

BRICK-BY-BRICK NUMERACY

LEGO BRAILLE BRICKS
series



AMERICAN
PRINTING
HOUSE



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Collaborators

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- Library Associate
- Retired Teacher of Students with Visual Impairments

Objectives

- Identify 5 Holistic Skills that children develop during play which is critical to learning.
- Identify 5 Characteristics of Playful Learning Experiences.
- Observe students engaged in play-based learning activities using LEGO Braille Bricks.
- Discriminate 3 types of pre-braille activities: manipulation, orientation, and constellation.



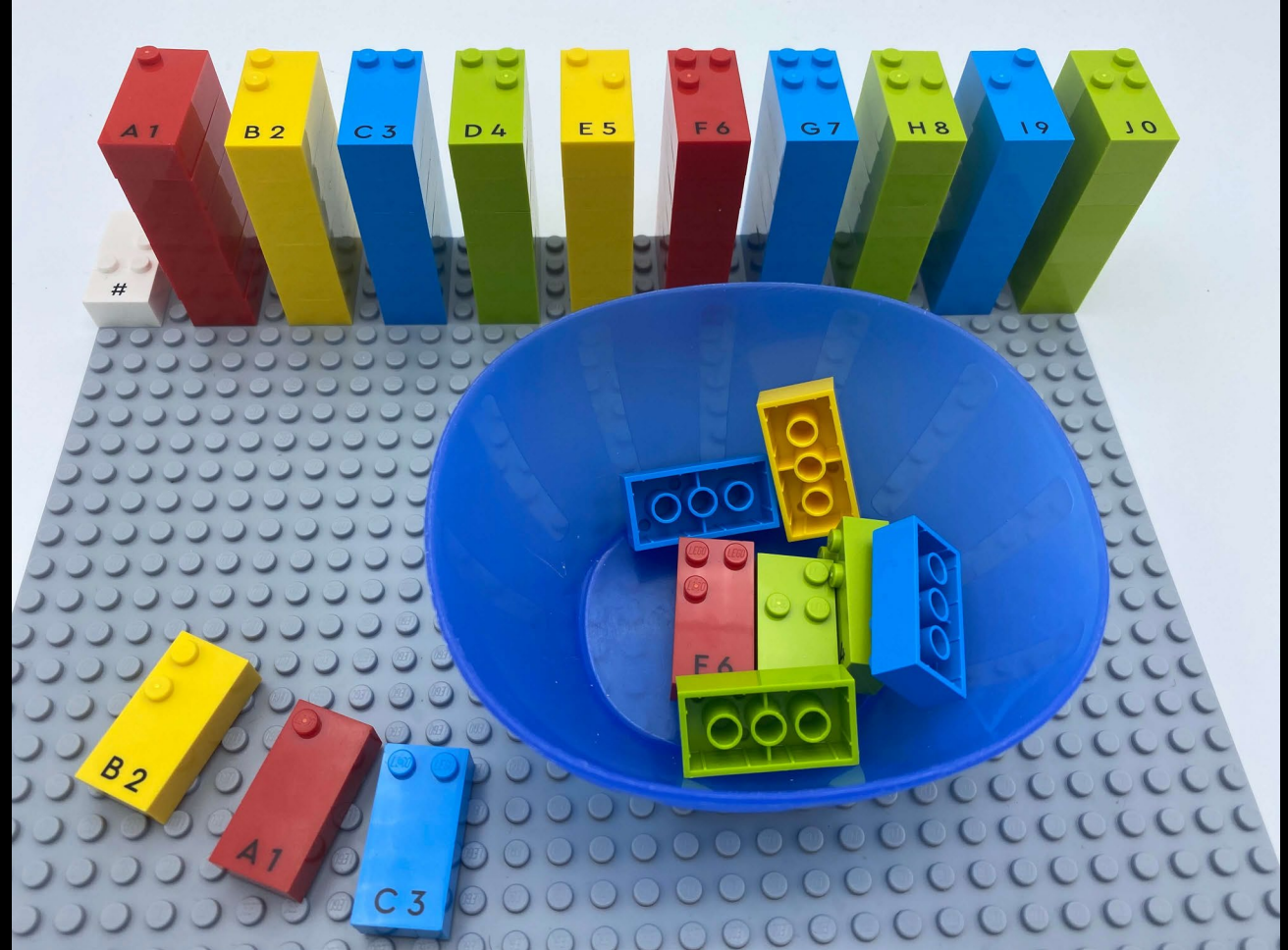


HOLISTIC SKILLS AND NUMERACY



Numeracy Definition

The ability to use, interpret, and communicate mathematical information to solve real-world problems.



Cognitive and Creative

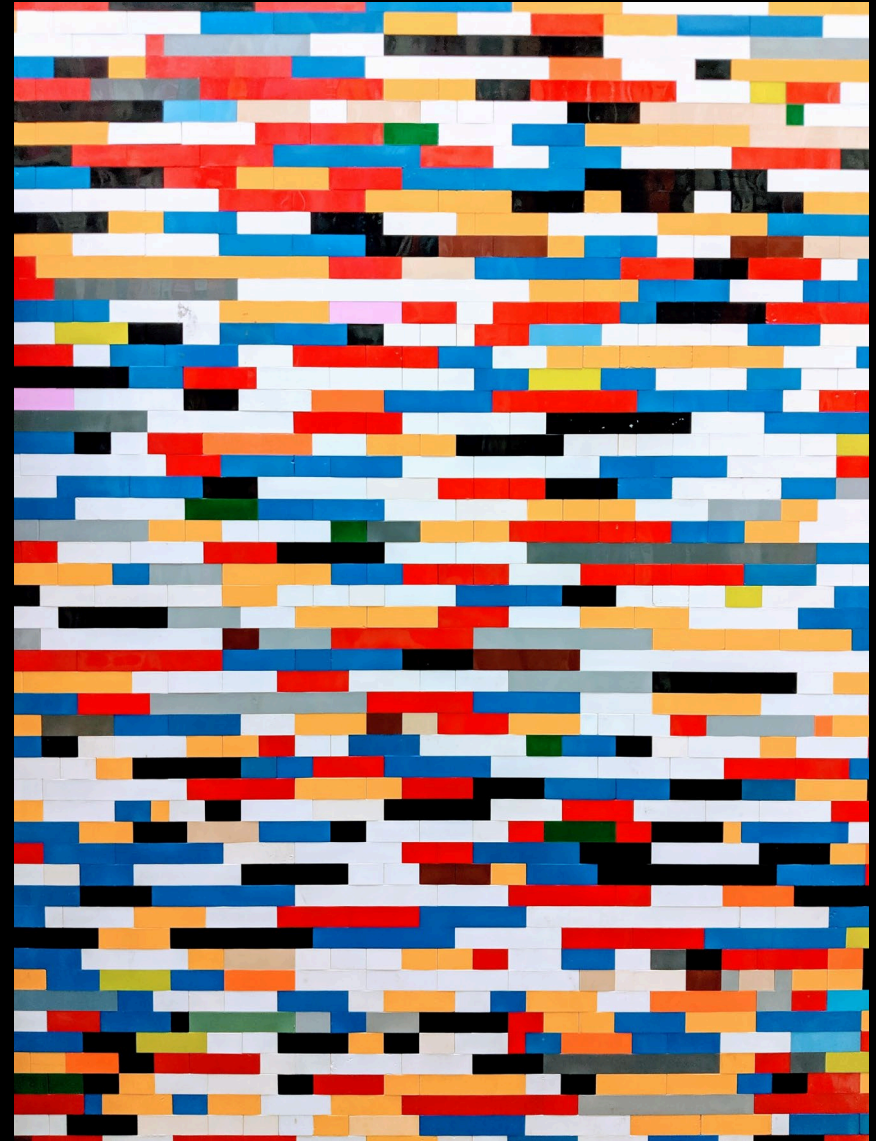
- Concentration
- Problem solving
- Working memory
- Flexible thinking

