

OVERVIEW Student Packets and Teacher Guide

Grades 6, 7, 8

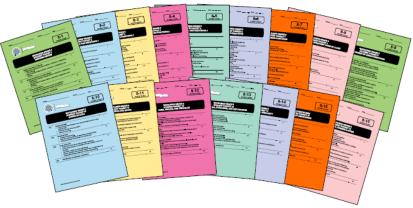
2015

MathLinks is a comprehensive middle school curriculum that was developed by math educators and mathematicians at the Center for Mathematics and Teaching (a non profit education group). Our team originated at UCLA and left in 2010 because we wanted to focus on creating curricular materials for CCSS-M and supporting teachers. Thank you your interest in our program.

In this session you will become familiar with the structure and some features of the *MathLinks* Student Packets *MathLinks* Teacher Guide

To help you more fully understand the program, extra commentary for each slide is located at the bottom of it.

Student materials for each grade level include:





- 16 Student Packets (SP)
- 2 Resource Guides (RG)
- Manipulatives (Grades 7, 8 only)

Students receive 16 consumable packets and two resource guides (one for the first part of the course, another for the second part of the course). SPs are NOT just a workbook. We consider lesson pages to be "structured workspace." Lesson plans and notes in the teacher packets (TP) of the Teacher's Guide provide suggestions for engaging students in discussions that promote active participation.

Student materials are boxed by semester in sets of 10.

Teacher Packs for each grade level include:





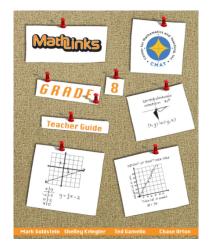
- Teacher Guide (TG)
- 16 Student Packets (SP)
- 2 Resource Guides (RG)
- Sample of Manipulatives (Grades 7, 8)

TEACHER PACKS come in a small box. All programs are set up the same way, with minor differences. For example, 6th grade contains no consumable manipulatives while 7th and 8th grade do. That's because we wanted to include essential manipulatives that may not be readily available at your school. Another difference is that 8th grade has no teaching note for "Itches" (See Teaching Note 5 in Grades 6 and 7). This note offers suggestions to motivate the lessons. We will be creating "itches" for 8th grade in the future.

We aimed for efficiency with Student Packets and Teacher Guides so that you can deliver high quality CCSS lessons without frivolous extras.

A Closer Look at the Teacher Guide

- Front
- Teacher Packets (Tab I)
- Assessment Information (Tab 2)
- Reproducibles (Tab 3)
- Tasks (Tab 4)
- Other Information (Tab 5)



There are 6 parts in the TG. Tab I includes Teacher Packets (color coded to match the SPs). Please see the annotated Grade 6, Teacher Packet II to learn more about its features. Some features of the other tabs follow here.



Front

- I6 packets/48 lessons
- Designed from ground up for coherence and efficiency
- Connections made between clusters and domains
- Content from earlier grades necessary for success with grade level work
- CCSS-M Standards cited

MATHLINKS: GRADE 6

(This Scope and Sequence is a <u>DRAFT</u>. The program will be available in Summer 2015.)

Packet	Lesson 1	Lesson 1 Lesson 2 Lesso				
1	Applying Properties of Arithmetic	Division with Remainder	Multiplication & Division: Standard Algorithms	4NBT.5, 6 5.NBT.2, 5, 6 6.NS.2		
2	Factors and Multiples	GCF and LCM	Numerical Expressions	6.NS4 6.EE.1, 2b, 3, 4		
3	Fraction Strips	Ordering Fractions on a Number Line	Renaming Fractions	3.NF1, 2, 3 4.NF.1, 2		
4	Fractions and Decimals	Decimal Place Value and Number Lines	Fraction, Decimal, and Percent Gardens	3.NF.3; 4.NF.6 5.NBT.1, 3ab 6.RP.3c		
5	Name Scores	Data Displays	Data Surveys	6.SP.1, 2, 3, 4, 5abcd		
6	Equivalent Fractions	Fraction Addition	Fraction Subtraction	4.NF.1, 2 5.NF.1, 2		
7	Fraction Multiplication	Fraction Division Concepts	Fraction Division Procedure	5.NF4ab, 6, 7abc 6.NS.1		
8	A Checking Account	Decimal Multiplication	Decimal Division	5.NBT.1, 2, 3a 5.NBT. 4-7 6.NS.2, 3		
9	Algebraic Expressions	Algebraic Equations	Inequalities	6.NS.3 6.EE.2abc, 3-8		
10	Order of Operations	Mental Equation Solving Strategies	Solving Equations with Fractions and Decimals	6.NS.3 6.EE.1, 2ab, 3-7		
11	Ratios	Rates	Proportional Reasoning Problems	6.RP.1, 2, 3ab		
12	Understanding Percentages	Linking Percent to Proportions	Measurement Conversions	6.RP.3cd		
13	Areas of Polygons	Surface Area	Volume	6.EE.2a, 4 6.G. 1, 2, 4		
14	Temperature and Number Lines	Opposites, Distance, and Absolute Value	Rational Numbers on the Number Line	6.NS.5, 6a, 7abcd		
15	Integers and the Coordinate Plane	Rational Numbers and the Coordinate Plane	Reflections in the Coordinat Plane	te 6.NS.6abc, 8 6.G.3		
16	Best Buy Problems	Saving for a Purchase	The Mixing Paint Problem	6.RP2, 3a 6.EE. 4, 6, 9 6.G.4		
	Ratios Proporti Relationshi	onal Expressions and Equations (EE)	Geometry (G)	Statistics and Probability (SP)		

