

HPS Scope & Sequence
K-8 Grade Level Essential Skills
Created: August 2009
Last Revision: June 2010

Grade Level: Fifth Grade
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 has undertaken 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 were then piloted in the 2009-2010 school year, with our teaching staff providing on-going feedback on the document during this pilot. At the conclusion of each semester the original teacher groups re-assembled under the guidance of educational consultants and HPS administration to review the edit suggestions. These steps culminated in revisions and a secure document that will remain fluid.

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

1 of 4 Rotating Quarters: Objects in the Sky (5ES)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will . . .			11 			
Science Processes: Inquiry Process						asteroids atmosphere of planets axis calendar comets composition of planets constellations dependent variable dwarf planet graph gravitational pull gravity heat energy independent variable lunar eclipse month moon phase neap tide orbit planet relative distance revolution revolve rotate rotation scale season	Activity Page
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.	Thinking of questions and finding answers by doing an investigation (experiment).					Journal Page
S.IP.05.11	Generate scientific questions based on observations, investigations, and research.	Use prior knowledge to ask questions related to science topics.	Y	9	1, 2, 3, 5, 6, 7, 9, 10, 11		Class discussion/ conclusion
S.IP.05.12	Design and conduct scientific investigations.	Create and perform an experiment.	Y	8	1, 2, 3, 5, 8, 9, 10, 11		Class Discussion/ Charts and Graphs
S.IP.05.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens) appropriate to scientific investigations.	Use appropriate tools and equipment during an experiment.	Y	8	1, 2, 3, 5, 8, 9, 10, 11		Group Presentations
S.IP.05.14	Use metric measurement devices in an investigation.	Use metric tools.	Y	6	3, 5, 8, 9, 10, 11		Student Models
S.IP.05.15	Construct charts and graphs from data and observations.	Organize data in charts and graphs.	Y	8	1, 2, 3, 5, 8, 9, 10, 11		Student Presentations
S.IP.05.16	Identify patterns in data.	Look for patterns in data gathered from experiments.	Y	7	1, 2, 3, 5, 9, 10, 11		Sequence/Moon Phases Cards

1 of 4 Rotating Quarters: Objects in the Sky (5ES)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will . . .			11 			
Science Processes: Inquiry Analysis and Communication						solar eclipse solar system spring tide stars tide tilt x-axis y-axis year	
S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.	Analyze and present information learned from an investigation to create new questions and experiments.	Y				
S.IA.05.11	Analyze information from data tables and graphs to answer scientific questions.	Use information to answer questions about an experiment.	Y	8	1, 2, 3, 4, 5, 9, 10, 11	Marzano Vocabulary	
S.IA.05.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.	Discuss results of the experiment in a group.	Y	8	1, 2, 3, 4, 5, 9, 10, 12	apparent movement of the planets apparent movement of the stars apparent movement of the Sun	
S.IA.05.13	Communicate and defend findings of observations and investigations using evidence.	Share and support your data from experiments.	Y	8	1, 2, 3, 4, 5, 9, 10, 13	astronomical distance astronomical object astronomical size	
S.IA.05.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.	Answer questions using data from several parts of an experiment.	Y	5	1, 2, 3, 4, 9	astronomy Earth's axis Earth's orbit gases of the atmosphere Moon's orbit	

1 of 4 Rotating Quarters: Objects in the Sky (5ES)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will . . .						
S.IA.05.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.	Use several reliable sources of information to evaluate whether your conclusions are strong or weak.	Y			Moons orbit Moons Phases outer space telescope	
Science Processes: Reflection and Social Implications							
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history and within society.	Using your knowledge to look at information from an experiment to see how it relates to science and society in the past and future.	Y				
S.RS.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.	Judge the value of claims, arguments and data.	Y	8	1, 2, 3, 4, 5, 9, 10, 11		
S.RS.05.12	Describe limitations in personal and scientific knowledge.	Describe why knowledge of science may be limited.	Y	5	3, 4, 9, 10, 11		
S.RS.05.13	Identify the need for evidence in making scientific decisions.	Tell why evidence must be used to make scientific decisions.	Y	8	1, 2, 3, 4, 5, 9, 10, 11		

