

Keys of the Universe

Mathematics - Materials Price List

Caveats: This is not entirely a complete comparison, because both companies do not sell all the same materials. And you might purchase the least expensive of any given option at each one of them. I also have not calculated if you bought all available at one and filled in with the other. Consider this: some of this you will find cheaper used; or you can indeed make it yourself.

	<i>Alison</i>	<i>IFIT</i>	<i>Keys/other</i>
I. Introduction			
<i>Story of Numbers</i>	8 Charts		<i>Printable</i>
II. Early Work - Numeration			
<i>Wooden Hierarchical Material</i>	<i>wood materials</i>	350	<i>patterns/ideas</i>
	<i>number cards</i>	---	<i>printable</i>
<i>Large Bead Frame: Introduction</i>	<i>large bead frame</i>	20.00	21.00
<i>Exercises I-IV</i>	<i>frame paper</i>		<i>printable</i>
<i>Commutative & Distributive Laws</i>	<i>decanomial bead bar box</i>	85.00	84.00
	<i>number box**</i>		<i>printable</i>
<i>Multiples</i>	<i>bead cabinet</i>	153*	280
<i>Least Common Multiples</i>			+240
<i>Factors</i>	<i>arrows in boxes</i>	61.60	38.00
<i>Last Steps of LCM to Abstraction</i>	<i>Tables A, B, C, E</i>		<i>printable</i>
<i>Divisibility: by 2, 5, 25</i>	<i>pegboard & pegs</i>	60.00	88.00
	<i>thin strips of cardstock</i>		<i>hardware store</i>
	<i>golden beads</i>		<i>golf tees</i>
		\$60**	
		749.60	811.00
Cabinet currently not listed on Alisons.			
III. Operations			
<i>Long Multiplication</i>			
<i>Large Bead Frame</i>	<i>large bead frame</i>	---	---
<i>Bank Game – buy/make as set – or make</i>	<i>Bank Game</i>	30.00	19.00
<i>gray/colored to match golden bead cards size</i>	<i>flat bead frame</i>	18.00	16.00
<i>Flat Bead Frame – cut own strips of paper</i>	<i>checkerboard</i>	63.00	44.00
<i>Checker Board: Exercises 1 & 2</i>	<i>bead bars</i>	<i>deca</i>	<i>deca</i>
<i>Geometrical Form of Multiplication</i>	<i>Racks/Tubes</i>	145	88.00
<i>Category Multiplication</i>	<i>Stamp Game</i>	35.00	24.00
<i>Long Division</i>	<i>circles fractions</i>	---	---
<i>Distributive Division with Racks/Tubes</i>			
<i>Group Division</i>			
<i>Group Division & Word Problems w/ Fractions</i>			
		291.00	191.00

IV. Squares and Cubes of Numbers

Prerequisites to Squares and Cubes of Numbers	bead cabinet	---	---	
Notation of Squares	prepared labels			printable
Notation of Cubes	bead bars	(deca)	(deca)	
Games 1-3	division skittles	---	---	
Game 4: Decanomial Square				
Paper Decanomial				
Sums Using Squares and Cubes				

V. Fractions

Notes on Fraction Charts	21 charts			printable
Introduction to Fractions	fraction circles	125	85	
	black strips	w/stds	w/stds	
Equivalence of Fractions	prepared labels			printable
Simple Operations	Add'l pieces 1-10	50.00	35.00	printable
Add & Subtract Fraction w/Diff Denom	Practice Problems			printable
Exercises Leading to Abstraction of Above	green skittles	---	---	
Multiplication of a Fraction by a Fraction	prepared problems			printable
Division by a Fraction	transparencies*			
	division fraction skittles	60.00	39.00	
		235.00	159.00	

VI. Decimal Fractions

Quantity – pull beads from racks/tubes	decimal cubes	55.00	26.00	
Symbol Linked to Quantity	#s bank game	---	---	
Formation and Reading of Quantities	#s w/cubes	---	---	
Operations	propeller			Printable
Conversion of Common Fractions to Decimal	push-pin			
Effects of Mult/Div Numbers by Powers of 10	decimal board	---*	9.00	
Multiply Decimal Fraction by Dec Fraction	king symbol			
Introduction to the Decimal Checkerboard	black frame	24*	14.00	
Decimal Checkerboard	felt squares			printable
Relative Size of Terms in Mult Problem	Decimal Checkerboard	36.00	40.00	
Relative Size of Numbers When Dividing	Number Box	---	---	
Division of a Dec Fraction by a Dec Fraction	Bead Bars 1-9	<u>deca</u>	<u>deca</u>	
Leading to Abstraction of Mult of Dec Frac				
Division of a Decimal Fraction on Paper				
		115.00	89.00	

Black frame = "Centesimal circle and Protractor" ---- Alison's is green.

