FEATURES TO ENGAGE STUDENTS

At the Center for Mathematics and Teaching, we know that all students have the potential to achieve in mathematics, we believe that the development of mathematics should reflect the connectedness of Big Ideas into a coherent whole, and we aim to make mathematics inviting and inclusive to more students. Many features in the *MathLinks* program engage students in problems and routines that will help them experience success as they see the beauty and utility of mathematics. Some are located in the Student Packets while others are located under Packet Resources in the Teacher Portal.

The Student Packet (SP)	**Packet Resources in the Teacher Portal**
Features are embedded into: • Lessons • Practice (for the lessons) • Review (for the packet) • Spiral Review (for the program)	Features are located in: • Essential Skills (ES) • Math Talks (MT) • Nonroutine Problems (NP) • Tasks (T) • Projects (P) • Technology Activities (TA)

KINESTHETIC ACTIVITIES

Building conceptual understanding is at the heart of every *MathLinks* Core course, and many lessons employ kinesthetic methods to engage students and attain this goal. For Grade 6, here are some exemplars.

- Packet 1 (Geometry): Multiple pieces of 8×5-inch paper allow for making solids for which volumes can be explored and compared. Volumes formulas for cylinders, cones, and spheres are developed by using physical models or technology. And a cardboard toilet paper roll, followed by a card sort activity, sheds insight into angle measures and relationships.

- Packet 2 (Geometry): A triangle “cut-up-proof” is at the heart of justifying the famous Pythagorean theorem.

- Packet 3 (Expressions and Equations): Folding a piece of paper, and keeping track of the sections created, provides a pattern that gives meaning to the fact that a number to the zero power is equal to one.

- Packet 4 (Expressions and Equations): A fun board game/puzzle sets the stage for collecting data and generalizing patterns using algebra.

- Packet 6 (Statistics and Probability): A stacking cups investigation leads to imperfect data and the need to look at patterns of association that can be represented by lines of best fit and their equations.

- Packet 7 (Expressions and Equations): Using positive and negative integer counters with cups to represent unknowns sets the stage for manipulating expressions and solving equations with variables on both sides.

- Packets 9 / 10 (Geometry): Students use patty paper to explore rigid motions and arrive at the definitions of congruence and similarity. Included also is a rubber band experiment that helps students make sense of dilations.

TECHNOLOGY ACTIVITIES

MathLinks promotes the use of technology for exploration of concepts, but the program is not technology driven. All *MathLinks* Technology Activities (TA) are open source and available to all. We have partnered with mathematics technology leaders like Desmos and Geogebra to align many of their meaningful activities directly to our lessons. Many technology activities come with a *MathLinks* worksheet as a companion to the technology activity to facilitate deeper thinking and connect it to a *MathLinks* lesson. TA are located under Packet Resources in the Teacher Portal.

ACTIVITY ROUTINES

Activity Routines are recurring features in *MathLinks*, designed to engage students in problem solving and practice. Detailed instructions for each Activity Routine, along with introductory sample activities can be found under General Resources in the Teacher Portal. We recommend that teachers use these samples to establish classroom norms and procedures for the activities.

Activity Routines – Grade 8	**Packet / Domain**									
	1 G	**2 NS**	**3 EE**	**4 F**	**5 F**	**6 SP**	**7 EE**	**8 EE**	**9 G**	**10 G**
Big Square Puzzles		ES[1]	SP NP[1]		ES[1]		SP	SP NP[1]		
Four in a Row	ES	ES NP	ES	ES	ES	ES	ES		c	
Match and Compare Sorts	SP		SP			SP			o	s
Math Talks	MT	MT	MT	MT	MT	MT	MT	MT	m	o
Open Middle Problems	ES	ES	ES NP	NP	SP NP	NP	SP NP	SP ES NP	i	o
Poster Problems	SP	SP	SP	SP	SP	SP	SP	SP	n	n
Why Doesn't It Belong?		SP	SP	SP			SP		g	
Alge-Grid: What's the *a*?		SP		SP		SP		SP		
READY-X	SP		SP		SP		SP			
Using the *MathLinks* Rubric	SP T	SP T	SP T	SP T	SP T	SP T	SP T	SP T		

[1]These Big Square Puzzle are each in the form of a "Big Triangle."

PUZZLES, GAMES, AND CARD SORTS

Puzzles, games, and card sorts add variety and promote student interaction as students develop skills and practice concepts. These activities frequently include a reproducible.

