



The Power of Structure



How recognizing patterns makes everything easier

Name: _____

Date: _____

The Big Idea

When you recognize that something new has the same STRUCTURE as something you already know, you don't have to start from scratch.

Part 1: A Pattern in Hero Stories

Think about these famous heroes. What do their stories have in common?

Hero	Raised by...	Discovers they are...	Goes to learn at...	Becomes...
Harry Potter				
Percy Jackson				
Superman				
Luke Skywalker				
Spider-Man				

Discovery Question

1. What pattern do you notice? What do all these heroes have in common?
2. If a NEW story began: "A child is being raised by people who aren't their real parents..." — what would you predict happens next?

Part 2: Same Story, 400 Years Apart

Hamlet (1600)

- Prince of Denmark
- Father is murdered by uncle
- Uncle takes the throne
- Prince is sent away
- Father's ghost appears
- Prince returns for revenge

The Lion King (1994)

- Prince of Pride Rock
- Father is murdered by uncle
- Uncle takes the throne
- Prince runs away
- Father's ghost appears
- Prince returns for revenge

One has people. One has lions. Same structure underneath!

Part 3: Can You Read These Numerals?

These symbols are from the ancient Mayan civilization. What numbers do they represent?



Can you figure out what numbers these represent?

Hint: In Mayan numerals, a DOT = 1 and a LINE = 5.

So one line with two dots on top = $5 + 2 = 7$

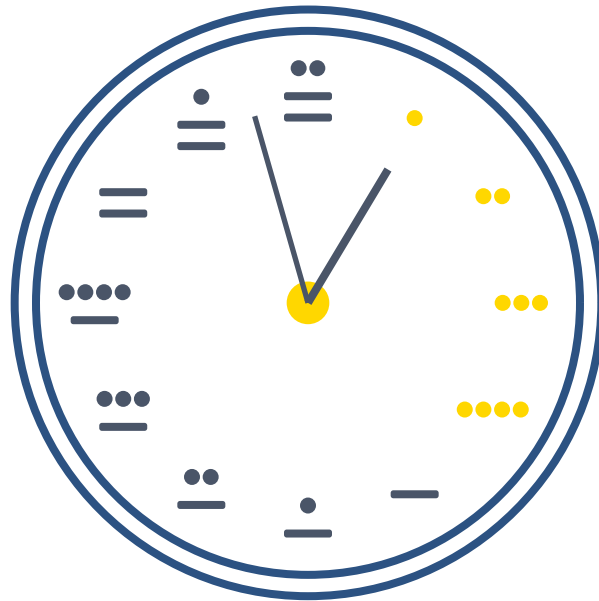


Discovery Question

3. Now imagine these same symbols arranged around a clock face, in order from 1 to 12. Would they be easier to read? Why?

The Clock Reveals the Pattern

The same numerals — just organized differently:



Discovery Question

4. Now can you read all the numerals? What changed — the symbols, or how they were organized?
5. What does this tell you about the power of recognizing structure?

Part 4: The Fifteen First Game

Fifteen First

1 2 3 4 5 6 7 8 9

Rules:

- Two players take turns. Each turn, choose one number that hasn't been taken.
- Once a number is taken, the other player can't use it.
- You WIN if any THREE of your numbers add up to exactly 15.

Play this game with a partner or adult helper.
Play at least 3 rounds, then answer the questions below.

BEFORE you learn any strategy, reflect on the game:

6. How easy or hard was it to understand the rules?

Easy / Medium / Hard

7. What strategy did you try?

8. Is there an advantage to going first?

Yes / No / Not sure

9. How confident are you that you could always win or at least tie (never lose)?

Rate your confidence: 1 2 3 4 5 6 7 8 9 10
(circle one) not confident very confident

The Secret Structure Revealed!

What if we arrange the numbers 1-9 like this?

4	9	2
3	5	7
8	1	6

This is called a MAGIC SQUARE. Every row, column, and diagonal adds to 15!

$$4 + 9 + 2 = 15 \quad 3 + 5 + 7 = 15 \quad 8 + 1 + 6 = 15$$

But wait... if getting three numbers that sum to 15 means getting three in a row...

Fifteen First IS Tic-Tac-Toe!

NOW answer these questions:

10. Now how confident are you that you could always win or at least tie?

Rate your confidence: 1 2 3 4 5 6 7 8 9 10
(circle one) not confident very confident

Discovery Question

- 11.** What changed between your first rating and your second? Did YOU change, or just your understanding?
- 12.** You already knew how to play Fifteen First — you just didn't recognize the structure. What does this teach you?

Why This Matters

Structure Is Power

You didn't need to learn a new game — you needed to see the structure.
You didn't need to memorize Mayan numerals — you needed them organized.
Once you see the pattern, your existing knowledge works automatically.

In the worksheets that follow, you'll explore colorful tables with hidden structure.

You'll discover patterns. You'll find properties. You'll solve puzzles.

And eventually... you'll realize you've been doing something very familiar all along.

Discovery Question

13. Think of a time when something confusing suddenly "clicked" because you recognized a pattern. What was it?

Coming Up Next:

Worksheet 1: Discovering properties in a colorful Cayley Table...