

Michigan Science Grade Level Content Expectations

Correlations with *Seeds of Science/Roots of Reading*[™] 3rd/4th grade units:

*Light Energy,
Weather and Water,
Variation and Adaptation,
and,
Digestion and Body Systems*

- ● ● = Major focus on concept, skill, or understanding, explicitly taught
- ● = Moderate focus on concept, skill, or understanding with explicit teaching or practice
- = Peripheral focus on concept, skill, or understanding with practice

	Light Energy	Weather & Water	Variation & Adaptation	Digestion & Body Systems
GRADE 3- SCIENCE PROCESSES				
S.IP.E.1 Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.				
S.IP.03.11 Make purposeful observation of the natural world using the appropriate senses.	• • •	• • •	• • •	• • •
S.IP.03.12 Generate questions based on observations.	• •	• • •	• •	• •
S.IP.03.13 Plan and conduct simple and fair investigations.	• •	• •	• •	• •
S.IP.03.14 Manipulate simple tools that aid observation and data collection	• • •	• • •		• •
S.IP.03.15 Make accurate measurements with appropriate units for the measurement tool.	• •	• • •		
S.IP.03.16 Construct simple charts and graphs from data and observations.	• •	• • •	• •	• •
S.IA.E.1 Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.				
S.IA.03.11 Summarize information from charts and graphs to answer scientific questions.	• •	• • •	• •	• •
S.IA.03.12 Share ideas about science through purposeful conversation in collaborative groups.	• • •	• • •	• • •	• • •
S.IA.03.13 Communicate and present findings of observations and investigations.	• • •	• • •	• • •	• • •
S.IA.03.14 Develop research strategies and skills for information gathering and problem solving.	• • •	• • •	• • •	• • •
S.IA.03.15 Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.	• • •	• •	•	•

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	Light Energy	Weather & Water	Variation & Adaptation	Digestion & Body Systems
GRADE 3- SCIENCE PROCESSES continued				
S.RS.E.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.				
S.RS.03.11 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	••	••	••	••
S.RS.03.14 Use data/samples as evidence to separate fact from opinion.	••	••	••	••
S.RS.03.15 Use evidence when communicating scientific ideas.	•••	•••	•••	•••
S.RS.03.16 Identify technology used in everyday life.	••	•		
S.RS.03.17 Identify current problems that may be solved through the use of technology.	••	••		
S.RS.03.18 Describe the effect humans and other organisms have on the balance of the natural world.	•	•	•	
S.RS.03.19 Describe how people have contributed to science throughout history and across cultures.	••	••	••	••
GRADE 3- PHYSICAL SCIENCE				
P.FM.E.2 Gravity- Earth pulls down on all objects with a force called gravity. With very few exceptions, objects fall to the ground no matter where the object is on the Earth.				
P.FM.03.22 Identify the force that pulls objects towards the Earth.				
P.FM.E.3 Force- A force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force. The change is also related to the weight (mass) of the object on which the force is being exerted. When an object does not move in response to a force, it is because another force is being applied by the environment.				
P.FM.03.35 Describe how a push or a pull is a force.				
P.FM.03.36 Relate a change in motion of an object to the force that caused the change of motion.				
P.FM.03.37 Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.				
P.FM.03.38 Demonstrate when an object does not move in response to a force, it is because another force is acting on it.				

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GRADE 3- PHYSICAL SCIENCE continued				
P.FM.E.4 Speed- An object is in motion when its position is. The speed of an object is defined by how far it travels divided by the amount of time it took to travel that far.				
P.FM.03.41 Compare and contrast the motion of objects in terms of direction.				
P.FM.03.42 Identify changes in motion				
P.FM.03.43 Calculate the speed of an object based on the distance it travels divided by the amount of time it took to travel that distance.				
P.EN.E.1 Forms of Energy- Heat, electricity, light, and sound are forms of energy.				
P.EN.03.11 Identify light and sound as forms of energy.	•••			
P.EN.E.2 Light Properties- Light travels in straight lines. Shadows result from light not being able to pass through an object. When light travels at an angle from one substance to another (air and water), it changes direction.				
P.EN.03.21 Demonstrate that light travels in a straight line and that shadows are made by placing an object in a path of light.	•••			
P.EN.03.22 Demonstrate what happens to light when it travels from water to air.	•••			
P.EN.E.3 Sound- Vibrating objects produce sound. The pitch of sound varies by changing the rate of vibration.				
P.EN.03.31 Relate sounds to their sources of vibrations				
P.EN.03.32 Distinguish the effect of fast or slow vibrations as pitch.				
P.PM.E.5 Conductive and Reflective Properties- Objects vary to the extent they absorb and reflect light energy and conduct heat and electricity.				
P.PM.03.51 Demonstrate how some materials are heated more than others by light that shines on them.	•••			
P.PM.03.52 Explain how we need light to see objects: light from a source reflects off objects and enters our eyes.	•••			

