

# NUMB3RS Activities Curriculum Alignment

Season's 1 – 3

All activities are hyperlinked and can be downloaded from the Texas Instruments Activity Exchange by CTRL-clicking the activity title.

## NUMB3RS Episode

## Activity Title

## Topic

<b>Algebra</b>			
	<b>Composite Functions</b>		
	episode #: 305 "The Mole"	<a href="#">Coded Messages</a>	Inverse Matrices
	episode #: 213 "Double Down"	<a href="#">Perfect Out-Shuffles</a>	Card Shuffling
	<b>Expressions</b>		
	episode #: 304 "Provenance"	<a href="#">Checkbook (Mis)Calculations</a>	Algebraic Expressions, Linear Diophantine Equations
	<b>Equations</b>		
	episode #: 214 "Harvest"	<a href="#">Meltdown</a>	Direct Variation With the Square
	episode #: 313 "Finders Keepers"	<a href="#">Barging In</a>	Rates, Direct and Inverse Variation, Algebra
	episode #: 323 "Money for Nothing"	<a href="#">Velocity of Circulation</a>	Economics, Simulation, Using Formulas
	episode #: 310 "Brutus"	<a href="#">The Crowded Ballroom</a>	Area, Perimeter, Percentages
	episode #: 220 "Guns and Roses"	<a href="#">Seeing in the Dark</a>	Using Sound Waves to measure Distance
	episode #: 220 "Guns and Roses"	<a href="#">Bat Sonar</a>	Echolocation in Bats
	episode #: 320 "Burn Rate"	<a href="#">Energy</a>	Solving Equations
	episode #: 308 "Hardball"	<a href="#">The Pythagorean Expectation</a>	Algebra and Sabermetrics
	episode #: 111 "Sacrifice"	<a href="#">Sabermetrics</a>	Linear Modeling
	episode #: 102 "Uncertainty Principle"	<a href="#">Checksum</a>	Checksum Algorithms
	episode #: 214 "Harvest"	<a href="#">Getting In Focus</a>	Ellipses
	episode #: 214 "Harvest"	<a href="#">Waxing Elliptical</a>	Ellipses
	episode #: 207 "Convergence"	<a href="#">Two-Dimensional Trilateration</a>	Locating GPS Receivers
	episode #: 224 "Hot shot"	<a href="#">Parabolic Food Flight</a>	Parabolas and Curve Fitting – Matrix Method Sys of Eq.
	<b>Functions</b>		
	episode #: 303 "Traffic"	<a href="#">Up to Speed</a>	Elementary Traffic Flow Models
	episode #: 222 "Backscatter"	<a href="#">What Are You Implying?</a>	Explicit and Implicit Functions
	episode #: 304 "Provenance"	<a href="#">Magnetism</a>	Data Collection, Modeling
	<b>Graphs</b>		
	episode #: 220 "Guns and Roses"	<a href="#">Seeing in the Dark</a>	Piecewise functions and sound waves
	episode #: 301 "Spree"	<a href="#">The Chase</a>	Introduction to Pursuit Curves
	episode #: 213 "Double Down"	<a href="#">How Much Can They Win?</a>	Time Series Analysis – Graphing functions
	episode #: 213 "Double Down"	<a href="#">How Much Can They Win?</a>	Time Series Analysis – Graphing functions
	episode #: 310 "Brutus"	<a href="#">The Orchard Problem</a>	Lattice Points in the Coordinate Plane
	episode #: 322 "Under pressure"	<a href="#">Seeing Everyone</a>	Visible Lattice Points
	episode #: 222 "Backscatter"	<a href="#">The Graph Tells The Story</a>	Interpreting graphs Linear Regression & Scatter Plots
	episode #: 301 "Spree"	<a href="#">The Chase</a>	Introduction to Pursuit Curves
	episode #: 305 "The Mole"	<a href="#">Branch and Bound</a>	Linear Programming
	episode #: 302 "Spree, part II"	<a href="#">Spiraling Out</a>	Graphs of Polar Spirals

