a

HAMILTON TOWNSHIP SCHOOL DISTRICT

Science Curriculum Progress Indicator Matrix

A=Awareness
I = Introduction
D = Developing
M = Master

5.1 Scientific Processes

By the end of Grade 4, students will:	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
5.1.4 A. Habits of Mind									
1. Raise questions about the world around them and be willing to seek answers through making careful observations and experimentation.	**A**	**I**	**D**	**D**	**M**				
2. Keep records that describe observations, carefully distinguish actual observations from ideas and speculations and are understandable weeks and months later.	**A**	**A**	**I**	**D**	**M**				
3. Recognize that when a science investigation is replicated, very similar results are expected.	**A**	**I**	**D**	**D**	**M**				
4. Know that when solving a problem it is important to plan and get ideas and help form other people.	**A**	**I**	**D**	**D**	**M**				
5.1.4 B. Inquiry and Problem Solving									
1. Develop strategies and skills for information-gathering and problem solving, using appropriate tools and technologies.	**A**	**I**	**D**	**D**	**M**				
2. Identify the evidence used in an explanation.	**I**	**I**	**D**	**D**	**M**				
5.1.4 C. Safety									
1. Recognize that conducting science activities requires an awareness of potential hazards and the need for safe practices.	**I**	**D**	**D**	**M**					
2. Identify the evidence used in an explanation.	**D**	**D**	**M**						
By the end of Grade 8, students will:									
5.1.8 A. Habits of Mind									
1. Evaluate the strengths and weaknesses of data claims and arguments.						**A**	**I**	**D**	**M**
2. Communicates experimental findings to others.						**I**	**D**	**D**	**M**
3. Recognize that the results of scientific investigations are seldom exactly the same and the replication is often necessary.						**I**	**D**	**D**	**M**
4. Recognize that curiosity, skepticism, open-mindedness, and honesty are attributes of scientists.									
5.1.8 B. Inquiry and Problem Solving									
1. Identify questions and make predictions that can be addressed by conducting investigations.						**D**	**D**	**D**	**M**
2. Design and conduct investigations incorporating the use of a control.						**A**	**I**	**D**	**M**
3. Collect, organize, and interpret the data that result from experiments.						**D**	**D**	**D**	**M**
5.1.8 C. Safety									
1. Know when and how to use appropriate safety equipment with all classroom materials.						**D**	**D**	**D**	**M**
2. Understand and practice safety procedures for conducting science investigations.						**D**	**D**	**D**	**M**

5.2 Science and Society

By the end of Grade 4, students will:	K	1	2	3	4	5	6	7	8
5.2.4 A. Cultural Contributions									
1. Describe how people in different cultures have made and continue to make contributions to science and technology.		**A**	**I**	**D**	**M**				
5.2.4 B. Historical Perspectives									
1. Hear, read, write, and talk about scientists and inventors in historical context.		**A**	**I**	**D**	**M**				
By the end of Grade 8, students will:									
5.2.8 A. Cultural Contributions									
1. Recognize that scientific theories: ➢ Develop over time ➢ Depend on the contributions of many people: and ➢ Reflect the social and political climate of their time						**D**	**D**	**M**	
2. Know that scientists are men and women of many cultures who often work together to solve scientific and technological problems						**D**	**D**	**M**	
3. Describe how different people in different cultures have made and continue to make contributions to science and technology.						**D**	**D**	**M**	
5.2.8 B. Historical Perspectives									
1. Describe the impact of major events and people in the history of science and technology, in conjunction with other world events.						**I**	**D**	**M**	
2. Describe the development and exponential growth of scientific knowledge and technological innovations.						**I**	**D**	**M**	