- Expressing new ideas
- Exploring possibilities
- Identifying solutions



Physical

- Exercise mind and body
- Understand movement
- Understand space



Social and Emotional

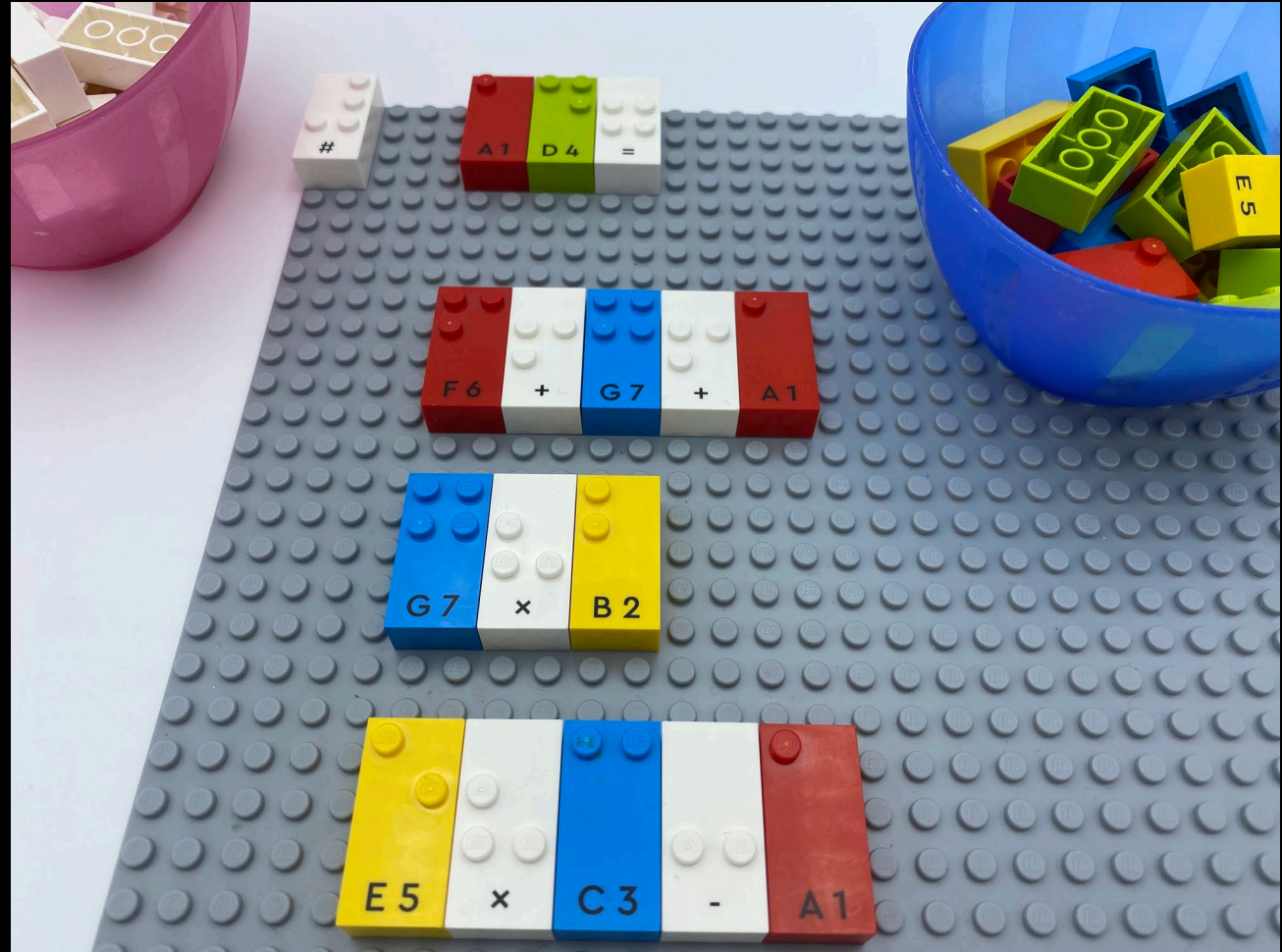
- Collaboration
- Communication
- Perspective-taking
- Sharing ideas
- Negotiating rules

- Understand emotions
- Manage emotions
- Express emotions
- Staying motivated
- Handling impulses



Standards

- Number & Operations
- Algebra
- Geometry
- Measurement
- Data Analysis & Probability





