, >. (Range ALDs) **Level 1** Students should be able to identify a fraction as a number and identify a fraction on a number line when the increments are equal to the denominator. **Level 2** Students should be able to understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; recognize simple equivalent fractions; express whole numbers as fractions; and recognize that comparisons are valid only when the two fractions refer to the same whole. **Level 3** Students should be able to understand a fraction a/b as the quantity formed by a parts of size $1/b$; represent a fraction on a number line with partitioning; generate simple equivalent fractions and recognize when they are equal to whole numbers; and compare two fractions with the same numerator or the same denominator by reasoning about their size. **Level 4** Students should be able to explain why two fractions are equivalent				

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		and approximate the location of a fraction on a number line with no partitioning.				
		A. Represent and solve problems involving multiplication and division. (Target Description) Tasks for this target require students to use multiplication and division within 100 using single-digit factors to solve straightforward, one-step contextual word problems in situations involving equal groups, arrays, and measurement quantities such as liquid volume and masses of objects. The majority of these problems should be of the equal groups and arrays situation types, with the more difficult measurement quantity situations in the minority. All of these tasks will code straightforwardly to standard 3.OA.A.3. Few of the tasks coding to this standard will make the method of solution a separate target of assessment. Non-contextual tasks that explicitly ask the student to determine the unknown number in a multiplication or division equation relating three whole numbers (3.OA.A.4) will support the development of items that provide a range of difficulty necessary for populating an adaptive item bank. The tasks coding to standards 3.OA.A.1 and 3.OA.A.2, which probe student understanding of the meanings of multiplication and division, will be assessed through Claim 4. (Evidence Required) 1. The student uses multiplication and division within 100 to solve straightforward one-step word problems in situations involving equal groups, arrays, and measurement quantities such as length, liquid volume and masses of objects. 2. The student determines an unknown whole number in a multiplication or division equation relating three whole numbers with single-digit factors within 100. (Range ALDs) **Level 1** Students should be able to represent multiplication and division problems within 100 involving equal groups of objects. **Level 2** Students should be able to use multiplication and division within 100 to solve one-step problems using arrays, to interpret the meaning of multiplication of two whole numbers and to determine the unknown number	1, 2	2, 3		

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		in a multiplication equation relating three whole numbers. **Level 3** Students should be able to select the appropriate operation (multiplication or division) within 100 to solve one-step problems involving measurement quantities of single-digit whole numbers and determine the unknown number in a division equation relating three whole numbers. They should be able to interpret the meaning of whole-number quotients of whole numbers. **Level 4** Students should be able to use multiplication and division within 100 to solve one-step problems involving measurement quantities.				
	Supporting Cluster	**E. Use place value understanding and properties of operations to perform multi-digit arithmetic.** (Target Description) Tasks associated with this target will be non-contextual computation problems that assess fluency in addition and subtraction within 1000. Some of these tasks should provide information about the strategies and/or algorithms students are using, in order to ensure that they are general (based on place value and properties of operations). Other tasks will assess either rounding (with an emphasis on conceptual understanding, if possible) or the more important multi-digit computations specified in 3.NBT.A.3. Because the answers to such multiplications are easily found by mnemonic tricks, these items should be of a conceptual nature to assess reasoning with place value and properties of operations. (Evidence Required) 1. The student solves non-contextual problems using place value understanding to round whole numbers to the nearest 10 or 100. 2. The student solves non-contextual problems by adding and/or subtracting within 1000, using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. 3. The student solves non-contextual computation problems by multiplying one-digit whole numbers by multiples of 10 in the range 10–90 using strategies based on place value and properties of operations. (Range ALDs) **Level 1** Students should be able to add and subtract within 100, using strategies and algorithms based on place value understanding. They should be able to round two-digit whole numbers to the nearest 10.	1	3-4		

