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 multiplication and 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) <u>Application/context</u>: 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) <u>Concept/property</u>: 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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ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	Property	Property	ns	Relationships
	Concept/prope				Single digit x multi-							Model-
PR1	rty	Equations	Multiplication		digit		2	Distributive			Arrays	equation
	Concept/prope				Single digit x single							Context-
PR3	rty	Equal groups	Multiplication		digit		2	Distributive				equation
	Concept/prope		Multiplication		Single digit x single			Multiplicative				
PR4	rty	Properties	and Division		digit	Single digit	2	inverse				
	Concept/prope				Single digit x multi-							Model-
PR5	rty	Equations	Multiplication		digit		2	Distributive			Arrays	equation
	Concept/prope				Single digit x multi-							Doubling and
PR7	rty		Multiplication		digit		2					halving
	Concept/prope				Single digit x single							Doubling and
PR9	rty		Multiplication		digit		2	Distributive				halving
	Concept/prope				Single digit x single							
PR10	rty	Equal groups	Multiplication		digit		2	Commutative				
	Concept/prope				Single digit x single							
PR11	rty		Multiplication		digit		2	Commutative				
	Concept/prope				Single digit x single							
PR12	rty		Multiplication		digit		More than 2	Associative				
	Concept/prope				Single digit x single							
PR13	rty		Multiplication		digit		More than 2	Associative				
	Concept/prope											
PR15	rty	Equations	Division			Single digit		Commutative				
	Concept/prope											Multiples and
PR18	rty		Multiplication		Powers of ten							factors
	Concept/prope					-						Multiples and
PR19	rty		Division			Powers of ten						factors
	Concept/prope				Multi-digit x multi-							
PR21	rty		Multiplication		digit		2	Distributive				
DDOO	Concept/prope					C						
PR23	rty		Division			Single digit		Distributive		-		
DD04	Concept/prope					C						Doubling and
PR24	rty		Division			Single digit						naiving
DDOF	Concept/prope				Multi-digit x multi-			Distribution			0	Model-
PR25	rty		Multiplication		aigit		2	Distributive			Open area	equation
0000	Concept/prope	Duran anti-			Davisor of tax							
PR30	rty Composit/or	Properties	wultiplication		Powers of ten						 	
DD21	concept/prope	Droportion	Multiplication		Dowers of ten							
FROI	rty	Properties	wuitiprication		Powers of ten							

Property (page 2 of 2)

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

Volume (Pilot items)

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

Equal Measure

Item Bank		Problem		Types of	Complexity of	Complexity of	Number of		Representatio		Problem
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	situations
											Number of
	Application/co	Egual									groups
EM1	ntext	measures	Division	Quotative		Multi-dgit					unknown
	Application/co	Egual				Ű					Group size
EM2	ntext	measures	Division	Partitive		Single digit					unknown
	Concept/prope	Equal									
EM3	rty	measures	Division	Quotative							
			Addition/subtraction								
			with								
	Application/co	Equal	multiplication/divisio		Multi-digit x						
EM4	ntext	measures	n		multi-digit		2				Unknown total
											Number of
	Application/co	Equal	Multiplication and		Single digit x						groups
EM6	ntext	measures	Division		single digit		2				unknown
	Application/co	Equal			Single digit x						
EM8	ntext	measures	Multiplication		multi-digit		2				Unknown total
											Number of
	Application/co	Equal								Meaning of	groups
EM11	ntext	measures	Division	Quotative		Single digit				remainders	unknown
	Application/co	Equal			Single digit x						
EM12	ntext	measures	Multiplication		multi-digit						Unknown total
	Application/co	Equal			Multi-digit x						
EM13	ntext	measures	Multiplication		multi-digit		3				Unknown total
											Number of
	Application/co	Equal								Meaning of	groups
EM14	ntext	measures	Division	Quotative		Multi-dgit				remainders	unknown
			Addition/subtraction								
	/		with								
	Application/co	Equal	multiplication/divisio		Fraction/decim						
EM15	ntext	measures	n		als						Unknown total
	A	E avent				Frankland (d. 1					Number of
EMAG	Application/co	Equal	Distates	O		Fractions/deci				Meaning of	groups
EIVITO	ntext	measures	Division	Quotative		mais				remainders	unknown
			Addition/subtraction								
	Application /ca	Equal	with multiplication/divisio								
	Application/co	Equal		Quotativo		Dowors of ton					
	IIIEXL	medsures		Quotative		Fowers of ten					
	Application/co	Found			Multi-digit v						
EM18	ntevt	measures	Multiplication		multi-digit						Linknown total
	Intert	incusui es	manuprication		mana argit						Survivo Will LOUGI

