About the OGAP Item Bank: The OGAP multiplicative reasoning item bank is composed of 280 short constructed response or extended multiple choice items that assess multiplication and division in the CCSS for grades 3 - 5. Each question is strategically engineered considering the interaction of the context of the problem and structures of problems (e.g., property, complexity of factors or divisors) that will elicit student developing understanding, common errors that students make, or preconceptions or misconceptions that may interfere with students learning new concepts or solving related problems. Some problems focus specifically on multiplicative or division while others involve multistep operations. The multi-step problems are coded in this document as "multiplication and division" and "multiplication or division and addition or subtraction." Pages 18-19 lists items by problem contexts and CCSSM clusters. (The Volume items are PILOT and are shaded.)

There are two types of problem in the OGAP item bank:
1) Application/context: Application/context problems are designed to elicit the strategies that students use to solve multiplication and division problems. (e.g., counting by ones, area model, algorithm)
2) Concept/property: Concept/property problem target very specific concept understanding (e.g., the base ten system, equations) or properties of operations (e.g., commutative, distributive). These items are found primarily in the Property and Equation sets of items.

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Property (page 1 of 2)

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Property	Property	Representations	Relationships
PR1	Concept/property	Equations	Multiplication		Single digit x multi-digit		2	Distributive			Arrays	Model-equation
PR3	Concept/property	Equal groups	Multiplication		Single digit x single digit		2	Distributive				Context-equation
PR4	Concept/property	Properties	Multiplication and Division		Single digit x single digit	Single digit	2	Multiplicative inverse				
PR5	Concept/property	Equations	Multiplication		Single digit x multi-digit		2	Distributive			Arrays	Model-equation
PR7	Concept/property		Multiplication		Single digit x multi-digit		2					Doubling and halving
PR9	Concept/property		Multiplication		Single digit x single digit		2	Distributive				Doubling and halving
PR10	Concept/property	Equal groups	Multiplication		Single digit x single digit		2	Commutative				
PR11	Concept/property		Multiplication		Single digit x single digit		2	Commutative				
PR12	Concept/property		Multiplication		Single digit x single digit		More than 2	Associative				
PR13	Concept/property		Multiplication		Single digit x single digit		More than 2	Associative				
PR15	Concept/property	Equations	Division			Single digit		Commutative				
PR18	Concept/property		Multiplication		Powers of ten							Multiples and factors
PR19	Concept/property		Division			Powers of ten						Multiples and factors
PR21	Concept/property		Multiplication		Multi-digit x multi-digit		2	Distributive				
PR23	Concept/property		Division			Single digit		Distributive				
PR24	Concept/property		Division			Single digit						Doubling and halving
PR25	Concept/property		Multiplication		Multi-digit x multi-digit		2	Distributive			Open area	Model-equation
PR30	Concept/property	Properties	Multiplication		Powers of ten							
PR31	Concept/property	Properties	Multiplication		Powers of ten							

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PR32	Concept/property	Properties	Multiplication	Multi-digit x multi-digit			Associative	Commutative		
PR33	Concept/property	Properties	Multiplication and Division	Multi-digit x multi-digit			Multiplicative inverse			
PR34	Concept/property	Properties	Multiplication	Single digit x multi-digit						Multiples and factors
PR35	Concept/property	Properties	Multiplication	Single digit x multi-digit						Multiples and factors
PR36	Concept/property	Properties	Division	Powers of ten						
PR37	Concept/property	Properties	Multiplication	Powers of ten			Associative	Commutative		
PR39	Concept/property	Properties	Multiplication	Single digit x multi-digit			Identity			
PR40	Concept/property	Properties	Multiplication and Division	Single digit x multi-digit	Single digit		Multiplicative inverse			
PR41	Concept/property	Properties	Multiplication	Multi-digit x multi-digit			Associative	Commutative		
PR42	Concept/property	Properties	Multiplication	Multi-digit x multi-digit			Distributive			
PR43	Concept/property	Properties	Multiplication							Multiples and factors
PR44	Concept/property	Properties	Multiplication							Multiples and factors
PR45	Concept/property	Properties	Multiplication	Powers of ten						
PR46	Concept/property	Properties	Multiplication	Powers of ten						
PR47	Concept/property	Properties	Multiplication	Powers of ten						
PR48	Concept/property	Properties	Multiplication and Division	Single digit x multi-digit			Multiplicative inverse			
PR49	Concept/property	Properties	Multiplication and Division	Single digit x multi-digit			Multiplicative inverse			
PR50	Concept/property	Properties	Multiplication	Single digit x single digit						Multiples and factors
PR51	Concept/property	Properties	Multiplication	Single digit x single digit					Arrays	
PR52	Concept/property	Properties	Multiplication and Division	Multi-digit x multi-digit			Multiplicative inverse			
PR53	Concept/property	Properties	Multiplication and Division	Multi-digit x multi-digit			Multiplicative inverse			