5.3 Mathematical Applications

By the end of Grade 4, students will:	K	1	2	3	4	5	6	7	8
5.3.4 A. Numerical Operations									
1. Determine the reasonableness of estimates, measurements, and computations of quantities when doing science.	**A**	**I**	**D**	**D**	**M**				
2. Recognize and comprehend the orders of magnitude associated with large and small physical quantities.	**A**	**A**	**I**	**D**	**M**				
3. Express quantities using appropriate number formats. ➢ intergers ➢ fractions		**A**	**I**	**D**	**M**				
5.3.4 B. Geometry and Measurement									
1. Select appropriate measuring instruments based on the degree of precision requiresd.			**I**	**D**	**M**				
2. Use a variety of measuring instruments and record measured quantities using the appropriate units.	**A**	**I**	**D**	**D**	**M**				

5.3.4 C. Patterns and Algebra	K	1	2	3	4	5	6	7	8
1. Identify patterns when observing the natural and constructed world.	I	I	D	D	M				
5.3.4 D. Data Analysis and Probability									
1. Use tables and graphs to represent and interpret data.	I	I	D	D	M				
By the end of Grade 8, students will:									
5.3.8 A. Numerical Operations									
1. Express quantities using appropriate number formats. ➢ Decimals ➢ Percents ➢ Scientific Notation						D	D	D	M
5.3.8 B. Geometry and measurement									
1. Perform mathematical computations using labeled quantities and express answers in correctly derived units.						D	D	D	M
2. Use a variety of measuring instruments and record measured quantities using the appropriate units.						D	D	D	M
5.3.8 C. Patterns and Algebra									
1. Express physical relationships in terms of mathematical equations derived from collected data.						I	D	D	M
5.3.8 D. Data Analysis and Probability									
1. Represent and describe mathematical relationships among variables using graphs and tablets.						I	D	D	M
2. Analyze experimental data sets using measures of central tendency. ➢ Mean Mode Median						D	D	D	M
3. Construct and use a graph of experimental data to draw a line of best fit and identify a linear relationship between variables.						I	D	D	M
4. Use computer spreadsheets, graphing and database applications to assist in quantitative analysis of data.						I	D	D	M

5.4 Nature and Process of Technology

By the end of Grade 2, students will:	K	1	2	3	4	5	6	7	8
5.4.2 A. Science and Technology									
1. Indicators for this strand are introduced at a higher grade level.									
5.4.2 B. Nature of Technology									
1. Select and use simple tools and materials to complete a task.	I	D	M						
5.4.2 C. Technological Design									
1. Make a plan in order to design a solution to a problem.	I	D	M						
2. Describe a toy or other familiar object as a system with parts that work together.	I	D	M						

By the end of Grade 4, students will:	K	1	2	3	4	5	6	7	8
5.4.4 A. Science and Technology									
1. Distinguish between things that occur in nature and those that have been designed to solve human problems.				**D**	**M**				
5.4.4 B. Nature of Technology									
1. Demonstrate how measuring instruments are used to gather information in order to design things that work properly.				**D**	**M**				
5.4.4 C. Technological Design									
1. Describe a product or device in terms of the problem it solves or the need it meets.				**D**	**M**				
2. Choose materials most suitable to make simple mechanical constructions.				**D**	**M**				
3. Use the design process to identify a problem, look for ideas, and develop and share solutions with others.				**D**	**M**				
By the end of Grade 6, students will:									
5.4.6 A. Science and Technology									
1. Reinforce indicators from previous grade level.						**D**	**M**		
5.4.6 B. Nature of Technology									
1. Reinforce indicators form previous grade level.						**D**	**M**		
5.4.6 C. Technological Design									
1. Select a technological problem and describe the criteria and constraints and criteria that are addressed in solving the problem.						**D**	**M**		
2. Identify the basic components of a technological system. ➢ Input ➢ Process ➢ Output and feedback						**D**	**M**		
By the end of Grade 8, students will:									
5.4.8 A. Science and Technology									
1. Compare and contrast science with technology, illustrating similarities and differences between these two human endeavors.								**D**	**M**
5.4.8 B. Nature of Technology									
1. Analyze a product or system to determine the problem it was designed to solve, the design constraints, trade-offs, and risks involved in using the product or system, how the product or system might fail, and how the product or system might be improved.								**D**	**M**
5.4.8 C. Technological Design									
1. Recognize how feedback loops are used to control systems.								**D**	**M**