 Image: Intersection
 Image: Intersection
 Image: Intersection
 Unknown total

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 Unknown total

Equal Groups (page 1 of 4)

Item Bank		Problem		Types of	Complexity of	Complexity of	Number of		Representatio		Problem
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	situations
504	Application/co		Multiplication and		Single digit x						More than one
EG1	ntext	Equal groups	Division	Quotative	multi-digit		2				situation
											Number of
500	Application/co			a		o				Meaning of	groups
EG2	ntext	Equal groups	Division	Quotative		Single digit				remainders	unknown
F 0 0	Application/co	Farral analysis			Single digit x		2				Linka sum total
EG3	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application /co										Number of
EC4	Application/co	Equal groups	Division	Quatativa		Single digit					groups
204	Application/co	Lquai gioups	DIVISION	Quotative	Single digit y	Single uigit					unknown
EG5	ntext	Faual groups	Multiplication		multi-digit		More than 2				Linknown total
205	Application/co	Equal groups	Marapheadon		Single digit v						Onknown totar
EG6	ntext	Found groups	Multiplication		single digit	G	More than 2				Unknown total
200	Concent/prope	Equal Broups	Marapheadon		Shighe digit	5	More than 2				on total
EG7	rty	Found groups	Multiplication						Equal groups		
201	Concent/prope	Equal Broups	Marapheadon		Single digit x				Equal Broups		
FG8	rty	Foual groups	Multiplication		single digit		2		Equal groups		
	Application/co	Equal Broups	marapheadon		Single digit x		_		Equal Broups		
EG9	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application/co	-4 8			Single digit x		_				
EG10	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application/co	1			Multi-digit x						
EG11	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application/co				Single digit x						
EG12	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application/co				Multi-digit x						
EG13	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application/co				Single digit x						
EG14	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
			Addition/subtraction								
			with								
	Application/co		multiplication/divisio		Single digit x						
EG15	ntext	Equal groups	n		single digit		2				Unknown total
	Application/co				Single digit x						
EG16	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
	Application/co				Multi-digit x					Doubling and	
EG17	ntext	Equal groups	Multiplication		multi-digit		2			halving	Unknown total
	Application/co				Multi-digit x						
EG18	ntext	Equal groups	Multiplication		multi-digit		2				Unknown total
			Addition/subtraction		1						
			with		1						
	Application/co		multiplication/divisio		Single digit x						
EG19	ntext	Equal groups	n		multi-digit		2	Distributive			Unknown total

Equal Group (page 2 of 4)

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

Equal Group (page 3 of 4)