1 of 4 Rotating Quarters: Objects in the Sky (5ES)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	Explain what you know and learn in a variety of ways.	Y	9	1, 2, 3, 4, 5, 8, 9, 10, 11		
S.RS.05.16	Design solutions to problems using technology.	Use technology to answer problems.	Y	5	1, 2, 3, 10, 11		
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	Describe how many people have contributed to advance science throughout history.	Y	2	10, 11		
Earth Science: Earth Systems							
Statement E.ES.M.6	Seasons- Seasons result from annual variations in the intensity of sunlight and length of day due to the tilt of the axis of the Earth relative to the plane of its yearly orbit around the sun.	Seasons are the result of the tilt of the Earth.	C				

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Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
E.ES.05.61	Demonstrate using a model, seasons as the result of variations in the intensity of sunlight caused by the tilt of the Earth on its axis, and revolution around the sun.	Show how seasons occur on the Earth using a model.	C	4	1, 2, 3, 4		
E.ES.05.62	Explain how the revolution of the Earth around the sun defines a year.	Show that it takes a year for the Earth to go around the sun.	C	2	3, 4		
Earth Science: Earth in Space and Time							
Statement E.ST.M.1	Solar System- The sun is the central and largest body in our solar system. Earth is the third planet from the sun in a system that includes other planets and their moons, as well as smaller objects, such as asteroids and	The Solar System includes planets, moons, and other small objects that orbit the sun.	C				

1 of 4 Rotating Quarters: Objects in the Sky (5ES)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will . . .						
E.ST.05.11	Design a model that describes the position and relationship of the planets and other objects (comets and asteroids) to the sun.	Make an accurate model of the objects in our solar system.	C	4	8, 9, 10, 11		
Statement E.ST.M.2	Solar System Motion- Gravity is the force that keeps most objects in the solar system in regular and predictable motion.	Gravity holds most objects of the solar system in their orbits of the sun.	C				
E.ST.05.21	Describe the motion of planets and moons in terms of rotation on axis and orbits due to gravity.	Show how gravity affects how planets and moons move.	C	3	9, 10, 11		
E.ST.05.22	Explain moon phases as they relate to the position of the moon in its orbit around the Earth, resulting in the amount of observable reflected light.	Explain the changing appearance of the moon as it moves around the Earth.	C	1	5		
E.ST.05.23	Recognize that nighttime objects (stars and constellations) and the sun appear to move because the Earth rotates on its axis and orbits the sun.	Recognize that objects in the night sky appear to move because the movement of the Earth.	C	2	3, 4		

1 of 4 Rotating Quarters: Objects in the Sky (5ES)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
E.ST.05.24	Explain lunar and solar eclipses based on the relative positions of the Earth, moon, and sun, and the orbit of the moon.	Explain that eclipses are a result of the positions of the sun, Earth and moon.	C	2	6, 7		
E.ST.05.25	Explain the tides of the oceans as they relate to the gravitational pull and orbit of the moon.	Explain that tides of the oceans are the result of the moon's gravity.	C	1	7		

1 of 4 Rotating Quarters: Forces & Motion (5PS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Science Processes: Inquiry Process						average speed balanced forces change of motion change of speed constant speed effort force force force on the load force strength fulcrum graph gravitational force gravity instantaneous speed lever load mass motion newton non-zero net force pulley relative time point of reference simple machine speed	Activity pages
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.	Thinking of questions and finding answers by doing an investigation (experiment).	Y				Journal Page
S.IP.05.11	Generate scientific questions based on observations, investigations, and research.	Use prior knowledge to ask questions related to science topics.	Y	10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10		Group Activity
S.IP.05.12	Design and conduct scientific investigations.	Create and perform an experiment.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		Group/Class Discussions
S.IP.05.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens) appropriate to scientific investigations.	Use appropriate tools and equipment during an experiment.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		Data Collection
S.IP.05.14	Use metric measurement devices in an investigation.	Use metric tools.	Y	6	1, 2, 3, 4, 7, 9		Group Presentations
S.IP.05.15	Construct charts and graphs from data and observations.	Organize data in charts and graphs.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		Science Talk
S.IP.05.16	Identify patterns in data.	Look for patterns in data gathered from experiments.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		Group Investigations
Science Processes: Inquiry Analysis and Communication							Student Investigations