5.5 Characteristics of Life

By the end of Grade 2, students will:		K	1	2	3	4	5	6	7	8
5.5.2 A. Matter, Energy, and Organization in Living Systems										
1. Investigate the basic needs of humans and other organisms.	**I**	**D**	**M**							
2. Compare and contrast essential characteristics that distinguish living things from nonliving things.	**D**	**D**	**M**							
5.5.2 B. Diversity and Biological Evolution										
1. Recognize that different types of plants and animals live in different parts of the world.	**D**	**D**	**M**							
2. Recognize that some kinds of organisms that once lived on Earth have completely disappeared.	**D**	**D**	**M**							
5.5.2 C. Reproduction and Heredity										
1. Recognize that humans and other organisms resemble their parents.	**D**	**D**	**M**							
By the end of Grade 4, students will:										
5.5.4 A. Matter, Energy and Organization in Living Systems										
1. Identify the roles that organisms may serve in a food chain.		**A**	**I**	**D**	**M**					
2. Differentiate between the needs of plants and those of animals.	**I**	**D**	**D**	**D**	**M**					
3. Recognize that plants and animals are composed of different parts performing different functions and working together for the well being of the organism.	**A**	**D**	**D**	**D**	**M**					
4. Describe the basic functions of the major systems of the human body including, but not limited to a. Digestive system b. Circulatory system c. Respiratory system d. Nervous system e. Skeletal system f. Muscular system g. Reproductive system	**I**	**I**	**D**	**D**	**M**					
5.5.4 B. Diversity and Biological Evolution										
1. Develop a simple classification scheme for grouping organisms.	**I**	**I**	**D**	**D**	**M**					
2. Recognize that individuals vary within every species, including humans.	**I**	**I**	**D**	**D**	**M**					
5.5.4 C. Reproduction and Heredity										
1. Identify different stages in the lives of various organisms.	**I**	**I**	**D**	**D**	**M**					
By the end of Grade 6, students will:										
5.5.6 A. Matter, Energy and Organization in Living Systems										
1. Explain how systems if the human body are interrelated and regulate the body's internal environment.						**D**	**M**			

2. Identify and describe the structure and function of cells and cell parts.						D	M		
5.5.6 B. Diversity and Biological Evolution	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Describe and give examples of the major categories of organisms and of the characteristics shared by organisms.						D	M		
2. Compare and contrast acquired and inherited characteristics in human and other species.						D	M		
5.5.6 C. Reproduction and Heredity									
1. Describe life cycles of humans and other organisms.						D	M		
By the end of Grade 8, students will:									
5.5.8 A. Matter, Energy and Organization in Living Systems									
1. Explain how the products of respiration and photosynthesis are recycled.								D	M
2. Recognize that complex multi-cellular organisms, including humans, are composed of and defined by interactions of the following: ➢ Cells ➢ Tissues ➢ Organs ➢ Systems								D	
5.5.8 B. Diversity and Biological Evolution									
1. Compare and contrast kinds of organisms using their internal and external characterisitics.								D	M
2. Discuss how changing environmental conditions can result in evolution or extinction of a species.								D	M
3. Recognize that individual organisms with certain traits are more likely to survive and have offspring.								D	M
5.5.8 C. Reproduction and Heredity									
1. Describe how the sorting and recombining of genetic material results in the potential for variation among offspring of humans and other species.								D	M

5.6 Chemistry

By the end of Grade 2, students will:									
5.6.2 A. Structure and Properties of Matter									
1. Sort objects according to the materials from which they are made or their physical properties and give a rationale for sorting.	**I**	**D**	**M**						
2. Use magnifiers to observe materials, then draw and describe what more can be seen using the tools.	**I**	**D**	**M**						
3. Observe that water can be a liquid or a solid and can change from one form to the other.	**I**	**D**	**M**						
5.6.2 B. Chemical Reactions									
1. Indicators for this strand are introduced at a higher grade level.									