PLAYFUL LEARNING EXPERIENCES AND NUMERACY

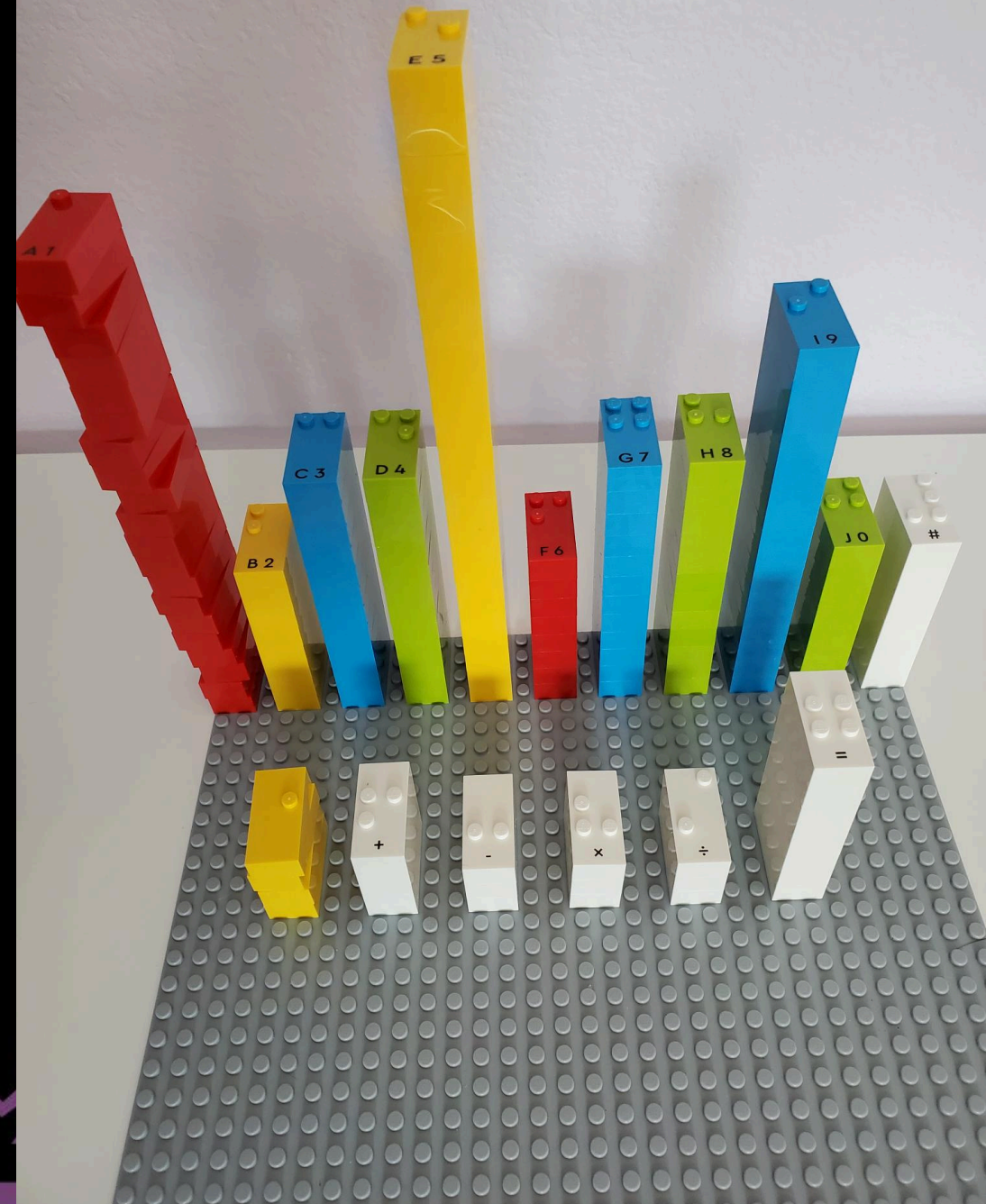


Ordering Numbers



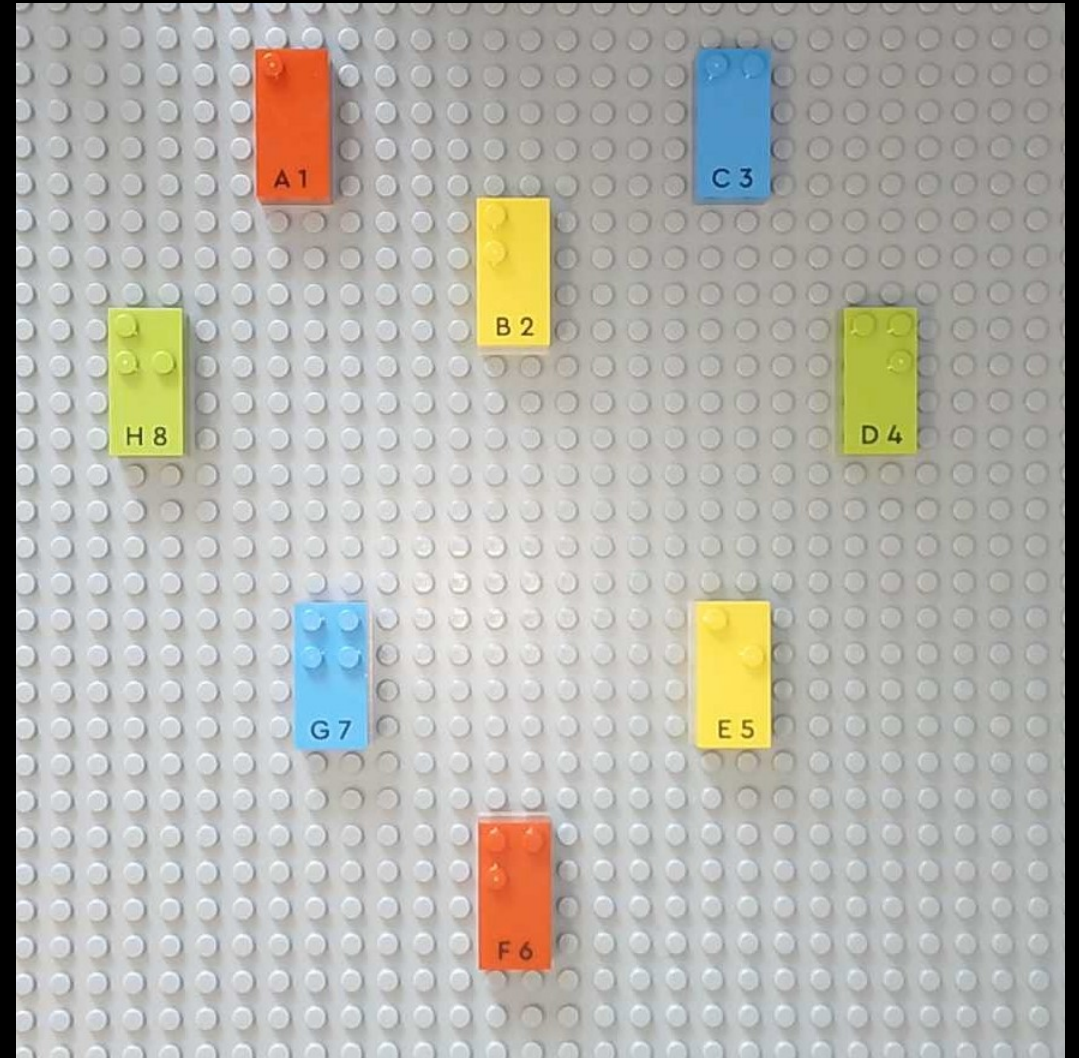
Numeracy Braille Bricks

- 5 has 24 bricks
- 1 has 20 bricks
- 9 has 16 bricks
- 3, 4, 7, 8 have 12 bricks
- 0, 2, 6, #, =, and dot 5 prefix have 8 bricks
- +, -, x, ÷ have 4 bricks