Volume (Pilot items)

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors
V1	Concept/property	Volume	Multiplication		Single digit x multi-digit		More than 2
V2	Concept/property	Volume	Multiplication				More than 2
V3	Concept/property	Volume	Multiplication and Division		Single digit x multi-digit		More than 2
V4	Application/context	Volume	Multiplication		Single digit x multi-digit		More than 2
V5	Concept/property	Volume	Addition/subtraction with multiplication/division		Single digit x multi-digit		More than 2
V6	Application/context	Volume	Multiplication		Multi-digit x multi-digit		More than 2
V7	Application/context	Volume	with multiplication/divisio		Multi-digit x multi-digit		More than 2
V8	Application/context	Volume	Multiplication and Division		Multi-digit x multi-digit		More than 2
V9	Application/context	Volume	Addition/subtraction with multiplication/division		Multi-digit x multi-digit		More than 2
V10	Application/context	Volume	Multiplication		Fraction/decimals		More than 2
V11	Application/context	Volume	Multiplication and Division		Multi-digit x multi-digit		More than 2
V12	Application/context	Volume	Multiplication and Division		Fraction/decimals		More than 2
V13	Application/context	Volume	Multiplication and Division		Fraction/decimals		More than 2

Equal Measure

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
EM1	Application/context	Equal measures	Division	Quotative		Multi-dgit					Number of groups unknown
EM2	Application/context	Equal measures	Division	Partitive		Single digit					Group size unknown
EM3	Concept/property	Equal measures	Division	Quotative							
EM4	Application/context	Equal measures	Addition/subtraction with multiplication/division		Multi-digit x multi-digit		2				Unknown total
EM6	Application/context	Equal measures	Multiplication and Division		Single digit x single digit		2				Number of groups unknown
EM8	Application/context	Equal measures	Multiplication		Single digit x multi-digit		2				Unknown total
EM11	Application/context	Equal measures	Division	Quotative		Single digit				Meaning of remainders	Number of groups unknown
EM12	Application/context	Equal measures	Multiplication		Single digit x multi-digit						Unknown total
EM13	Application/context	Equal measures	Multiplication		Multi-digit x multi-digit		3				Unknown total
EM14	Application/context	Equal measures	Division	Quotative		Multi-dgit				Meaning of remainders	Number of groups unknown
EM15	Application/context	Equal measures	Addition/subtraction with multiplication/division		Fraction/decimals						Unknown total
EM16	Application/context	Equal measures	Division	Quotative		Fractions/decimals				Meaning of remainders	Number of groups unknown
EM17	Application/context	Equal measures	Addition/subtraction with multiplication/division	Quotative		Powers of ten					
EM18	Application/context	Equal measures	Multiplication		Multi-digit x multi-digit						Unknown total

Equal Groups (page 1 of 4)