The Front of the TG includes essential general information about the program. Pictured here is scope and sequence for the Grade 6 program. It appears in color in the MathLinks brochure and online, and in black and white in TG. These lessons comprehensively develop all grade level standards with focus, coherence, and rigor.



Front

- Manageable one year program (about 160 days)
- Majority of time spent on major clusters

DIFFERENTIATION THROUGH PACING

With MathLinks: Grade 6, ALL students have ample opportunities for success with challenging and interesting grade level mathematics, as ALL Grade 6 content standards and math practices are fully developed through the packets alone.

For students who enter the course with a solid background in Grade 5 CCSS-M mathematics, proficiency challenges and tasks will deepen their knowledge of grade level content. For students who have struggled in mathematics in the past, many lessons and skill builders include review of essential skills that will help them attain proficiency.

Three possible examples of how differentiation might occur are provided below. We encourage teachers to (1) adapt pacing and (2) select proficiency challenge questions and tasks that are appropriate for their students.

Packet (%) ¹	An	Plan A nodified program where students require substantial review.		Plan B A basic program where students require some review.	Plan C An enriched program where students require minimal review.					
1 (20%)		2 weeks Proficiency Challenge 1		1 week Proficiency Challenge 1, Task 2		1 week Proficiency Challenge 1, Tasks 1-2				
2 (33%)		2 weeks Task 4		2 weeks Proficiency Challenge 2, Task 3		2 weeks Proficiency Challenge 2, Tasks 3-5				
3 (0%)	(16 weeks)	2 weeks Task 6		1 week Proficiency Challenge 3, Task 6		0.5 week Proficiency Challenge 3, Task 6				
4 (33%)	(16 w	2 weeks Proficiency Challenge 4	1 week Proficiency Challenge 4 Proficiency Challenge 5, Task 8 1.5 weeks Proficiency Challenge 6 Proficiency Challenge 7		weeks)	0.5 week Proficiency Challenge 4, Task 7				
5 (10%)	Semester 1	2 weeks			(15.5 v	2 weeks Proficiency Challenge 5, Task 8				
6 (0%)	Seme	2 weeks Proficiency Challenge 6	ter 1 (1.5 weeks Proficiency Challenge 6	ter 1 (1 week Proficiency Challenge 6, Task 9				
7 (75%)		2 weeks	emes	2 weeks Proficiency Challenge 7	Semester 1	2.5 weeks Proficiency Challenge 7, Task 10				
8 (10%)		2 weeks Task 11	S	2 weeks Proficiency Challenge 8, Task 11	s	2 weeks Proficiency Challenge 8, Task 11				
9 (100%)		2 weeks Task 12		2 weeks Proficiency Challenge 9, Task 12		2 weeks Proficiency Challenge 9, Task 12				
10 (100%)		2 weeks		2 weeks Proficiency Challenge 10, Task 13		2 weeks Proficiency Challenge 10, Task 13				
11 (100%)	weeks)	2.5 weeks	(3.5 weeks Proficiency Challenge 11, Task 14	_	3.5 weeks Proficiency Challenge 11, Task 14				
12 (100%)	2 (16 w	2.5 weeks Task 15	veeks	3 weeks Proficiency Challenge 12, Task 15	weeks)	3.5 weeks Proficiency Challenge 12, Tasks 15				
13 (75%)	ster 2	2.5 weeks Task 18	2 (15.5 weeks)	3 weeks Proficiency Challenge 13, Task 19	(16.5 v	3.5 weeks Proficiency Challenge 13, Tasks 18-3				
14 (100%)	Semester	1.5 weeks		2 weeks Proficiency Challenge 14, Task 21	2	2 weeks Proficiency Challenge 14, Task 21				
15 (100%)		1.5 weeks Task 22	Semester	2 weeks Proficiency Challenge 15	Semester	2 weeks Proficiency Challenge 15, Tasks 22-				
16 (100%)		1.5 weeks	S	2 weeks Proficiency Challenge 16	S	2 weeks Proficiency Challenge 16, Tasks 24-2				

¹Approximate percent of the packet that addresses one or more major grade level standards.