Early Numeracy

- Learn through patterns
- Build block towers
- Connect the dots



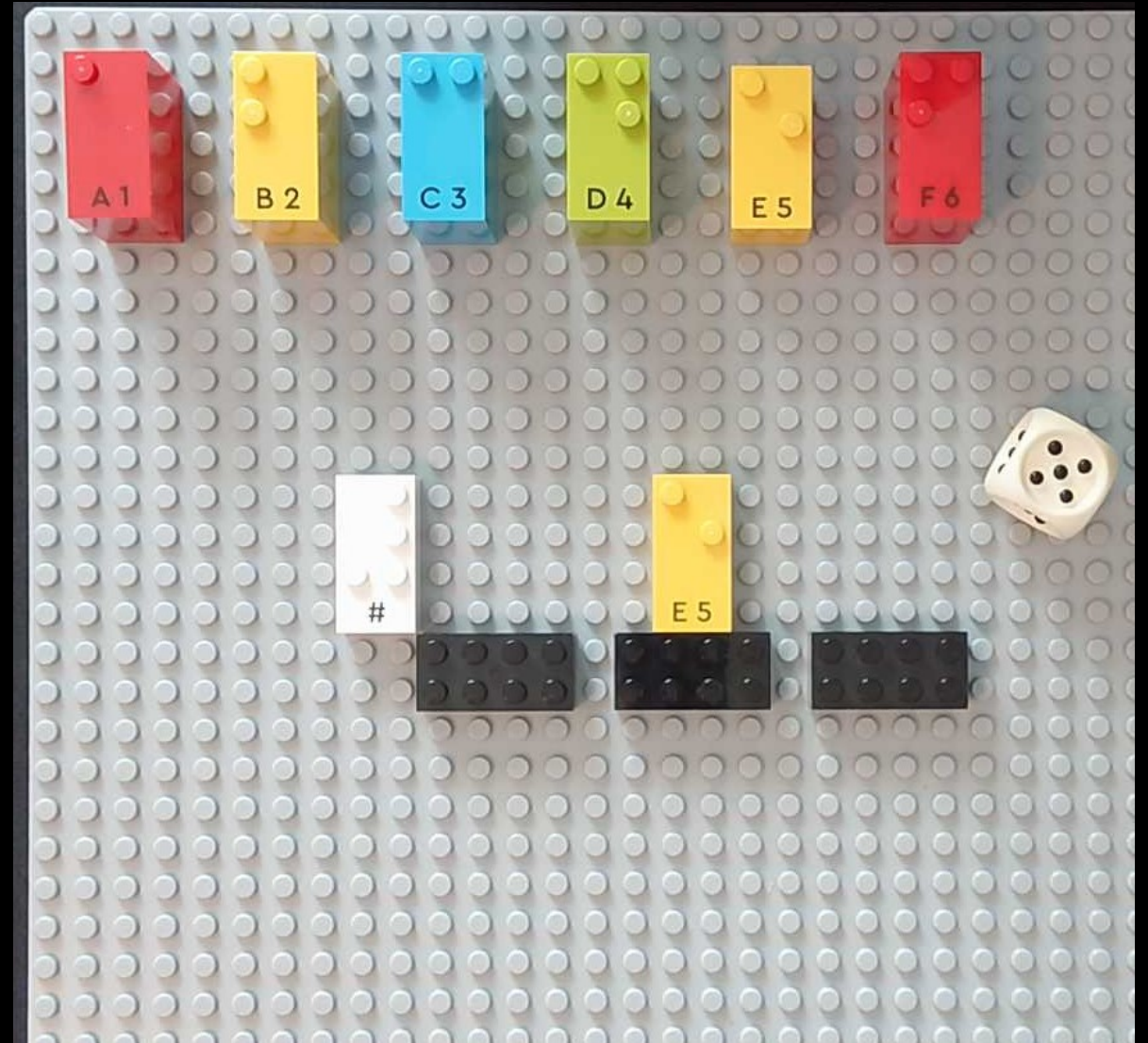


PLAY-BASED LEARNING ACTIVITIES



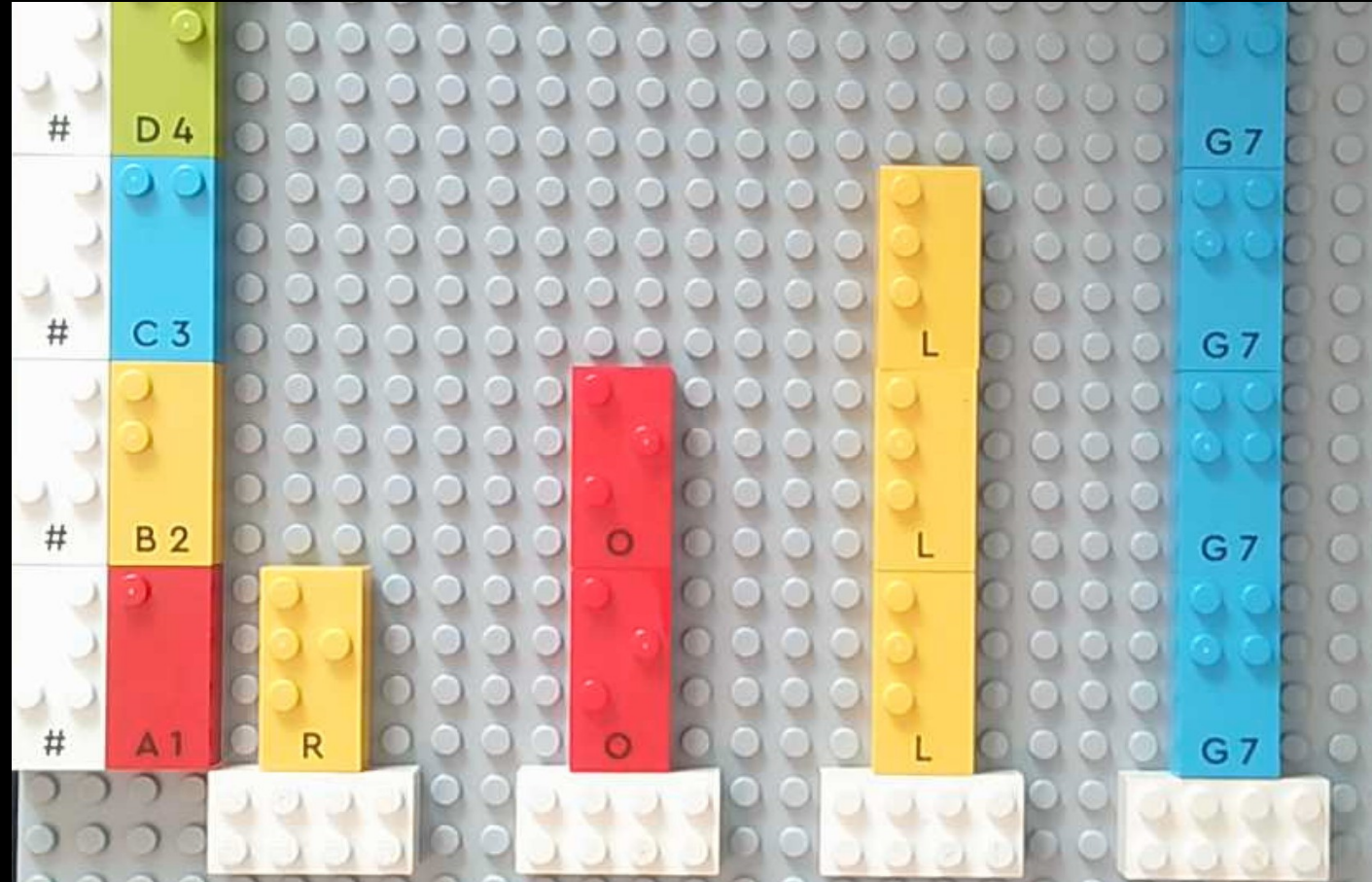
Number Builders

- Materials
 - ✓ Pair of dice
 - ✓ 2 base plates
 - ✓ 2 # bricks
 - ✓ Six each of 1-6
 - ✓ 6 traditional bricks



Sweet Math

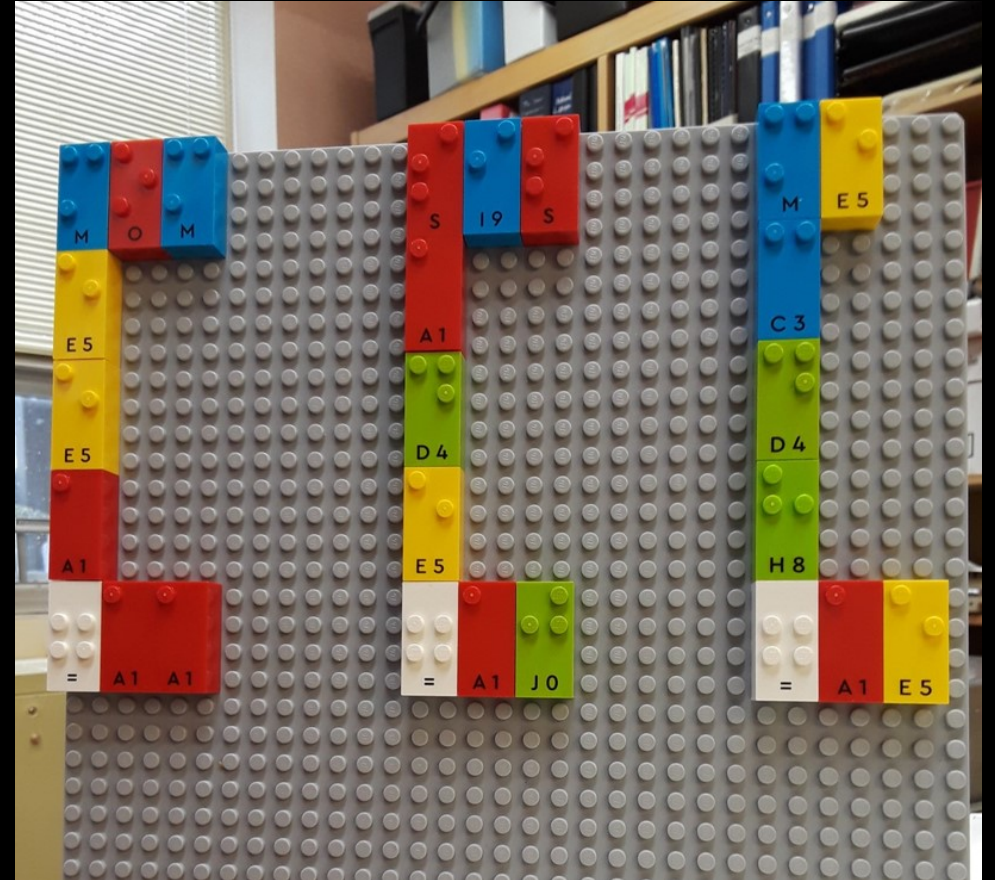
- Materials
 - Package of Runtts or Jujufruits (no more than 7 of each)
 - 1-7 bricks
 - 7 # bricks
 - 2 bowls
 - 5 traditional bricks
 - 7 bricks of 5 different letters