										Number of
	Application/co									groups
EG41	ntext	Equal groups	Division	Quotative		Single digit				unknown
										Number of
	Application/co									groups
EG42	ntext	Equal groups	Division	Quotative		Multi-dgit				unknown
	Application/co									Group size
EG43	ntext	Equal groups	Division	Partitive		Single digit				unknown
	Application/co									Group size
EG44	ntext	Equal groups	Division	Partitive		Single digit				unknown
	Application/co									
EG45	ntext	Equal groups	Division	Partitive		Single digit				Unknown total
	Application/co									
EG46	ntext	Equal groups	Division	Partitive		Single digit				Unknown total
E C 47	Application/co	Facual analysis	Division	De utitione		Circular di site				Group size
EG47	mext	Equal groups	Addition/subtraction	Partitive		Single digit				unknown
			with							
	Application/co		multiplication/divisio		Single digit x					
EG49	ntext	Equal groups	n		single digit		2	Equal groups		Unknown total
		-4 8	Addition/subtraction				-	-4 8		
			with							Number of
	Application/co		multiplication/divisio							groups
EG50	ntext	Equal groups	n	Quotative		Single digit				unknown
										Number of
	Application/co									groups
EG51	ntext	Equal groups	Division	Quotative		Single digit				unknown
										Number of
	Application/co									groups
EG52	ntext	Equal groups	Division	Quotative		Single digit				unknown
5.050	Application/co				Single digit x					
EG53	ntext	Equal groups	Multiplication		single digit	ļ	2	 		Unknown total
E O E A	Application/co	Facual analysis			Single digit x					
EG04	mext	Equal groups	Addition (subtraction		single digit		3			UTIKITOWIT LOLAT
			with							Number of
	Application/co		multiplication/divisio						Meaning of	groups
EG55	ntext	Equal groups	n	Quotative		Single digit			remainders	unknown
				-						Number of
	Application/co									groups
EG56	ntext	Equal groups	Division	Quotative		Multi-dgit				unknown
	Application/co				Single digit x					
EG57	ntext	Equal groups	Multiplication		multi-digit		2			Unknown total
	Concept/prope				Single digit x				Multiples and	Unknown
EG58	rty	Equal groups	Multiplication		multi-digit		2		factors	product
	Application/co				Single digit x					
EG59	ntext	Equal groups	Multiplication		single digit	ļ	More than 2			Unknown total
						1	1			Number of
F.C.60	Application/co	Cause Language	Division	0		Davison of t	1			groups
EGOU	Intext	Equal groups	Division	Quotative	Cinglo d'etter	Powers of ten				unknown
EG 62	Application/co	Equal groups	Multiplication		single digit x	1	,			Unknown total
LG 02	mext	Equal groups	waraprication		single ulgit	I	2			Unknown total

Equal Groups (page 4 of 4)

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

Multiplicative Comparison

Item Bank		Problem		Types of	Complexity of	Complexity of	Number of		Representatio		Problem
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	situations
	Application/co	Multiplicative									
MCM1	ntext	comparison	Multiplication		Powers of ten		More than 2				Unknown total
	Application/co	Multiplicative	Multiplication and		Single digit x						Group size
MCM2	ntext	comparison	Division		single digit	Single digit	2				unknown
	Application/co	Multiplicative			Multi-digit x						
MCM3	ntext	comparison	Multiplication		multi-digit		2				Unknown total
1014	Application/co	Multiplicative			Single digit x						
MCM4	ntext	comparison	Multiplication		single digit		2				Unknown total
	Application/co	Multiplicativo									Number of
MCM5	ntext	comparison	Division		Powers of ten	Multi-dgit	2				unknown
momo		comparison	Bivision		r owers or ten	Marti ugit					Number of
	Application/co	Multiplicative									groups
MCM6	ntext	comparison	Division			Single digit	2				unknown
	Application/co	Multiplicative			Multi-digit x						
MCM7	ntext	comparison	Multiplication		multi-digit		2				Unknown total
	Application/co	Multiplicative									
MCM8	ntext	comparison	Multiplication		Base Ten		2				Unknown total
	Application/co	Multiplicative			Single digit x						
MCM11	ntext	comparison	Multiplication		single digit		2				Unknown total
	Application/co	Multiplicative									
MCM12	ntext	comparison									
MCM12	Application/co	Multiplicative	Division			Cinalo diait					Group size
	ntext	comparison	Division			Single digit					Unknown
	Application/co	Multiplicative									number of
MCM15	ntext	comparison	Division			Single digit					unknown
	Application/co	Multiplicative				ongre argre					Group size
MC16	ntext	change	Division			Single digit					unknown
						0 0					Number of
	Application/co	Multiplicative									groups
MC17	ntext	change	Division			Multi-dgit					unknown
	Application/co	Multiplicative			Single digit x						
MC18	ntext	change	Multiplication		multi-digit		2				Unknown total
	Application/co	Multiplicative			Single digit x						
MC19	ntext	change	Multiplication		single digit		2				Unknown total
											Number of
MC20	Application/co	Multiplicative	Division			Dowers of top					groups
IVIC20	ntext	change	DIVISION		-	Powers of ten					Number of
	Application/co	Multiplicative		1	1	1					groups
MC21	ntext	change	Division	1		Powers of ten					unknown
	Application/co	Multiplicative		<u> </u>							Group size
MC22	ntext	change	Division			Powers of ten					unknown

