Grade 4 Math Unit 3-Operations and Algebraic Thinking

UNIT OVERVIEW

This unit will go beyond the 3 Critical Focus Areas for 4th grade and address Analyzing Patterns.

This unit will address the cluster work in Generate and analyze patterns. * (See Connections for explanation)

Students will generate a number or shape pattern that follows a given rule. Students will identify apparent features of the pattern that were not initially apparent.

STANDARDS

CC_Common Core State Standards - Mathematics (2010) - Grade 4

Domain 4.OA Operations and Algebraic Thinking

Cluster Statement: Use the four operations with whole numbers to solve problems

Standard 4.OA.3 Solve multistep word problems posed with wholenumbers and having whole-numbers answers using the four operations, including problems in which remainders must be interpreted.   Represent these problems using equations with a letter standing fro the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Cluster Statement: Generate and analyze patterns.

Standard 4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

CONTENT ELABORATIONS

4.OA.3	Work on this standard continues from previous units.
4.OA.5	**4.OA.5** Patterns involving numbers or symbols either repeat or grow. Students need multiple opportunities creating and extending number and shape patterns. Numerical patterns allow students to reinforce facts and develop fluency with operations. Patterns are rules repeated. A pattern is a sequence that repeats the same process over and over. A rule dictates what that process will look like. Students investigate different patterns to find rules, identify features in the patterns and justify the reason for those features. After students have identified rules and features of a pattern, they need to generate a numerical or shape pattern from a given rule. A t-chart is a tool to help students see number patterns. **MP.2, MP.4, MP.5, MP.6, MP.7, MP.8** should be emphasized.

UNIT VOCABULARY

pattern	rule	input
nonnumeric patterns	term	output
numeric patterns	sequence	

BIG IDEAS

ENDURING UNDERSTANDINGS	**ESSENTIALS QUESTIONS** Choose a few questions based on the needs of your students

● How are patterns used in mathematics?

There are geometric and number patterns.

CONNECTIONS

The work in this cluster is related to *Solve problems involving the four operations,* and *identify and explain patterns in arithmetic* .**(3.OA.9)**

Standards for Mathematical Practice (SMP)
MP.1 Make sense of problems and persevere in solving them
MP.2 Reason abstractly and quantitatively
MP.3 Construct viable arguments and critique the reasoning of others
MP.4 Model with mathematics
MP.5 Use appropriate tools strategically
MP.6 Attend to precision
MP.7 Look for and make use of structure (Deductive reasoning)
MP.8 Look for and express regularity in repeated reasoning (Inductive Reasoning)

Generate and analyze patterns

	CONTENT	SKILLS
4.OA.5	Identify a number or shape pattern	Identify a number or shape pattern 1. Identify a pattern 2. Find the rule 3. Identify features that are not explicit in the rule 4. Justify the reason for the rule
4.OA.5	Generate a number or shape pattern from a rule	Generate a number or shape pattern from a rule 1. Use a t-chart to generate number patterns

UNIT RESOURCES

Common Core Model Curriculum
McGraw-Hill, **My Math** Chapter 7
manipulatives
graph paper
Discovery Video
Logic for Space Age Kids - Literature reading