

## High School Math Transition Course Scope and Sequence (DRAFT)

Real-World Contexts	Title of Lesson	Short Description	Math Practice Standards	Ohio Learning Standards	Remediation Free Standards	Number of 45-minute classes	Number of 90-minute classes
	<b>Pre-Assessment</b>					1	0.5
	Introduction	The first few weeks concentrate on fostering a growth mindset in students and expose them to problem-solving strategies.	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8			9	4.5
<b>Total:</b>						<b>10</b>	<b>5</b>
<b>Theme 1: Number and Quantity</b>							
Context 1	Farm Co-op Swap Meet	Students explore dimensional analysis and perform single and multiple unit conversions. They construct viable arguments as to why their calculations are correct and critique the reasoning of others.	MP.1 MP.3 MP.5 MP.7	N.Q.1	MP.PS.C MP.PS.D MP.CMI.A MP.CMI.C MP.CM.I.B MP.AUTT.A NO.SNS.A NO.O.D	2	1
	Reinforcement Activities	QR, Unit Conversion/Estimation				2	1
Context 2	Remodeling the Classroom	Students develop a cost estimate for remodeling the classroom. The remodel includes running a gas line, new carpet, and paint.	MP.1 MP.5	A.CED.1a F.BF.1 G.MG.3 S.ID.9	MP.PS.A MP.PS.D MP.AUTT.B A.G.C A.FA.E G.M.E	5	2.5-3
	Reinforcement Activities	QR, Measurement and Reasonableness and Composite Area and Perimeter				2	1
Context 3	<b>Gears???</b>	<b>Ratios and Proportions</b>				1	0.5
	Reinforcement Activities	TBD				1	0.5
	<b>Assessment</b>					1	0.5
<b>Total:</b>						<b>14</b>	<b>7-7.5</b>

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<b>Theme 2: Linear Functions</b>							
Context 4	Ramps (See Rachael)	Slope				1	0.5
	Reinforcement Activities	TBD				1	0.5
Context 5	How Many Ways Can You Grab?	This activity is a linear regression activity. Students measure the distance from their thumb to their pinky. Then they reach into a bowl of Starbursts and try to get the largest handful they can. It turns out that the data is linear. Students interpret the slope and $y$ -intercept and decide when the $y$ -intercept is useful. They decide which measurement of the hand will be the best predictor, in hopes that it will spark a better understanding of correlation.	TBD	TBD	TBD	5-7	3
	Reinforcement Activities	Linear regression, slope, and $y$ -intercept, graphing linear functions				3	2
Context 6	Follow the Bouncing Ball	Students use experimental design and mathematical modeling to collect, organize, and analyze data and construct a model which describes the functional relationship between initial drop height and height of first bounce.	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6	A.CED.2 A.CED.3 F.IF.4 F.IF.6 S.ID.6 S.ID.8 S.ID.9	MP.PS.A MP.PS.D MP.AUTT.B MP.CMI.A MP.CMI.B MP.CMC.A A.EI.D A.FA.E A.OAO.C A.G.A PS.RUD.A PS.RUD.C	4	2
	Reinforcement Activities	QR, measurement, functional relationships, independent and dependent variables, domain and range in context, scatterplots, predictor				4	2

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		value, modeling-extrapolation, solving linear equations					
Context 7	What Route Should I Take To Work?		TBD	TBD	TBD	1	0.5
	Reinforcement Activities	TBD				1	0.5
Context 8	Barbie Bungee	Using experimental design and mathematical modeling, students will collect, organize, and analyze data to construct a bungee cord which can provide an optimal jump from a specified height.	MP.1 MP.5	A.CED.2a F.IF.4a F.BF.1ai S.ID.6	MP.PS.D MP.CMI.C MP.AUTT.A MP.AUTT.B A.EI.D A.FA.E A.OAO.C PS.RUD.A	7	3.5
	Reinforcement Activities	QR, measurement, dimensional analysis, different representations of functions (graphical, written, analytic, tabular)				4	2
	Assessment					1	0.5
<b>Total:</b>						<b>32-34</b>	<b>17</b>
<b>Theme 3: Exponential and Power Functions and Geometric Sequences</b>							
Context 9	Which Cell Phone Plan Should I Choose?	Students will review their knowledge of different types of functions and their multiple representations through the context of choosing cell phone plans that best fit their families' needs.	MP.1 MP.2 MP.3 MP.4 MP.5	A.REI.6 A.REI.10 F.LE.1 F.LE.3 F.LE.5	MP.PS.A MP.PS.D MP.AUTT.B MP.CMI.B MP.CMC.A A.EI.B A.EI.D A.FA.E A.OAO.C A.G.A PS.RUD.A	4	2
	Reinforcement Activities	QR, solving non-linear equations algebraically and graphically, solving systems of nonlinear				4	1.5

