

Participation, Supported Independence, and Functional Independence Science Extended Benchmarks (EBs)

FINAL VERSION 9/17/07

STRAND 5: USING EARTH SCIENCE KNOWLEDGE

Background Information: The science benchmarks in this document are taken from the Michigan Curriculum Framework Science Content Benchmarks, 2000 version (MCF v.2000). These benchmarks have been extended for the MI-Access Functional Independence, Supported Independence, and Participation populations, and are presented in this document. The coding keys below explain abbreviations found throughout the document, including the benchmark and extended benchmark codes. If a cell contains **N/A**, the MCF v.2000 Benchmark was determined to be inappropriate to extend for the population and/or grade span by the MI-Access Science Assessment Plan Writing Team.

| MCF v.2000 Science Elementary, Middle School, and High School (Grades K-12) Benchmark Organization | | | | |
|--|---|---|---|--|
| STRAND 1 Constructing New Scientific Knowledge (C) | STRAND 2 Reflecting on Scientific Knowledge (R) | STRAND 3 Using Life Science Knowledge (L) | STRAND 4 Using Physical Science Knowledge (P) | STRAND 5 Using Earth Science Knowledge (E) |
| Standards | | | | |
| CN: Constructing New Scientific Knowledge | RO: Reflecting on Scientific Knowledge | CE: Cells OR: Organization of Living Things HE: Heredity EV: Evolution EC: Ecosystems | ME: Matter and Energy CM: Changes in Matter MO: Motion of Objects WV: Waves and Vibrations | GE: Geosphere HY: Hydrosphere AW: Atmosphere and Weather SS: Solar System, Galaxy, and Universe |

| Extended Benchmark Coding Examples | | | |
|---|--|--|--|
| Extended Benchmark: E.GE.FI.EB.V.1.e.1a | | Extended Benchmark: E.GE.FI.EB.V.1.m.1ADDh | |
| E | Using Earth Science Knowledge | E | Using Earth Science Knowledge |
| GE | Geosphere | GE | Geosphere |
| FI | Functional Independence | FI | Functional Independence |
| EB | Extended Benchmark | EB | Extended Benchmark |
| V.1.e.1 | MCF v.2000 Benchmark | V.1.m.1 | MCF v.2000 Benchmark |
| a | First Extended Benchmark in this document linked to MCF v.2000 Benchmark V.1.e.1 | ADDh | This Extended Benchmark is linked to a middle school MCF v.2000 Benchmark (V.1.m.1) but has been added to high school. |