Patterns

Item Bank		Problem		Types of	Complexity of	Complexity of	Number of		Representatio		Problem
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	situations
	Application/co				Single digit x						
P1	ntext	Patterns	Multiplication		multi-digit						
			Addition/subtraction								
			with								
	Application/co		multiplication/divisio		Single digit x						
P2	ntext	Patterns	n		single digit						
	Application/co		Multiplication and		Multi-digit x						More than one
P3	ntext	Patterns	Division	Partitive	multi-digit	Single digit	2				situation
	Application/co		Multiplication and		Single digit x						More than one
P4	ntext	Patterns	Division	Partitive	multi-digit	Single digit	2				situation
	Application/co		Multiplication and		Single digit x					Context-	
P5	ntext	Patterns	Division		single digit					equation	
	Application/co		Multiplication and		Single digit x					Context-	
P6	ntext	Patterns	Division		multi-digit					equation	
											Number of
	Application/co										groups
P7	ntext	Patterns	Division	Quotative		Multi-dgit					unknown
	Application/co									Context-	
P8	ntext	Patterns	Division			Multi-dgit				equation	
	Application/co									Context-	
P9	ntext	Patterns	Division			Single digit				equation	
	Application/co									Context-	
P10	ntext	Patterns	Division			Multi-dgit				equation	
	Application/co		Multiplication and		Single digit x					Context-	
P11	ntext	Patterns	Division		single digit	Single digit				equation	
B 10	Application/co		Multiplication and		Single digit x					Context-	
P12	ntext	Patterns	Division		single digit	Single digit				equation	
			Addition/subtraction								
			with								
D12	Apprication/co	Dattarns	mutuprication/divisio								
FIJ	mext	Patterns	II Addition (subtraction								
			Addition/subtraction								
	Application/co		multiplication/divisio								
P14	ntext	Patterns	n								
	Application/co										
P15	ntext	Patterns	Multiplication		Powers of ten						
	Application/co				Fraction/decim						
P16	ntext	Patterns	Multiplication		als					Context -model	
<u> </u>	Application/co				Single digit ×						
P17	ntext	Patterns	Multiplication		single digit						