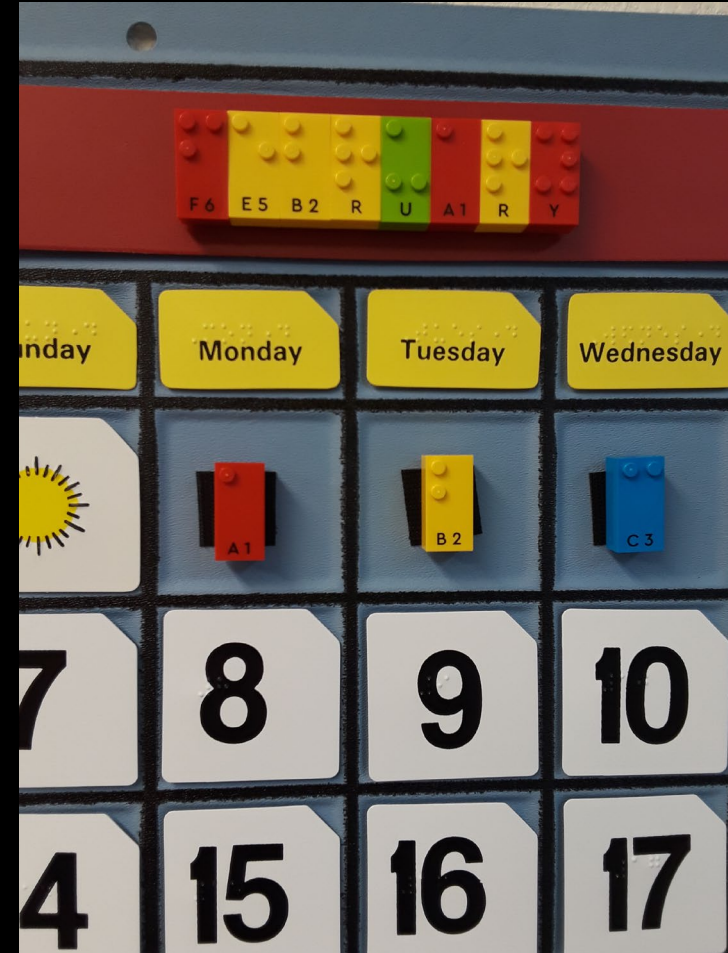
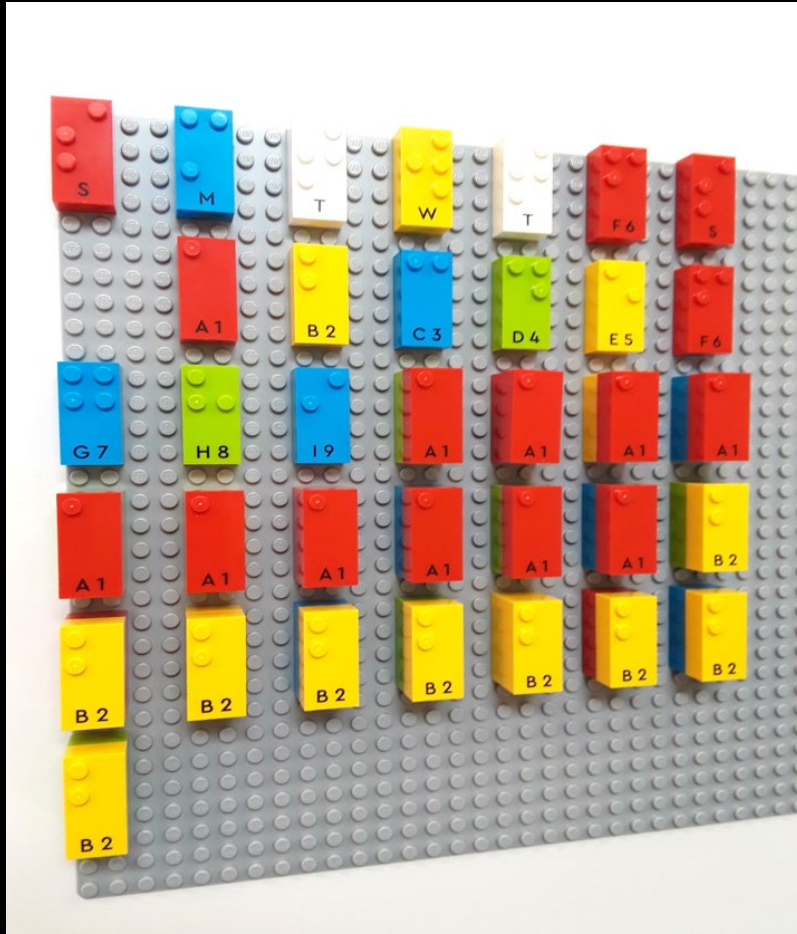
Scoring Card for Games