**Participation, Supported Independence, and Functional Independence
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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: GEOSPHERE (GE) | | | |
| <i>All students will describe the earth's surface.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | <p>V.1.e.1 Describe major features of the earth's surface.</p> <p><i>Key concepts:</i> Types of landforms—mountains, plains, valleys; bodies of water—rivers, oceans, lakes (see EH-V.2 e.2); deserts.</p> <p><i>Real-world contexts:</i> Examples of Michigan surface features, such as hills, valleys, rivers, waterfalls, Great Lakes; pictures of global land features, including mountains, deserts.</p> | <p>V.1.m.1 Describe and identify surface features using maps.</p> <p><i>Key concepts:</i> Landforms—plains, deserts, plateaus, basin, Great Lakes, rivers, continental divide, mountains, mountain range, or mountain chain.</p> <p><i>Tools:</i> Maps—relief, topographic, elevation.</p> <p><i>Real-world contexts:</i> Maps showing continental and regional surface features, such as the Great Lakes or local topography.</p> | None |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.FI.EB.V.1.e.1a Identify major features of the earth's surface.</p> <p><i>Key concepts:</i> Landforms—plains, deserts, mountains; bodies of water—rivers, oceans, lakes.</p> <p><i>Real-world contexts:</i> Examples of Michigan geography for awareness of different surface features for travel and with map skills.</p> | <p>E.GE.FI.EB.V.1.m.1a Identify and/or describe major features of the earth's surface using maps.</p> <p><i>Key concepts:</i> Landforms—plains, deserts, mountains, mountain range; bodies of water—rivers, oceans, lakes, Great Lakes; maps.</p> <p><i>Real-world contexts:</i> Maps showing continental and regional surface features, such as the Great Lakes or local topography, for travel and recreational purposes.</p> | <p>E.GE.FI.EB.V.1.m.1ADDh Identify and/or describe surface features using maps.</p> <p><i>Key concepts:</i> Landforms—plains, deserts, mountains, mountain range; bodies of water—rivers, oceans, lakes, Great Lakes; maps.</p> <p><i>Real-world contexts:</i> Maps showing continental and regional surface features, such as the Great Lakes or local topography, for travel and recreational purposes.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.SI.EB.V.1.e.1a Identify major features of the earth's surface.</p> <p><i>Key concepts:</i> Mountains, rivers, oceans, lakes.</p> <p><i>Real-world contexts:</i> Improving the ability to relate to events and give directional information; leisure activities, such as boating, sledding, snowboarding.</p> | <p>E.GE.SI.EB.V.1.m.1a Identify major features of the earth's surface.</p> <p><i>Key concepts:</i> Mountains, rivers, oceans, lakes, plains, deserts, Great Lakes.</p> <p><i>Real-world contexts:</i> Improving the ability to relate to events and give directional information; leisure activities, such as boating, sledding, snowboarding.</p> | <p>E.GE.SI.EB.V.1.m.1ADDh Identify and/or describe major features of the earth's surface.</p> <p><i>Key concepts:</i> Mountains, rivers, oceans, lakes, plains, deserts, Great Lakes.</p> <p><i>Real-world contexts:</i> Improving the ability to relate to events and give directional information; leisure activities, such as boating, sledding, snowboarding.</p> |
| Participation Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.P.EB.V.1.e.1a Identify major features of the earth's surface.</p> <p><i>Key concepts:</i> Land, water.</p> <p><i>Real-world contexts:</i> Relating experiences</p> | <p>E.GE.P.EB.V.1.m.1a Identify major features of the earth's surface.</p> <p><i>Key concepts:</i> Land, water.</p> <p><i>Real-world contexts:</i> Relating experiences or</p> | <p>E.GE.P.EB.V.1.m.1ADDh Identify major features of the earth's surface.</p> <p><i>Key concepts:</i> Land, water.</p> <p><i>Real-world contexts:</i> Relating experiences</p> |

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| SCIENCE | | | |
|---|--------------------------|----------------------|--------------------|
| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: GEOSPHERE (GE) | | | |
| <i>All students will describe the earth's surface.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: | Elementary School | Middle School | High School |

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| (Classroom/LEA/ISD, State) | | | |
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| MCF v.2000 Science Benchmark | <p>V.1.e.2 Recognize and describe different types of earth materials.</p> <p><i>Key concepts:</i> Materials—mineral, rock, boulder, gravel, sand, clay, soil.</p> <p><i>Tools:</i> Hand lens.</p> <p><i>Real-world contexts:</i> Samples of natural earth materials, such as rocks, sand, soil, ores.</p> | None | None |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.FI.EB.V.1.e.2a Identify types of earth materials.</p> <p><i>Key concepts:</i> Materials—rocks, boulders, gravel, sand, clay, soil.</p> <p><i>Real-world contexts:</i> Art projects, gardening, beach and playground activities.</p> | <p>E.GE.FI.EB.V.1.e.2ADDm Identify and/or describe types of earth materials.</p> <p><i>Key concepts:</i> Materials—rocks, boulders, gravel, sand, clay, soil; attributes—size, texture, color, hardness.</p> <p><i>Real-world contexts:</i> Art projects, gardening, beach and playground activities, yard work.</p> | <p>E.GE.FI.EB.V.1.e.2ADDh Identify and/or describe types of earth materials and their uses.</p> <p><i>Key concepts:</i> Materials—rocks, boulders, gravel, sand, clay, soil; attributes—size, texture, color, hardness; uses—cement, glass, roads, sidewalks, gravel.</p> <p><i>Real-world contexts:</i> Home care, gardening, landscaping, construction, farming.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.SI.EB.V.1.e.2a Identify earth materials.</p> <p><i>Key concepts:</i> Rocks, soil, sand, vs. plastic, car, paper.</p> <p><i>Real-world contexts:</i> Planting and soil, gardening; leisure activities, such as a trip to the beach.</p> | <p>E.GE.SI.EB.V.1.e.2ADDm Identify types of earth materials.</p> <p><i>Key concepts:</i> Rocks, soil, sand, boulders, gravel.</p> <p><i>Real-world contexts:</i> Observing landscape around school and in the community, planting, yard work, shopping at landscape supply.</p> | <p>E.GE.SI.EB.V.1.e.2ADDh Identify and/or describe types of earth materials.</p> <p><i>Key concepts:</i> Rocks, soil, sand, boulders, gravel.</p> <p><i>Real-world contexts:</i> Observing landscape around school and in the community, planting, yard work, shopping at landscape supply, job with landscaping company.</p> |