1 of 4 Rotating Quarters: Forces & Motion (5PS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.	Analyze and present information learned from an investigation to create new questions and experiments.	Y			spring scale unbalanced forces variables weight wheel and axle zero net force Marzano vocabulary acceleration applied force change of direction measurement of motion position over time relative position	
S.IA.05.11	Analyze information from data tables and graphs to answer scientific questions.	Use information to answer questions about an experiment.	Y	8	1, 2, 3, 4, 6, 7, 8, 9,		
S.IA.05.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.	Discuss results of the experiment in a group.	Y	8	1, 2, 3, 4, 6, 7, 8, 9,		
S.IA.05.13	Communicate and defend findings of observations and investigations using evidence.	Share and support your data from experiments.	Y	8	1, 2, 3, 4, 6, 7, 8, 9,		
S.IA.05.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.	Answer questions using data from several parts of an experiment.	Y	7	1, 2, 3, 4, 7, 8, 9		
S.IA.05.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.	Use several reliable sources of information to evaluate whether your conclusions are strong or weak.	Y	5	1, 2, 6, 7, 10		
Science Processes: Reflection and Social Implications							

1 of 4 Rotating Quarters: Forces & Motion (5PS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the	Using your knowledge to look at information from an experiment to see how it relates to science and society in the past and future.	Y				
S.RS.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.	Judge the value of claims, arguments and data.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		
S.RS.05.12	Describe limitations in personal and scientific knowledge.	Describe why knowledge of science may be limited.	Y	1	6		
S.RS.05.13	Identify the need for evidence in making scientific decisions.	Tell why evidence must be used to make scientific decisions.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits,	Explain what you know and learn in a variety of ways.	Y	9	1, 2, 3, 4, 6, 7, 8, 9, 10		
S.RS.05.16	Design solutions to problems using technology.	Use technology to answer problems.	Y	7	1, 2, 3, 4, 8, 9, 10		
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	Describe how many people have contributed to advance science throughout history.	Y	3	8, 9, 10		
Physical Science: Force and Motion							

1 of 4 Rotating Quarters: Forces & Motion (5PS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Statement P.FM.M.2	Force Interactions- Some forces between objects act when the objects are in direct contact (touching), such as friction and air resistance, or when they are not in direct contact (not touching), such as magnetic force, electrical force, and gravitational force.	Forces can act through direct contact (touching) like friction or indirect contact (not touching) like magnetic force.	A				
P.FM.05.21	Distinguish between contact forces and non-contact forces.	Identify the difference between contact and non-contact forces.	A	2	7, 8		
P.FM.05.22	Demonstrate contact and non-contact forces to change the motion of an object.	Show how the two types of forces change the motion of an object.	A	2	7, 8		
Statement P.FM.M.3	Force- Forces have a magnitude and direction. Forces can be added. The net force on an object is the sum of all of the forces acting on the object. The speed and/or direction of motion of an object changes when a non-zero net force is applied to it. A balanced force on an object does not change the motion of the object (the object either remains at rest or continues to move at a constant speed in a straight line).		A				

1 of 4 Rotating Quarters: Forces & Motion (5PS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
P.FM.05.31	Describe what happens when two forces act on an object in the same or opposing directions.	Show what happens when two forces act on an object.	A	2	5, 6		
P.FM.05.32	Describe how constant motion is the result of balanced (zero net) forces.	Show how motion doesn't change when the forces on it are balanced.	A	3	5, 8, 9		
P.FM.05.33	Describe how changes in the motion of objects are caused by a non-zero net (unbalanced) force.	Show how motion changes when the forces on it are not equal.	A	6	5, 6, 7, 8, 9, 10		
P.FM.05.34	Relate the size of change in motion to the strength of unbalanced forces and the mass of the object.	Show how the mass of an object and the strength of unbalanced forces relate to the amount of change in motion.	A	2	9, 10		
Statement P.FM.M.4	Speed- Motion can be described by a change in position relative to a point of reference. The motion of an object can be described by its speed and the direction it is moving. The position and speed of an object can be measured and graphed as a function of time.		A				
P.FM.05.41	Explain the motion of an object relative to its point of reference.	Explain that the motion of an object can be described using other objects.	A	6	1, 2, 3, 4, 5, 6		