The page is called "Differentiating Instruction" in grade 8, and "Differentiation Through Pacing" in grades 6 and 7. The left column shows the approximate percent of time spent on major clusters of CCSS-M in the packet. Then three possible pacing suggestions are given.

The basic difference in the three options is the amount of time spent on review material, and the amount of time then carved out for proficiency challenges (PC) and tasks. ALL students who complete PLAN A (all packets and an occasional PC or task) above will study all grade level standards and experience lots of concept development, skills practice to attain fluency, and applications . PCs and tasks deepen the study of that work.



Front

	Materials	Photo Copies
PACKET 5	[5 1, 5.2, 5.3] Positive Counters (red manipulative sheet) [5 1, 5.2, 5.3] (Vegar) [9 1, 5.2, 5.3] [1 1, 5.2, 5.3] (Vegar) [1 1, 5.3] (Vegar) [Outz 5A, 5B Profolency Challenge 5 Test Part 5 R2: Positive Counters (Red) [5,1,5,2,5,3] R1: Cupie (Gary) [5,1,5,2,5] R1: Cupie (Gary) [5,1,5,2,5] Task, Page 5: Create a Number Trick [5,2] R2, R3, and R1 are included for teacher convenience. These manipulatives are provided with the program.
PACKET 6	[6:1] Cupe and Counters [6:1] Baggies or envelopes for storage [6:2, 6:3] Calculators (optional) Each red and blue sheet (provided with the program) contains sufficient counters for 8 students.	Out 6A, 6B Profoency Challenge 6 Test Fart 6 Test Fart 6 Test Fart 6 Test Fart 6 Test Fast 6 Test Fast 7 Test, Page 6 Equations (5.1) Task, Page 6 Equations (5.1) Task, Page 6 Equations (5.3) R2, R3, R1 are included for fascher convenience. These manipulatives are provided with the program.
PACKET 7	(7.2) Millimeter ruler (7.2) Clear container with straight sides (7.2) Clear containers (ups (7.2) Small measuring cups (7.2) Water in containers (7.2) Paper towels	Quiz 7A, 7B Proficiency Challenge 7 Test Part 7 Task, Page 7: Functional Relationships? [7,1] Task, Page 8: Describing and Drawing Graphs [7,2]
PACKET 8	[8,1,8,2,8,3] Rulers [8,1] Graph paper (optional) [8,1] Graph paper (optional) [8,1] Linking cobes (optional) [8,2] Cups [8,2] Cups	Ouiz 8A, 8B Proficiency Challenge 8 Test Part 8 R8: Graph Paper [8,1] R14: Dot Paper [8,1] R15: Input-Output Game Template [8,2] Task, Pape 9: Staircase Slopes [8,1]

Quantity for 40 students 5 250 80 250 1 – 8 sets	Optional
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1 – 8 sets	X
hool warehouse. The li a student supply list. Quantity for 40 students	st estimate
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Quantity for 40 students 200 50 One Bag 1 flashlight 1 box 1 roll 1 small box 1 package	Optional
	40 students 40 4 reams 40 40 40 20 20

You will also find copy lists and shopping lists to help you organize your classroom.

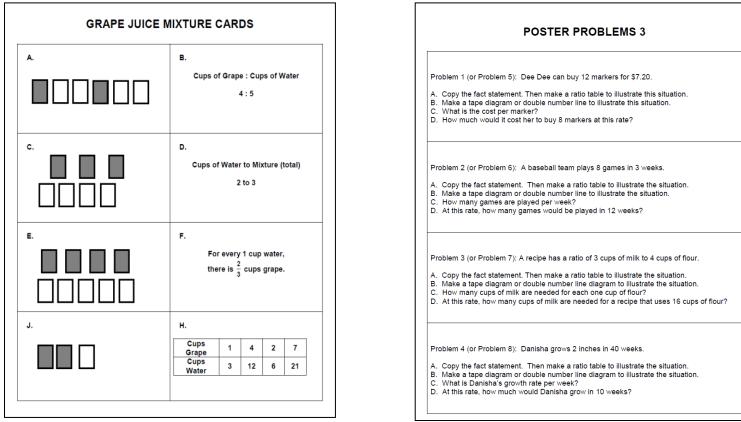
Tab 2: Assessment Information

- Details about variety of assessments and suggestions for using them.
- Every assessment item is correlated to the Standards.
- No assessment items expect knowledge above grade level.
- Assessments address DOK I-4.

