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 (Statistics and Probability): Physical coins, number cubes, and spinners lead to data collection, data displays, and developing important probability concepts.
- Packets 4 / Packet 5 (Number Sense): Manipulating positive and negative integer counters lead to the collection of empirical evidence to form the rules for operating on integers. This is extended to all rational numbers by further exploration on number lines and using patterns.
- Packets 6 / 7 (Expressions and Equations): Combining the positive and negative integer counters with cups to represent unknowns sets the stage for manipulating expressions and solving equations.
- Packet 8 (Geometry): Several geometric investigations require the use or various tools throughout the packet. Tearing corners off of triangles and quadrilaterals leads to an understanding about the sum of the angles of these polygons. Students use protractors with straightedges and also technology to draw figures with specific characteristics and properties, and then further the exploration by building polygons with “sticks” of various lengths. And then students explore cross sections of solids using either physical models or technology.
- Packet 9 (Geometry): Students use circular objects and measuring tools to discover pi and develop the circle circumference formula. Manipulating the wedges cut from a paper circle leads to the circle area formula.
- Packet 10 (Statistics and Probability): Students solidify statistics concepts, specifically about data collection and sampling to estimate a population, by performing a hands-on “fishing” simulation.

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 7	Packet / Domain									
	1 SP	**2 RP**	**3 RP**	**4 NS**	**5 NS**	**6 EE**	**7 EE**	**8 G**	**9 G**	**10 SP**
Big Square Puzzles	ES SP	ES				NP[1]	SP NP[1]			
Fluency Challenge: Math Path	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
Four in a Row	ES	ES	ES	ES NP	ES	ES NP	ES NP	ES	ES	ES
Match and Compare Sorts	SP		SP					SP	SP	SP
Math Talks	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT
Open Middle Problems	ES	ES	ES	ES NP	SP ES	ES	SP ES	ES	NP	ES
Poster Problems	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
Why Doesn't It Belong?	SP	SP				SP	SP	SP[2]		
Using the *MathLinks* Rubric	SP T	SP T	SP T	SP T	SP T	SP T	SP T	SP T	SP T	SP T

[1]These Big Square Puzzles are each in the form of a "Big Triangle."
[2]Embedded in a slide deck.

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 (SP)	Spinner Puzzles (SP, ES, NR) Big Square Puzzle (SP) Fluency: Math Path (SP)	Race to the Top (SP) Flip and Roll (SP) The Terminator (SP) Four in a Row (ES)	Will it Happen? (SP) Match and Compare Sort (SP) Spinner Puzzles (NR)
2 (RP)	Fluency: Math Path (SP)	Four in a Row (ES) Tic-Tac-Toe (ES)	Percent Increase and Decrease (SP) Matching Scale Drawings of Triangles and Squares (SP) Match 'em Up (ES) Percent Applications (NP)
3 (RP)	Fluency: Math Path (SP)	Four in a Row (ES)	Matching Activity: Nuts (SP) Match and Compare Sort (SP)
4 (NS)	Practice 3 Practice 4 Big Square Puzzles (SP) Fluency: Math Path (SP)	Integer Battle (SP) Integer Showdown (ES) Four in a Row (ES) Summing Squares (NP) Four in a Row (NP)	
5 (NS)	Practice 5 (SP) Fluency: Math Path (SP) Order of Operations Puzzles (ES)	Four in a Row (ES)	
6 (EE)	Fluency: Math Path (SP)	Expression Game (SP) Four in a Row (ES) Battling Ships (ES) Big Triangle Puzzle (NP) Four in a Row (NP) Simplifying Expressions Challenge (NP)	Expression Card Sort (SP)
7 (EE)	Hundred Chart Puzzle(SP) Big Square Puzzle (SP) Fluency: Math Path (SP) Big Square Puzzle (NP)	Four in a Row (ES) Four in a Row (NP) 2-Step Equations Challenge	
8 (G)	Fluency: Math Path (SP) Who Am I? (ES)	Four in a Row (ES)	Match and Compare Sort (SP)
9 (G)	Fluency: Math Path (SP)	Four in a Row (ES)	Match 'Em Up (SP) Area Challenge (SP) Match and Compare Sort (SP)
10 (SP)	Fluency: Math Path (SP)	Four in a Row (ES)	Match and Compare Sort (SP)

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. 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 (SP)	Race to the Top* A Coin Flip Experiment A Spinner Experiment* Flip and Roll The Terminator* The Cereal Box Simulation	Fair or Unfair? (T) Strange Spinners (T) Design a Game (P) Intransitive Spinners Game (P)
2 (RP)	Using Coupons* The Birdhouse* A Floor Plan Sports Playing Surfaces	Drawn to Scale (NP) Savings (T) A Flag Project (P)
3 (RP)	Length and Area Patterns Twinkie the Dog* Practice 2 (Amusement Park) Capt'n Sherman's Shrimp Shop* Practice 3 (Fruity Fizzy Water) Jenna's Cornbread, Practice 6	Protein Drinks (NP) T-Shirts (T) Bubble Teas (P)
4 (NS)	Mortimer's Magic Cubes* A Zero-Sum Game	Fixing the Pipe (T) Create an Integers Operation Game (P)
5 (NS)	More of Mr. Mortimer's Magic* Practice 2	Integer Card Game (T)
6 (EE)	Crossing the Lake* How Many on the Border* What Comes Next?* Trousers for Sale	Rectangle Reasoning (T)
7 (EE)	Joan's Phones	Hanging Pictures (T) Reasoning About Solutions (T) Create your own Four in a Row (Equations) Game! (P)
8 (G)	Tear it Up Practice 2 Polygon Investigations	Paperfolding Polygons (T) A Pattern Block Protractor (P) Fruity Cross-Sections (P)
9(G)	Felix the Sheep* Penny Drop Probabilities Dart Board Probabilities Birdhouse Revisited* Practice 6	The Flag of Finland (NP) A Cube Pattern (NP) The American Flag (T) Pitching Pennies (T)
10 (SP)	Screen Time* Math Score Samples* Estimating Fish Populations Practice 4 (Fish Lengths)	School Lunch Survey (ES) Interpreting Data (NP) Fishy Lengths (NP) 400 Meter Freestyle Times* (NP) Investigating Box Plots (T) A Fishing Competition

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