1 of 4 Rotating Quarters: Forces & Motion (5PS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
P.FM.05.42	Describe the motion of an object in terms of distance, time and direction, as the object moves, and in relationship to other objects.	Show that motion of an object is measured in terms of distance, time and direction and in relationship to other objects.	A	6	1, 2, 3, 4, 5, 6		
P.FM.05.43	Illustrate how motion can be measured and represented on a graph.	Measure motion and create a graph to show that motion.	A	4	2, 3, 4, 5		

1 of 4 Rotating Quarters: Forces & Motion (5PS)							
Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Science Processes: Inquiry Process						air resistance contact force electromagnet inclined plane magnetic attraction magnetic repulsion non-contact force screw wedge Marzano Vocabulary air movement battery charge attraction charge repulsion energy transfer	Activity Pages
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.	Thinking of questions and finding answers by doing an investigation (experiment).	Y				Journal Pages
S.IP.05.11	Generate scientific questions based on observations, investigations, and research.	Use prior knowledge to ask questions related to science topics.	Y	5	12,13, 14, 15, 16		Airplane Trials
S.IP.05.12	Design and conduct scientific investigations.	Create and perform an experiment.	Y	5	11, 12, 13, 15, 16		Class Discussion
S.IP.05.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens) appropriate to scientific	Use appropriate tools and equipment during an experiment.	Y	5	12, 13, 14, 16, 17		Group Presentations
S.IP.05.14	Use metric measurement devices in an investigation	Use metric tools.	Y	4	11, 12, 13, 17		Student Research
S.IP.05.15	Construct charts and graphs from data and observations.	Organize data in charts and graphs.	Y	4	11, 12, 16, 17		Telegraph Sounders
S.IP.05.16	Identify patterns in data.	Look for patterns in data gathered from experiments.	Y	2	12, 16		Student Presentations
Science Processes: Inquiry Analysis and Communication							

1 of 4 Rotating Quarters: Forces & Motion (5PS)							
Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.	Analyze and present information learned from an investigation to create new questions and experiments.	Y				
S.IA.05.11	Analyze information from data tables and graphs to answer scientific questions.	Use information to answer questions about an experiment.	Y	3	11, 12, 16		
S.IA.05.12	Evaluate data, claims, and personal knowledge through collaborative	Discuss results of the experiment in a group.	Y	4	11, 12, 13, 16		
S.IA.05.13	Communicate and defend findings of observations and investigations using evidence.	Share and support your data from experiments.	Y	6	11, 12, 13, 14, 16, 17		
S.IA.05.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.	Answer questions using data from several parts of an experiment.	Y	5	11, 12, 14, 16, 17		
S.IA.05.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.	Use several reliable sources of information to evaluate whether your conclusions are strong or weak.	Y	4	11, 12, 14, 17		
Science Processes: Reflection and Social Implications							

1 of 4 Rotating Quarters: Forces & Motion (5PS)							
Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout	Using your knowledge to look at information from an experiment to see how it relates to science and society in the past and future.	Y				
S.RS.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.	Judge the value of claims, arguments and data.	Y	5	11, 12, 14, 16, 17		
S.RS.05.12	Describe limitations in personal and scientific knowledge.	Describe why knowledge of science may be limited.	Y	4	12, 14, 16, 17		
S.RS.05.13	Identify the need for evidence in making scientific decisions.	Tell why evidence must be used to make scientific decisions.	Y	2	11, 16		
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	Explain what you know and learn in a variety of ways.	Y	6	12, 13, 14, 16, 17		
S.RS.05.16	Design solutions to problems using technology.	Use technology to answer problems.	Y	4	11, 12, 14, 17		
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	Describe how many people have contributed to advance science throughout history.	Y		11, 12		