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
EG1	Application/context	Equal groups	Multiplication and Division	Quotative	Single digit x multi-digit		2				More than one situation
EG2	Application/context	Equal groups	Division	Quotative		Single digit				Meaning of remainders	Number of groups unknown
EG3	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG4	Application/context	Equal groups	Division	Quotative		Single digit					Number of groups unknown
EG5	Application/context	Equal groups	Multiplication		Single digit x multi-digit		More than 2				Unknown total
EG6	Application/context	Equal groups	Multiplication		Single digit x single digit	G	More than 2				Unknown total
EG7	Concept/property	Equal groups	Multiplication						Equal groups		
EG8	Concept/property	Equal groups	Multiplication		Single digit x single digit		2		Equal groups		
EG9	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG10	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG11	Application/context	Equal groups	Multiplication		Multi-digit x multi-digit		2				Unknown total
EG12	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG13	Application/context	Equal groups	Multiplication		Multi-digit x multi-digit		2				Unknown total
EG14	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG15	Application/context	Equal groups	Addition/subtraction with multiplication/division		Single digit x single digit		2				Unknown total
EG16	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG17	Application/context	Equal groups	Multiplication		Multi-digit x multi-digit		2			Doubling and halving	Unknown total
EG18	Application/context	Equal groups	Multiplication		Multi-digit x multi-digit		2				Unknown total
EG19	Application/context	Equal groups	Addition/subtraction with multiplication/division		Single digit x multi-digit		2	Distributive			Unknown total

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EG20	Application/context	Equal groups	Multiplication		Multi-digit x multi-digit		2			Unknown total
EG21	Application/context	Equal groups	Multiplication		Multi-digit x multi-digit		2			Unknown total
EG22	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2			Unknown total
EG24	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2			Unknown total
EG25	Application/context	Equal groups	Multiplication		Powers of ten		2			Unknown total
EG26	Application/context	Equal groups	Multiplication		Single digit x single digit		2			Unknown total
EG27	Application/context	Equal groups	Multiplication		Powers of ten		2			Unknown total
EG28	Application/context	Equal groups	Multiplication		Single digit x multi-digit		More than 2			Unknown total
EG29	Application/context	Equal groups	Multiplication		Powers of ten		More than 2			Unknown total
EG30	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2			Unknown total
EG31	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2			Unknown total
EG32	Application/context	Equal groups	Multiplication		Single digit x single digit		2			Unknown total
EG33	Application/context	Equal groups	Multiplication		Single digit x single digit		More than 2			Unknown total
EG34	Application/context	Equal groups	Multiplication		Single digit x multi-digit		More than 2			Unknown total
EG35	Application/context	Equal groups	Multiplication		Single digit x single digit		2			Unknown total
EG36	Concept/property	Equal groups	Multiplication		Single digit x single digit		2		Equal groups	Unknown total
EG37	Concept/property	Equal groups	Addition/subtraction with multiplication/division		Single digit x single digit		2			Unknown total
EG38	Application/context	Equal groups	Division	Quotative		Multi-dgit				Number of groups unknown
EG39	Application/context	Equal groups	Division	Quotative		multi-digit			Meaning of remainders	Number of groups unknown