By the end of Grade 4, students will:	K	1	2	3	4	5	6	7	8
5.6.4 A. Structure and Properties of Matter									
1. Sort materials based on physical characteristics that can be seen by using magnifications.	**A**	**A**	**I**	**D**	**M**				
2. Observe that water can be a liquid or a solid and can change from one form to the other the mass remains the same.	**A**	**A**	**I**	**D**	**M**				
3. Recognize that water as an example of matter, can exist as a solid, liquid or gas and can be transformed from one state to another by heating or cooling.	**A**	**A**	**I**	**D**	**M**				
4. Show that not all materials respond in the same way when exposed to similar conditions.	**A**	**A**	**I**	**D**	**M**				
5.6.4 B. Chemical Reactions									
1. Combine two or more materials and show that the new material may have properties that are different from the original material.			**I**	**D**	**M**				
By the end of Grade 6, students will:									
5.6.6 A. Structure and Properties of Matter									
1. Recognize that about 100 different elements have been identified and most materials on Earth are made of a few of them.						**I**	**M**		
2. Show that equal volumes of different substances usually have different masses.						**D**	**M**		
3. Describe the properties of mixtures and solutions, including concentration and saturation.						**I**	**M**		
4. Describe characteristic physical properties such as boiling point, melting point, and solubility, and recognize that the property is independent of the amount of sample.						**I**	**M**		
5.6.6 B. Chemical Reactions									
1. Recognize evidence of a chemical change.						**I**	**M**		
By the end of Grade 8, students will:									
5.6.8 A. Structure and Properties of Matter									
1. Know that all matter is composed of atoms that may join together to form molecules.								**M**	
2. Recognize that the phase of matter is determined by the arrangement and motion of atoms and molecules and that the motion of these particles is related to the energy of the system.								**M**	
3. Know that there are groups of elements that have similar properties, including highly reactive metals, less reactive metals, highly reactive non-metals, and some almost completely non-reactive gases.								**M**	
4. Recognize that a mixture often can be separated into the original substances using one of more of their characteristic physical properties.								**M**	
5.6.8 B. Chemical Reactions									
1. Show how substances can chemically react with each other to form new substances having properties different from those of the original substances.								**D**	**M**
2. Show that in most chemical reactions energy is transferred into or out of a system.								**D**	**M**

3. Demonstrate that regardless how substances within a simple closed system interact, the total mass of the system remains the same.								**I**	**M**
4. Illustrate how atoms are rearranged when substances react, but that the total number of atoms and the total mass of the products remain the same as the original substances.								**I**	**M**

5.7 Physics

By the end of Grade 2, students will:	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
5.7.2 A. Motion and Forces									
1. Distinguish among the different ways objects can move such as ➢ Fast and slow ➢ In a straight line ➢ In a circular path ➢ Back and forth	**I**	**D**	**M**						
2. Show that the position and motion of an object can be changed by pushing or pulling the object.	**I**	**D**	**M**						
5.7.2 B. Energy Transformations									
1. Demonstrates that sound can be produces by vibrating objects.	**I**	**D**	**M**						
By the end of Grade 4, students will:									
5.7.4 A. Motion and Forces									
1. Recognize that changes in the speed or direction of a moving object are caused by forces and that the greater the force, the greater the change in motion will be.		**A**	**I**	**D**	**M**				
2. Recognize that some forces can act at a distance ➢ Gravity ➢ Magnetism ➢ Static electricity	**A**	**I**	**D**	**D**	**M**				
5.7.4 B. Energy Transformations									
1. Identify sources of heat and demonstrate that heat can be transferred from one object to another.	**A**	**I**	**D**	**D**	**M**				
2. Identify sources of light and demonstrate that light can be reflected from some surfaces and pass through others.	**A**	**I**	**D**	**D**	**M**				
3. Use devices that show electricity producing heat, light, sound, and magnetic effects.	**A**	**A**	**I**	**D**	**M**				
4. Show that differences in sound (loud or soft, high or low) can be produced by varying the way objects vibrate.	**A**	**A**	**I**	**D**	**M**				
By the end of Grade 6, students will:									
5.7.6 A. Motion and Forces									
1. Recognize that an object at rest will remain at rest and on object moving in a straight line at a steady speed will continue to move in a straight at a steady speed unless a net (unbalanced) force acts on it.						**D**	**M**		
2. Recognize that motion can be retarded by forces such as friction and air resistance.						**D**	**M**		

