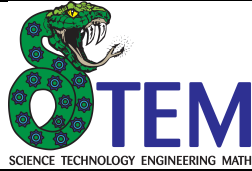


Robotics – Polynomials

Length: 4 Weeks



Mathematics Unit Plan

Teacher: Williamson	Grade: 9	Course: Algebra I
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Unit Title: Robotics – Polynomials

LEARNING TARGETS

LT4: I can perform arithmetic operations on polynomials. (CC.A-APR.3)
LT5: I can understand the relationship between zeros and factors of polynomials. (CC.A-APR.3)

UNIT OVERVIEW

Overall summary of the unit, activities, tasks, and/or content.

In this unit, students will apply the properties of exponents and polynomials in real world situations and justify solutions to those problems. Students will also examine the use of artificial intelligence in applications other than robotics, and will evaluate if it's possible to replace a math teacher with programs that employ artificial intelligence.

MOTIVATORS

Hooks for the unit and supplemental activities. (PBL scenarios, video clips, websites, literature)

~ Video Clip showing how roller coasters work.
<http://www.sciencechannel.com/video-topics/engineering-construction/machines-rollercoaster/>
 ~ Video Clip of Artificial Intelligence
<http://marvel.com/videos/watch/4983>

Week	Learning Targets	Materials & Resources	Instructional Procedures	Differentiated Instruction	Assessment
1	LT4: I can perform arithmetic operations on polynomials.	Curricular: <ul style="list-style-type: none"> http://tweentribune.com/tween56/japanese-robot-get-artificial-intelligence http://www.futuregov.asia/articles/artificial-intelligence-tools-to-be-used-in-singapore-schools http://chinmayxdas.hubpages.com/hub/Artificial-Intelligence-Applications-in-Everyday-Life 	Essential Questions: How can I evaluate expressions containing zero, integer and rational exponents? How can I perform arithmetic operations on polynomials? How can I synthesize information from articles regarding the use of artificial intelligence in various real world applications? Set: Teacher will put a message on the promethean board, and then ask students to rewrite it as a shortened version texting style. Teacher will then project a spreadsheet with calculations for distances to other planets. Students and teacher will then discuss ways to rewrite	Remediation Review lesson from http://www.scribd.com/doc/164479724/Exponent-Rules-Lesson Enrichment Pascal's triangle enrichment activity. Chapter 5 Enrichment Activity	Formative FAL lesson 'Estimating Length using scientific notation' from http://map.mathshell.org/materials/download.php?fileid=1221

