HPS Scope & Sequence
K-8 Grade Level Essential Skills
DRAFT
August 2009

Grade Level: 6
Subject: Science

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

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Grade 6
Science/Quarterly

Quarter 1

Standard or GLCE #	Standard or GLCE Language Students will	What this means:	Q	Lessons or Days 45	Examples of Formative Assessments	Vocabulary
						
Science Processes: Inquiry Process						Kinetic Energy Potential energy Energy transfer conduction convection radiation mass closed system transformation
S.IP.06.11	Generate scientific questions based on observations, investigations, and research.		Y			
S.IP.06.12	Design and conduct scientific investigations.		Y			
S.IP.06.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens, thermometer, models, sieves, microscopes) appropriate to scientific investigations.		Y			
S.IP.06.14	Use metric measurement devices in an investigation.		Y			
S.IP.06.15	Construct charts and graphs from data and observations.		Y			
S.IP.06.16	Identify patterns in data.		Y			
Science Processes: Inquiry Analysis and Communication						
S.IA.06.11	Analyze information from data tables and graphs to answer scientific questions.		Y			
S.IA.06.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.		Y			
S.IA.06.13	Communicate and defend findings of observations and investigations using evidence.		Y			
S.IA.06.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.		Y			
S.IA.06.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.		Y			
Science Processes: Reflection and Social Implications						
S.RS.06.11	Evaluate the strengths and weaknesses of claims, arguments, and data.		Y			
S.RS.06.12	Describe limitations in personal and scientific knowledge.		Y			
S.RS.06.13	Identify the need for evidence in making scientific decisions.		Y			

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S.RS.06.14	Evaluate scientific explanations based on current evidence and scientific principles.		Y			
S.RS.06.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		Y			
S.RS.06.16	Design solutions to problems using technology.		Y			
S.RS.06.17	Describe the effect humans and other organisms have on the balance of the natural world.		Y			
S.RS.06.18	Describe what science and technology can and cannot reasonably contribute to society.		Y			
S.RS.06.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.		Y			
Physical Science: Energy						
P.EN.06.11	Identify kinetic or potential energy in everyday situations (for example: stretched rubber band, objects in motion, ball on a hill, food energy).	Students will be able to explain that energy makes things happen.	1	5	Through inquiry activities, students will identify kinetic and potential energy; stretching a rubber band, objects in motions, energy from food.	
P.EN.06.12	Demonstrate the transformation between potential and kinetic energy in simple mechanical systems (for example: roller coasters, pendulums).	Students will be able to demonstrate potential and kinetic energy by applying them within a mechanical system.	1	10	Students will create a roller coaster using simple classroom supplies showing potential and kinetic energy.	
P.EN.06.41	Explain how different forms of energy can be transferred from one place to another by radiation, conduction, or convection.	Students explain how different forms of energy can be transferred.	1	10	Students will explore the transfer of energy through hands on examples of conduction, convection and radiation. After experimenting with the different methods of transfer, students will draw a picture and describe each of the 3 ways energy is transferred.	
P.EN.06.42	Illustrate how energy can be transferred while no energy is lost or gained in the transfer.	Students will be able to draw a picture and explain how energy is not lost when it is transferred.	1	10	Students will draw a diagram to show how energy can be transferred with no loss or gain in mass when transferred.	
Physical Science: Changes in Matter						

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P.CM.06.11	Describe and illustrate changes in state, in terms of the arrangement and relative motion of the atoms or molecules.	Students will explain solids, liquids and gases.	1	7	Students will draw the 3 states of matter: showing the movement and arrangement of molecules.	
P.CM.06.12	Explain how mass is conserved as it changes from state to state in a closed system.	Students will explain how mass stays the same in a closed system.	1	3	Students will create a model to demonstrate how mass is conserved as it changes state.	

