



Math Magic Concept Lab: Master the Foundations



★ **PR** – Pattern Recognition & Number Sense ★ **OP** – Structures (ST)

★ **OP** – Operations & Mathematical Choices (OP) ★ **FR** – Fractions, Ratios & Proportions (FR)

Concept Lab Item	Domain Code	Why This Fits
Patterns	PR	Foundational pattern recognition before operations or structure

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Multiplication	OP	Core operation that creates groups
Division (Inverse of Multiplication)	OP	Undoing / reversing an operation
Inverse (Opposites)	OP	Operational undoing (prepares for integers later)
Identity Property (Multiplication)	OP	Rule governing how an operation behaves
Operation	OP	Meta-concept about choosing actions

Concept Lab item	Domain Code	Why This Fits
Prime Numbers	ST	Describes number structure, not an operation
Prime Factorization	ST	Breaking numbers into structural building blocks
Multiples (2, 4, 6, 8, 10)	ST	Repeating structure formed by grouping
Factors	ST	Structural components of numbers
Greatest Common Factor	ST	Shared structure across numbers
Least Common Multiple	ST	Coordinating repeating structures

Concept Lab item	Domain Code	Why This Fits
Proportion	FR	Relationship between quantities
Ratio	FR	Comparison relationship
Equivalent Fractions	FR	Same relationship, different representation
Cross Product	FR	Operation used to analyze proportional relationships

Flexible; neuroscience-aligned entry points to core concepts.

[Math Magic Concept Lab — Grid]

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🔍 Patterns	PR	Foundational pattern recognition before operations or structure
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因子 Factors	ST	Structural components of numbers
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✖ Multiplication	OP	Core operation that creates groups
➗ Division (Inverse of Multiplication)	OP	Undoing / reversing an operation
⌚ Inverse (Opposites)	OP	Operational undoing (prepares for integers later)
⌚ Identity Property (Multiplication)	OP	Rule governing how an operation behaves
⌚ Operation	OP	Meta-concept about choosing actions
🧩 Mathematical Expression	EX	Representation of thinking, not action yet
🔟 Exponents	EX	Repeated multiplication expressed symbolically
✓ Square Root	ST	Structural inverse of squaring
⚖️ Proportion	FR	Relationship between quantities
⌚ Ratio	FR	Comparison relationship
⌚ Equivalent Fractions	FR	Same relationship, different representation
⌚ Cross Product	FR	Operation <i>used</i> to analyze proportional relationships

✓ What This Confirms (Important)

Each item cleanly answers one question:

- **PR** → “Do you see the pattern?”
- **OP** → “What action is happening?”
- **ST** → “How is this number built or organized?”
- **FR** → “How do quantities relate?”

- EX → “How do we *represent* thinking?”

That's a **coherent math ontology**, not just a list of topics.