	episode #: 211 "Scorched "	<a href="#">Mapping Fireprints</a>	3-Dimensional Graphing
	episode #: 313 "Finders Keepers"	<a href="#">Where's Cheetah?</a>	Simulation, Cylindrical Coordinates
	<b>Logarithms &amp; Exponentials</b>		
	episode #: 301 "Spree"	<a href="#">A Pursuit Curve Problem</a>	Data collection, Graphs, Distance Formula
	episode #: 324 "The Janus List"	<a href="#">Pile It On</a>	Exponents and Powers of Two
	episode #: 110 "dirty bomb"	<a href="#">A Matter of Half-Life and Death</a>	Exponential Decay
	episode #: 108" Identity Crisis"	<a href="#">Exponential Growth</a>	Exponential Growth
	episode #: 103 "Vector"	<a href="#">Logistics Growth</a>	Logistics Growth
	episode #: 222 " Backscatter "	<a href="#">Chains and Pyramids</a>	Geometric Progressions and Exponential Growth
	episode #: 218 "All's Fair "	<a href="#">Logging Witnesses</a>	Probability and Logistic Regression
	episode #: 210 "Bones of Contention"	<a href="#">How to Get a Date</a>	Exponential Decay
	episode #: 209 "Toxin"	<a href="#">How Hard Can It Be?</a>	Entropy
	episode #: 205 "Calculated Risk"	<a href="#">Financial Futures</a>	Compounding Interest
	episode #: 222 " Backscatter "	<a href="#">Chains and Pyramids</a>	Geometric Progressions and Exponential Growth
	episode #: 301 "Spree"	<a href="#">The Four Bug Problem</a>	Data Collection, Graphs, Distance Between
	<b>Parabolas</b>		
	episode #: 104 "Structural Corruption"	<a href="#">Exploring Parabolas</a>	Parabolas
	episode #: 224 "Hot shot"	<a href="#">Parabolic Food Fight</a>	Parabolas and Curve Fitting
	episode #: 224 "Hot shot"	<a href="#">Clearing All Obstacles</a>	Parabolic Equations
	<b>Parametric Equations</b>		
	episode #: 305 "The Mole"	<a href="#">Cycloid I</a>	Geometry and Algebra
	episode #: 302 "Spree, part II "	<a href="#">Trawling for an Intersection</a>	Solving Parametric Equations
	episode #: 113 "Man Hunt"	<a href="#">The Great Escape</a>	Dynamic Parametric Equations
	episode #: 207 "Convergence "	<a href="#">Where is the Bullet?</a>	Projectile Motion
	episode #: 315 "End of Watch"	<a href="#">Angling for Distance</a>	Maximizing the Distance Traveled by a Projectile
	episode #: 319 "Pandora's Box"	<a href="#">Fresh Air and Parabolas</a>	Parametric Equations, Quadratic Equations
	<b>Properties</b>		
	episode #: 207 "Convergence"	<a href="#">1+1=2</a>	Group Theory
<b>Calculus</b>			
	episode #: 308 "Hardball"	<a href="#">Implicit Orbits</a>	Implicit Differentiation
	episode #: 305 "The mole"	<a href="#">Cycloid I</a>	Arc length
	episode #: 223 "Undercurrents"	<a href="#">Riding the Waves</a>	Vector Fields
	episode #: 223 "Undercurrents"	<a href="#">Where's the Source?</a>	Vector Fields
	episode #: 313 "Finders Keepers"	<a href="#">Where's Cheetah?</a>	Cylindrical Coordinates
	episode #: 320"Burn Rate"	<a href="#">A "Normal" Explosion</a>	Calculus Derivatives
<b>Discrete Mathematics</b>			
	<b>Graph Theory</b>		
	episode #: 209 "Toxin"	<a href="#">The Koenigsberg Bridge Problem</a>	Graph Theory
	episode #: 315 "End of Watch"	<a href="#">Critical Maths</a>	Critical Path Analysis (CPA)
	episode #: 210 " Bones of Contention "	<a href="#">Location! Location! Location!</a>	Voronoi Diagrams
	episode #: 322 "Under Pressure"	<a href="#">Close Encounters</a>	Social Networks, Connected graphs, Mean
	episode #: 323 "Money for Nothing"	<a href="#">Driving With Dijkstra</a>	Graph Theory, Dijkstra's Algorithm