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		Level 2 Students should be able to add and subtract within 1,000, using strategies and algorithms based on the relationship between addition and subtraction. They should be able to round whole numbers to the nearest 100 and multiply one-digit whole numbers by multiples of 10 in the range of 10–90. **Level 3** Students should be able to fluently add and subtract within 1,000, using strategies or algorithms based on place value understanding, properties of arithmetic, and/or the relationship between addition and subtraction. **Level 4** Students should be able to use multiple strategies to fluently add and subtract within 1,000.				
		J. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. (Target Description) Tasks associated with standard (3.MD.D.8) will assess students' ability to solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. (Evidence Required) 1. The student solves real-world and mathematical problems involving finding the perimeter of a polygon given the side lengths. 2. The student distinguishes between area and perimeter of a rectangle. (Range ALDs) **Level 1** Students should be able to find the perimeter of polygons when given all side lengths in problems. **Level 2** Students should be able to solve for an unknown side length of a polygon when given the perimeter in problems. **Level 3** Students should be able to identify rectangles with the same perimeter and different areas or with the same area and different perimeters. **Level 4** No Descriptor	1			
		K. Reason with shapes and their attributes. (Target Description) These tasks should support Grade 3 fraction and area work. Technology-enhanced tasks could involve partitioning a shape into parts with equal areas; more traditional tasks could involve expressing the area of each part as a unit	1, 2			

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		fraction of the whole. For these tasks, shapes may be partitioned into non-rectangular parts; for example, students will use intuitive ideas about area to reason that a square with both diagonals drawn has been partitioned into four equal parts. Other tasks for this target will connect less directly to other material in the grade, continuing the standards' progression of increasingly sophisticated spatial and logical reasoning about shapes and their attributes (cf. 2.G.1). Most of these tasks will assess understanding of the hierarchy of quadrilaterals as detailed in 3.G.A.1. A few tasks may involve categories of shapes not explicitly mentioned in the standard, so as to assess understanding of property-based categorization per se at this level. For example, a regular octagon and a rectangle might be shown and the student asked to select a category to which both figures belong—e.g., figures that can be partitioned into triangles—and then to produce a figure not belonging to that category (e.g., a circle). (Evidence Required) 1. The student identifies, draws, and classifies shapes (e.g., rhombuses, rectangles, and others) according to their attributes (e.g., having four sides), and recognizes that shared attributes can define a classification category. 2. The student partitions shapes into parts with equal areas and can express the area of each part as a unit fraction of the whole. (Range ALDs) **Level 1** Students should be able to recognize rhombuses, rectangles, and squares. **Level 2** Students should be able to reason with the attributes of quadrilaterals to recognize rhombuses, rectangles, and squares as examples of quadrilaterals and reason with shapes to partition them into parts with equal areas. **Level 3** Students should be able to draw examples of quadrilaterals that do not belong to given subcategories by reasoning about their attributes; partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole; and understand that shapes in different categories may share attributes and that the shared attributes can define a larger category. **Level 4** No Descriptor				

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		H. Represent and interpret data. (Target Description) Tasks associated with this target should involve using information presented in scaled bar graphs to solve one- and two-step "how many more" and "how many less" problems. Technology might be used to enable students to draw a scaled picture graph and a scaled bar graph to represent a data set with up to four categories. Other tasks can involve the cycle indicated in 3.MD.B.4 (measure to generate data and show the data by making a line plot); such tasks should indeed involve fractional measurement values. (Evidence Required) 1. The student creates a scaled picture graph and a scaled bar graph to represent a data set with up to four categories. 2. The student solves one-and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. 3. The student generates measurement data by measuring lengths using rulers marked with halves and fourths of an inch and makes a line plot with fractional measurement values. (Range ALDs) **Level 1** Students should be able to draw a picture graph and a bar graph to represent a data set with up to four categories; generate measurement data by measuring length using rulers marked with one inch intervals; and create a line plot to represent a data set where the horizontal scale is marked in whole unit intervals. **Level 2** Students should be able to solve one-step "how many more?" and "how many less?" problems using information presented in picture and bar graphs; generate measurement data by measuring lengths using rulers marked with half-inch intervals; and represent measurement data on a line plot with a horizontal scale marked in half-unit intervals. **Level 3** Students should be able to draw a scaled picture graph and a scaled bar graph to represent a data set; solve two-step "how many more?" and "how many less?" problems using information presented in a scaled bar graph; generate measurement data by measuring length using rulers marked with quarter-inch intervals; and create a line plot with a horizontal scale marked in quarter-unit intervals. **Level 4** No Descriptors	2, 3	1		

