

Is there Life After Linear Functions?

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Lesson 2.10

Name _____

PERIMETER FUNCTIONS


1. 

Fig. #	Perimeter
1	4
2	6
3	8
4	
10	
100	
n	

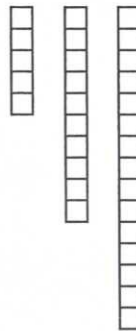
2. 

Fig. #	Perimeter
1	
2	
3	
4	
10	
100	
n	

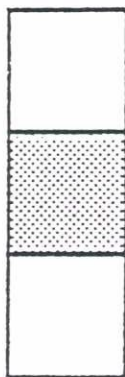
THE SHUTTLE GAME

Start with green cubes on one side and yellow on the other.

The goal is to reverse the colors in the fewest moves possible, following these rules:

- 1) A moves means to either move one space or jump one over one tile (opposite color).
- 2) You may not move backwards.

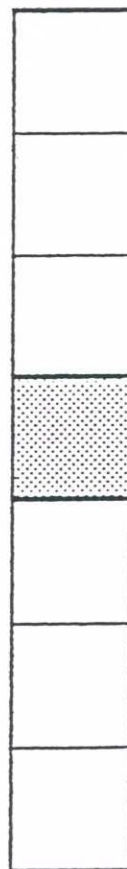
1 CUBE ON EACH SIDE



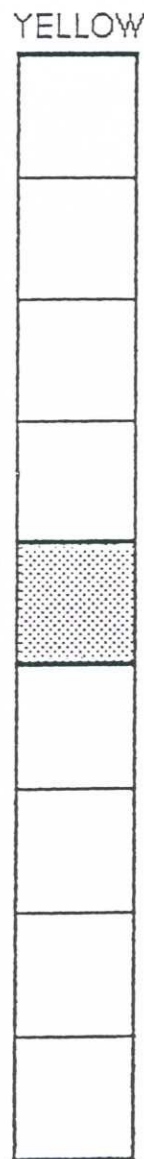
2 CUBES ON EACH SIDE



3 CUBES ON EACH SIDE



4 CUBES ON EACH SIDE



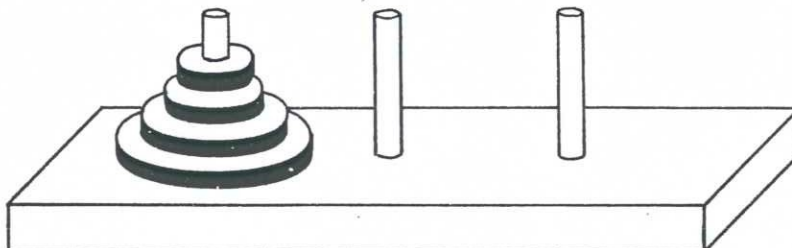
5 CUBES ON EACH SIDE



CUBES	MOVES
1	
2	
3	
4	
5	
6	
7	
10	
50	
N	

TOWER OF HANOI

The object of this ancient puzzle is to transfer the tower of discs to either of the two vacant pegs in the fewest possible moves. You may only move one disc at a time. You may not place a disc on one that is smaller.



In the table to the right, n represents the number of discs in the tower. M represents the fewest number of moves it takes to transfer those discs to the vacant pegs.

What is the fewest number of moves with four discs?

Complete the table at the right through seven discs.

Find a pattern which would give you the solution for 64 discs.

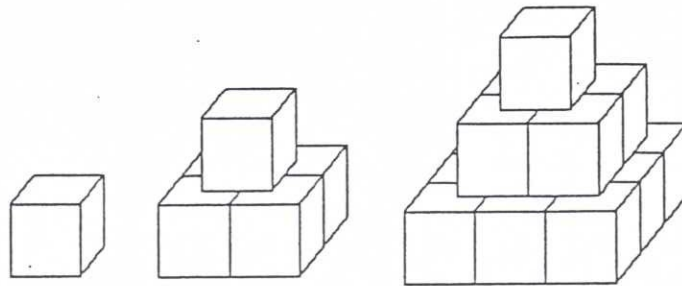
How did you find the pattern?

What is the formula for the fewest number of moves needed to transfer n number of discs?

Find a pattern for the number of moves each disc makes. Consider the smallest disc number one.

n	M
1	
2	
3	
4	
5	
6	
7	
...	
64	
...	
n	

Pyramid Functions



You can use blocks to build pyramids such as those shown above. Complete the table showing the number of layers in each pyramid and the number of blocks needed to build it. All pyramids are solid with no empty space inside.

a.

Layers (n)	1	2	3	4	5	8	50
Blocks (b)							

- b. Use finite differences to find the degree of the relationship.
- c. Write an equation for this relationship.
- d. Use your model to predict the number of blocks needed to build a pyramid 8 layers high.
- e. Graph and trace the curve to find the number of layers in a pyramid built with 650 blocks.