Alison's sells decimal board with pieces for 55; IFIT sells them separate for 26 and 9.

VII. Squaring and Cubing

Squaring	bead squares	cabinet	cabinet	
Transformation of a Square, Ex 1-6	rubber bands			
Passing From One Square to Another	paper square of 10			<i>printable</i>
Squaring a Sum	bead squares	cabinet	cabinet	
Squaring with a Hierarchical Value	bead bars	deca	deca	
Cubing	golden beads	---	---	
Passing From One Cube to Another	gold bead cards	---	---	
Cubing a Binomial	pegboard/pegs	---	---	
Cubing a Trinomial	wood cube material	450	290.00	
Cubing a Quadrinomial	+ binomial cube	40.50	23.00	
Cubing a Trinomial w/ Numerical Value	prepared labels			<i>printable</i>
The Story of the Three Kings	trinomial cube	59.50	34.00	
Cubing a Number with Decimal Value	prepared labels			<i>printable</i>
Square Roots – could use portion of pegboard	"hierarchical			
Introduction to the Concept	trinomial (aka	54.00	34.00	
Exercises 1-4	algebraic/arithmetic)"			
Backtracking	3 Kings prep tickets			<i>printable</i>
Passages to Abstraction	Square roots board	22.50	19.00	
Special Cases	units from div tubes	---		
Recap of Square Roots	golden bead material	---		
Rule for the Extraction of Square Roots	hierarchical guides		9.00	<i>printable</i>
Cube Roots	N Charts (2)			<i>printable</i>
Concept	box of 1cm cubes	30.00		
Larger Numbers	wood cube material	---	---	
Exercise 1: Next Digit and Backtracking				
Exercise 2: 3-Digit Roots				
Exercise 3: Passage to Abstraction				
Recap of Cube Roots				
Rule for the Extraction of Cube Roots				
		656.90	409.00	

VIII. Other Topics

Signed Numbers	negative snake game	*	\$59.00	
Negative Snake Game	power of 2 cube	40.50	23.00	
Operations	box 1cm cubes	---	*	
Powers of Numbers	number box	---	---	
Powers of 2	wood cube material	---	---	
Powers of 3				
Combination Of Powers of Two/Three	Non-decimal base board	*	*	
Powers of 10	gold beads	---	---	
Operations – Exponential Notation	bead cabinet	---	---	
Expanded Power Notation	receipt tape			
Operations Using Expanded Power	operation finger charts			Printable
Other Number Bases	decanomial bead bars	---	---	
Numeration (Introduction)	number box	---	---	
Operations	cups			
Conversion				
Ratio and Proportion	Prepared envelopes w/ tickets			printable
Introduction to Ratio				
Problem Solving Using Ratio				
Ratios and Fractions	prepared cards			printable
More Problem-Solving with Ratios				
Proportion				
Word Problems				
Introduction to Word Problems				
Introductory Word Problems				
Distance/Velocity/Time: Sensorial				
Distance/Velocity/Time: Arith Level				
Distance/Velocity/Time: Algebraic				
Principal/Interest/Rate/Time: Sensorial				
Princ/Interest/Rate/Time: Arith/Alg				
Introduction to Algebra				
Introductory Algebra				
Balancing an Equation				
Solving for an Unknown in an				
Equation				
Algebra Word Problems				
Solving for Two Unknowns				
			40.50	82.00

I did not see the Negative Snake Game at Alison's.

I did not see the 1cm cubes at IFIT.

Draw the non-decimal bases on your posterboard or cardboard – this is NOT the one available for sale!