Target Sampling Mathematics Grade 3						
Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
2. Problem Solving 4. Modeling and Data Analysis	Problem Solving (drawn across content domains)	**A. Apply mathematics to solve well-posed problems arising in everyday life, society , and the workplace.** (General Task Model Expectations) 1. The student is asked to solve a well-posed problem arising in a mathematical context or everyday life, society, or the workplace. 2. Mathematical information from the context is presented in a table, graph, or diagram, or is extracted from a verbal description or pictorial representation of the context. 3. Solving the problem requires one or more steps consisting of one of the four operations with whole numbers or fractions (division of fractions is limited to division of a whole number by a unit fraction or a unit fraction by a whole number). 4. Understandings from geometry or measurement may be needed to determine the operations to be performed. 5. The task does not indicate by key words or other scaffolding which operations are to be performed or in what order. 6. Difficulty of the task may be adjusted by varying (a) the difficulty of extracting information from the context, (b) the number of steps, (c) the complexity of the numbers used, or (d) the complexity of the interpretation required.	2, 3	2	1-2	8-10
		B. Select and use appropriate tools strategically. (General Task Model Expectations) 1. Mathematical information from the context is presented in a table, graph, or diagram, or is extracted from a verbal description or pictorial representation of the context. 2. The student uses tools or makes strategic selection of tools. 3. Tasks may require the student to use a familiar tool in a non-standard way, for example using a ruler from a non-standard starting point or using a number line to represent time. 4. Difficulty of the task may be adjusted by varying (a) the difficulty of extracting information from the context (b) the number of steps (c) the complexity of the numbers used or (d) the complexity of the interpretation required. **C. Interpret results in the context of a situation.** (General Task Model Expectations) 1. The student provides a numeric answer to a problem where the context requires them to go beyond the result of a single computation.	1, 2, 3	1		

Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		2. The student may be asked to choose a value that falls into a range of acceptable values limited by information given in a real-world context. 3. The student may be asked to round up or round down based on the constraints of the context. 4. The student may be asked to interpret the meaning of mathematical computations, for example, the different interpretations of arithmetic operations. 5. The student may be asked to interpret the meaning of points on the number line or in the coordinate plane in a real-world context. 6. The student may be asked to solve a problem that requires the integration of concepts and skills from multiple domains. 7. Difficulty of the task may be adjusted by varying (a) the difficulty of extracting information from the context (b) the number of steps (c) the complexity of the numbers used or (d) the complexity of the interpretation required. **D. Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flow charts, or formulas).** (General Task Model Expectations) 1. The student is presented with a mathematical problem in a real-world context where the quantities of interest are not named explicitly, are named but represented in different ways, or the relationship between the quantities is not immediately clear. 2. The student is asked to solve a problem that may require the integration of concepts and skills from multiple domains. 3. Target 2D identifies a key step in the modeling cycle, and is thus frequently present in problems with real-world contexts. Note that Target 2D is rarely the primary target for an item, but is frequently a Secondary or Tertiary Target for an item with primary alignment to 2A, 2B, or 2C; see example items for many of the task models in those Targets.				
	Modeling and Data Analysis (drawn across content domains)	**A. Apply mathematics to solve problems arising in everyday life, society, and the workplace.** (General Task Model Expectations) 1. The student is asked to solve a problem arising in everyday life, society, or the workplace. 2. Information needed to solve the problem has a level of complexity that is	2, 3	1	1-3	