3. Recognize that everything on or near the Earth is pulled toward the Earth's center by gravitational force.						D	M		
5.7.6 B. Energy Transformations	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Recognize that heat flows through materials or across space from warmer objects to cooler ones.						D	M		
2. Show that vibrations in materials can generate waves that can transfer energy from one place to another.						D	M		
3. Design an electric circuit to investigate the behavior of a system.						D	M		
By the end of Grade 8, students will:									
5.7.8 A. Motion and Forces									
1. Use quantitative data to show that when more than one force acts on an object at the same time, the forces can reinforce or cancel each other producing a net (unbalanced) force that will change speed and/or direction of the object.								D	M
2. Recognize that every object exerts a gravitational force on every other object, and that the force depends on how much mass the objects have and how far apart they are.								D	M
5.7.8 B. Energy Transformations									
1. Recognize that the sun is a major source of the earth's energy and that solar energy includes visible, infrared and ultraviolet radiation.								M	
2. Describe the nature of various forms of energy, including heat, light, sound, chemical, mechanical, and electrical and trace energy transformations from one form to another.								I	M
3. Describe how heat can be conducted through materials or transferred across space by radiation and know that if the material is a fluid, convection currents may aid the transfer of heat.									M
4. Show that light is reflected, refracted, or absorbed when it interacts with matter and that colors may appear as a result of this interaction.								M	

5.8 Earth Science

By the end of Grade 2, students will:	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
5.8.2 A. Earth's Properties and Materials									
1. Observe and describe rocks and soil.	D	D	M						
5.8.2 B. Atmosphere and Water									
1. Identify the sources and uses of water.	D	D	M						
2. Recognize that water can disappear (evaporate) and collect on cold surfaces (condense).	I	D	M						
3. Describe current weather conditions and recognize how those conditions affect our daily lives.	D	D	M						
4. Describe daily and seasonal changes and patterns in the weather.	D	D	M						

5.8.2 C. Processes that Shape the Earth	K	1	2	3	4	5	6	7	8
1. Indicators for this strand are introduced at a higher grade level.									
5.8.2 D. How We Study the Earth									
1. Record observations that describe the features of the natural world in their local environment.	**I**	**D**	**M**						
By the end of Grade 4, students will:									
5.8.4 A. Earth's Properties and Materials									
1. Observe that most rocks and soils are made of several substances or minerals.	**A**	**A**	**I**	**D**	**M**				
2. Observe that the properties of soil vary from place to place and will affect the soil's ability to support life.	**A**	**I**	**D**	**D**	**M**				
3. Recognize that fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.	**A**	**I**	**D**	**D**	**M**				
5.8.4 B. Atmosphere and Water									
1. Recognize that air is a substance that surrounds us, takes up space, and moves around us as wind.	**A**	**I**	**D**	**D**	**M**				
2. Recognize that most of earth's surface is covered by water and be able to identify the characteristics of those sources of water. ➢ Oceans ➢ Rivers ➢ Lakes ➢ Underground sources ➢ Glaciers	**A**	**I**	**D**	**D**	**M**				
3. Observe weather changes and patterns by measurable quantities such as temperature, wind direction, and speed, and amounts of precipitation.	**A**	**I**	**D**	**D**	**M**				
4. Observe that when liquid water disappears, it turns into a gas (vapor) in the air and can reappear as a liquid when cooled, or as a solid if cooled below its freezing point.		**A**	**I**	**D**	**M**				
5. Observe that rain, snow, and other forms or precipitation come from clouds, but that not all clouds produce precipitation.	**A**	**A**	**I**	**D**	**M**				
6. Recognize that clouds and fog are made of tiny droplets of water and possibly tiny particles of ice.		**A**	**I**	**D**	**M**				
5.8.4 C. Processes that Shape the Earth									
1. Recognize that some changes of the Earth's surface are due to slow processes such as erosion and weathering, and some changes are due to rapid changes such as landslides, volcanic eruptions, and earthquakes.		**A**	**I**	**D**	**M**				
2. Recognize that moving water, wind, and ice continually shape the earth's surface by eroding rock and soil in some areas and depositing them in other areas.		**A**	**I**	**D**	**M**				
5.8.4 D. How We Study the Earth									
1. Use maps to locate and identify physical features on the earth.	**A**	**I**	**D**	**D**	**M**				