Rate

Item Bank		Problem		Types of	Complexity of	Complexity of	Number of		Representatio		
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	Problem situations
	Application/co										
R1	ntext	Rates	Multiplication								
	Application/co				Single digit x						
R2	ntext	Rates	Multiplication		multi-digit		2				Unknown total
	Application/co				Fraction/decim						
R3	ntext	Rates	Multiplication		als		2				Unknown total
	Application/co										
R4	ntext	Rates	Division			Single digit					Group size unknown
	Application/co										
R5	ntext	Rates	Division			Multi-dgit					Group size unknown
	Application/co										
R6	ntext	Rates	Division			Single digit					Group size unknown
	Application/co										Number of groups
R7	ntext	Rates	Division			Multi-dgit					unknown
Do	Application/co	Datas	Division			Cinal a diait					Number of groups
ко	ntext	Rates	DIVISION			Single digit					unknown
	Application/co										Number of groups
RQ	ntext	Rates	Division			Single digit					
	Application/co	nutes	Division		Multi-digit v	Single digit					
R10	ntext	Rates	Multiplication		multi-digit		2				Unknown total
	Application/co	nu tes	Marapheation		Single digit x		-				
R11	ntext	Rates	Multiplication		single digit		2				Unknown total
	Application/co										Number of groups
R12	ntext	Rates	Division			Multi-dgit					unknown
	Application/co				Multi-digit x	5					
R13	ntext	Rates	Multiplication		multi-digit		2				Unknown total
	Application/co										Number of groups
R14	ntext	Rates	Division			Multi-dgit					unknown
	Application/co										Number of groups
R15	ntext	Rates	Division			Multi-dgit					unknown
	Application/co				Single digit x						
R16	ntext	Rates	Multiplication		multi-digit		2				Unknown total
	Application/co										
R17	ntext	Rates	Division			Single digit	2				Group size unknown
	Application/co				Single digit x						
R18	ntext	Rates	Multiplication		multi-digit		2				Unknown total
	Application/co				Single digit x						
R19	ntext	Rates	Multiplication		single digit		2				Unknown total
Baa	Application/co	L .	L								
R20	ntext	Rates	Division			Singledigit					Group size unknown

Rectangular Area

Item Bank		Problem		Types of	Complexity of	Complexity of	Number of		Representatio		Problem
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	situations
	Application/co				Single digit x						
RA1	ntext	Area	Multiplication		multi-digit		2		Open area		
	Application/co				Single digit x					Context-	
RA2	ntext	Area	Multiplication		single digit		2			equation	
	Application/co				Single digit x					Context-	
RA3	ntext	Area	Multiplication		multi-digit		2		Open area	equation	
	Application/co				Single digit x						
RA4	ntext	Area	Multiplication		multi-digit		2				
	Application/co				Single digit x						
RA5	ntext	Area	Multiplication		multi-digit		More than 2		Area		
	Application/co				Single digit x						
RA6	ntext	Area	Multiplication		single digit		2		Area		
	Application/co				Single digit x						
RA10	ntext	Area	Multiplication		single digit		2		Area		
	Application/co										
RA12	ntext	Area	Division			Single digit					
			Addition/subtraction								
			with								
	Application/co		multiplication/divisio		Single digit x						
RA13	ntext	Area	n		multi-digit	Multi-dgit	2		Open area		
	Application/co									Context-	
RA14	ntext	Area	Division			Multi-dgit				equation	
	Application/co				Multi-digit x						
RA15	ntext	Area	Multiplication		multi-digit		2				
	Application/co				Single digit x						
RA16	ntext	Area	Multiplication		single digit		2		Area		
			Addition/subtraction								
			with								
	Application/co		multiplication/divisio		Multi-digit x						
RA17	ntext	Area	n		multi-digit		2		Open area		
			Addition/subtraction								
			with								
	Application/co		multiplication/divisio		Multi-digit x						
RA19	ntext	Area	n		multi-digit		2		Open area		
	Application/co									Context-	
RA20	ntext	Area	Division			Powers of ten			Open area	equation	
	Application/co		Multiplication and		Multi-digit x						
RA21	ntext	Area	Division		multi-digit		2		ļ		
1			Addition/subtraction								
			with						1		
	Application/co		multiplication/divisio		Fraction/decim				1		
RA22	ntext	Area	n		als		2		Open area		
	Application/co				Fraction/decim						
RA23	ntext	Area	Multiplication		als		2				

Measure Conversions (page 1 of 2)

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

Measure Conversions (page 2 of 2)