Claim	Content Category	Assessment Targets	DOK	Items CAT	PT	Total Items
		not present in items within Claim 2 Target A. For example, the student must • distinguish between relevant and irrelevant information, or • identify information that is not given in the problem and request it, or • make a reasonable estimate for one or more quantities and use that estimate to solve the problem. 3. The student must select a mathematical model independently and is not directly told what arithmetic operation or geometric structure to use to solve the problem. 4. Tasks in this model often have secondary alignments to other Claim 4 targets, in particular Target 4B, constructing autonomous chains of reasoning, Target 4D, requiring the student to interpret results in the context of the problem, and Target 4F, requiring students to identify quantities and map relationships between them. 5. The student is often required to draw upon knowledge from different domains, including knowledge from earlier grade- levels. **D. Interpret results in the context of a situation.** (General Task Model Expectations) 1. The student must solve a problem that results in a numerical answer and interpret the number in the context of the problem.				
		B. Construct, autonomously, chains of reasoning to justify mathematical models used, interpretations made, and solutions proposed for a complex problem. (General Task Model Expectations) 1. The student is presented with a multi-step problem with little or no scaffolding, or 2. The student must make estimates or choose between different reasonable assumptions in order to solve the problem. 3. Note that Target 4B is never the primary target for an item, but is frequently a Tertiary or Quaternary Target for an item with primary alignment to other targets; see, for example, items in Task Models for 4A, 4C, and 4E. **E. Analyze the adequacy of and make improvements to an existing model or develop a mathematical model of a real phenomenon.** (General Task Model Expectations) 1. The student is presented with a problem arising in everyday life, society, or the workplace. The student either	2, 3, 4	1		

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Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		• chooses between competing mathematical models to solve the problem (which may depend on different interpretations of the problem), • evaluates a partial or complete (possibly incorrect) solution to the problem, or • constructs a mathematical model to solve the problem. It is not necessary that a student constructs a complete solution to the problem for this target. 2. Tasks in this model can also assess Target 4B (Construct, autonomously, chains of reasoning to justify mathematical models used, interpretations made, and solutions proposed for a complex problem). Thus some tasks should plausibly entail a chain of reasoning to complete the task, not just a single step. 3. The student is often required to draw upon knowledge from different domains, including knowledge from earlier grade-levels.				
		C. State logical assumptions being used. (General Task Model Expectations) 1. The student is presented with a problem arising in everyday life, society, or the workplace. The student either • identifies information or assumptions needed to solve the problem, • researches additional information needed to solve the problem, or • provides a reasoned estimate of a quantity needed to solve the problem. It is not necessary that a student constructs a complete solution to the problem for this target. 2. Tasks in this model generally have either more information than is needed solve the problem (and students identify the relevant information) or not enough information (and students must provide a reasoned estimate). 3. The student is often required to draw upon knowledge from different domains, including knowledge from earlier grade- levels. 4. Tasks for this target may also assess Target 4B or 4D. **F. Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flow charts, or formulas).** (General Task Model Expectations) 1. Students are presented with a mathematical problem in a real-world context where the quantities of interest are not named explicitly, are named	1, 2, 3	1		

Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		but represented in different ways, or the relationship between the quantities is not immediately clear. 2. The student is asked to solve a problem that may require the integration of concepts and skills from multiple domains.				
		G. Identify, analyze, and synthesize relevant external resources to pose or solve problems. (General Task Model Expectations) Measured in performance tasks only, students should have access to external resources to support their work in posing and solving problems (e.g., finding or constructing a set of data or information to answer a particular question or looking up measurements of a structure to increase precision in an estimate for a scale drawing). Constructed response items should incorporate "hyperlinked" information to provide additional detail (both relevant and extraneous).	3, 4	0		
3. Communicating Reasoning	Communicating Reasoning (drawn across content domains)	**A. Test propositions or conjectures with specific examples.** (General Task Model Expectations) 1. Items for this target should focus on the core mathematical work that students are doing around numbers and operations, with mathematical content from other domains playing a supporting role in setting up the reasoning contexts. 2. Items in this task model should probe the key mathematical structures that students at that grade-level are studying, such as the structure of base-ten numbers, fractions, or the four operations and their properties. 3. In response to a claim or conjecture, the student should: • Find a counterexample if the claim is false, • Find examples and non-examples if the claim is sometimes true, or • Provide supporting examples for a claim that is always true without concluding that the examples establish that truth, unless there are only a finite number of cases and all of them are established one-by-one. The main role for using specific examples in this case is for students to develop a hypothesis that the conjecture or claim is true, setting students up for work described in Claim 3B. 3. False or partially true claims that students are asked to find counterexamples for should frequently draw upon commonly held mathematical misconceptions. 4. Note: Use appropriate mathematical language in asking students for a single example. While a single example can be used to refute a conjecture, it cannot be used to prove one is always true unless that is the one and only	2, 3	3	0-2	8-10

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Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	

		case.
		
		D. Use the technique of breaking an argument into cases.
		(General Task Model Expectations)
		1. Items for this target should focus on the core mathematical work that students are doing around numbers and operations, with mathematical content from other domains playing a supporting role in setting up the reasoning contexts.
		2. The student is given
		  • A problem that has a finite number of possible solutions, some of which work and some of which don't, or
		  • A proposition that is true in some cases but not others.
		3. Items for Claim 3 Target D should either present an exhaustive set of cases to consider or expect students to consider all possible cases in turn in order to distinguish it from items in other targets.
		4. In grades 3-5, the student will be given the cases to consider.				

		B. Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. (General Task Model Expectations) 1. Items for this target should focus on the core mathematical work that students are doing around numbers and operations, with mathematical content from other domains playing a supporting role in setting up the reasoning contexts. 2. Items for this target can probe a key mathematical structure such as the structure of base-ten numbers, fractions, or the four operations and their properties. 3. Items for this target can require students to solve a multi-step, well-posed problem involving the application of mathematics to a real-world context. The difference between items for Claim 2A and Claim 3B is that the focus in 3B is on communicating the reasoning process in addition to getting the correct answer. 4. Note that in grades 3–5, items can provide more structure than items for later grades to help them understand the expectations for justifying or refuting a proposition or conjecture. **E. Distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in the argument—explain what it is.** (General Task Model Expectations)	2, 3, 4		3	

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Claim	Content Category	Assessment Targets	DOK	Items		Total Items
				CAT	PT	
		1. Items for this target should focus on the core mathematical work that students are doing around numbers and operations, with mathematical content from other domains playing a supporting role in setting up the reasoning contexts. 2. The student is presented with valid or invalid reasoning and told it is flawed or asked to determine its validity. If the reasoning is flawed, the student identifies, explains, and/or corrects the error or flaw. 3. The error should be more than just a computational error or an error in counting, and should reflect an actual error in reasoning. 4. Analyzing faulty algorithms is acceptable so long as the algorithm is internally consistent and it isn't just a mechanical mistake executing a standard algorithm.				
		C. State logical assumptions being used. (General Task Model Expectations) 1. Items for this target should focus on the core mathematical work that students are doing around numbers and operations, with mathematical content from other domains playing a supporting role in setting up the reasoning contexts. 2. For some items, the student must explicitly identify assumptions that • Make a problem well-posed, or • Make a particular solution method viable. 3. When possible, items in this target should focus on assumptions that are commonly made implicitly and can cause confusion when left implicit. 4. For some items, the student will be given a definition and be asked to reason from that definition. **F. Base arguments on concrete referents such as objects, drawings, diagrams, and actions.** (General Task Model Expectations) In earlier grades, the desired student response might be in the form of concrete referents. In later grades, concrete referents will often support generalizations as part of the justification rather than constituting the entire expected response.	2, 3	2		