Remedial Mathematics

Introduction to Remediation

Numbers 1-10

Decimal System – Quantity

Decimal System - Symbol

Formation of Numbers with
Beads and Cards

Collective Exercises: Operations

Memorization of Tables

Teen Beads and Boards: 11-19

Ten Beads and Boards: 11-99

Final Notes on Remediation

- *Bead bars – if the child is not yet counting to 10 OR cannot yet write the numerals. Pull the bead bars from the Decanomial Bead Bar Box. (need for elementary)*
- *Golden beads (45 units and tens, 45 wooden hundreds and 9 wooden thousands) – need for elementary anyway*
- *Teens and Tens boards (can be made on paper for the purposes of remediation), with beads from the Decanomial Bead Bar Box and golden units – but if you have them for another primary child, then use the regular ones.*
- *Stamp Game (need for elementary)*
- *Geometry materials: cabinet, solids, geometric solids – need for elementary geometry*

Teens/Tens Boards: 64.80	Teens/Tens Boards: 50.00	printables available soon
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64.80

50.00

Contents of Operations Box (also called Number Box or Box of Numbers):

- Gray number cards 1-9, 0 (at least 5 sets)
 - White number cards 1-9, 0 (at least 5 sets)
 - Operation symbols
 - Decimal points
 - Parenthesis – 8 sets
 - Blank tickets
-

Printable = available in the album or at Garden of Francis or at Keys online support

"---" = listed above – use the same material

Assume: graphite pencil, colored pencils, paper, graph paper in a variety of sizes, ruler

Transparencies: could be laminating pouch sealed together; overhead transparency, page protector, etc.

IFIT Notes:

Golden beads:

If you don't need the trays and cups, purchase the following:

- 9 Wooden Cubes: \$24
- 45 Wood Hundreds: \$26
- 45 Ten Bars: \$11
- 45 Units: \$1.50
- (if you buy the bead cabinet material from here, pull a beaded cube and beaded hundred from the bead cabinet for needed presentations; otherwise, add 1 beaded cube and 1 beaded square --- beaded cube is \$25; set of 9 beaded hundreds is \$26).
- You'll need to add your choice of number cards as well; or cut your own cardstock and make your own. (printable on Keys of the Universe)

Alison Notes:

- With the golden beads, verify which decimal cards and sizes you are getting; consider printing your own.

IFIT = \$1791

Missing: Hierarchical material, 1cm cubes, decimal cards

Alison = \$2152.80

Missing: Negative Snake Game, golden beads, decimal cards, bead cabinet itself

PRIMARY OVERLAP	Alisons	IFIT	Keys
Large Bead Frame	20.00	21.00	(paper)
Decanomial bead bar box	85.00	84.00	
Bead cabinet, beads, arrows	153.00 (beads)	280 (beads)	
	61.60 (arrows)	240 (display)	
		38.00 (arrows)	
Division racks/tubes	145.00	88.00	
Stamp Game	35.00	24.00	
Circle Fractions	125.00 (w/stds)	85.00 (w/stds)	
Binomial Cube	40.50	23.00	
Trinomial Cube	54.00	34.00	
Negative Snake Game (use portions for Addition and Subtraction in primary)	(don't see it)	59.00	
TOTAL TO <MAYBE> SUBTRACT	\$719.10	\$976.00	

Mathematics Materials List

Main Materials – it is best to read the album page while preparing or purchasing the materials, so that details do not have to be repeated here and you can immediately see what each piece will be used for when considering alternates:

- Golden bead materials – 45 units, 45 tens, 45 hundreds, 9 thousands (no more)
- Decanomial bead bar box (bars 1-10, 55 of each bar) –
 - At-home: some presentations need just a few more bead bars – you could make the 4-7 extra with pony beads or connected Legos
 - ideal for classes: add bead bar box of 1-10 with a smaller quantity
- Box of bead bars 1-9 (schools may want 2-5 of these; homes do not need it at all)
- Box of number cards: white set with 1-9, 0, gray set with same (3 copies of each #)
 - Could be same box with operation signs and dots for decimal points
 - Another section for blank tickets and pencil
 - Classrooms need 3+ boxes
 - Could store some parentheses in here
 - A tacklebox is ideal
- Prepared tickets for various operations
- 8 sets of parenthesis (cut from cardstock)
- 3 sets of small decimal system cards, 1 – 3000, stored on a tray/basket¹
- Pegboard (30 by 30 ideal; 25 x 30 if that is all that is available)
- Box of hierarchical pegs (green, red, blue – could be cut down golf pegs)
- Tables A, B, C, E (on paper for children to use)
- Wooden hierarchical material and corresponding number cards (used in early work and in Powers of 10 later) – this is the material that goes to millions
- Large bead frame
 - Large/long notation paper for the large bead frame
- Complete bead material (bead cabinet: long/short chains, squares, cubes, labels)
- Bank Game card material (colored background; black font – NO beads)
- Checkerboard for Multiplication
- Flat bead frame
- Rulers in various styles
- Fraction circle insets (1-10)

