1 Exploring Patterns in Linear and Quadratic Relationships

Topic 2: Exploring and Analyzing Patterns

ELPS: 1.A, 1.C, 1.E, 1.F, 1.G, 2.C, 2.E, 2.I, 3.D, 3.E, 4.B, 4.C, 5.B, 5.F, 5.G

Topic Pacing: 19 Days

Lesson	Lesson Title	Highlights	TEKS*	Pacing**
1	**Patterns: They're Grrrrrowing!** Observing Patterns	Students investigate three scenarios that illustrate sequences. They analyze diagrams representing each sequence, describe observable patterns, sketch other terms or designs in the sequence, and then answer questions relevant to the problem situation. Tables and graphs are used to organize data and help recognize patterns as they emerge.	**2A.8C**	1
	Suggested Placement of Learning Individually with Skills Practice or MATHia			1
2	**The Cat's Out of the Bag!** Generating Algebraic Expressions	This lesson revisits the three scenarios from the previous lesson. Students write equivalent algebraic expressions for each of the scenarios. They use algebraic properties and graphical representations to show that the expressions are equivalent. Students describe the similarities and differences among linear, exponential, and quadratic functions.	2A.5B 2A.8A **2A.8C**	2
	Suggested Placement of Learning Individually with Skills Practice or MATHia			1
3	**Samesies** Comparing Multiple Representations of Functions	Students compare the graphic, verbal, numeric, and algebraic representations of a function. They group equivalent representations of functions and then identify their function families. Students analyze a tile pattern and use a table to represent the sequence and recognize patterns. They then create expressions that represent different aspects of the design. Within this same context, students show that different expressions are algebraically equivalent.	2A.8A	2
	Suggested Placement of Learning Individually with Skills Practice or MATHia			1
	Mid-Topic Assessment			1
4	**True to Form** Forms of Quadratic Functions	Students match quadratic equations with their graphs using key characteristics. The standard form, the factored form, and the vertex form of a quadratic equation are reviewed, as is the concavity of a parabola. Students then sort each of the equations with their graphs depending on the form in which the equation is written, while identifying key characteristics of each function, such as the axis of symmetry, the *x*-intercept(s), concavity, the vertex, and the *y*-intercept. Next, students analyze graphs of parabolas in relation to a pair of numberless axes and select possible functions that could model the graph. A Worked Example shows that a unique quadratic function is determined when the vertex and a point on the parabola are known, or the roots and a point on the parabola are known. Students are given information about a function and use it to determine the most efficient form (standard, factored, or vertex) to write the function. They then use the key characteristics of a graph and reference points to write a quadratic function, if possible. Finally, students analyze a Worked Example that demonstrates how to write and solve a system of equations to determine the unique quadratic function given three points on the graph. They then use this method to determine the quadratic function that models a problem situation and use it to answer a question about the situation.	**2A.3A** **2A.3B** 2A.4A 2A.4D 2A.7B	2
	Suggested Placement of Learning Individually with Skills Practice or MATHia			1

Texas Algebra II: Module 1, Topic 2 Pacing Guide

165-Day Pacing

Lesson	Lesson Title	Highlights	TEKS*	Pacing**
5	**The Root of the Problem** Solving Quadratic Equations	Students solve quadratic equations of the form $y = ax^2 + bx + c$. They first factor trinomials and use the Zero Product Property. Students then use the method of completing the square to determine the roots of a quadratic equation that cannot be factored. Finally, students use the Quadratic Formula to solve problems in real-world and mathematical problems.	**2A.4F**	2
Suggested Placement of Learning Individually with Skills Practice or MATHia				1
6	***i* Want to Believe** Imaginary and Complex Numbers	Students are introduced to imaginary numbers to calculate the square root of a negative number, and imaginary numbers are placed within the complex number system. They apply the Commutative Property, the Associative Property, and the Distributive Property to add, subtract, and multiply complex numbers. Students use the structure of quadratic equations in the form $y = ax^2 + c$, in vertex form, and in standard form, as well as the discriminant and the graph, to determine whether the roots of an equation are real or imaginary. They solve quadratic equations that have imaginary roots. They apply the Fundamental Theorem of Algebra to make sense of the fact that a quadratic equation can have two unique real number solutions, two equal real number solutions, or two imaginary solutions..	**2A.4F** 2A.7A	2
Suggested Placement of Learning Individually with Skills Practice or MATHia				1
End of Topic Assessment				1

Texas Algebra II: Module 1, Topic 2 Pacing Guide

165-Day Pacing

TEXAS MATH SOLUTION

1 Day Pacing = 45-minute Session

✱ This activity highlights a key term or concept that is essential to the learning goals of the lesson.

Day 1	Day 2	Day 3	Day 4	Day 5
TEKS: **2A.8C** **LESSON 1** **Patterns: They're Grrrrowing!** GETTING STARTED ACTIVITY 1 ✱ ACTIVITY 2 ✱ ACTIVITY 3 ✱ TALK THE TALK	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia	TEKS: 2A.5B, 2A.8A, **2A.8C** **LESSON 2** **The Cat's Out of the Bag!** GETTING STARTED ✱ ACTIVITY 1 ✱	**LESSON 2** continued ACTIVITY 2 ✱ ACTIVITY 3 ✱ TALK THE TALK	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
TEKS: 2A.8A **LESSON 3** **Samesies** GETTING STARTED ACTIVITY 1	**LESSON 3** continued **Samesies** ACTIVITY 2 TALK THE TALK	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia	**MID-TOPIC ASSESSMENT**	TEKS: **2A.3A**, **2A.3B**, 2A.4A, 2A.4D, 2A.7B **LESSON 4** **True to Form** GETTING STARTED ✱ ACTIVITY 1 ✱ ACTIVITY 2 ✱
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
LESSON 4 continued ACTIVITY 3 ✱ ACTIVITY 4 ✱ TALK THE TALK	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia	TEKS: **2A.4F** **LESSON 5** **The Root of the Problem** GETTING STARTED ✱ ACTIVITY 1 ✱ ACTIVITY 2 ✱	**LESSON 5** continued ACTIVITY 3 ✱ TALK THE TALK ✱	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia

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165-Day Pacing

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Day 16	Day 17	Day 18	Day 19
TEKS: **2A.4F**, 2A.7A **LESSON 6** ***i* Want to Believe** GETTING STARTED * ACTIVITY 1 * ACTIVITY 2 * ACTIVITY 3	**LESSON 6** continued ACTIVITY 4 * ACTIVITY 5 * TALK THE TALK *	**LEARNING INDIVIDUALLY** Skills Practice **OR** MATHia	**END OF TOPIC ASSESSMENT**