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GRADE 3- LIFE SCIENCE				
L.OLE.3 Structures and Functions- Organisms have different structures that serve different functions in growth, survival, and reproduction.				
L.OL.03.31 Describe the function of the following plant parts: flower, stem, root and leaf.			•	
L.OL.03.32 Identify and compare structures in animals used for controlling body temperature, support, movement, food-getting, and protection			•••	
L.OLE.4 Classification- Organisms can be classified on the basis of observable characteristics.				
L.OL.03.41 Classify plants on the basis of observable physical characteristics				
L.OL.03.42 Classify animals on the basis of observable physical characteristics			•••	
L.EV.E.1 Environmental Adaptation- Different kinds of organisms have characteristics that help them to live in different environments.				
L.EV.03.11 Relate characteristics and functions of observable parts in a variety of plants that allow them to live in their environment			•	
L.EV.03.12 Relate characteristics and functions of observable body parts to the ability of animals to live in their environment			•••	
GRADE 3- EARTH SCIENCE				
E.ES.E.4 Natural Resources- The supply of many natural resources is limited. Humans have devised methods for extending their use of natural resources through recycling, reuse, and renewal.				
E.ES.03.41 Identify natural resources				
E.ES.03.42 Classify renewable and non-renewable resources.				
E.ES.03.43 Describe ways humans are protecting, extending, and restoring resources	•			
E.ES.03.44 Recognize that paper, metal, glass, and some plastics can be recycled.				
E.ES.E.5 Human Impact- Humans depend on their natural and constructed environment. Humans change environments in ways that are helpful or harmful for themselves and other organisms.				
E.ES.03.51 Describe ways humans are dependent on the natural environment		•		
E.ES.03.52 Describe helpful or harmful effects of humans on the environment	••	•		

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GRADE 3- EARTH SCIENCE continued				
E.SE.E.1 Earth Materials- Earth materials that occur in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Some Earth materials have properties which sustain plant and animal life.				
E.SE.03.13 Recognize and describe different types of earth materials				
E.SE.03.14 Recognize that rocks are made up of minerals.				
E.SE.E.2 Surface Changes- The surface of Earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.				
E.SE.03.22 Identify and describe natural causes of change in the Earth's surface				
E.SE.E.3 Using Earth Materials- Some Earth materials have properties that make them useful either in their present form or designed and modified to solve human problems. They can enhance the quality of life as in the case of materials used for building or fuels used for heating and transportation.				
E.SE.03.31 Identify Earth materials used to construct some common objects				
E.SE.03.32 Describe how materials taken from the Earth can be used as fuels for heating and transportation.				
GRADE 4- SCIENCE PROCESSES				
S.IP.E.1 Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.				
S.IP.04.11 Make purposeful observation of the natural world using the appropriate senses.	•••	•••	•••	•••
S.IP.04.12 Generate questions based on observations.	••	•••	••	••
S.IP.04.13 Plan and conduct simple and fair investigations.	••	••	••	••
S.IP.04.14 Manipulate simple tools that aid observation and data collection	•••	•••		••
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S.IA.04.12 Share ideas about science through purposeful conversation in collaborative groups.	• • •	• • •	• • •	• • •
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GRADE 4- PHYSICAL SCIENCE				
P.EN.E.1 Forms of Energy- Heat, electricity, light, and sound are forms of energy.				
P.EN.04.12 Identify heat and electricity as forms of energy.	• • •			

