Grade Level: 8
Subject: Math

Howell Public Schools (HPS), like many of our fellow Michigan districts, has studied the work of Dr. Robert Marzano and other educational consultants. In his book *What Works in Schools: Translating Research into Action*, Marzano points to the necessity of school districts having a "guaranteed and viable curriculum." Marzano stresses the importance of everyone in the school community understanding what skills will be taught for mastery at each grade level, and then guaranteeing that happens. Using this research, our district is undertaking the task of creating an aligned curriculum that prepares students to successfully meet the academic rigors of Michigan's Grade Level Content Expectations (GLCEs).

During the 2008-09 school year, small groups of teachers worked under the guidance of curriculum consultants and HPS administrators to study the core content curriculums of English, math, science and social studies. Through professional development efforts, these groups learned to identify subsets of fundamental, non-negotiable content expectations that require a higher degree of mastery than the other expectations within the content area. HPS has chosen to call these fundamental, non-negotiable content expectations for each grade level subject "Essential Skills". Teacher groups then assigned a recommended number of lessons, per quarter, needed to successfully teach each GLCE, thus securing the curriculum as viable. Vocabulary, a researched component to uniform student achievement, was identified by quarter (nine-week sessions). Examples of formative assessments were provided for each expectation, with the creation of uniform summative assessments to follow the final approval of this document. Upon completion of draft essential skills for each subject, the teacher groups used supporting MDE documents to align their chosen skills horizontally for grades kindergarten through eight.

The essential skills found within this document will be piloted in the 2009-2010 school year. Our teaching staff will provide on-going feedback on the document during this pilot. At the conclusion of each semester the original teacher groups will re-assemble under the guidance of educational consultants and HPS administration to review the edit suggestions. These steps will culminate in revisions for a final document.

It should be noted that as a subset of Michigan's Grade Level Content Expectations, the overall number of expectations identified as essential skills is smaller than the total articulated within the State's course expectation documents. This is the intentional result of a process that asked teacher leaders to identify fundamental content expectations that require a higher degree of mastery than others included within the discipline. Expectations that were not considered fundamental to the success of all students are not included in this document, but may be found on the MDE web site at http://www.michigan.gov/mde/0,1607,7-140-28753_33232---,00.html

Quarter 1

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
	Students will			41		

Number and Numeration

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
N.ME.08.02	Understand meanings for zero and negative integer exponents.	understand the meaning of zero and negative number exponents (power).	1	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	rational number irrational number measures of variation and central trendency outcomes simple event probability sample space therotical probability experiemental probability solution system of equations substitution
N.ME.08.03	Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number line; know fraction forms of common repeating decimals, e.g., 0.1= 1/9 ; 0.3= 1/3 .	write fractions as decimals that end or repeat.	1	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	

Data and Probability

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
D.AN.08.01	Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices, for answering certain questions; justify the choice made.	when to use mean, median and mode to best represent information.	1	5	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
D.PR.08.03	Compute relative frequencies from a table of experimental results for a repeated event. Interpret the results using relationship of probability to relative frequency.*	find the relative frequency from a given table of results.	1	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations, Experiments and Games	

Algebra

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
A.FO.08.10	Understand that to solve the equation f(x) = g(x) means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of 3x2 + 2 = 4x + 2, but 1 is not a solution).	understand if a number is a solution to an equation.	1	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	

Quarter 2

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
	Students will			42		

Number and Numeration

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
N.FL.08.11	Solve problems involving ratio units, such as miles per hour, dollars per pound, or persons per square mile.*	solve problems involving interest, charges to a credit card, and sale discounts.	2	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	cross products percent equation discount simple interest percent of change percent of increase/decrease real numbers rational/irrational numbers
N.MR.08.07	Understand percent increase and percent decrease in both sum and product form, e.g., 3% increase of a quantity x is x + .03x = 1.03x.	find percent increase and decrease of an amount such as sale items and tips.	2	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
N.MR.08.08	Solve problems involving percent increases and decreases.	solve problems showing how the amount has increased or decreased from the original amount (population growth, college tuition).	2	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
N.FL.08.06	Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, e.g., √130 is between 11 and 12.	understand what it means when using the √ key on the calculator gives a decimal or whole number.	2	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	

Data and Probability

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
D.PR.08.05	Find and/or compare the theoretical probability, the experimental probability, and/or the relative frequency of a given event.*	compare what actually happens to what should happen in a probability experiment.	2	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations, Experiments and Games	

Quarter 3

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
	Students will			42		

Geometry

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
G.GS.08.01	Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems.	use the Pythagorean Theorem ($a^2 + b^2 = c^2$)	3	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations, Projects	legs hypotenuse Pythagorean Theorem solving a right triange converse Distance Formula midpoint
G.LO.08.02	Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem.	find the distance of 2 points on a grid.	3	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations, Projects	midpoint formula function vertical line test

Algebra

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
A.FO.08.11	Solve simultaneous linear equations in two variables by graphing, by substitution, and by linear combination; estimate solutions using graphs; include examples with no solutions and infinitely many solutions.	find a common solution to two linear equations using graphs.	3	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
A.FO.08.12	Solve linear inequalities in one and two variables, and graph the solution sets.	find a common solution to inequalities using graphs.	3	10	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
A.RP.08.04	Use the vertical line test to determine if a graph represents a function in one variable.	test if a graph is a function.	3	2	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations, Graph Boards	

Quarter 4

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
	Students will			43		

Geometry

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	Lessons or Days	Examples of Formative Assessments	Vocabulary
G.SR.08.03	Understand the definition of a circle; know and use the formulas for circumference and area of a circle to solve problems.	understand the definition of a circle, the distance around and its area.	4	9	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	circle diameter radius center circumference pi base altitude formula perimeter area volume cylinder cone pyramid
G.SR.08.04	Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles).	find the area and distance around other shapes by separating them into familiar shapes.	4	9	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
G.SR.08.05	Solve applied problems involving areas of triangles, quadrilaterals, and circles.	solve problems using area formulas for familiar shapes	4	9	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
G.SR.08.06	Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids (1/3 (area of base) x height), and spheres (4/3 π (radius) 3) and apply them to solve problems.	use the volume formulas for cylinders, cones, pyramids and spheres.	4	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	
G.SR.08.07	Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders.	use the surface area formulas for cylinders, cones, pyramids and spheres.	4	8	End of Unit Tests, Online Self Check Quizzes and Tests, Verbal Explanations	