1 of 4 Rotating Quarters: Forces & Motion (5PS)							
Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
Physical Science: Force and Motion							
Statement P.FM.M.2	Force Interactions- Some forces between objects act when the objects are in direct contact (touching), such as friction and air resistance, or when they are not in direct contact (not touching), such as magnetic force, electrical force, and	Forces can act through direct contact (touching) like friction or indirect contact (not touching) like magnetic force.	B				
P.FM.05.21	Distinguish between contact forces and non-contact forces.	Identify the difference between contact and non-contact forces.	B	5	12,13,14,15,17		
P.FM.05.22	Demonstrate contact and non-contact forces to change the motion of an object.	Show how the two types of forces change the motion of an object.	B	5	12,13,14,15,17		
Statement P.FM.M.3	Force- Forces have a magnitude and direction. Forces can be added. The net force on an object is the sum of all of the forces acting on the object. The speed and/or direction of motion of an object changes when a non-zero net force is applied to it. A balanced force on an object does not change the motion of the object (the		B				

1 of 4 Rotating Quarters: Forces & Motion (5PS)							
Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
P.FM.05.31	Describe what happens when two forces act on an object in the same or opposing directions.	Show what happens when two forces act on an object.	B	2	14,17		
P.FM.05.32	Describe how constant motion is the result of balanced (zero net) forces.	Show how motion doesn't change when the forces on it are balanced.	B	1	17		
P.FM.05.33	Describe how changes in the motion of objects are caused by a non-zero net (unbalanced) force.	Show how motion changes when the forces on it are not equal.	B	3	11,16,17		
P.FM.05.34	Relate the size of change in motion to the strength of unbalanced forces and the mass of the object.	Show how the mass of an object and the strength of unbalanced forces relate to the amount of change in motion.	B	3	11,16,17		

1 of 4 Rotating Quarters: Systems and Survival (5LS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will			13			

Science Processes: Inquiry Process

Statement	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.	Thinking of questions and finding answers by doing an investigation (experiment).	Y				
S.IP.M.1			Y				
S.IP.05.11	Generate scientific questions based on observations, investigations, and research.	Use prior knowledge to ask questions related to science topics.	Y	10	1, 2, 3, 4, 5, 6, 7, 8, 11, 12	acquired traits adaptation anatomical features ancient life forms behavioral adaptation behavioral characteristic blood bones catastrophic event circulatory system classification climate change cold-blooded digestive system endangered species environment environmental factors excretory system external cues extinct flowering plants fossils	Journal Page Class Discussion Posters Activity Page Class List of Questions Handout Class Chart/Class Discussion Science Talk
S.IP.05.12	Design and conduct scientific investigations.	Create and perform an experiment.	Y	3	6, 8, 11		
S.IP.05.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens) appropriate to scientific investigations.	Use appropriate tools and equipment during an experiment.	Y	3	8, 9, 11		
S.IP.05.14	Use metric measurement devices in an investigation.	Use metric tools.	Y	2	9, 11		
S.IP.05.15	Construct charts and graphs from data and observations.	Organize data in charts and graphs.	Y	9	1, 3, 4, 5, 6, 8, 9, 11, 12		

1 of 4 Rotating Quarters: Systems and Survival (5LS)

Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)	
				13				
Students will								
S.IP.05.16	Identify patterns in data.	Look for patterns in data gathered from experiments.	Y	4	1, 8, 9, 11	genetic relatedness growth habit habitat habitat habitat destruction heart heredity inherited traits internal cues instinctive behavior invertebrates learned behavior modern life forms multicellular organism muscles muscular system natural selection needs to survive nervous system nocturnal		
Science Processes: Inquiry Analysis and Communication								
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.	Analyze and present information learned from an investigation to create new questions and experiments.	Y					
S.IA.05.11	Analyze information from data tables and graphs to answer scientific questions.	Use information to answer questions about an experiment.	Y	7	1, 4, 5, 7, 8, 9, 11			
S.IA.05.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.	Discuss results of the experiment in a group.	Y	8	2, 4, 5, 6, 8, 9, 11, 12			
S.IA.05.13	Communicate and defend findings of observations and investigations using evidence.	Share and support your data from experiments.	Y	7	1, 2, 7, 8, 9, 11, 12			
S.IA.05.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.	Answer questions using data from several parts of an experiment.	Y	5	4, 7, 8, 9, 11			

