

**Hardin County Schools Combined Curriculum Guide  
Mathematics -- Fourth Grade – Algebraic Thinking  
DRAFT**

Big Idea	<b>ALGEBRAIC THINKING</b>			
<b>Academic Expectations</b>	<b>2.8</b> Students understand various mathematical procedures and use them appropriately and accurately. <b>2.11</b> Students understand mathematical change concepts and use them appropriately and accurately. <b>2.12</b> Students understand mathematical structure concepts including the properties and logic of various mathematical systems.			
<b>POS Understandings</b>	<b>MA-4-AT-U-1</b> Students will understand that patterns, relations and functions are tools that help explain or predict real-world phenomena.		<b>9 Weeks Taught</b>	<b>1 2 3 4</b>
<b>POS Skills &amp; Concepts</b>	<b>Date(s) Taught</b>	<b>Core Content for Assessment</b>	<b>Objective</b>	<b>Essential Vocabulary</b>
<b>MA-4-AT-S-PRF2</b> Students will compare, contrast and/or extend patterns of numbers and shapes and sounds from real-world or mathematical situations.		<b>MA-04-5.1.1</b> <b>Students will extend patterns (e.g., 108, 208, 308, 408, ...; □○○△□○○△...) from real-world and mathematical problems; compare simple patterns (numbers, pictures, words; e.g., △□△□△□ ; △○○△○○); and describe rules for simple number patterns (e.g., 1, 3, 5, 7, ...; 5, 10, 15, 20, ...; 30, 27, 24, 21, ...).</b>  <div style="text-align: right;"><b>DOK 3</b></div>	I can continue patterns from real-world and mathematical problems.  I can compare and describe rules for simple number patterns.	Pattern
<b>Strategies &amp; Activities</b>		<b>Resources</b>	<b>Common Assessments</b>	
		<b>Essential Questions</b>	<b>Higher Order Questions</b>	

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POS Understandings	MA-4-AT-U-2 Students will understand that numerical patterns can be written as rules that generate the pattern.		9 Weeks Taught	1	2	3	4
POS Skills & Concepts	Date(s) Taught	Core Content for Assessment	Objective	Essential Vocabulary			
<b>MA-4-AT-S-PRF1</b> Students will represent, describe, analyze and/or formulate rules for number relationships or functions through a variety of methods (e.g., the use of variables, ordered pairs, lists in tables, plots on graphs and patterns).		<b>MA-04-5.1.1</b> Students will extend patterns (e.g., 108, 208, 308, 408, ...; □OO△□OO△...) from real-world and mathematical problems; compare simple patterns (numbers, pictures, words; e.g., △□△□△□ ; △OO△OO); and describe rules for simple number patterns (e.g., 1, 3, 5, 7, ...; 5, 10, 15, 20, ...; 30, 27, 24, 21, ...).  <div style="text-align: right;">DOK 3</div>	See U-1	See U-1			
Strategies & Activities		Resources	Common Assessments				
		Essential Questions	Higher Order Questions				

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POS Understandings	MA-4-AT-U-3 Students will understand that algebra represents mathematical situations and structures for analysis and problem solving.		9 Weeks Taught	1	2	3	4
POS Skills & Concepts	Date(s) Taught	Core Content for Assessment	Objective	Essential Vocabulary			
<p><b>MA-4-AT-S-VEO1</b> Students will explore unknowns and open sentences to express relationships.</p> <p><b>MA-4-AT-S-VEO2</b> Students will write stories about mathematical sentences with missing values.</p> <p><b>MA-4-AT-S-EI1</b> Students will solve simple equations (e.g., <math>4 = 7 - [ ]</math>, <math>6 + [ ] = 10</math>).</p> <p><b>MA-4-AT-S-EI2</b> Students will solve simple inequalities (e.g., <math>N + 5 &gt; 14</math>).</p> <p><b>MA-4-AT-S-EI3</b> Students will apply number sentences to solve real-world problems.</p>		<p><b>MA-04-5.3.1</b> Students will model real-world and mathematical problems with simple number sentences (equations and inequalities) with a variable or a missing value (e.g., <math>4 = 7 - \underline{\quad}</math>, <math>N + 5 &gt; 14</math>, <math>\frac{1}{2} + N = 1</math>) and apply simple number sentences to solve mathematical and real-world problems.</p> <p style="text-align: right;"><b>DOK 2</b></p>	I can solve for the variable or missing value of a number sentence that represents real-world or mathematical problems.	Variable	Equation	Number sentence	
Strategies & Activities		Resources	Common Assessments				
		Essential Questions	Higher Order Questions				

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POS Understandings	MA-4-AT-U-4 Students will understand that real-world situations can be represented using mathematical models to analyze quantitative relationships.		9 Weeks Taught	1	2	3	4
POS Skills & Concepts	Date(s) Taught	Core Content for Assessment	Objective	Essential Vocabulary			
<b>MA-4-AT-S-EI4</b> Students will read or create and solve story problems using mathematical sentences with missing values.  <b>MA-4-AT-S-EI5</b> Students will model real-world situations with simple number sentences using manipulatives, numbers and/or symbols.		<b>MA-04-5.3.1</b> Students will model real-world and mathematical problems with simple number sentences (equations and inequalities) with a variable or a missing value (e.g., $4 = 7 - \underline{\quad}$ , $N + 5 > 14$ , $\frac{1}{2} + N = 1$ ) and apply simple number sentences to solve mathematical and real-world problems. DOK 2	See U - 3	See U - 3			
Strategies & Activities		Resources	Common Assessments				
		Essential Questions	Higher Order Questions				

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<b>POS Understandings</b>	<b>MA-4-AT-U-5</b> Students will understand that functions are used to analyze change in various contexts and model real-world phenomena.		<b>9 Weeks Taught</b>	<b>1   2   3   4</b>
	<b>MA-4-AT-U-6</b> Students will understand that functions can be written in words, as a symbolic sentence or in a table.			
<b>POS Skills &amp; Concepts</b>	<b>Date(s) Taught</b>	<b>Core Content for Assessment</b>	<b>Objective</b>	<b>Essential Vocabulary</b>
<b>MA-4-AT-S-PRF1</b> Students will represent, describe, analyze and/or formulate rules for number relationships or functions through a variety of methods (e.g., the use of variables, ordered pairs, lists in tables, plots on graphs and patterns)		<b>MA-04-5.1.2</b> <b>Students will describe functions (input-output) through pictures, tables, and words; and will analyze functions from a table based on real-world and mathematical problems.</b> <p style="text-align: right;"><b>DOK 2</b></p> <b>MA-04-5.1.3</b> <b>Students will determine the value of an output given a function rule and an input value.</b> <b>DOK 2</b>	I can calculate input/output function tables using pictures, tables and words.	Function table Input Output Rule Value
<b>MA-4-AT-S-PRF2</b> Students will compare, contrast and/or extend patterns of numbers and shapes and sounds from real-world or mathematical situations.				
<b>Strategies &amp; Activities</b>		<b>Resources</b>	<b>Common Assessments</b>	
		<b>Essential Questions</b>	<b>Higher Order Questions</b>	