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GRADE 4- PHYSICAL SCIENCE continued				
P.EN.E.4 Energy and Temperature- Increasing the temperature of any substance requires the addition of energy.				
P.EN.04.41 Demonstrate how temperature can be increased in a substance by adding energy.	••			
P.EN.04.42 Describe heat as the energy produced when substances burn, certain kinds of materials rub against each other, and when electricity flows through wire.				
P.EN.04.43 Describe how heat is produced through electricity, rubbing, and burning.				
P.EN.E.5 Electrical Circuits- Electrical circuits transfer electrical energy and produce magnetic fields.				
P.EN.04.51 Explain how electrical energy is transferred and changed through the use of a simple circuit.				
P.EN.04.52 Create a simple working electromagnet and explain the conditions necessary to make the electromagnet.				
P.PM.E.1 Physical Properties- All objects and substances have physical properties that can be measured.				
P.PM.04.16 Measure the weight and mass of objects.				
P.PM.04.17 Measure volumes of liquids and capacities of containers in milliliters and liters.				
P.PM.04.18 Demonstrate the use of centimeter cubes poured into a container to estimate the container's capacity.				
P.PM.E.2 States of Matter- Matter exists in several different states: solids, liquids, and gases. Each state of matter has unique physical properties. Gases are easily compressed, but liquids and solids do not compress easily. Solids have their own particular shapes, but liquids and gases take the shape of the container.				
P.PM.04.23 Compare and contrast the states of matter.		•••		
P.PM.E.3 Magnets- Magnets can repel or attract other magnets. Magnets can also attract certain non-magnetic objects at a distance.				
P.PM.04.33 Demonstrate magnetic field by observing the patterns formed with iron filings using a variety of magnets.				
P.PM.04.34 Demonstrate that non-magnetic objects are affected by the strength of the magnet and the distance away from the magnet.				
P.PM.E.5 Conductive and Reflective Properties- Objects vary to the extent they absorb and reflect light energy and conduct heat and electricity.				
P.PM.04.53 Identify objects that are good conductors or poor conductors of heat and electricity.				

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GRADE 4- PHYSICAL SCIENCE continued				
P.CM.E.1 Changes in State- Matter can be changed from one state to another and then back again. This may be caused by heating and cooling.				
P.CM.04.11 Explain how matter can change from one state to another by heating and cooling.		• • •		
GRADE 4- LIFE SCIENCE				
L.OL.E.1 Life Requirements- Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.				
L.OL.04.15 Determine that plants require air, water, light, and a source of energy and building material for growth and repair.			• •	
L.OL.04.16 Determine that animals require air, water, and a source of energy and building material for growth and repair.			• •	
L.EV.E.2 Survival- Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.				
L.EV.04.21 Identify individual differences in organisms of the same kind.			• • •	
L.EV.04.22 Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.			• • •	
L.EC.E.1 Interactions- Organisms interact in various ways including providing food and shelter to one another. Some interactions are helpful: others are harmful to the organism and other organisms.				
L.EC.04.11 Identify organisms as part of a food chain or food web.				
<i>L.EC.E.2 Changed Environment Effects- When the environment changes, some plants and animals survive to reproduce; others die or move to new locations.</i>				
L.EC.04.21 Explain how environmental changes can produce a change in the food web.				

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GRADE 4- EARTH SCIENCE				
E.ST.E.1 Characteristics of Objects in the Sky- Common in the sky have observable characteristics.				
E.ST.04.11 Identify common objects in the sky, such as the sun and the moon.				
E.ST.04.12 Compare and contrast the characteristics of the sun, moon and Earth, including relative distances and abilities to support life.				
E.ST.E.2 Patterns of Objects in the Sky- Common objects in the sky have observable characteristics and predictable patterns of movement.				
E.ST.04.21 Describe the orbit of the Earth around the sun as it defines a year.				
E.ST.04.22 Explain that the spin of the Earth creates day and night.				
E.ST.04.23 Describe the motion of the moon around the Earth.				
E.ST.04.24 Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.				
E.ST.04.25 Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.				
E.ST.E.3 Fossils- Fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.				
E.ST.04.31 Explain how fossils provide evidence of the history of the Earth.			• • •	
E.ST.04.32 Compare and contrast life forms found in fossils and organisms that exist today.			• • •	

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