Name _____ Date _____ Period _____

Lesson 10-3 · Group 1

Reinforce Understanding

10.3 Small Group · Group 1

With my small group, I can use patterns and relationships to make sense of the Tower of Hanoi puzzle and think logically about its solutions — one step at a time, with support.

Worked model

Before moving anything, I describe what the solved puzzle will look like: the discs in the same order — smallest on top to largest on bottom — but on a different rod.

1. Then I play the small cases: a one-disc tower takes 1 move, and a two-disc tower takes 3 moves.
2. A three-disc tower takes at least 7 moves. Small cases are how mathematicians play.

Practice

Complete each exercise. Show the reasoning that supports your answer.

1. Sort each move: legal or against the rules?

Write the name of the correct group on each line.

Groups: Legal move Against the rules

- _____Move the top disc of any stack
- _____Place a small disc on a bigger disc
- _____Move exactly one disc at a time
- _____Move two discs at once
- _____Place a big disc on a smaller disc
- _____Pull a disc out from the middle of a stack

2. Use the doubling pattern to complete the table of fewest moves.

Complete the table. Show how you found each value.

Discs	Pattern: double the previous, add 1	Fewest moves
3		
4		
6		

Show your work

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3. What is the fewest number of moves needed to solve a three-disc Tower of Hanoi puzzle?

Circle the letter of the best answer. Show how you know.

A. 3 moves
B. 6 moves
C. 7 moves
D. 9 moves

Show your work