	episode #: 310 "Brutus"	<a href="#">Dial the Phone</a>	Triangular Numbers, Networks
	episode #: 307 "Blackout"	<a href="#">Navigating Networks</a>	Networks, Directed Weighted Graphs
	episode #: 224 "Hot shot"	<a href="#">Sinks &amp; Sources</a>	Directed Graphs
	episode #: 216 "Protest"	<a href="#">A Party of Six</a>	Graph Theory and Ramsey Numbers
	episode #: 212 "The O.G."	<a href="#">It's All Connected</a>	Social Network Analysis
	episode #: 209 "Toxin"	<a href="#">Slippery Paths</a>	Steiner Paths and Trees
	episode #: 314 "Take Out"	<a href="#">Restaurant Ranking</a>	Probability and Directed Graphs
	<b>Algorithms</b>		
	episode #: 317 "One Hour"	<a href="#">The Labyrinth</a>	Logic Mazes
	episode #: 324 "The Janus List"	<a href="#">Pack It In</a>	Knapsack Problems
	episode #: 317 "One Hour"	<a href="#">Have Your Cake And Eat It Too</a>	Discrete Mathematics / Fair Division
	episode #: 323 "Money for Nothing"	<a href="#">Truth or Dare</a>	Logic Riddles
	episode #: 324 "The Janus List"	<a href="#">Straddling Checkerboard</a>	Cryptography, Number Theory, Math History
	episode #: 201 "Assassin"	<a href="#">Code Crackers</a>	Simple Codes
	episode #: 220 "Guns and Roses"	<a href="#">DNA Sequence Alignment</a>	Bio-Mathematics DNA Sequencing
	episode #: 106 "Sabotage"	<a href="#">Breaking the Code</a>	Cryptography
	<b>Mathematical Modeling</b>		
	episode #: 206 "Soft Target"	<a href="#">Escape</a>	Percolation Theory
	episode #: 206 "Soft Target"	<a href="#">Percolation Theory</a>	Percolation Theory
	episode #: 221 "Rampage"	<a href="#">Tesseract</a>	Tesseracts and Hypercubes
	episode #: 218 "All's Fair"	<a href="#">Sudoku Puzzles</a>	Sudoku Puzzles
	episode #: 207 "Convergence"	<a href="#">The Dating Game</a>	Algorithms for Calculating Dates
	episode #: 315 "End of Watch"	<a href="#">Ants Go Marching</a>	Ant Colony Optimization
	episode #: 321 "The Art of Reckoning"	<a href="#">No Place Left to Hide</a>	Pursuit Evasion, Families of Graphs, and Proof
	episode #: 303 "Traffic"	<a href="#">Up to Speed</a>	Elementary Traffic Flow Models
	episode #: 309 "Waste not"	<a href="#">Hide and Seep</a>	Visual Mathematical Modeling
	episode #: 312 "Nine Wives"	<a href="#">Lost And Found</a>	Modeling a Lost Person's Path
	episode #: 111 "Sacrifice"	<a href="#">Phreak Out!</a>	Van Eck Phreaking
	episode #: 208 "In Plain Sight"	<a href="#">Follow the Flock</a>	Introduction to Flock Behavior
	<b>Matrices</b>		
	episode #: 305 "The Mole"	<a href="#">Coded Messages</a>	Inverse Matrices
	episode #: 304 "Provenance"	<a href="#">Matrix Operations</a>	Matrix Operations
	episode #: 304 "Provenance"	<a href="#">Set the Trap</a>	Probability Matrices
	episode #: 224 "Hot shot"	<a href="#">Parabolic Food Flight</a>	Parabolas and Curve Fitting
	episode #: 220 "Guns and Roses"	<a href="#">Settling the Score</a>	Using Matrices for scoring mechanisms
	episode #: 214 "Harvest"	<a href="#">Markov Chain Links</a>	Markov Chains
	episode #: 201 "Assassin"	<a href="#">The Escape Game</a>	Game Theory
	episode #: 207 "Convergence"	<a href="#">Air Hockey</a>	Matrices: Meaning and Operations
<b>Geometry</b>			
	episode #: <b>204-17</b> "Obsession"	<a href="#">Guarding the Goods I</a>	The Art Gallery Problem
	episode #: <b>204-17</b> "Obsession"	<a href="#">Guarding the Goods II</a>	Securing Art Galleries
	episode #: 319 "Pandora's Box"	<a href="#">Thinking Backwards</a>	Inverse Problems, Geometric Reflections
	episode #: 310 "Brutus"	<a href="#">The Crowded Ballroom</a>	Area, Perimeter, Percentages
	episode #: 320 "Burn Rate"	<a href="#">Regular Polygon Centroids</a>	Geometry, Points of Concurency
	episode #: 101 "Pilot"	<a href="#">The Center of it All</a>	Circumcenter of Circles
	episode #: 320 "Burn Rate"	<a href="#">Irregular Polygon Centroids</a>	Geometry, Points of Concurency
	<b>Reasoning and Proof</b>		
	episode #: 309 "Waste not"	<a href="#">A Group of Symmetries</a>	Symmetries of an Equilateral Triangle
	episode #: 321 "The Art of Reckoning"	<a href="#">No Place Left to Hide</a>	Pursuit Evasion, Families of Graphs, and Proof
	episode #: 318 "Democracy"	<a href="#">Shaken, Not Stirred</a>	Application Of Inductive Reasoning In Problem Solving
	episode #: 221 "Rampage"	<a href="#">Circling Around</a>	Venn Diagrams, Intersecting Circles and