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EG41	Application/context	Equal groups	Division	Quotative		Single digit					Number of groups unknown
EG42	Application/context	Equal groups	Division	Quotative		Multi-dgit					Number of groups unknown
EG43	Application/context	Equal groups	Division	Partitive		Single digit					Group size unknown
EG44	Application/context	Equal groups	Division	Partitive		Single digit					Group size unknown
EG45	Application/context	Equal groups	Division	Partitive		Single digit					Unknown total
EG46	Application/context	Equal groups	Division	Partitive		Single digit					Unknown total
EG47	Application/context	Equal groups	Division	Partitive		Single digit					Group size unknown
EG49	Application/context	Equal groups	Addition/subtraction with multiplication/division		Single digit x single digit		2		Equal groups		Unknown total
EG50	Application/context	Equal groups	Addition/subtraction with multiplication/division	Quotative		Single digit					Number of groups unknown
EG51	Application/context	Equal groups	Division	Quotative		Single digit					Number of groups unknown
EG52	Application/context	Equal groups	Division	Quotative		Single digit					Number of groups unknown
EG53	Application/context	Equal groups	Multiplication		Single digit x single digit		2				Unknown total
EG54	Application/context	Equal groups	Multiplication		Single digit x single digit		3				Unknown total
EG55	Application/context	Equal groups	Addition/subtraction with multiplication/division	Quotative		Single digit				Meaning of remainders	Number of groups unknown
EG56	Application/context	Equal groups	Division	Quotative		Multi-dgit					Number of groups unknown
EG57	Application/context	Equal groups	Multiplication		Single digit x multi-digit		2				Unknown total
EG58	Concept/property	Equal groups	Multiplication		Single digit x multi-digit		2			Multiples and factors	Unknown product
EG59	Application/context	Equal groups	Multiplication		Single digit x single digit		More than 2				Unknown total
EG60	Application/context	Equal groups	Division	Quotative		Powers of ten					Number of groups unknown
EG 62	Application/context	Equal groups	Multiplication		Single digit x single digit		2				Unknown total

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EG 65	Application/context	Equal groups	Division	Partitive		Multi-dgit					Group size unknown
EG 66	Application/context	Equal groups	Division	Partitive		Multi-dgit				Meaning of remainders	Group size unknown
EG 67	Application/context	Equal groups	Multiplication and Division		Single digit x multi-digit						Unknown Total
EG 68	Application/context	Equal groups	Multiplication and Division		Single digit x multi-digit	Single digit					Unknown total
EG 69	Application/context	Equal groups	Multiplication		Single digit x single digit						Unknown total
EG70	Application/context	Equal groups	Division	Partitive		Multi-dgit				Meaning of remainders	Group size unknown
EG71	Application/context	Equal groups	Division	Quotative		Multi-dgit				Meaning of remainders	Number of groups unknown
EG72	Application/context	Equal groups	Division	Quotative		Multi-dgit				Meaning of remainders	Number of groups unknown
EG73	Application/context	Equal groups	Division	Partitive		Multi-dgit				Meaning of remainders	Group size unknown
EG74	Application/context	Equal groups	Division	Partitive		Multi-dgit				Meaning of remainders	Group size unknown
EG75	Application/context	Equal groups	Division	Partitive		Fractions/decimals				Meaning of remainders	Group size unknown

Multiplicative Comparison

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
MCM1	Application/context	Multiplicative comparison	Multiplication		Powers of ten		More than 2				Unknown total
MCM2	Application/context	Multiplicative comparison	Multiplication and Division		Single digit x single digit	Single digit	2				Group size unknown
MCM3	Application/context	Multiplicative comparison	Multiplication		Multi-digit x multi-digit		2				Unknown total
MCM4	Application/context	Multiplicative comparison	Multiplication		Single digit x single digit		2				Unknown total
MCM5	Application/context	Multiplicative comparison	Division		Powers of ten	Multi-dgit	2				Number of groups unknown
MCM6	Application/context	Multiplicative comparison	Division			Single digit	2				Number of groups unknown
MCM7	Application/context	Multiplicative comparison	Multiplication		Multi-digit x multi-digit		2				Unknown total
MCM8	Application/context	Multiplicative comparison	Multiplication		Base Ten		2				Unknown total
MCM11	Application/context	Multiplicative comparison	Multiplication		Single digit x single digit		2				Unknown total
MCM12	Application/context	Multiplicative comparison									
MCM13	Application/context	Multiplicative comparison	Division			Single digit					Group size unknown
MCM15	Application/context	Multiplicative comparison	Division			Single digit					Number of groups unknown
MC16	Application/context	Multiplicative change	Division			Single digit					Group size unknown
MC17	Application/context	Multiplicative change	Division			Multi-dgit					Number of groups unknown
MC18	Application/context	Multiplicative change	Multiplication		Single digit x multi-digit		2				Unknown total
MC19	Application/context	Multiplicative change	Multiplication		Single digit x single digit		2				Unknown total
MC20	Application/context	Multiplicative change	Division			Powers of ten					Number of groups unknown
MC21	Application/context	Multiplicative change	Division			Powers of ten					Number of groups unknown
MC22	Application/context	Multiplicative change	Division			Powers of ten					Group size unknown