By the end of Grade 6, students will:	K	1	2	3	4	5	6	7	8
5.8.6 A. Earth's Properties and Materials									
1. Reinforce indicators from previous grade levels.						**D**	**M**		
5.8.6 B. Atmosphere and Water									
1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.						**D**	**M**		
2. Describe and illustrate the water cycle.						**D**	**M**		
5.8.6 C. Processes that Shape the Earth									
1. Summarize the process involved in the rock cycle and describe the characteristics of the rocks involved.						**I**	**M**		
5.8.6 D. How We Study the Earth									
1. Utilize various tools such as map projections and topographical maps to interpret features on earth's surface.						**D**	**M**		
By the end of Grade 8, students will:									
5.8.8 A. Earth's Properties and Materials									
1. Reinforce indicators from previous grade levels.								**D**	**D**
5.8.8 B. Atmosphere and Water									
1. Describe conditions in the atmosphere that lead to weather systems and how these systems are represented on weather maps..									**M**
1. Explain how earth's landforms and materials are created through constructive and destructive processes.									**M**
2. Show how successive layers of sedimentary rock and the fossils contained in them can be used to confirm the age, history, changing life forms, and geology of earth.								**M**	
5.8.8 D. How We Study the Earth									
1. Utilize data gathered from emerging technologies (e.g.. geographic information systems (GIS) and global positioning systems (GPS) to create representations and describe processes of change on the earth's surface.									**M**
2. Explain how technology designed to investigate features of the earth's surface impacts how scientists study the earth.									**M**

5.9 Astronomy and Space Science

By the end of Grade 2, students will:	K	1	2	3	4	5	6	7	8
5.9.2 A. Earth, Moon, and Sun System									
1. Recognize that the sun supplies light and heat to the Earth.	**D**	**D**	**M**						

2. Observe the patterns of day and night and the movements of the shadows of an object on the earth during the course of a day.	**D**	**D**	**M**						
5.9.2 B. Solar System	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Recognize that the sun can only be seed during the day, but the moon can be seen sometimes at night and sometimes during the day.	**D**	**D**	**M**						
5.9.2 C. Stars									
1. Observe that stars are many scattered, and different in brightness.	**D**	**D**	**M**						
2. Observe that the position of the stars, with respect to each other (constellations) is unchanging.	**I**	**D**	**M**						
5.9.2 D. Galaxies and Universe									
1. Indicators for this strand are introduces at a higher grade level.									
By the end of Grade 4, students will:									
5.9.4 A. Earth, Moon, Sun System									
1. Observe patterns that result from the earth's position relative to the sun and rotation of the earth on its axis.		**I**	**D**	**D**	**M**				
2. Recognize and describe the phases of the moon.		**I**	**D**	**D**	**M**				
5.9.4 B. Solar System									
1. Describe earth as one of several planets that orbit the sun and the moon as a satellite of the earth.	**A**	**I**	**D**	**D**	**M**				
5.9.4 C. Stars									
1. Observe that stars are not all the same in brightness, size, and color.	**A**	**I**	**D**	**D**	**M**				
5.9.4 D. Galaxies and Universe									
1. Recognized that images of celestial objects can be magnified and seen in greater detail when observed using binoculars and light telescopes.		**I**	**D**	**D**	**M**				
2. Observe and record short-term and long-term changes in the night sky.		**A**	**I**	**D**	**M**				
By the end of Grade 6, students will:									
5.9.6 A. Earth, Moon, Sun System									
1. Explain how the motions of the earth, sun, and moon define units of time including days, months, and years.					**D**	**M**			
2. Recognize that changes in the earth's position relative to the sun produces differing amounts of daylight seasonally.					**D**	**M**			
5.9.6 B. Solar System									
1. Using models, demonstrate an understanding of the scale of the solar system that shows distance and size relationships among the sun and planets.					**I**	**M**			
2. Recognize that the sun's gravitational pull holds the planets in their orbits and that the planets gravitational pull holds their moons in their orbits.					**I**	**M**			