- Rolling dice
- Rock, paper, scissors
- Go Fish
- Nim

photo courtesy: Gina Carr



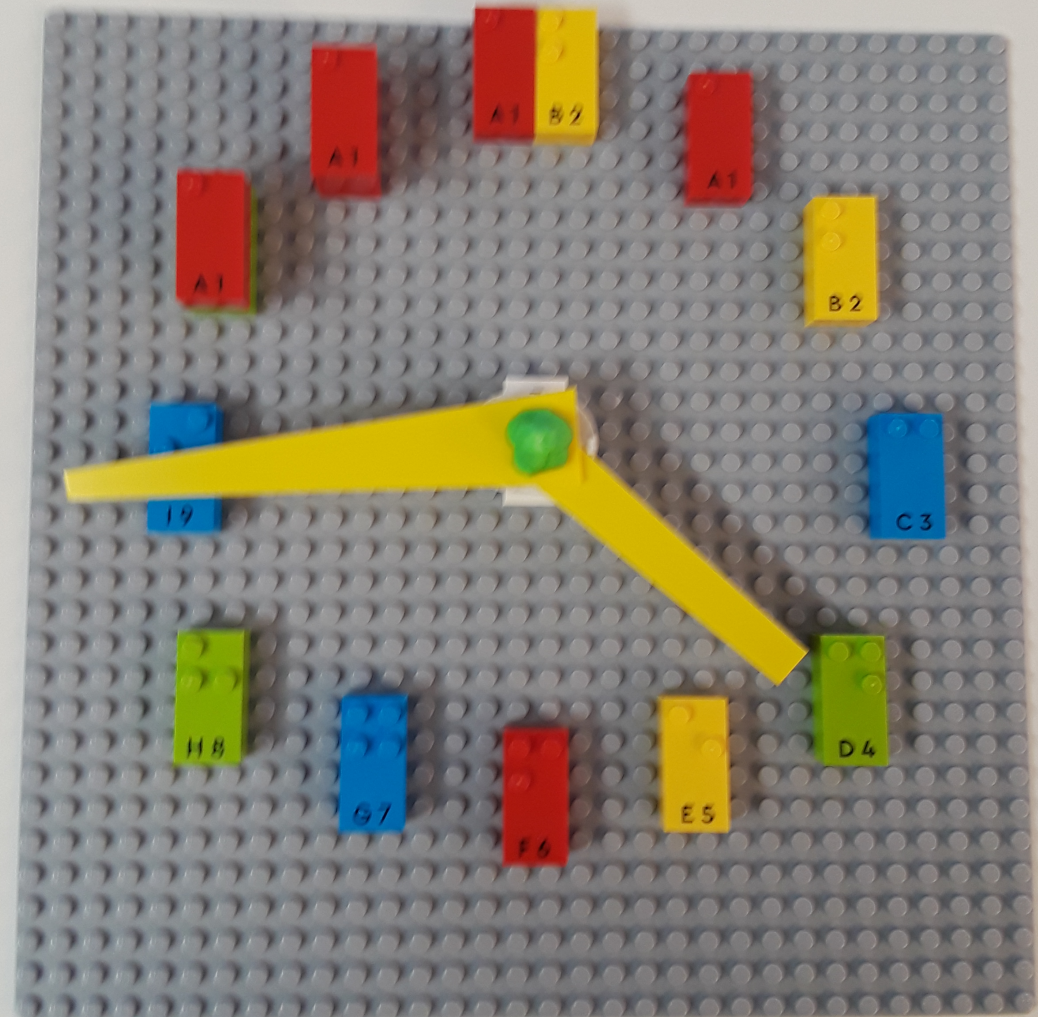
Calendar



Clocks and Telling Time

- Grade 1: Hour and half hour
- Grade 2: Five minutes
- Grade 3: To the minute

photo courtesy: Gina Carr



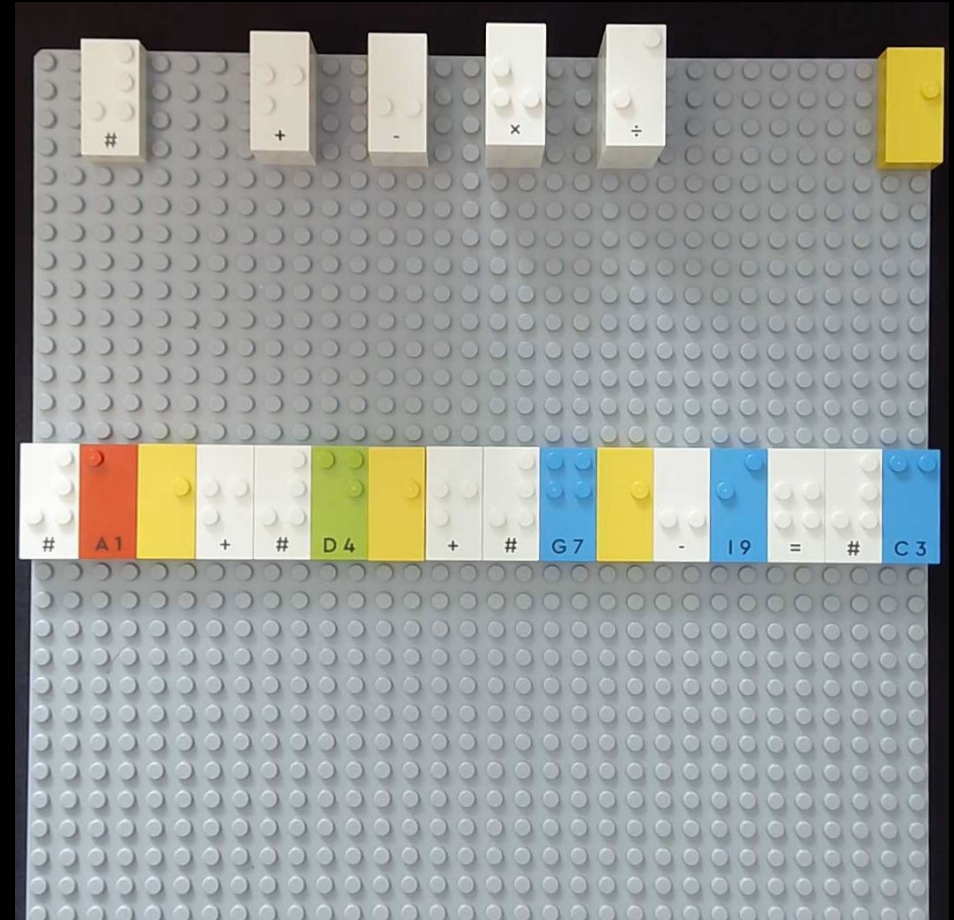
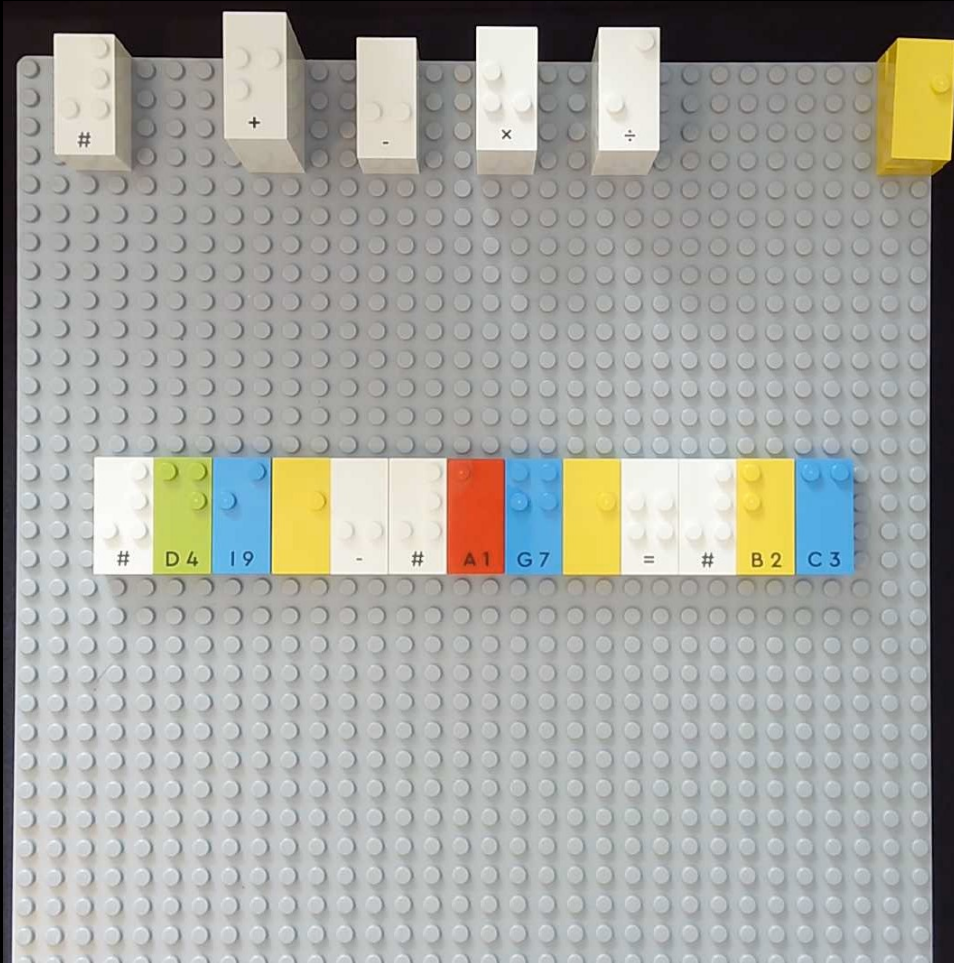