Patterns

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
P1	Application/context	Patterns	Multiplication		Single digit x multi-digit						
P2	Application/context	Patterns	Addition/subtraction with multiplication/division		Single digit x single digit						
P3	Application/context	Patterns	Multiplication and Division	Partitive	Multi-digit x multi-digit	Single digit	2				More than one situation
P4	Application/context	Patterns	Multiplication and Division	Partitive	Single digit x multi-digit	Single digit	2				More than one situation
P5	Application/context	Patterns	Multiplication and Division		Single digit x single digit					Context-equation	
P6	Application/context	Patterns	Multiplication and Division		Single digit x multi-digit					Context-equation	
P7	Application/context	Patterns	Division	Quotative		Multi-dgit					Number of groups unknown
P8	Application/context	Patterns	Division			Multi-dgit				Context-equation	
P9	Application/context	Patterns	Division			Single digit				Context-equation	
P10	Application/context	Patterns	Division			Multi-dgit				Context-equation	
P11	Application/context	Patterns	Multiplication and Division		Single digit x single digit	Single digit				Context-equation	
P12	Application/context	Patterns	Multiplication and Division		Single digit x single digit	Single digit				Context-equation	
P13	Application/context	Patterns	Addition/subtraction with multiplication/division								
P14	Application/context	Patterns	Addition/subtraction with multiplication/division								
P15	Application/context	Patterns	Multiplication		Powers of ten						
P16	Application/context	Patterns	Multiplication		Fraction/decimals					Context -model	
P17	Application/context	Patterns	Multiplication		Single digit x single digit						

Rate

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
R1	Application/context	Rates	Multiplication								
R2	Application/context	Rates	Multiplication		Single digit x multi-digit		2				Unknown total
R3	Application/context	Rates	Multiplication		Fraction/decimals		2				Unknown total
R4	Application/context	Rates	Division			Single digit					Group size unknown
R5	Application/context	Rates	Division			Multi-dgit					Group size unknown
R6	Application/context	Rates	Division			Single digit					Group size unknown
R7	Application/context	Rates	Division			Multi-dgit					Number of groups unknown
R8	Application/context	Rates	Division			Single digit					Number of groups unknown
R9	Application/context	Rates	Division			Single digit					Number of groups unknown
R10	Application/context	Rates	Multiplication		Multi-digit x multi-digit		2				Unknown total
R11	Application/context	Rates	Multiplication		Single digit x single digit		2				Unknown total
R12	Application/context	Rates	Division			Multi-dgit					Number of groups unknown
R13	Application/context	Rates	Multiplication		Multi-digit x multi-digit		2				Unknown total
R14	Application/context	Rates	Division			Multi-dgit					Number of groups unknown
R15	Application/context	Rates	Division			Multi-dgit					Number of groups unknown
R16	Application/context	Rates	Multiplication		Single digit x multi-digit		2				Unknown total
R17	Application/context	Rates	Division			Single digit	2				Group size unknown
R18	Application/context	Rates	Multiplication		Single digit x multi-digit		2				Unknown total
R19	Application/context	Rates	Multiplication		Single digit x single digit		2				Unknown total
R20	Application/context	Rates	Division			Single digit					Group size unknown