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		equations graphically, solving inequalities using domain and range in context.					
Context 10	Modeling Cancer Cells with M&M's	The purpose of this activity is to provide a simple model to illustrate exponential growth of cancerous cells.	MP.4 MP.7	A.CED.2c F.LE.1 F.LE.2	MP.PS.D MP.MR.D A.EI.B A.FA.A A.FA.B A.FA.E	2	1
	Reinforcement Activities	QR, exponential and logarithmic growth by solving graphically and analytically				1	0.5
Context 11	Thinking about False Positives	Students will analyze the probability of getting a false positive when getting screened for cancer. They will then discuss whether or not cancer screenings are useful.	MP.1 MP.2 MP.4 MP.6	S.CP.3 S.CP.4 S.CP.5 S.CP.6	MP.PS.A MP.PS.D MP.CMI.A MP.CMC.A PS.DDI.A PS.PC.B	1	0.5
	Reinforcement Activities	QR, probability				3	1.5
Context 12	Skid Mark Trial	Using experimental design and mathematical modeling, students will collect, organize, and analyze data to construct a Model to predict the speed of a car based upon the length of the skid marks the car left when braking. The students will then prepare an argument based on their model as to whether a driver was exceeding the speed limit or not.	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6	A.CED.2 A.CED.3 S.ID.6	MP.PS.A MP.PS.D MP.AUTT.B MP.CMI.A MP.CMI.B MP.CMC.A A.EI.D A.FA.A A.FA.E	2-3	1
	Reinforcement Activities	QR, roots as a subset of power functions				1	0.5
	Reinforcement Activities (Balloons and Breaths)	The difference between power and exponential functions.				2	1
Context 13	The Big Fish Story	Students use a spreadsheet to gain understanding of linear difference equations and equilibrium for a stocked pond.	MP.1 MP.2 MP.4	N.Q.1 N.Q.2 N.Q.3	MP.PS.A MP.PS.D MP.AUTT.B	5	2.5

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			MP.5 MP.6 MP.7 MP.8	A.CED.2c A.CED.3a F.IF.3 F.IF.9 F.BF.1c F.BF.2	MP.CMI.A MP.CMI.B MP.CMC.A MP.MR.D NO.SNS.A NO.O.B A.EI.D A.EI.F A.G.A A.FA.A A.FA.B		
	Reinforcement Activities	QR, recursive sequences on a spreadsheet, arithmetic and geometric sequences				3	1.5
	Assessment						
<b>Total:</b>						<b>28</b>	<b>13.5</b>
<b>Theme 4: Statistics</b>							
Context 14	Misusing Statistics	Students will look at various graphs that are manipulated to convey a message. Then students will create their own misleading graphs.	MP.2 MP.3 MP.6	S.ID.3 S.ID.7 S.ID.8 S.ID.9 S.IC.1 S.IC.6	TBD	5	3
	Reinforcement Activities	Reading and interpreting graphs				1	0.5
Context 15	Flinging Frogs	Students will fling toy frogs to collect data in order to gain an intuition about measures of spread using a dot plot.	MP.2 MP.4 MP.5 MP.6	S.ID.1 S.ID.2 S.ID.3 N.Q.2 N.Q.3	MP.CMC.A MP.AUTT.A MP.CMI.A MP.CMI.D PS.DDI.A PS.DDI.B	4	2
	Reinforcement Activities	TBD				2	1
	Did I Trap the Median (STEW) reinforcement activity	The mean and five-number summaries and box plots are used to obtain point and interval	MP.1 MP.2	S.ID.1 S.ID.2		2	1

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		estimates of the class's median foot size. Students explore the relationships between samples sizes shapes of population distributions and variability and the intervals reliability to estimate the population mean.	MP.3 MP.4 MP.5	S.ID.3 S.IC.1			
Context 16	Colors Challenge (STEW)	Students design and perform an experiment mimicking the Stroop Effect. Five Number Summaries and box plots are used to summarize the data. (Level B)	MP.1 MP.2 MP.3 MP.4 MP.5	S.ID.1 S.ID.2 S.ID.3 S.IC.1 S.IC.5		2-3	1.5
	Reinforcement Activities	TBD				1	0.5
Context 17	NFL Quarterback Salaries	Students will set up a statistical question to explore how to interpret a linear regression equation the correlation coefficient for a relationship between two quantitative variables in the context of NFL salaries. Students need to demonstrate an understanding of correlation vs causation. (STEW Level C)	MP.4 MP.7	S.ID.6 S.ID.7 S.ID.8 S.ID.9		2	1
	Reinforcement Activities	TBD				1	0.5
Context 18	Are Double stuffed Oreos actually Double Stuffed?	Collect data to determine sample size, extrapolation, graphical representation of categorical data. (Level C STEW)	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6	S.ID.1 S.ID.2 S.ID.3 S.IC.1 S.IC.5	TBD	2	1
	Reinforcement Activities	TBD				1	0.5
Context 19	M&M's Sampling Distributions	Use data collection to gain intuition about proportional reasoning, sampling distributions, and Central Limit Theorem. (Level B. Also see STEW)	MP.1 MP.2 MP.4 MP.5 MP.6	S.ID.1 S.IC.1 S.ID.1 S.IC.1 S.IC.3 S.IC.4	MP.PS.D MP.AUTT.B MP.CMI.A MP.CMC.A PS.DDI.A PS.DDI.B	3	1.5