		PACKET 11		
Problem Number	QUIZ AB	PROFICIENCY CHALLENGE	TEST	
1	6.RP.3a, 6.RP.1	MP8	6.RP.1	
2	6.RP.3a	MP8	6.RP.3a	
3	6.RP.3b	MP8	6.RP.3a	PERFIC
4	6.RP.3b	6.RP.3a	6.RP.3a, 6.RP.2	
5	6.RP.3b	6.RP.3a	6.RP.2, 6.RP.3b	
6	6.RP.2	6.EE.7	6.RP.3b .	GRANE & FRIE ASSESSMENT AL CORRAN DE ADARDES DELLES
7	6.RP.2, 6.RP.3b	MP1	6.RP.1, 6.RP.2, MP6	The second sec
8	6.RP.2			
				Least and a list of the cost of the cost of the list of the l

Tab 2 includes assessment information and itemized correlations to all quizzes, tests, and proficiency challenges. The actual assessments are in the assessment envelope that is shipped with the program. They are also available on the CMAT website through a password protected login.

Tab 3: Reproducibles



Reproducibles (R) support the lessons in a variety of ways as you will see when you flip through the section.

Here we show two R pages used for Grade 6, Packet 11. In groups, students sort Grape Juice Mixtures from "least grapey" to "most grapey". This concept development work leads to representing ratios with tape diagrams. Through Poster Problems, students work collaboratively to practice solving ratio and rate problems.

Tab 4: Tasks



Tab 4 contains at least one task to accompany each packet. Many are "performance task-like" in nature, some are more like "problems-of-the-week," and still others are more like projects. A chart at the beginning of the section shows how the tasks align to the Smarter Balance Claims.



Tab 5: Other Information

CORRELATION OF MATHLINKS: GRADE 6 COMPONENTS TO COMMON CORE STATE STANDARDS										
		Lessons	Quizzes	Proficiency Challenges	Tests	Tasks				
R	ATIOS AND PROPORTIONAL RELATIONSHIPS									
6.RP.A	Understand ratio concepts and use ratio reasoning to solve problems.									
6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."	11.1 11.2	11		11	14				
6.RP.2	Understand the concept of a unit rate <i>a/b</i> associated with a ratio <i>a:b</i> with <i>b</i> ≠0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."	11.2 11.3 16.2 16.3	11 16		11 16	25				

Tab 5 includes a document that correlates to all components of the program to the Common Core Standards.

Tab 5: Other Information

MATHLINKS: GRADE 7 TOPIC ANALYSIS BY PACKET

TOPIC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		-	-	-		-										
Ratio and Proportion																
Write ratios	R	R		R	R	E										
Compute unit rates				R	R	E	R		R				R			
Tables	R	R				R	R		R		R		R			R
Tape diagram						R	R		R							
Double number line						R	R		R			R				
Write, test, analyze proportional relationships						E		R			Е	R	R			R
Percent concepts (meaning of %; change						R				R	R					

This document shows when topics appear as emphasis or review in the program. Research shows that distributed practice is a more effective strategy for retaining information than massed practice (50 problems on a page to practice a skill, but it is not revisited). Carefully constructed lessons and skill builders offer ample opportunities for students to preview, practice, and review skills throughout the year.



To learn more, please check out:

A Student Packet (SP)

http://mathandteaching.org/CMAT/wp-content/uploads/2015/08/Gr-6-SP11-annotated.pdf

A Teacher Packet (TP)

http://mathandteaching.org/CMAT/wp-content/uploads/2015/08/Gr-6-TP11-annotated.pdf

on our website

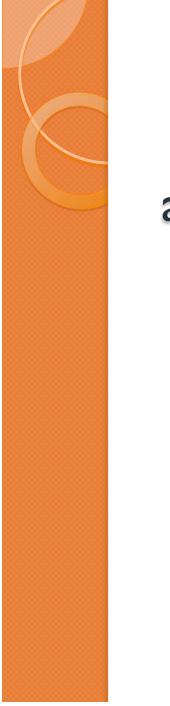
www.mathandteaching.org

Additional resources will be available online with a teacher login.

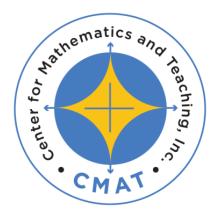
Check with your math coordinator or contact Cary Matthews (<u>cary@mathandteaching.org</u>)

for login information.





Thank you. We look forward to hearing from you.



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