Rectangular Area

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
RA1	Application/context	Area	Multiplication		Single digit x multi-digit		2		Open area		
RA2	Application/context	Area	Multiplication		Single digit x single digit		2			Context-equation	
RA3	Application/context	Area	Multiplication		Single digit x multi-digit		2		Open area	Context-equation	
RA4	Application/context	Area	Multiplication		Single digit x multi-digit		2				
RA5	Application/context	Area	Multiplication		Single digit x multi-digit		More than 2		Area		
RA6	Application/context	Area	Multiplication		Single digit x single digit		2		Area		
RA10	Application/context	Area	Multiplication		Single digit x single digit		2		Area		
RA12	Application/context	Area	Division			Single digit					
RA13	Application/context	Area	Addition/subtraction with multiplication/division		Single digit x multi-digit	Multi-dgit	2		Open area		
RA14	Application/context	Area	Division			Multi-dgit				Context-equation	
RA15	Application/context	Area	Multiplication		Multi-digit x multi-digit		2				
RA16	Application/context	Area	Multiplication		Single digit x single digit		2		Area		
RA17	Application/context	Area	Addition/subtraction with multiplication/division		Multi-digit x multi-digit		2		Open area		
RA19	Application/context	Area	Addition/subtraction with multiplication/division		Multi-digit x multi-digit		2		Open area		
RA20	Application/context	Area	Division			Powers of ten			Open area	Context-equation	
RA21	Application/context	Area	Multiplication and Division		Multi-digit x multi-digit		2				
RA22	Application/context	Area	Addition/subtraction with multiplication/division		Fraction/decimals		2		Open area		
RA23	Application/context	Area	Multiplication		Fraction/decimals		2				

Measure Conversions (page 1 of 2)

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors
MCV1	Application/context	Measure conversions	Multiplication		Multi-digit x multi-digit		2
MCV2	Application/context	Measure conversions	Multiplication		Single digit x single digit		2
MCV3	Application/context	Measure conversions	Multiplication		Multi-digit x multi-digit		2
MCV4	Application/context	Measure conversions	Multiplication		Single digit x single digit		2
MCV5	Application/context	Measure conversions	Division			Powers of ten	2
MCV6	Application/context	Measure conversions	Multiplication		Powers of ten		2
MCV7	Application/context	Measure conversions	Multiplication		Powers of ten		2
MCV8	Application/context	Measure conversions	Multiplication		Powers of ten		
MCV9	Application/context	Measure conversions	Division			Single digit	
MCV10	Application/context	Measure conversions	Division			Single digit	
MCV11	Application/context	Measure conversions	Multiplication and Division		Single digit x multi-digit	Fractions/decimals	2
MCV12	Application/context	Measure conversions	Multiplication		Powers of ten		2
MCV13	Application/context	Measure conversions	Division			Multi-dgit	
MCV14	Application/context	Measure conversions	Multiplication and Division		Single digit x multi-digit	Multi-dgit	2
MCV15	Application/context	Measure conversions	Multiplication and Division		Single digit x single digit	Single digit	2
MCV16	Application/context	Measure conversions	Multiplication		Single digit x single digit		2
MCV17	Application/context	Measure conversions	Division			Single digit	
MCV18	Application/context	Measure conversions	Multiplication		Single digit x multi-digit		More than 2

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MCV19	Application/context	Measure conversions	Multiplication		Single digit x multi-digit		2	
MCV20	Application/context	Measure conversions	Division			Single digit		
MCV21	Application/context	Measure conversions	Addition/subtraction with multiplication/division		Single digit x multi-digit	Single digit	2	
MCV22	Application/context	Measure conversions	Multiplication		Fraction/decimals		2	
MCV23	Application/context	Measure conversions	Addition/subtraction with multiplication/division		Powers of ten		2	
MCV24	Application/context	Measure conversions	Addition/subtraction with multiplication/division		Single digit x single digit		2	
MCV25	Application/context	Measure conversions	Multiplication and Division		Single digit x multi-digit	Powers of ten	2	
MCV26	Application/context	Measure conversions	Multiplication		Single digit x multi-digit		2	
MCV27	Application/context	Measure conversions	Addition/subtraction with multiplication/division		Powers of ten		2	
MCV28	Application/context	Measure conversions	Addition/subtraction with multiplication/division			Multi-dgit		
MCV29	Application/context	Measure conversions	Multiplication		Single digit x multi-digit		More than 2	
MCV30	Application/context	Measure conversions	Multiplication		Powers of ten		More than 2	
MCV31	Application/context	Measure conversions	Multiplication and Division		Powers of ten		More than 2	
MCV32	Application/context	Measure conversions	Multiplication and Division		Multi-digit x multi-digit	Single digit		