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Quarter 2

Standard or GLCE #	Standard or GLCE Language Students will	What this means:	Q	Lessons or Days 45	Examples of Formative Assessments	Vocabulary
						
Life Science: Organization of Living Things						
L.OL.06.51	Classify organisms (producers, consumers, and decomposers) based on their source of energy for growth and development.	Students will be able to identify organisms based on how they get their energy and food.	2	10	Students will make a poster classifying producers, consumers, and decomposers based on their source of energy and food.	Consumers decomposers bacteria fungus ecosystem population community parasite predator symbiosis competition biotic components abiotic components resource depletion species extinction
Life Science: Ecosystems						
L.EC.06.11	List examples of populations, communities, and ecosystems including the Great Lakes region.	Students will be able to describe how organisms interact with other organisms and their environment.	2	10	When provided examples, students can identify and describe different populations, communities and ecosystems.	
L.EC.06.21	Describe common patterns of relationships between and among populations (competition, parasitism, symbiosis, predator/prey).	Students will be able to describe how organisms interact with other organisms and their environment.	2	10	Students will design a skit to show the relationships between and among populations. From video clips, pictures, or a reading students could describe the different relationships present.	
L.EC.06.31	Identify the living (biotic) and nonliving (abiotic) components of an ecosystem.	Students will be able to identify the living and nonliving parts of an ecosystem.	2	5	Through examples of pictures or sample ecosystems, students could classify those things that are living and nonliving.	
L.EC.06.32	Identify the factors in an ecosystem that influence changes in population size.	Students will be able to identify different factors that affect populations.	2	5	After observing and reading about different ecosystems, students will list factors that influence their populations.	
L.EC.06.41	Describe how human beings are part of the ecosystem of the Earth and that human activity can purposefully, or accidentally, alter the balance in ecosystems.	Students will be able to explain how humans impact the earth.	2	5	Students will use the internet to research ways humans positively and negatively affect the Earth. Students will create a presentation of their findings to share with the class; example, power point, poster, etc.	

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Quarter 3

Standard or GLCE #	Standard or GLCE Language Students will	What this means:	Q	Lessons or Days 45	Examples of Formative Assessments	Vocabulary
						
Earth Science: Solid Earth						
E.SE.06.11	Explain how physical and chemical weathering lead to erosion and the formation of soils and sediments.	Students will be able to describe how weathering leads to the formation of soils.	3	10	Students will match pictures of different landforms that show chemical and physical weathering.	
E.SE.06.12	Explain how waves, wind, water, and glacier movement, shape and reshape the land surface of the Earth by eroding rock in some areas and depositing sediments in other areas.	Students will explain how the land is reshaped.	3	15	Students will create a pictorial timeline of the reshaping of the earth including erosion and deposition.	
E.SE.06.14	Compare different soil samples based on particle size and texture.	Students will be able to identify the different rock types.	3	10	When given a sample of rocks, students will identify the rock types.	
Earth Science: Earth in Space and Time						
E.ST.06.31	Explain how rocks and fossils are used to understand the age and geological history of the earth (timelines and relative dating, rock layers).	Students will explain how rocks and fossils are used to understand the history of the earth.	3	10	Students will create a timeline showing the age of the earth with fossils as evidence.	

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Standard or GLCE #	Standard or GLCE Language Students will	What this means:	Q	Lessons or Days 45	Examples of Formative Assessments	Vocabulary
						
Earth Science: Solid Earth						
E.SE.06.51	Explain plate tectonic movement and how the lithospheric plates move centimeters each year.	Students will explain how the surface of the Earth has changed as a result of the movement of its plates.	4	20	Students will create a poster showing the movement of the lithospheric plates and present it to the class.	Pangaea lithospheric plates plate tectonic geological events earthquakes mountain building crust convecting mantle lava tremor seismograph volcanic eruptions lithosphere upper mantle Richter scale magma vibrations magnitude magnetic field poles navigation metallic core
E.SE.06.52	Demonstrate how major geological events (earthquakes, volcanic eruptions, mountain building) result from these plate motions.	Students will explain how geological events happen as a result of plate motion.	4	15	Using clay, students will create a model of the different land formations.	
E.SE.06.61	Describe the earth as a magnet and compare the magnetic properties of the Earth to that of a natural or man-made magnet.	Students will be able to describe the Earth as a magnet.	4	10	Students will write a paragraph describing how Earth acts like a magnet. Students could also create a diagram to show their understanding.	