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| Participation Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.P.EB.V.1.e.2a Identify earth materials.</p> <p><i>Key concepts:</i> Rocks, soil, sand, vs. plastic, car, paper.</p> <p><i>Real-world contexts:</i> Awareness of environment; caring for house plants.</p> | <p>E.GE.P.EB.V.1.e.2ADDm Identify earth materials.</p> <p><i>Key concepts:</i> Rocks, soil, sand, vs. plastic, car, paper.</p> <p><i>Real-world contexts:</i> Awareness of environment; caring for house plants.</p> | <p>E.GE.P.EB.V.1.e.2ADDh Identify types of earth materials.</p> <p><i>Key concepts:</i> Rocks, soil, sand.</p> <p><i>Real-world contexts:</i> Awareness of environment; yard chores.</p> |
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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: GEOSPHERE (GE) | | | |
| <i>All students will describe and explain how the earth's features change over time.</i> | | | |
| Level of Independence (Full, FI, SI, P) | Elementary School | Middle School | High School |

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| Assessable at: (Classroom/LEA/ISD, State) | | | |
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| MCF v.2000 Science Benchmark | <p>V.1.e.3 Describe natural changes in the earth's surface.</p> <p><i>Key concepts:</i> Causes of changes—volcanoes, earthquakes, erosion (water, wind, gravity, glaciers). Results of change—valleys, hills, lakes, widened rivers, mountains, cracks, movement of earth materials (boulders, gravel, sand, clay).</p> <p><i>Real-world contexts:</i> Places around the school where erosion has occurred, such as gullies formed in down-hill gravel areas, cracks in asphalt. Places beyond the school where changes have occurred, such as volcanic mountains, shorelines, landslides, sand dunes, slopes, river valleys.</p> | <p>V.1.m.2 Explain how rocks are formed.</p> <p><i>Key concepts:</i> Rock cycle processes—melting and cooling (igneous rocks); heat and pressure (metamorphic rocks); cementing and crystallization of sediments (sedimentary rocks). Minerals. Heat source is interior of earth. Materials—silt, clay, gravel, sand, rock, lava, magma, remains of living things (bones, shells, plants).</p> <p><i>Real-world contexts:</i> Physical environments where rocks are being formed: volcanoes; depositional environments, such as ocean floor, deltas, beaches, swamps; metamorphic environments deep within the earth's crust.</p> | <p>IV.1.h.1 Explain the surface features of the Great Lakes region using Ice Age theory.</p> <p><i>Key concepts:</i> Glacial processes—climate change, snow changing to ice, pressure, moving (advance, retreat), melting; deposits; features—hills, lakes, Great Lakes. See EAW-V.3 h.1 (long-term climate change.)</p> <p><i>Tools:</i> Relief map, topographic map, elevation map.</p> <p><i>Real-world contexts:</i> Examples in Michigan of glacial formations, such as moraines, kettles, drumlins.</p> |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.FI.EB.V.1.e.3a Identify and/or describe changes in the earth's surface.</p> <p><i>Key concepts:</i> Earthquakes, volcanoes, erosion.</p> <p><i>Real-world contexts:</i> Examples of surface changes include places around the school where erosion has occurred, such as gullies formed in downhill gravel areas, cracks in asphalt; sand dunes.</p> | <p>E.GE.FI.EB.V.1.m.2a Identify and/or describe major events in the rock cycle.</p> <p><i>Key concepts:</i> Boulders, gravel, sand, volcanoes, earthquake, erosion.</p> <p><i>Real-world contexts:</i> Mountains, beaches. Examples of surface changes include places around the school where erosion has occurred, such as gullies formed in downhill gravel areas, cracks in asphalt; sand dunes.</p> | <p>E.GE.FI.EB.IV.1.h.1a Identify and/or describe surface features caused by the Ice Age.</p> <p><i>Key concepts:</i> Freezing and melting.</p> <p><i>Real-world contexts:</i> Lakes.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.SI.EB.V.1.e.3a Identify geological events.</p> <p><i>Key concepts:</i> Earthquakes, volcanoes.</p> <p><i>Real-world contexts:</i> Building prior knowledge for participation in conversations.</p> | <p>E.GE.SI.EB.V.1.m.2a Identify geological events.</p> <p><i>Key concepts:</i> Earthquakes, volcanoes.</p> <p><i>Real-world contexts:</i> Building prior knowledge for participation in conversations and understanding media coverage.</p> | <p>E.GE.SI.EB.IV.1.h.1a Identify surface features caused by geological events.</p> <p><i>Key concepts:</i> Earthquakes, volcanoes, lakes.</p> <p><i>Real-world contexts:</i> Building prior knowledge for participation in conversations and understanding media coverage.</p> |
| Participation Extended Benchmark | N/A | N/A | N/A |