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Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
S.IA.05.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.	Use several reliable sources of information to evaluate whether your conclusions are strong or weak.	Y	10	1, 3, 5, 6, 7, 8, 9, 10, 11, 12	nutrients physical adaptation physical characteristics (traits) repair reproductive system respiratory system single cell organism skeletal system survival transport vertebrates warm blooded Marzano Vocabulary ability to support life	
Science Processes: Reflection and Social Implications							
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science	Using your knowledge to look at information from an experiment to see how it relates to science and society in the past and future.	Y				
S.RS.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.	Judge the value of claims, arguments and data.	Y	7	1, 2, 4, 5, 8, 11, 12	birth bones/ no bones disease environment environmental changes environmental	
S.RS.05.12	Describe limitations in personal and scientific knowledge.	Describe why knowledge of science may be limited.	Y	4	1, 8, 11, 12		

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Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
S.RS.05.13	Identify the need for evidence in making scientific decisions.	Tell why evidence must be used to make scientific decisions.	Y	6	1, 2, 4, 5, 8, 11	conditions extinction food chain food web	
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	Explain what you know and learn in a variety of ways.	Y	10	1, 2, 4, 5, 7, 8, 10, 11, 12, 13	fossil evidence herbivore inherited characteristic	
S.RS.05.17	Describe the effect humans and other organisms have on the balance in the natural world.	Show how living things affect their environment	Y	4	4, 6, 9, 10	life cycle living organism migration naturalistic	
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	Describe how many people have contributed to advance science throughout history.	Y	5	1, 4, 6, 9, 10	observation nutrients offspring omnivore photosynthetic plants	
Life Science: Organization of Living Things							
Statement L.OL.M.4	Animal Systems- Multicellular organisms may have specialized systems that perform functions which serve the needs of the organism.		D			plant organ plant product plant root predator reproduction survival of organisms	

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Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
L.OL.05.41	Identify the general purpose of selected animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive).	Explain the general function of selected animal body systems.	D	2	12, 13		
L.OL.05.42	Explain how animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive) work together to perform selected activities.	Explain how animal systems work together.	D	2	12, 13		
Life Science: Heredity							
Statement L.HE.M.1	Inherited and Acquired Traits - The characteristics of organisms are influenced by heredity and environment. For some characteristics, inheritance is more important; for other characteristics, interactions with the		D				
L.HE.05.11	Explain that the traits of an individual are influenced by both the environment and the genetics of the individual.	Show that traits are influenced by both environment and heredity.	D	3	6, 7, 8		

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Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
L.HE.05.12	Distinguish between inherited and acquired traits.	Tell the difference between inherited and learned traits.	D	3	6, 7, 8		
Life Science: Evolution							
Statement L.EV.M.1	Species Adaptation and Survival- Species with certain traits are		D				
L.EV.05.11	Explain how behavioral characteristics (adaptation, instinct, learning, habit) of animals help them to survive in their environment.	Show how behaviors help animals survive in their environment.	D	7	2, 3, 4, 5, 6, 7, 8		
L.EV.05.12	Describe the physical characteristics (traits) of organisms that help them survive in their environment.	Show that animal and plant parts help them to survive in their environment.	D	8	2, 3, 4, 5, 6, 7, 8, 11		
L.EV.05.13	Describe how fossils provide evidence about how living things and environmental conditions have changed.	Describe how fossils provide evidence of environmental change.	D	1	9		

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Standard or GLCE #	Standard or GLCE Language	What this means:	Q	# of Science Activities	Corresponding Battle Creek Activities	Vocabulary	Embedded Assessment(s)
	Students will						
L.EV.05.14	Analyze the relationship of environmental change and catastrophic events (for example: volcanic eruption, floods, asteroid impacts, tsunami) to species extinction.	Recognize how changes in the environment, including catastrophic events, effect the ability of organisms to survive or cause them to become extinct.	D	2	10, 11		
Statement L.EV.M.2	Relationships Among Organisms- Similarities among organisms are found in anatomical features, which can be used to infer the degree of relatedness among organisms. In classifying organisms, biologists consider details of internal and external structures to be more important than behavior or general appearance.		D				
L.EV.05.21	Relate degree of similarity in anatomical features to the classification of contemporary organisms.	Compare and classify organisms on the basis of physical similarities and differences.	D	3	1, 3, 5		