	Science Benchmarks Grade Seven
	The student will:
	Standard 1: NATURE OF SCIENCE Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.
7-1a.	Give examples of how scientific knowledge and conceptual models and explanations have changed over time in the sciences.
7-1b.	Identify the people, cultures, and conditions that led to the changed scientific knowledge and concepts over time.
7-1c.	Identify how the general rules of science apply to the development and use of evidence in scientific investigations and model making.
7-1d.	Understand the reasoning and evidence that confirms that science is one way of answering questions and explaining the natural world.
7-1e.	Describe ways in which scientific knowledge is shared and checked.
7-1f.	Identify and illustrate ways in which scientific knowledge is extended and how these processes change over time.
7-1g.	Explain the ways in which scientific knowledge is useful and limited when applied to social issues.
	Standard 2: SCIENCE INQUIRY Investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.
7-2a.	Identify questions that they can investigate using resources and equipment that they have available.
7-2b.	Identify data and locate sources of information to answer the questions being investigated.
7-2c.	Design and safely conduct investigations that provide reliable data, appropriate to answer their questions.
7-2d.	Extend prior knowledge to help develop a hypothesis for their investigations and use the observations to check their prior knowledge.
7-2e.	Use accepted scientific knowledge, models, and theories to explain their results and to raise further questions about their investigations.
7-2f.	State what they have learned from investigations relating their prior knowledge to scientific knowledge and to data that they have collected.
7-2g.	Explain their data and conclusions in ways that allow an audience to understand the questions that they selected for investigation and the answers that they have developed.
7-2h.	Use computer software and other technologies to organize, process, and present their data.
7-2i.	Evaluate, explain, and defend the validity of questions, hypotheses, and conclusions to their investigations.
7-2j.	Discuss the importance of their results and implications of their work with peers,

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	teachers, and adults.
7-2k.	Raise further questions that still need to be answered.
	Standard 3: PHYSICAL SCIENCE Demonstrate an understanding of the physical and chemical properties of matter, the forms, and properties of energy, and the ways in which matter and energy interact.
7-3a.	Explain how models of the atomic structures of matter have changed over time, including historical models and modern atomic theory.
7-3b.	Illustrate the motion of objects by describing the forces acting on them.
7-3c.	Apply commonly accepted definitions of energy to common physical and chemical interactions occurring in the laboratory and the outside world.
7-3d.	Distinguish that all matter is composed of atoms (atomic theory).
7-3e.	While conducting investigations, explain the motion of objects using concepts of speed, velocity, acceleration, friction, and change over time.
7-3f.	Investigate that heat can be transferred through materials by collisions of atoms or across space by radiation, and if the material is fluid, currents will be set up in that to aid the transfer of heat (materials that do not conduct heat well can reduce heat loss).
7-3g.	Understand that any two objects exert a force of attraction based on the mass of the object and the distance between objects, which defines gravity.
7-3h.	Demonstrate that all energy can be considered either kinetic energy (energy of motion) or potential energy (depends on relative position or condition).
7-3i.	While conducting investigations, applying Newton's laws, explain the motion of objects by describing the forces acting on them.
7-3j.	Recognize an atom, molecule, element, and compound.
7-3k.	Identify parts of matter known as proton, neutron, and electron.
7-3l.	Know that arrangements of atoms into groups comprise all substances; and know that atoms are far too small to see directly through a microscope.
	Standard 4: EARTH & SPACE SCIENCE Demonstrate an understanding of the structure and systems of the Earth, other bodies in the universe, and their interactions.
7-4a.	Explain why the Earth is the only body in our solar system that appears able to support life.
7-4b.	Explain that the nine planets of differing sizes and surface features and with differing compositions move around the sun in nearly circular orbits, including some planets that have varieties of moons and rings of particles orbiting around them (i.e., one moon, many artificial satellites and debris orbit Earth).
7-4c.	Identify the phases of the moon.
7-4d.	Describe the composition and structure of the Earth's atmosphere.

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7-4e.	Explain that because of the tilt of the Earth's axis, sunlight and hence, heat falls more intensely on one part or another of the Earth during its one year revolution around the sun; the difference in heating of the Earth's surface produces the planet's seasons and weather patterns.
7-4f.	Know that the sun's gravitational pull keeps the Earth and other planets in the orbits just as the gravitational pull of planets keeps their moons in orbit around them.
7-4g.	Know that the universe contains many billions of galaxies, each containing many billions of stars.
7-4h.	Know and be able to use light years in measuring space distances.
7-4i.	Know that many pieces of rock and ice orbit our sun; some meet the Earth in its orbit, glow and disintegrate from friction as they plunge through our atmosphere; other objects have long off-center or bits that bring them close to the sun, whose radiation gives off material and pushes it into a long, illuminated tail.
7-4j.	Know that the moon orbits around the Earth, resulting in the phases of the moon.
	Standard 5: LIFE & ENVIRONMENTAL SCIENCE Demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.
7-5a.	Investigate and compare the cells of the protist, moneran, and fungi kingdoms for the purpose of classification.
7-5b.	Describe how the inside of the cell is a variety of specialized structures that carry out such cell functions as energy production, transport of molecules, and the storage of the genetic material.
7-5c.	Show how different structures both reproduce and pass on characteristics of their group.
7-5d.	Show through investigation how organisms both depend on and contribute to the balance or imbalance of population and/or ecosystems, which in turn contribute to the total system of life on the planet including predator/prey relationships.
7-5e.	Illustrate and explain how some of the changes on the earth are contributing to changes in the balance of life and affecting the survival or population growth of certain species.
7-5f.	Illustrate how current trends in human resource use and population growth will influence the ecosystems, and show current policies affect those trends.
	Standard 6: SCIENCE APPLICATIONS Demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.
7-6a.	Identify new careers that have been created due to discoveries in science and technology.
7-6b.	Illustrate the positive and negative effects of science and technology on the environment.

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7-6c.	Design an experiment or model that will solve an environmental problem and be able to discuss potential side effects (i.e., simulation).
7-6d.	Research specific local, state, or regional problems to which there has been a possible scientific or technological solution including alternative proposals for courses of action.
7-6e.	Illustrate how science and technology are interdependent.
	Standard 7: SCIENCE IN SOCIAL & PERSONAL PERSPECTIVES Use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.
7-7a.	Describe how accuracy, bias, and credibility of sources affect the communication of scientific evidence by various media.
7-7b.	Demonstrate appropriate lab safety techniques and skills during laboratory activities.