			Intersecting Spheres	
	episode #: 318 "Democracy"	<a href="#">All Shook Up</a>	An Elementary Introduction to Inductive Reasoning	
	<b>Pythagorean Theorem</b>			Ve Int
	episode #: 303 "Traffic"	<a href="#">To Pythagoras and Beyond</a>	Law of Cosines	
	episode #: 303 "Traffic"	<a href="#">Pythagorean Triples</a>	The Pythagorean Theorem	
	episode #: 223 "Undercurrents"	<a href="#">Narrowing the Search</a>	Length of an N-Dimensional Vector	
<b>Probability</b>				
	episode #: <b>203</b> "Better or Worse"	<a href="#">Creating "Random" Numbers</a>	Pseudo-Random Numbers	
	episode #: <b>202</b> "Judgement Day"	<a href="#">Filtering Suspects</a>	Conditional Probability Leading to Bayesian Filtering	
	episode #: 309 "Waste not"	<a href="#">Hide and Seep</a>	Visual Mathematical Modeling	
	episode #: 309 "Waste not"	<a href="#">Sharpshooter</a>	Geometric Probability	
	episode #: 306 "Longshot"	<a href="#">The Odds-On Favorite</a>	Probability, Odds, and Odds Ratios	
	episode #: 306 "Longshot"	<a href="#">Not So Great Expectations</a>	Probability and Expected Values	
	episode #: 303 "Traffic"	<a href="#">What is Random?</a>	Random Numbers, Monty Carlo method of finding area	
	episode #: 303 "Traffic"	<a href="#">What is Random?</a>	Random Numbers	
	episode #: 303 "Traffic"	<a href="#">Birthday Surprise</a>	Probability Using Complementary Events	
	episode #: 304 "Provenance"	<a href="#">Set the Trap</a>	Probability Matrices	
	episode #: 302 "Spree, part II "	<a href="#">Galton Board</a>	Probability	
	episode #: 113 "man hunt"	<a href="#">Stick or Switch</a>	The "Monty Hall" or Three Door Problem	
	episode #: 221 "Rampage"	<a href="#">I...It...Itera...Iteration</a>	Iterative Processes	
	episode #: 218 "All's Fair "	<a href="#">Logging Witnesses</a>	Probability and Logistic Regression	
	episode #: 217 "Mind Games "	<a href="#">Walkabout</a>	Random Walks & pi	
	episode #: 312 "Nine Wives"	<a href="#">Lost And Found</a>	Modeling a Lost Person's Path	
	episode #: 215 " The Running Man "	<a href="#">We're Number 1!</a>	Benford's Law	
	episode #: 215 " The Running Man "	<a href="#">The Eyes Have It</a>	Probability	
	episode #: 213 " Double Down"	<a href="#">A Bit of Basic Blackjack</a>	Probability with Sampling/no replacement	
	episode #: 213 " Double Down "	<a href="#">That's So Random</a>	Randomization	
	episode #: 212 "The O.G."	<a href="#">Is it Really Rare?</a>	Poisson Distribution	
	episode #: 211 "Scorched"	<a href="#">Making "Fireprints"</a>	Modeling the Spread of Fire	
	episode #: 211 "Scorched "	<a href="#">The Power of Powers</a>	Counting Techniques	
	episode #: 209 "Toxin"	<a href="#">Message of the Bottle</a>	Code Breaking	
	episode #: 209 "Toxin"	<a href="#">How Hard Can It Be?</a>	Entropy	
	episode #: 208 "In Plain Sight "	<a href="#">Now You See It, Now You Don't</a>	Steganography	
	episode #: 206 "Soft Target"	<a href="#">Is This Seat Taken?</a>	The Math of Arranging Objects	
	episode #: 206 "Soft Target"	<a href="#">Are You Sure?</a>	Mathematical Prediction	
	episode #: 205 "Calculated Risk"	<a href="#">How Reliable is the Test?</a>	Conditional Probability Trees	
	episode #: 205 "Calculated Risk"	<a href="#">A Mathematics Sampler</a>	Conditional Probability: Sampling Without Replacement	
	episode #: 312 "Nine Wives"	<a href="#">All In The Family</a>	Genetic Probabilities	
	episode #: 312 "Nine Wives"	<a href="#">A Breed Apart</a>	Inbreeding Coefficients	
	episode #: 313 "Finders Keepers"	<a href="#">The Leaf Drops</a>	Experimental Probability, Histograms	
	episode #: 313 "Finders Keepers"	<a href="#">Where's Cheetah?</a>	Simulation, Cylindrical Coordinate	
	episode #: 314 "Take Out"	<a href="#">Restaurant Ranking</a>	Probability and Directed Graphs	
	episode #: 318 "Democracy"	<a href="#">No Desk Left Behind</a>	Probability and Simulation	