	K	1	2	3	4	5	6	7	8
5.9.6 C. Stars									
1. Observe and record short-term and long-term changes in the positions of the constellations in the night sky.						**I**	**M**		
2. Observe that the planets appear to change their position against the background of stars.						**I**	**M**		
5.9.6 D. Galaxies and Universe									
1. Reinforce indicators from previous grade levels.						**D**	**D**		
By the end of Grade 8, students will:									
5.9.8 A. Earth, Moon, Sun System									
1. Investigate the earth, moon, and sun as a system and explain how the motion of these bodies results in the phases of the moon and eclipses.								**M**	
2. Explain how the regular and predictable motions of the earth and moon produce tides.								**M**	
3. Explain how the tilt, rotation, and orbital pattern of the earth relative to the sun produce seasons and weather patterns.								**D**	**M**
5.9.8 B. Solar System									
1. Describe the physical characteristics of the planets and other objects within the solar system and compare earth to the rest of the planets.								**D**	**M**
5.9 8 C. Stars									
1. Understand that the sun is a star and that it shares characteristics with other stars.								**D**	**M**
5.9.8 D. Galaxies and Universe									
1. Know that the universe consists of many billions of galaxies, each including billions of stars.								**D**	**M**

5.10 Environmental Studies

By the end of Grade 2, students will:	K	1	2	3	4	5	6	7	8
5.10.2 A. Natural Systems and Interactions									
1. Associate organisms' basic needs with how they meet those needs within their surroundings.	**I**	**D**	**M**						
5.10.2 B. Human Interactions and Impact									
1. Identify various needs of humans that are supplied by the nature or constructed environment.	**I**	**D**	**M**						
By the end of Grade 4, students will:									
5.10.4 A. Natural Systems and Interactions									
1. Differentiate between natural resources that are renewable and those that are not.	**A**	**I**	**D**	**D**	**M**				
5.10.4 B. Human Interactions and Impact									
1. Explain how meeting human requirements affects the environment.	**A**	**I**	**D**	**D**	**M**				

By the end of Grade 6, students will:	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
5.10.6 A. Natural Systems and Interactions									
1. Explain how organisms interact with other components of an ecosystem.						**D**	**M**		
2. Describe the natural processes that occur over time in places where direct human impact is minimal.						**D**	**M**		
5.10.6 B. Human Interactions and Impact									
1. Describe the effect of human activities on various ecosystems.						**D**	**M**		
2. Evaluate the impact of personal activities on the local environment.						**D**	**M**		
By the end of Grade 8, students will:									
5.10.8 A. Natural Systems and Interactions									
1. Investigate the impact of catastrophic events such as forest fires, floods, and hurricanes on the environment of New Jersey.								**D**	**M**
5.10.8 B. Human Interactions and Impact									
1. Compare and contrast practices that affect the use and management of natural resources.								**D**	**M**