	Application/co	Measure		Single digit x			
MCV19	ntext	conversions	Multiplication	multi-digit		2	
	Application/co	Measure					
MCV20	ntext	conversions	Division		Single digit		
			Addition/subtraction				
			with				
	Application/co	Measure	multiplication/divisio	Single digit x			
MCV21	ntext	conversions	n	multi-digit	Single digit	2	
	Application/co	Measure		Fraction/decim	1		
MCV22	ntext	conversions	Multiplication	als		2	
			Addition/subtraction				
			with				
	Application/co	Measure	multiplication/divisio				
MCV23	ntext	conversions	n	Powers of ten		2	
			Addition/subtraction				
			with				
	Application/co	Measure	multiplication/divisio	Single digit x			
MCV24	ntext	conversions	n	single digit		2	
	Application/co	Measure	Multiplication and	Single digit x			
MCV25	ntext	conversions	Division	multi-digit	Powers of ten	2	
	Application/co	Measure		Single digit x			
MCV26	ntext	conversions	Multiplication	multi-digit		2	
			Addition/subtraction				
			with				
	Application/co	Measure	multiplication/divisio				
MCV27	ntext	conversions	n	Powers of ten		2	
			Addition/subtraction				
			with				
	Application/co	Measure	multiplication/divisio				
MCV28	ntext	conversions	n		Multi-dgit		
	Application/co	Measure		Single digit x			
MCV29	ntext	conversions	Multiplication	multi-digit		More than 2	
	Application/co	Measure					
MCV30	ntext	conversions	Multiplication	Powers of ten		More than 2	
	Application/co	Measure	Multiplication and				
MCV31	ntext	conversions	Division	 Powers of ten		More than 2	
	Application/co	Measure	Multiplication and	Multi-digit x			
MCV32	ntext	conversions	Division	multi-digit	Single digit		



Equations (page 1 of 2)

Item Bank	,	Problem		Types of	Complexity of	Complexity of	Number of		Representatio		Problem
ID	Problem Type	Contexts	Operation	Division	Factors	Divisors	factors	Properties	ns	Relationships	situations
E1	Concept/property	Equations	Multiplication		Powers of ten		2	Distributive		Model-equation	
					Single digit x						
E2	Concept/property	Equations	Multiplication		single digit		2		Arrays	Model-equation	Unknown total
					Single digit x						
E3	Concept/property	Equations	Multiplication		single digit		2	1			Unknown total
					Single digit x						
E4	Concept/property	Equations	Multiplication		multi-digit		2		Arrays	Addition-multiplication	Unknown total
					Single digit x						
E5	Concept/property	Equations	Multiplication		single digit					Addition-multiplication	Unknown total
50					Single digit x						
Eб	Concept/property	Equations	Multiplication		multi-digit		2			Context-equation	
Eo		Fauntings	Multiplication		Single digit x		Marathan 2			Madel equation	
EO		Equations	wuruprication		multi-digit		wore than 2			wodel-equation	
FQ	Concent/property	Faultions	Multiplication		single digit					Model-equation	
2.5	concept/property	Equations	Wataprication		Single digit x		2			Woder-equation	
F10	Concept/property	Equations	Multiplication		single digit					Context-equation	
2.0	concept, property	Equations	maraphearon		Single digit x					context equation	
E11	Concept/property	Equations	Multiplication		single digit		2			Context-equation	
		Equal									
E12	Concept/property	measures	Division	Partitive	Powers of ten	Single digit				Model-equation	
		Equal									
E13	Concept/property	measures	Division	Partitive	Powers of ten	Single digit				Model-equation	
											Group size
E14	Concept/property	Equations	Division	Partitive		Single digit				Context-equation	unknown
			Multiplication and								Group size
E16	Concept/property	Equations	Division							Context-equation	unknown
											Number of
F 4 7	Constant	E	Division	Questation		Circular di site				Contact constitut	groups
E17	Concept/property	Equations	Division	Quotative		Single digit				Context-equation	unknown
E10	Concont/property	Equations	Division			Single digit				Contact equation	
E 10	concept/property	Equations	DIVISION		-	Single uigit		1		context-equation	
E20	Concent/property	Faultions	Division			Single digit					
220	concept/property	Equations	Division			Single digit				context-equation	
E23	Concept/property	Equations	Multiplication							Model-equation	
E25	Concept/property	Equations	Multiplication		1	1		1	1		
	22ocp4 property										
E21	Concept/property	Equations	Division	Quotative		Single digit		1		Context-equation	