Equations (page 1 of 2)

Item Bank ID	Problem Type	Problem Contexts	Operation	Types of Division	Complexity of Factors	Complexity of Divisors	Number of factors	Properties	Representations	Relationships	Problem situations
E1	Concept/property	Equations	Multiplication		Powers of ten		2	Distributive		Model-equation	
E2	Concept/property	Equations	Multiplication		Single digit x single digit		2		Arrays	Model-equation	Unknown total
E3	Concept/property	Equations	Multiplication		Single digit x single digit		2				Unknown total
E4	Concept/property	Equations	Multiplication		Single digit x multi-digit		2		Arrays	Addition-multiplication	Unknown total
E5	Concept/property	Equations	Multiplication		Single digit x single digit					Addition-multiplication	Unknown total
E6	Concept/property	Equations	Multiplication		Single digit x multi-digit		2			Context-equation	
E8		Equations	Multiplication		Single digit x multi-digit		More than 2			Model-equation	
E9	Concept/property	Equations	Multiplication		Single digit x single digit		2			Model-equation	
E10	Concept/property	Equations	Multiplication		Single digit x single digit		2			Context-equation	
E11	Concept/property	Equations	Multiplication		Single digit x single digit		2			Context-equation	
E12	Concept/property	Equal measures	Division	Partitive	Powers of ten	Single digit				Model-equation	
E13	Concept/property	Equal measures	Division	Partitive	Powers of ten	Single digit				Model-equation	
E14	Concept/property	Equations	Division	Partitive		Single digit				Context-equation	Group size unknown
E16	Concept/property	Equations	Multiplication and Division							Context-equation	Group size unknown
E17	Concept/property	Equations	Division	Quotative		Single digit				Context-equation	Number of groups unknown
E18	Concept/property	Equations	Division			Single digit				Context-equation	
E20	Concept/property	Equations	Division			Single digit				Context-equation	
E23	Concept/property	Equations	Multiplication							Model-equation	
E25	Concept/property	Equations	Multiplication								
E21	Concept/property	Equations	Division	Quotative		Single digit				Context-equation	

Equations (page 2 of 2)

E32	Concept/property	Equations	Multiplication		Powers of ten					Context-equation
E33	Concept/property	Equations	Division	Quotative		Fractions/decimals				Context-equation
E34	Concept/property	Equations	Multiplication		Fraction/decimals	Fractions/decimals				Context-equation
E36	Concept/property	Equations	Addition/subtraction with multiplication/division		Single digit x multi-digit					Context-equation
E37	Concept/property	Equations	Addition/subtraction with multiplication/division		Single digit x multi-digit					Context-equation
E38	Concept/property	Equations	Addition/subtraction with multiplication/division		Single digit x multi-digit					
E39	Concept/property	Equations	Addition/subtraction with multiplication/division		Single digit x multi-digit					
E40	Concept/property	Equations	Addition/subtraction with multiplication/division		Single digit x multi-digit					
E41	Concept/property	Equations	Addition/subtraction with multiplication/division		Single digit x multi-digit					

Items by CCSSM Clusters (page 1 of 2)