¹ Small decimal cards could be the same ones that the children used in primary; each number is stored together (all three ones together, all three twos together)

- Stamp game
- Racks and Tubes (division)
- box labeled "squares of numbers" (usually homemade)
- Packet of 10 envelopes with the decanomials representing the decanomial square (homemade)
- box of extra fraction pieces (wholes through tenths – equivalent of 10 wholes in each fraction – on red material is best)
- 4 Cards with prepared fraction operations - simple (can repeat from primary)
- Fraction division skittles (whole, half, third, fourth)
- 2 transparencies: rectangular – one with 4 rectangles (lines drawn long side to long side), one with 3 (lines drawn from short side to short side) - homemade
- Packets of prepared fraction labels
- 4 cards with more complex fractions operations (one for each operation)
- Black frame with 0-100 marked around the inner circle (similar to Montessori protractor (geometry use) which is 0-360)
- felt 3" squares: green, red, blue, light green, pink, light blue
- Decimal Checkerboard
- Additional green unit skittles (if a classroom)
- Decimal Board (yellow board)
- Decimal Fraction material (cubes, number cards, black decimal points)
- Wooden cubing material – wood cube of each number, with 27+ wood squares for each number 1-10 – the beaded cubes cannot replace this material
- Binomial Cube
- Trinomial Cube
- set of prepared tickets in a box labeled " $(a+b)^3$ $(a+b+c)^3$ "
- 2 sets of prepared tickets in box labeled "Three Kings"
- Printed paper square of 10
- Square Root Pegboard (15 holes by 15 holes)
- N/N₃ Chart
- Box of plain wood 1 cm cubes (could use set from geometry)
- Hierarchical Trinomial Cube
- Elementary Negative Snake Game (should include box of grey 10-bars)
- Power of Two Cube

- An envelope marked "velocity" containing printed tickets
- An envelope marked "interest" containing printed tickets
- Non-Decimal Base Board - homemade
- 4 Arithmetic table finger charts (non-decimal bases) – these are the working charts from the primary level
- a piece of card divided into twelve equal strips, with small cards: pick & shovel

Other Materials:

- Large red felt mat (additional 10+ felt mats any color for classroom use)
- Large blank paper or posterboard for child-made charts
- Envelopes in varying sizes
- Sets of blank tickets in a container – may need 2-3 for a classroom
- Paper/pencil, colored pencils
- Graph paper – various sized squares from $\frac{1}{4}$ " to 1"
- Long thin strips of cardboard ($\frac{1}{4}$ – $\frac{1}{3}$ inch wide by about 11 inches long)
- Thin, narrow strips (2 inches by 11 inches long)
- Strips of paper (10.25 x 1.25 inches or so)
- Marker (such as a clear glass pebble or pretty stone or piece of glass)
- Index cards
- Additional transparencies for children to make their own fraction division pieces
- Small thin black strips (fraction lines)
- Symbol for a king (crown is ideal – fits on the decimal board unit space)
- Container with colored rubber bands
- Colored discs (one each: green, blue, red) – could pull from stamp game
- two plastic cups with a line of black tape or marker across each one
- Roll of adding machine tape

Charts:

- History of mathematics charts
- Fraction charts (homemade)

Other Resources to Have on Hand:

- <http://livingmath.net> for additional resources – perfect for cosmic education
- *Life of Fred* books can be interesting to this age and into middle/high school
- *Math Dictionary for Kids: The Essential Guide to Math Terms, Strategies, and Tables* (straight-forward, no-nonsense, illustrated)