		<ul style="list-style-type: none"> • Foldable graphic organizer for scientific notation and exponents • Grudge Game – links: <ul style="list-style-type: none"> ○ http://nathankraft.blogspot.com/2013/05/i-shall-never-play-review-game-again.html ○ https://www.scribd.com/fullscreen/106210809?access_key=key-s7odefj83zewhj2hpmo&allow_share=true&escape=false&view_mode=scroll ○ http://www.scribd.com/doc/164479724/Exponent-Rules-Lesson • Karuta Exponent Review <ul style="list-style-type: none"> ○ http://www.scribd.com/doc/79688142/Exponent-Rules-Karuta • Holt Fuse App chapter 6. Lessons 1-3 • Teacher created videos <ul style="list-style-type: none"> ○ https://Williamsonalgebra1.blogspot.com 	<p>numbers in a shortened version.</p> <p><u>Teaching Strategies</u></p> <ul style="list-style-type: none"> • Grudge game- inductive lesson for learning rules of exponents. http://nathankraft.blogspot.com/2013/05/i-shall-never-play-review-game-again.html • Using foldable graphic organizer, students and teacher will discuss exponent rules. https://www.scribd.com/fullscreen/106210809?access_key=key-s7odefj83zewhj2hpmo&allow_share=true&escape=false&view_mode=scroll • Using Holt Fuse App, students will work in pairs to solve problems using integer exponents. Chapter 5, lesson 1. • MDC Lesson Estimating Length Using Scientific Notation http://map.mathshell.org/materials/download.php?fileid=1221 • Student will break into groups of three. Groups will then redivide into three expert groups. Each expert group will read an article about artificial intelligence; take notes and re deliver information to home group. <p><u>Summarizing Strategy</u> Students will work in pairs to match exponent to rule using Karuta Exponent Review Game Activity. http://www.scribd.com/doc/79688142/Exponent-Rules-Karuta</p> <p><u>Homework</u> Students will watch teacher created videos regarding exponents and scientific notation, and will complete the guided summaries and questions that accompany each video. See: https://Williamsonalgebra1.blogspot.com Unit 5: Lessons 1-3 Exponents and Scientific Notation</p>	Holt. My.hrw.com	<p><u>Learning Styles</u> Visual, Auditory, and Kinesthetic Flexible Grouping</p>
2	LT4: I can perform arithmetic operations on polynomials.	<p><u>Curricular:</u></p> <ul style="list-style-type: none"> • Mix and Match Polynomial Graphic Organizer • Memory Multiplying Polynomials Activity • Teacher Created Videos • Bulls eye Polynomial practice worksheet • https://Williamsonalgebra1.blogspot.com 	<p><u>Essential Questions:</u> How can I classify polynomials by degree and by term? How can I perform arithmetic operations on polynomials? How can I research and evaluate an article about the use of artificial intelligence?</p> <p><u>Set:</u> Students will choose a game to play from a variety of games such as Toss Across, Angry Birds, Corn hole and basketball to illustrate the arc motion that correlates to a quadratic function. Teacher will then lead students in a whole group discussion of quadratic functions that create arc motions.</p> <p><u>Teaching Strategies</u></p> <ul style="list-style-type: none"> • Working in pairs, students will research real world uses of polynomials and will think pair share with another group, followed by a whole group discussion. • Using Freyer Model graphic organizer, students will classify 	<p><u>Remediation:</u> Holt Chapter 6 Ready to Go On Skills intervention worksheets.</p> <p><u>Enrichment:</u> Holt Chapter 6 Lesson 3 Explorations in Core Math, accessed via My.hrw.com.</p> <p><u>Learning Styles</u> Visual, Auditory, and Kinesthetic Flexible grouping</p>	<p><u>Summative</u> Teacher created assessment of arithmetic operations of polynomials using Holt Examview Test Generator.</p>

			<p>polynomials by degree and number of terms.</p> <ul style="list-style-type: none"> • Students will complete a bull’s eye practice worksheet then will create their own with problems and solutions. In the innermost circle they will write a polynomial, in the next ring they will write a polynomial, in the next rings they will add, subtract and multiply the two polynomials. They will then trade and complete another student’s. • Students will complete practice and problem solving in Holt fuse App lessons 6.3 through 6.5 • Working in pairs, students will complete Memory Multiplying Polynomials Activity, matching a trinomial with its binomial factors. • Students will research an article about the use of artificial intelligence, will write an abstract about the article and be prepared to share the article in class. <p><u>Summarizing Strategy</u> Students will create two polynomials, classify them by degree and term, add and subtract them and multiply them.</p> <p><u>Homework</u> Students will watch teacher created videos in unit 5 regarding multiplying polynomials and special products of binomials and will complete the guided summaries and questions that accompany each video. See: https://Williamsonalgebra1.blogspot.com</p>		
3	<p>LT4: I can perform arithmetic operations on polynomials.</p> <p>LT5: I can understand the relationship between zeros and factors of polynomials.</p>	<p><u>Curricular:</u></p> <ul style="list-style-type: none"> • Holt Fuse App • Teacher created videos • http://map.mathshell.org/lessons.php?unit=8205&collection=8&redir=1 • Algebra Connect Factoring Activity • Factoring Cut Outs Activity • Sum /Product Puzzles • “I have – Who Has” activity 	<p><u>Essential Questions:</u> How can I factor polynomials? How can I evaluate the use of artificial intelligence in a math classroom?</p> <p><u>Set:</u> Teacher shows students you tube Quadratic Formula song to Adele’s ‘Rolling in the Deep’. Teacher will then explain that factoring is an alternate method to using the quadratic formula.</p> <p><u>Teaching Strategies</u></p> <ul style="list-style-type: none"> • Using Holt Fuse App, students will work in pairs to solve problems factoring greatest common factors and trinomials from lessons 8.1 through 8.3 • MDC Lesson generalizing patterns using difference of two squares. • http://map.mathshell.org/lessons.php?unit=8205&collection=8&redir=1 • Students will practice factoring trinomials while playing an activity similar to the board game ‘Connect Four’. • To reinforce correct factoring of binomials, students and teacher will engage in whole group activity “I have- who has” matching trinomials to their factored forms. • Students will evaluate the Holt Ready to Go On quiz feature and 	<p><u>Remediation</u> Review lesson from http://www.scribd.com/doc/164479724/Exponent-Rules-Lesson</p> <p><u>Enrichment</u> Pascal’s triangle enrichment activity. Chapter 5 Enrichment Activity Holt. My.hrw.com</p> <p><u>Learning Styles</u> Auditory, Visual, and Kinesthetic.</p>	<p><u>Formative:</u> MDC ‘Generalizing Patterns Using the Difference of Two Squares. http://map.mathshell.org/lessons.php?unit=8205&collection=8&redir=1</p>