	episode #: 320 "Burn Rate"	<a href="#">Random Thoughts</a>	Probability
	episode #: 321 "The Art of Reckoning"	<a href="#">Spies Like Us</a>	Probability Game
	episode #: 314 "Take Out"	<a href="#">No Fly Zone</a>	Geometry and Probability
	episode #: 306 "Longshot"	<a href="#">Expected Value</a>	Geometric Probability, Expected Value
<b>Counting and Combinatorics</b>			
	episode #: 302 "Spree, part II - daughters"	<a href="#">Social Security Numbers</a>	Combinatorics
	episode #: 223 "Undercurrents"	<a href="#">Numb3rs of the I Ching</a>	Counting, Symbolism and Encoding
	episode #: 312 "Nine Wives"	<a href="#">All In The Family</a>	Genetic Probabilities
	episode #: 312 "Nine Wives"	<a href="#">A Breed Apart</a>	Inbreeding Coefficients
<b>Statistics</b>			
	episode #: 311 "Killer Chat"	<a href="#">The Perfect House</a>	Marketing (Conjoint Analysis)
x	episode #: 309 "Waste not"	<a href="#">Different or Not</a>	Two-Proportion Z-test
	episode #: 306 "Longshot"	<a href="#">Harmonizing Means</a>	Harmonic Mean
	episode #: 217 "Mind Games"	<a href="#">Right or Wrong</a>	The Binomial Theorem
	episode #: 217 "Mind Games "	<a href="#">Thumbs Up!</a>	Using Simulations to Understand Variability
x	Episode #: 315 "End of Watch"	<a href="#">Candy Land</a>	Chi-square Test for Goodness-of-fit
x	episode #: 316 "Contenders"	<a href="#">Choosing Contenders</a>	Weighted Averages, Z-scores
x	episode #: 308 "Hardball"	<a href="#">Less Is More</a>	Least Squares Regression
<b>Data Analysis</b>			
	episode #: <b>202</b> "Judgement Day"	<a href="#">How Tall is the Criminal?</a>	Scatterplots
	episode #: 311 "Killer Chat"	<a href="#">Stylometry</a>	Box-and-Whisker Plots
	episode #: 308 "Hardball"	<a href="#">Is It For Real?</a>	Data Analysis & Scatter Plots
	episode #: 301 "Spree"	<a href="#">The Missing City</a>	Logical Reasoning
	episode #: 111 "Sacrifice"	<a href="#">Sabermetrics</a>	Linear Modeling
	episode #: 109 "Sniper zero"	<a href="#">How Does it Fit</a>	Statistics – Regression
	episode #: 104 "Structural corruption"	<a href="#">Fours and Sevens, Oh My!</a>	Using Histograms To Analyze Data
	episode #: 224 "Hot shot"	<a href="#">A Stab in the Dark</a>	Histograms, Relative Frequency and Probability
	episode #: 314 "Take Out"	<a href="#">Outliers</a>	Statistics and Outliers
	episode #: 316 "Contenders"	<a href="#">Dialing Ben</a>	Scatterplots, Least-squares Regression and Residuals
	episode #: 201 "Assassin"	<a href="#">Experimenting With Paper Airplanes</a>	Experimenting With Paper Airplanes
<b>Sequence &amp; Series</b>			
	episode #: 307 "Blackout"	<a href="#">Maintaining Balance</a>	Center of Mass, Harmonic Series
	episode #: 216 "Protest"	<a href="#">A Recursion Excursion</a>	Sequences Defined Recursively
	episode #: 215 "The Running Man"	<a href="#">An Irrational Approach to Music</a>	Simple Continued Fractions
	episode #: 108 "Identity crisis"	<a href="#">Growing Geometrically</a>	Geometric Sequences and Series
<b>Trigonometry</b>			
	episode #: 301 "Spree"	<a href="#">Traveling on Good Circles</a>	Geodesics On a Sphere (Arc Length)
	episode #: 107 "Counterfeit reality"	<a href="#">Let's Add Some Trig</a>	Operations with Trigonometric Functions & Graphs
	episode #: 107 "Counterfeit reality"	<a href="#">Changing Sines</a>	Introduction to Trigonometric Graphs
	episode #: <b>204</b> "Obsession"	<a href="#">Telling Time With the Sun</a>	Uses of Trigonometry

