BULGARIAN SOLITAIRE

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ABOUT THE MATH CIRCLES OF CHICAGO

- **Soon to be six sites spread across the city**
- **450 (to 600) kids, five levels of Circles**
- **Novel math, Non-Competitive**
- **Access for *All* kids in Chicago**

BULGARIAN SOLITAIRE: HOW TO PLAY

- **Step 1: Take a card from each pile.**
- **Step 2: Make a new pile from those cards you picked up.**
- **Step 3: Go back to Step 1.**

EXAMPLE

- 7,3
- 6,2,2
- 5,3,1,1
- 4,4,2
- 3,3,3,1
- 4,2,2,2

- 4,3,1,1,1
- 5,3,2
- 4,3,2,1
- 4,3,2,1
- 4,3,2,1

THE INVESTIGATION

- **Explore different partitions**
- **Explore different numbers of cards**
- **Representations**
- **Tables, conjectures, proofs**
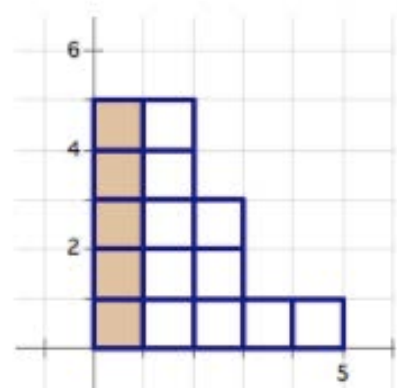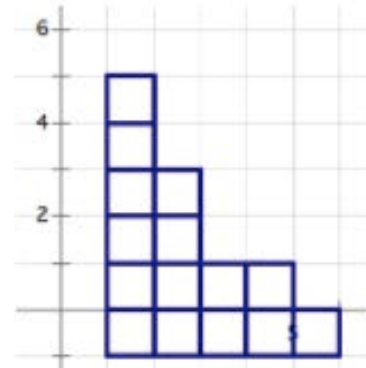
THE INVESTIGATION

N	Fix?	Pattern

THE INVESTIGATION

N	Fix?	Pattern
1	Yes	1→1→1→….
2	No; 2 cycle	2→1,1→2→1,1→
3	Yes	2,1→2,1→….
4	No; 3 cycle	2,2→2,1,1→3,1→2,2→….
5	No; 3 cycle	3,2→2,2,1→3,1,1→3,2→…

MC²

MATHEMATICAL CONNECTIONS: REPRESENTATIONS

- **Cards**

- **Lists**

- **Young tableau**

- **Conventions & Communication**

MATHEMATICAL CONNECTIONS: ITERATION & PATTERNS

- **Fixed points, cycles**
- **3,2 → 2,2,1 →3,1,1 → 3,2…**
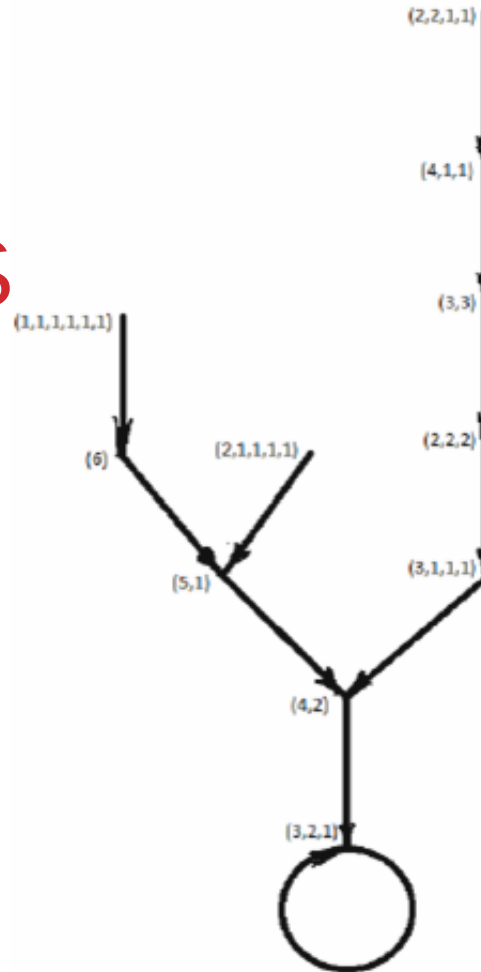- **3,2,1 → 3,2,1 →**
- **Triangular Numbers**

MATHEMATICAL CONNECTIONS: PROBLEM SOLVING

- **Make a Simpler Problem**
- **Introduce Appropriate Notation**
- **Make a Table, Look for a Pattern**
- **Use Structure**
- **Generalize; Extend**

MATHEMATICAL CONNECTIONS: OLDER STUDENTS

- **Digraphs**
- **Partitions**
- **Monovariance**

PEDAGOGICAL PROS

- **Access—Low Floor, Tactile**
- **Accessible justification**
- **Agency—Opportunities for conjectures, problem extension**
- **High Ceiling**
- **Lesson with many paths**

LET'S COLLABORATE!

- **MC² has plans for 5 levels of plans that span 2 years**
- **Focus now is on improvement of these plans**
- **Interested in access, community, engagement**

LET'S COLLABORATE!

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