			<p>discuss its applicability as a form of artificial intelligence.</p> <p><u>Summarizing Strategy</u> Students will factor a trinomial when “c” term is positive, one when the “c” term is negative, and will explain the rule for factoring each.</p> <p><u>Homework</u> Students will watch teacher created videos regarding factoring and will complete the guided summaries and questions that accompany each video. See: https://Williamsonalgebra1.blogspot.com Unit 5: Lessons 6-8 Factoring</p>		
4	<p>LT4: I can perform arithmetic operations on polynomials.</p> <p>LT5: I can understand the relationship between zeros and factors of polynomials</p>	<p><u>Curricular:</u></p> <ul style="list-style-type: none"> • Holt Fuse App Chapter 6 • Teacher Created Videos • Memory Multiplying Activity • Sum and Product Puzzles • Holt Online Chapter 6 Performance Task 	<p><u>Essential Questions:</u> How can I factor polynomials with a leading coefficient greater than one? How can I factor special products? How can I evaluate and defend the use of artificial intelligence in a math classroom?</p> <p><u>Set:</u> Students will watch video of Final Four basketball game, focusing on arc length of three point shots, and will discuss how trajectory can be calculated by factoring.</p> <p><u>Teaching Strategies:</u></p> <ul style="list-style-type: none"> • Using Holt Fuse App, students will work in pairs to solve problems factoring quadratic trinomials and special products from lessons 7.4 and 7.5. • Students will solve sum and product puzzles that will reinforce factoring as they determine factors and addends that create sum and product answers. They will then share and compare puzzles with another student. • Working in pairs, students will complete Memory Multiplying Polynomials Activity, practicing both factoring and multiplying binomials. • Students will engage in classroom debate about the use of artificial intelligence in a math class. They will use the articles previously read and evaluation of Ready to Go On feature of Holt Fuse app as resources to draw upon for the debate. <p><u>Summarizing Strategy:</u> Students will choose one special product rule, explain it in words, create an example of it and factor it.</p> <p><u>Homework</u> Students will watch teacher created videos regarding factoring trinomials and special products and will complete the guided summaries and questions that accompany each video. See: https://Williamsonalgebra1.blogspot.com</p>	<p><u>Remediation:</u> Ready to Go On, leveled practice worksheets from Holt Online. My.hrw.com</p> <p><u>Enrichment:</u> Ready to Go On Enrichment activity. Chapter 6 Holt Online. My.hrw.com</p> <p><u>Learning Styles</u> Auditory, Visual, and Kinesthetic.</p>	<p><u>Formative:</u> Performance Task chapter 6, Holt Online. My.hrw.com</p> <p><u>Summative:</u> Teacher created assessment of factoring polynomials.</p>

			Unit 5: Lesson5 Multiplying Polynomials and Special Products of Binomials.		
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