<b>Number Theory</b>			
	episode #: 106 "Sabotage"	<a href="#">It All Started With a Pair of Rabbits</a>	Fibonacci Numbers
	episode #: 105 "Prime suspect"	<a href="#">Prime Time</a>	Prime Numbers
	episode #: 318 "Democracy"	<a href="#">I Never Metadata I Didn't Like</a>	Pattern Analysis and Recognition
<b>Game Theory</b>			
	episode #: 302 "Spree, part II "	<a href="#">Tic-Tac-Toe</a>	Game Theory
	episode #: 201 "Assassin"	<a href="#">The Escape Game</a>	Game Theory
	episode #: 321 "The Art of Reckoning"	<a href="#">To C or Not to C</a>	The Prisoner's Dilemma
<b>Computer Science</b>			
	episode #: 311 "Killer Chat"	<a href="#">Onion Peeler</a>	Onion Routing networks
	episode #: 317 "One Hour"	<a href="#">Turing Origami</a>	Computer Science, Logic
	episode #: 208 "In Plain Sight "	<a href="#">Error Correction</a>	Error Correction Codes

Other

episode #: 111 "Sacrifice"	<a href="#">Phreak Out!</a>	Van Eck Phreaking
episode #: 221 "Rampage"	<a href="#">Tesseract</a>	Tesseracts and Hypercubes
episode #: 218 "All's Fair"	<a href="#">Sudoku Puzzles</a>	Sudoku Puzzles
episode #: 207 "Convergence "	<a href="#">The Dating Game</a>	Algorithms for Calculating Dates
episode #: 203 "Better or Worse"	<a href="#">Shifting Cells</a>	Finding Patterns Using Cellular Automata