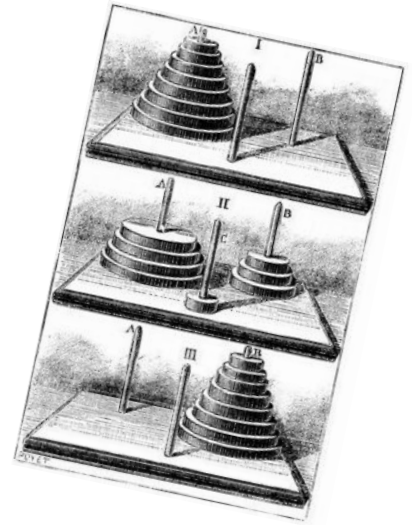


# Lesson 1: A Towering Sequence



# Learning Targets:

- I can give an example of a sequence



# Required Materials:

- Digital device (applets)
- Paper
- pencil



Let's explore the Tower of Hanoi.



# 1.1 What's Next?

Here is a rule for making a list of numbers:

Each number is 1 less than twice the previous number.

Pick a number to start with, then follow the rule to build a list of 5 numbers

# Activity Synthesis:

What are some lists that you came up with?

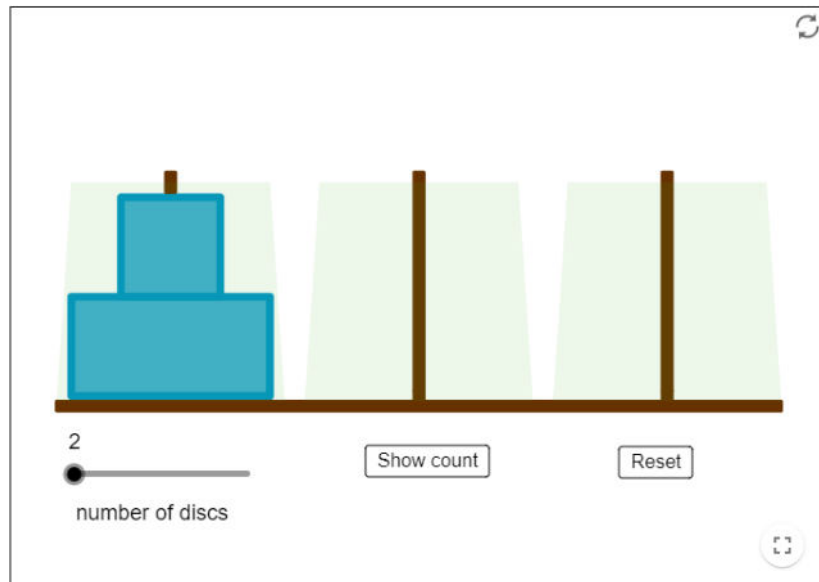
# 1.2 The Tower of Hanoi

In the Tower of Hanoi puzzle, a set of discs sits on a peg, while there are 2 other empty pegs.

A *move* in the Tower of Hanoi puzzle involves taking a disc and moving it to another peg. To move a disc, click on it, and then click on the peg where you want it to go. You cannot *drag* a disc. There are two rules:

- Only move 1 disc at a time.
- Never put a larger disc on top of a smaller one.

You complete the puzzle by building the complete tower on a different peg than the starting peg.



number of discs	1	2	3	4	5	6	7
number of moves							

# Activity Synthesis:

How many moves does it take to complete the puzzle with 1 disc?

What is the smallest number of moves for 3 discs? 4 discs?

Can you explain what Jada's strategy was?



# Activity Synthesis:

Sequence: a list of numbers

Example: 1, 3, 7, 15, 31

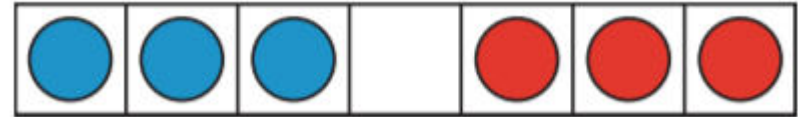
Term: a specific number in the list

How would you describe the rule for the next term in this sequence.

1, 3, 7, 15, 31

# 1.3 Checker Jumping Puzzle

Some checkers are lined up, with blue on one side, red on the other, with one empty space between them.

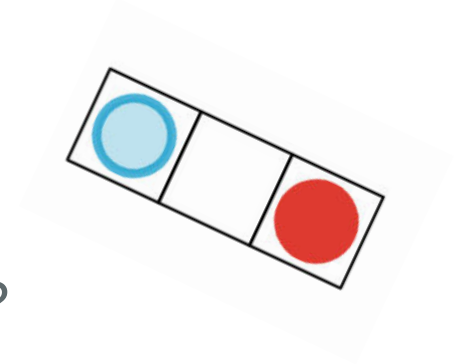


- A move in this checker game pushes any checker forward 1 space, or jumps over any 1 checker of the other color.
- Jumping the same color is not allowed, moving backwards is not allowed, and 2 checkers cannot occupy the same space..

number of checkers on each side	1	2	3	4	5	6	7
number of moves	3						

# Activity Synthesis:

- What is the smallest number of moves for 2, 3 and 4 checkers on each side?
  - Anyone solve this with fewer moves?
- Can you explain what Noah's strategy was?



# Lesson Synthesis:

Create a sequence of 5 numbers that follows some rule.

Trade with a partner and have them find the next term.