Packet	Puzzles	Games	Card Sorts
1 (G)	A Big Puzzle (SP) READY-X (SP)	Four in a Row (ES)	Angles (SP) Angle Facts Related to Triangles (SP) Match and Compare Sort (SP) Angles Match (ES)
2 (NS/G)	Alge-Grid: What's the *a*? (SP) Big Triangle Puzzle (ES)	Four in a Row (ES) [2 games] 2-Step Equation Challenge (ES) Four in a Row (NP)	Lengths and Areas (SP) Sort and Match (SP)
3 (EE)	READY-X (SP)	Exponent Challenge 1 (ES) Four in a Row (ES) Exponent Challenge 2 (NP) A "Powerful" Big Triangle Puzzle (NP)	Big and Small Jigsaw (SP) Match and Compare Sort (SP)
4 (F)	Slides and Jumps (SP) Alge-Grid: What's the *a*? (SP)	Battling Ships (ES) Four in a Row (ES)	$y = 3x + 4$ (SP)
5 (F)	READY-X (SP)	Big Triangle Puzzle (ES) Four in a Row (ES) Linear Function Memory (NP) Create Your Own Linear Function Memory Game (P)	Matching Activity (SP) Proportion Sort (ES)
6 (SP)	Alge-Grid: What's the *a*? (SP)	Four in a Row (ES)	Match and Compare Sort (SP) Fighting Stereotypes (SP) Slope Sort (ES)
7 (EE)	Big Square Puzzle READY-X (SP) Balance Scale Puzzles (ES) Shapes Puzzles (NP) Systems of Equations Maze (NP)	Expression Game (ES) 2-Step Equations Challenge (ES) Four in a Row (ES)	
8 (EE)	Number Tricks (SP) Big Square Puzzle (SP) Alge-Grid: What's the *a*? (SP) A Rational Number Maze (ES) Mystery Values (ES) Big Triangle Puzzle (NP)	Play it Positively or Negatively (SP) Rational Number Challenge (ES) Simplifying Expressions Challenge (ES)	Sorting Systems of Equations (NP) Get a Club (NP)
9 (G)	Coming soon	Coming soon	Coming soon
10 (G)	Coming soon	Coming soon	Coming soon

REAL LIFE AND MATHEMATICAL PROBLEMS

Real life and mathematical problems provide natural opportunities to work on the Standards for Mathematical Practice in the context of grade level mathematics. These problems sometimes create a need to know, and sometimes provide opportunities to apply math concepts to meaningful and interesting work. Many problems are located in the Student Packet. Problems are also located in Packet Resources. Look for a note on the Answer Key when "Using the *MathLinks* Rubric," is an appropriate feedback or assessment enhancement.

Packet	Student Packet (SP)	Packet Resources in the Teacher Portal Essential Skills (ES) Tasks (T) Nonroutine Problems (NP) Projects (P)
1 (G)	Paper Solids* A Coin Problem Ice Cream Cones	Canned Fruit (NP) All About Angles (T) Packaging Problems (T) Shapes in Our World (T)
2 (NS/G)	Rectangle Paradox* Trying Triangles The Club and the Box	Sports and Hobbies (NP) Trying Triangles (T)
3 (EE)	Folding Paper* What in the World?* A Gut Feeling *	Pay it Forward (T) Create a Comic Strip (T)
4 (F)	Slides and Jumps* The Pool Problem Saving vs. Spending To School and Back Home The Bath Graph The Rollercoaster	Step by Step (T) Growing Squares (T)
5 (F)	The Rope Investigation * Rectangle Paradox: A Fresh Look *	Saving Money (T) Parallel Linear Functions (T)
6 (SP)	Stacking Cups* Education* Obesity* Two Way Frequency Tables* Curfews and Chores Fighting Stereotypes	Dance Fundraiser (ES) Grades or Popularity? (NP) Phone Battery (T) Vitruvian Man (T)
7 (EE)	100-Mile Walking Challenge Saving for a Skateboard (Practice 3) Going to the Park	The Algebra Machines (T) Soccer Club Orders (T)
8 (EE)	Training for a Marathon Watering Cans Talia's Coin Jar	Working Out (T)
9 (G)	Coming soon	Coming soon
10 (G)	Coming soon	Coming soon

*Extensions or followups are included in the packet or program.