Equations (page 2 of 2)

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

Items by CCSSM Clusters (page 1 of 2)

				Equal	Mult.					
	Property	Equal Group	Volume	Measure	Comparison	Patterns	Rate	Area	Conversions	Equations
Grade 2 - Work with equal groups of objects		69,35,44								
										1,10,11,12,13
Crade 2 Benresent and salve multiplicative and division										,14,16,18,2,2
problems		1,10,12,14,16,19,30,31,32,33		2						0,21,23,25,3,
problems	1345691011	,4,0,7		2						4,3,0,8,9
Grade 3- understand properties and relationships between	,12,13,15,48,49,									
multiplication and division	50	3,36,37,8,15,7		3						
										1,10,11,12,13
Grade 2. Solve problems involving the 4 operations and		C2 15 22 2C 20 42 45 4C 40 5				1 11 12 12 14				,14,16,18,2,2
explain patterns in arithmetic		62,15,22,26,38,43,45,46,49,5 1 52 53 54 57 58 59				4 5 6				0,21,23,3,4,5,
		62,1,12,14,16,19,22,26,3,30,				,,,,,,,				0,0,5
Grade 3 - Use place value understanding and properties of		31,32,33,38,4,43,45,46,49,51		6,8,11,13,14,						
operations to perform multi-digit arithmetic		,52,53,54,57,58,59,6		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								16,10,12,3,4,		
multiplication and addition								5,6		
Grade 3 - Distinguish between area and perimeter										
		63,64,65,66,11,13,17,18,2,20					1,10,11,12,13			
Grade 4 - Use four operations with whole numbers to solve		,21,24,25,27,28,29,34,39,40,			16,17,18,19,1		,14,15,16,17,			17 20 21 22 2
problems		.72.73.74.75.9		11.13.14.18.4	2.3.4.5.6.7.8		4.5.6.7.8.9			3.34.36.37
Grade 4 - Gain familiarity with factors and multiples	34 35 43 44	, , , , ,								
	34, 33, 43, 44					10.17.3.7.8.9.				
						1,13,14,16,2,				
Grade 4- Generate and analyze patterns						3				
Grade 4 - Generalize place value understanding for multi-										
digit whole numbers	30,31,26,37,45					15				
	10 21 23 24 25 3	63,64,65,66,10,11,13,17,18,2								
Grade 4 - Use place value understanding and properties of	2.33.39.40.41.42	40.41.42.47.5.50.55.56.60.70								
operations to perform multi-digit arithmetic	,52,53	,71,72,73,74,75,9								
							1 10 11 12 12		10,11,12,13,14,15,	
				1			,14,15,16,17.	1,12,13,14.15	1,22,23,24,25,26.2	
Grade 4 - Solve problems involving measurement (area				1			18,19,2,20,3,	,17,19,2,20,2	7,28,29,3,30,31,32,	
and perimeter) and conversion from a larger to smaller unit				17			4,5,6,7,8,9	1,3,4,5,6	4,5,6,7,8,9	

Items by CCSSM Clusters (page 2 of 2)

				Equal	Mult.					
	Property	Equal Group	Volume	Measure	Comparison	Patterns	Rate	Area	Conversions	Equations
Consulta D. Marte mill annual annuna af abianta		60.05 M								
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	30,31,36,37,45,1 8,18,21					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, 16,17,18,19,2,20,2 1,22,23,24,25,26,2 7,28,29,3,30,31,32, 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							