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				S.IC.6			
	Reinforcement Activities	TBD				1	0.5
Context 20	<b>Batting Averages</b> <a href="http://ww2.amstat.org/publications/jse/v10n2/albert.html">http://ww2.amstat.org/publications/jse/v10n2/albert.html</a>	Descriptive and Inferential Statistics	TBD	TBD	TBD	1	0.5
	Reinforcement Activities	TBD	TBD			1	0.5
Context 21	<b>I Always Feel Like Someone Is Watching Me</b>	Students will perform an experiment to test The Psychic Staring Effect. It is used to demonstrate confidence intervals and looking at categorical data and probability distributions (STEW Level C)	MP.1 MP.2 MP.4 MP.5 MP.6	S.ID.5 S.IC.1	PS.DDI.A PS.RUD.D	3	1.5
	Reinforcement Activities	TBD	TBD			1	0.5
Context 20	<b>March Madness Part 1 Feb (2) Part 2-March (1) Part 3- April (2)</b>	Present statistics, research, making judgement	TBD	TBD	TBD	5	2.5
Context 22	What Does the Normal Distribution Sound Like (STEW)	Students investigate the rate of change when popping microwave popcorn. They will summarize data using histograms, and approximate a normal curve for the relationship between the rate of popping and shape of distribution. The affects of human error in data collection will be discussed (Level B)	MP.1 MP.2 MP.4 MP.6 MP.7	S.ID.1 S.ID.4	TBD	1	0.5
Context 23	Over the Hill-Aging Population (US Census)	Students will use census data about the U.S. population that is 65 and older to make estimates using normal distribution models. They will estimate percentages based on a normal distribution and use a data set's mean	MP.2	S.ID.4	TBD	1	0.5

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		and standard deviation to fit it to a normal distribution (Level C)					
Context 24	Walk the Line (STEW)	Students test the theory that humans are not able to walk in a straight line without be able to see landmarks. They will perform an experiment and test the data set for normality and build a 95% confidence interval to estimate the mean distance students can walk. (Level C)	MP.1 MP.2 MP.3 MP.4	S.ID.1 S.ID.4	TBD	2	1
	Reinforcement Activities	Normal Distribution, TBD				3	1.5
	Assessment					1	0.5
					<b>Total</b>	<b>46</b>	<b>24</b>
<b>Theme 5: Probability</b>							
Context 25	<b>Coke vs Pepsi Challenge</b>	Theoretical vs Experimental Probability	TBD	TBD	TBD	2	1
	Reinforcement Activities	TBD				1	0.5
Context 26	Random Babies	Babies in a hospital who lost their bracelets would find their mother Simulating probability, cumulative frequency	TBD	TBD	TBD	1	0.5
	Reinforcement Activities	TBD				1	0.5
Context 27	<b>One Child Policy</b>	Simulation	TBD	TBD	TBD	3	1.5
	Reinforcement Activities	TBD				1	0.5
	Assessment					1	0.5
					<b>Total</b>	<b>10</b>	<b>5</b>
<b>Theme 6: Applications of Number and Quantity and Statistics</b>							
Context 28	Volcanoes		TBD	TBD	TBD	5	2.5
	Reinforcement Activities	TBD				2	1
Context 29	Inflation and Consumer Price Index		TBD	TBD	TBD	1	0.5
	Reinforcement Activities	TBD				1	0.5
Context 30	Loan Project	Students will develop a pamphlet or handout suitable for a community organization that describes the mathematics involved in loans,	MP.1 MP.2 MP.4	N.Q.1 N.Q.2 A.SSE.3c	MP.PS.A MP.PS.D MP.AUTT.B	5	2.5



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		with the purpose of promoting financial responsibility. Students will study different types of loans and create a product to showcase their understanding.	MP.5 MP.6	A.CED.2 A.CED.3 A.CED.4 F.LE.2 F.BF.1 F.IF.6	MP.CMI.A MP.CMC.A NO.O.A NO.O.C A.OAO.A A.FA.A A.FA.E		
	Reinforcement Activities	TBD				2	1
Context 31	Carnival Games	Deciding whether games are fair or favor the house. Theoretical and Probability.	TBD	TBD	TBD	5	2.5
	Reinforcement Activities	TBD				2	1
Context 32	The Mathematics of Running		TBD	TBD	TBD	5	2.5
	Reinforcement Activities	TBD				2	1
	<b>Assessment</b>					1	0.5
					<b>Total</b>	<b>31</b>	<b>15.5</b>
<b>Theme 7: Wrap-Up</b>							
	How do I use Math in my Future?	3 page essay about college and future career and personal reflection.				3-5	2
	Mindset Reflection	Mindset Reflection				1	0.5
	<b>Post-Assessment</b>					1	0.5
					<b>Total</b>	<b>5</b>	<b>2.5</b>
					<b>Grand Total</b>	<b>176</b>	<b>88</b>