	Property	Equal Group	Volume	Equal Measure	Mult. Comparison	Patterns	Rate	Area	Conversions	Equations
Grade 2 - Work with equal groups of objects		69,35,44								
Grade 3 - Represent and solve multiplicative and division problems		1,10,12,14,16,19,30,31,32,33,4,6,7		2						1,10,11,12,13,14,16,18,2,20,21,23,25,3,4,5,6,8,9
Grade 3- understand properties and relationships between multiplication and division	1,3,4,5,6,9,10,11,12,13,15,48,49,50	3,36,37,8,15,7		3						
Grade 3 - Solve problems involving the 4 operations and explain patterns in arithmetic		62,15,22,26,38,43,45,46,49,51,52,53,54,57,58,59				1,11,12,13,14,4,5,6				1,10,11,12,13,14,16,18,2,20,21,23,3,4,5,6,8,9
Grade 3 - Use place value understanding and properties of operations to perform multi-digit arithmetic		62,1,12,14,16,19,22,26,3,30,31,32,33,38,4,43,45,46,49,51,52,53,54,57,58,59,6		6,8,11,13,14,17,18,4	20,21,22					
Grade 3 - Solve problems involving measurement				2,3,6,8						
Grade 3 - Understand concepts to area and relate area to multiplication and addition								16,10,12,3,4,5,6		
Grade 3 - Distinguish between area and perimeter										
Grade 4 - Use four operations with whole numbers to solve problems		63,64,65,66,11,13,17,18,2,20,21,24,25,27,28,29,34,39,40,41,42,47,5,50,55,56,60,70,71,72,73,74,75,9		11,13,14,18,4	16,17,18,19,1,11,12,13,15,2,3,4,5,6,7,8	1,10,11,12,13,14,15,16,17,18,19,2,20,3,4,5,6,7,8,9				17,30,31,32,33,34,36,37
Grade 4 - Gain familiarity with factors and multiples	34, 35, 43, 44									
Grade 4- Generate and analyze patterns						10,17,3,7,8,9,1,13,14,16,2,3				
Grade 4 - Generalize place value understanding for multi-digit whole numbers	30,31,26,37,45					15				
Grade 4 - Use place value understanding and properties of operations to perform multi-digit arithmetic	19,21,23,24,25,32,33,39,40,41,42,52,53	63,64,65,66,10,11,13,17,18,2,20,21,24,25,27,28,29,34,39,40,41,42,47,5,50,55,56,60,70,71,72,73,74,75,9								
Grade 4 - Solve problems involving measurement (area and perimeter) and conversion from a larger to smaller unit				17			1,10,11,12,13,14,15,16,17,18,19,2,20,3,4,5,6,7,8,9	1,12,13,14,15,17,19,2,20,21,3,4,5,6	10,11,12,13,14,15,16,17,18,19,2,20,21,22,23,24,25,26,27,28,29,3,30,31,32,4,5,6,7,8,9	

Items by CCSSM Clusters (page 2 of 2)

	Property	Equal Group	Volume	Equal Measure	Mult. Comparison	Patterns	Rate	Area	Conversions	Equations
Grade 3 - Work with equal groups of objects		60,35,41								
Grade 5 - Write and interpret numerical expressions										38,39,40,41
Grade 5 - Analyze patterns and relationships						16,2,17,7				
Grade 5- Understand the place value system	30,31,36,37,45,18,18,21					15				
Grade 5 - Perform operations with multi-digit whole number and decimal to hundredths	46,47	67,68,72,73,74,75,67,68		15,16,4,13,18			1,10,11,12,13,14,15,16,17,18,19,2,20,3,4,5,6,7,8,9			33,34,36,37
Grade 5 - Convert like measurement units within a measurement system.									10,11,12,13,14,15,16,17,18,19,2,20,21,22,23,24,25,26,27,28,29,3,30,31,32,4,5,6,7,8,9	
Grade 5 - Understand concepts of volume. Relate volume to multiplication and division			1,2 ,3, 4,5,5,6							
Grade 5- Apply and extend previous understanding of multiplication and division to fractions							22,23			
Grade 6 - Compute fluently with multi-digit numbers and find common factors and multiples	34, 35, 43, 44									
Grade 6 - Solve real world and mathematical problems involving area, surface, and volume			10,11,12,13,7,8,9							