RAISING THE BAR

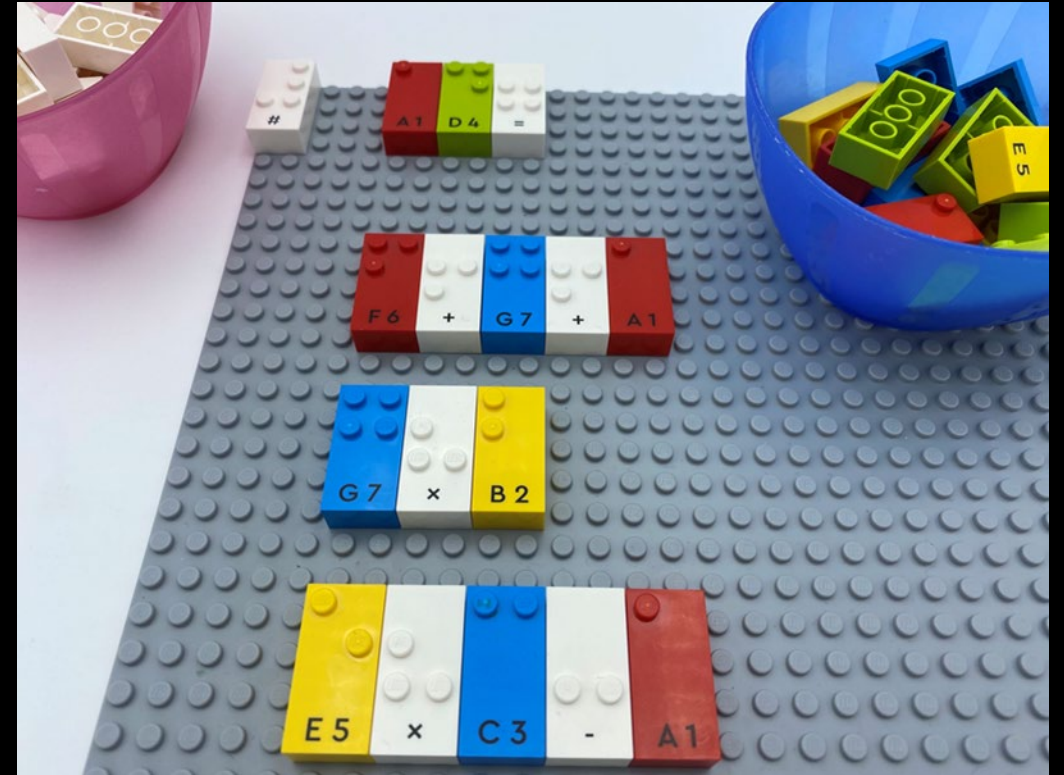
Higher Math Challenges



The Hundred Challenge

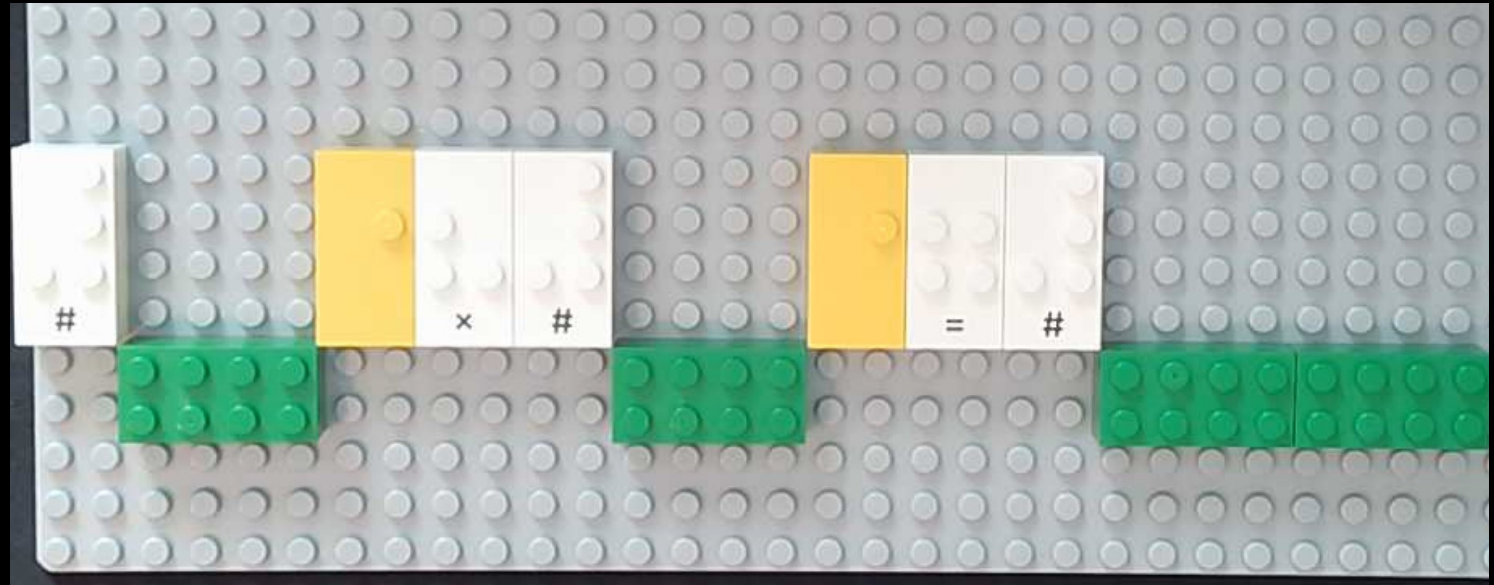


Math Symbols and Brick Equations

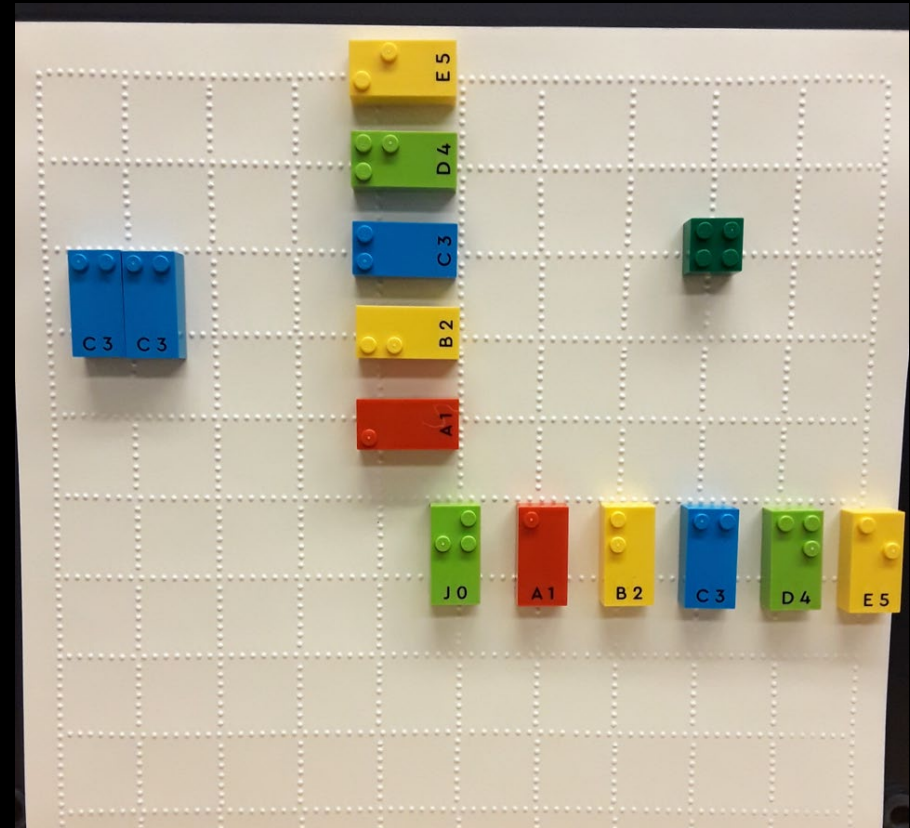
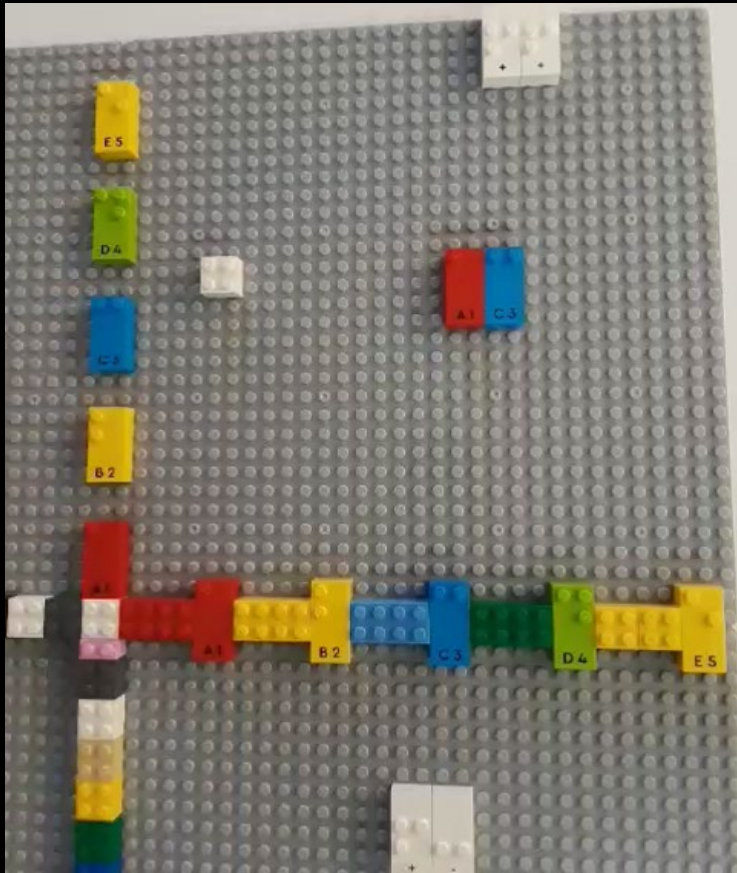


Multiplication Strikeout

- All digits available
- 1 multiplication sign
- 2 dot 5 symbols
- 3 number signs
- 2 base plates
- 4 letter x bricks

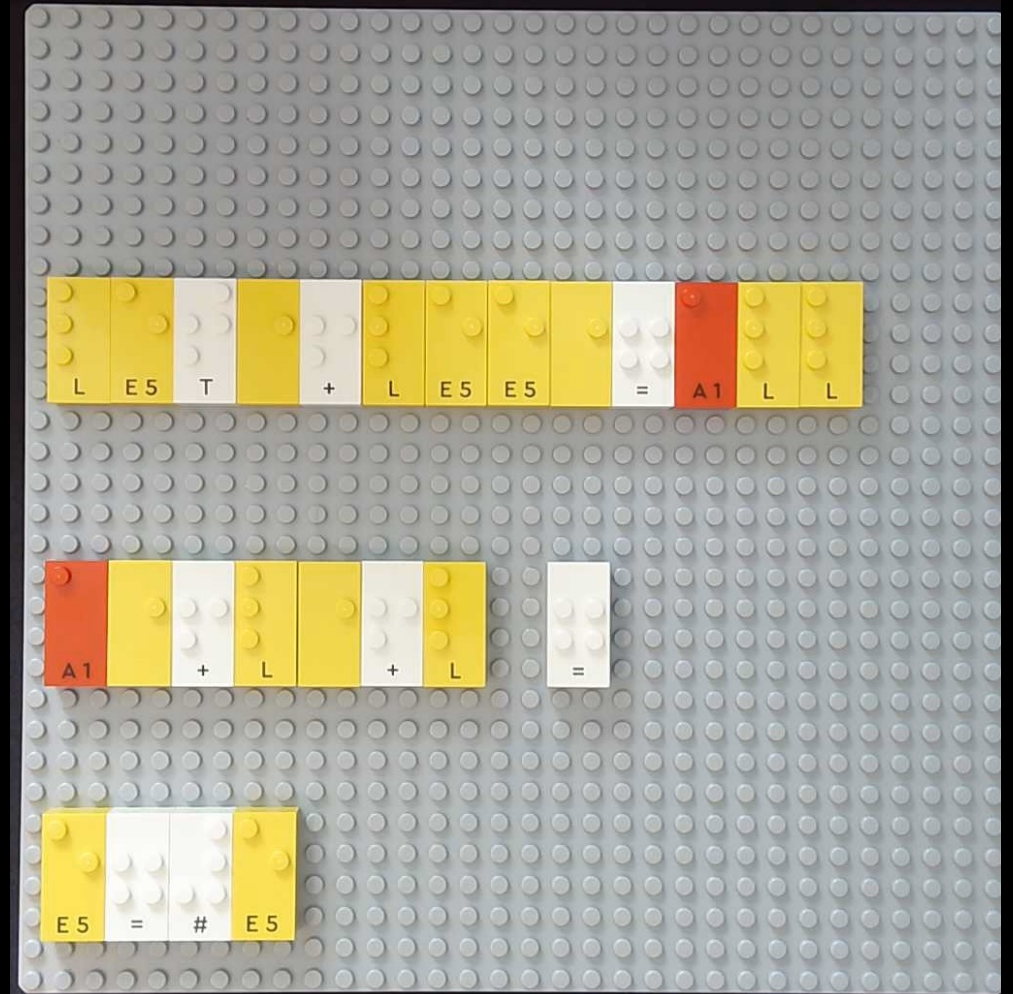


Graphing Points



Cryptarithmic Puzzles

- Letters represent numbers
- Can't start with zero
- Only one solution
- LET+LEE=ALL, then
 $A+L+L = ?$ Assume $E=5$



Characteristics of Play

- ❑ Actively engaging: active imagination, mentally immersed, no distraction
- ❑ Meaningful: relate new experiences, imitation
- ❑ Socially interactive: sharing ideas, communicating thoughts
- ❑ Joyful: power of surprise, frustration resolved by breakthrough
- ❑ Iterative: trial & error



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LEGO Braille Bricks Play-based Teaching Method

- Re-define play
- Re-imagine learning

ACVREP credit hours: 4



PLAYFUL EXPERIENCES FOR PRE-BRAILLE INSTRUCTION

Presenter:

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