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SCIENCE

STRAND: USING EARTH SCIENCE KNOWLEDGE (E)

STANDARD: GEOSPHERE (GE)

All students will describe and explain how the earth's features change over time.

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| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
|--|-------------------|--|--|
| MCF v.2000 Science Benchmark | None | <p>V.1.m.3 Explain how rocks are broken down, how soil is formed and how surface features change.</p> <p><i>Key concepts:</i> Chemical and mechanical weathering; erosion by glaciers, water, wind and downslope movement; decomposition, humus.</p> <p><i>Real-world contexts:</i> Regions in Michigan where erosion by wind, water, or glaciers may have occurred, such as river valleys, gullies, shoreline of Great Lakes; chemical weathering from acid rain, formation of caves, caverns and sink holes; physical weathering, frost action such as potholes and cracks in sidewalks; plant roots by bacteria, fungi, worms, rodents, other animals.</p> | <p>V.1.h.2 Use the plate tectonics theory to explain features of the earth's surface and geological phenomena and describe evidence for the plate tectonics theory.</p> <p><i>Key concepts:</i> Earth composition—crust, mantle: upper part is able to flow very slowly; core: interior at high temperature and pressure (see ES-V.4 h.3.) Forces—tension, compression shearing. Plates—continental crust, oceanic crust. Features—faults, trenches, mid-ocean ridges, folded mountains, hot spots, volcanoes. Related actions—earthquakes (see PWV-IV.4 m.6), volcanic activity, seafloor spreading, mountain building, convection in mantle. Evidence of “continental drift”—physical fit of continents, fossil evidence, measurements of movement, rock layer sequences, glacial evidence. See Reflecting on Scientific Knowledge benchmarks related to evidence and theory.</p> <p><i>Real-world contexts:</i> Recent patterns of earthquake and volcanic activities; maps showing the direction of movement of major plates and associated earthquake and volcanic activity; compressional boundaries: folded mountains, thrust faults, trenches, lines of volcanoes (e.g. Pacific “ring of fire”); tensional boundaries: mid-ocean ridges, rift valleys; shearing boundaries: lateral movement producing faults (e.g. San Andreas Fault).</p> |
| Functional Independence Extended Benchmark | N/A | N/A | N/A |
| Supported Independence Extended Benchmark | N/A | N/A | N/A |

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|-------------------------------------|-----|-----|-----|
| Participation Extended Benchmark | N/A | N/A | N/A |
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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: GEOSPHERE (GE) | | | |
| <i>All students will describe and explain how the earth's features change over time.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |

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| MCF v.2000 Science Benchmark | <p>V.1.e.4 Explain how rocks and fossils are used to understand the history of the earth.</p> <p><i>Key concepts:</i> Fossils, extinct plants and animals, ages of fossils, rock layers. See LE-III.4 e.1 (ancient life.)</p> <p><i>Real-world contexts:</i> Fossils found in gravel, mines, quarries, beaches (Petoskey stones), museum displays; Michigan examples of layered rocks; specific examples of extinct plants and animals, such as dinosaurs.</p> | <p>V.1.m.4 Explain how rocks and fossils are used to understand the age and geological history of the earth.</p> <p><i>Key concepts:</i> Fossils, extinct plants and animals, ages of fossils, rock layers, timelines, relative dating.</p> <p><i>Real-world contexts:</i> Fossils found in gravel, mines and quarries, museum displays; places where rock layers are visible, such as Pictured Rocks, quarries, Grand Canyon, road cuts; Michigan fossils, such as trilobites, brachiopods, Petoskey stones; specific examples of extinct plants and animals, such as dinosaurs.</p> | None |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | N/A | <p>E.GE.FI.EB.V.1.m.4a Identify fossils and/or explain that they are evidence of past life.</p> <p><i>Key concepts:</i> What is a fossil?, extinction.</p> <p><i>Real-world contexts:</i> Collections, drawing, leisure outings.</p> | <p>E.GE.FI.EB.V.1.m.4ADDh Identify and/or explain how rocks and fossils help us understand the history of the earth.</p> <p><i>Key concepts:</i> What is a fossil?, extinction, simple timelines (such as dinosaurs existed before humans).</p> <p><i>Real-world contexts:</i> Collections, drawing, writing, leisure outings.</p> |
| Supported Independence Extended Benchmark | N/A | N/A | N/A |
| Participation Extended Benchmark | N/A | N/A | N/A |

| SCIENCE | | | |
|--|-------------------|---------------|-------------|
| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: GEOSPHERE (GE) | | | |
| <i>All students will analyze effects of technology on the earth's surface and resources.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |

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| <p style="text-align: center;">MCF v.2000 Science Benchmark</p> | <p>V.1.e.5 Describe uses of materials taken from the earth.</p> <p><i>Key concepts:</i> Transportation, building materials, energy, water (see EH-V.2 e.3.)</p> <p><i>Real-world contexts:</i> Examples of uses of earth materials, such as gravel into concrete for walls, gypsum into drywall, sand into glass for windows, road salt, ores into metal for chairs, oil into gasoline for cars, coal burned to produce electricity, water for hydroelectric power. Samples of manufactured materials, such as concrete, drywall, asphalt, iron and steel.</p> | <p>V.1.m.5 Explain how technology changes the surface of the earth.</p> <p><i>Key concepts:</i> Types of human activities—surface mining, construction and urban development, farming, dams, landfills, restoring natural areas.</p> <p><i>Real-world contexts:</i> Local example of surface changes due to human activities listed in the Key concepts above; local examples of negative consequences of these changes, such as groundwater pollution, destruction of habitat and scenic land, reduction of arable land; local examples of positive consequences, such as soil conservation, reforestation, restoring wetlands.</p> | <p>V.1.h.3 Explain how common objects are made from earth materials and why earth materials are conserved and recycled.</p> <p><i>Key concepts:</i> Valuable materials—minerals, metallic ores, iron, copper, aluminum, fuels. Types of resources—renewable, nonrenewable. Conservation, limits, recycling, costs for developing more remote supplies. Manufacturing, refining, mining. Recycling processes—melting, shredding, dissolving.</p> <p><i>Real-world contexts:</i> Manufacturing processes—steel mills, auto assembly lines, paper making; local recycling center for materials, such as glass, plastic, aluminum, steel cans, motor oil; examples of technical and social means for slowing the depletion of earth’s resources, such as developing more fuel efficient cars and mandating their use; disposal in landfills and incinerators.</p> |
| <p style="text-align: center;">Functional Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p>E.GE.FI.EB.V.1.e.5a Identify uses of materials taken from the earth.</p> <p><i>Key concepts:</i> Water, gravel, coal, sand, oil, salt.</p> <p><i>Real-world contexts:</i> Personal use of water, leisure activities (such as boating, fishing, beach, sandbox), transportation, home uses of water.</p> | <p>E.GE.FI.EB.V.1.m.5a Identify and/or describe how materials are taken from the earth.</p> <p><i>Key concepts:</i> Mining, farming.</p> <p><i>Real-world contexts:</i> Local examples of surface changes.</p> | <p>E.GE.FI.EB.V.1.h.3a Identify and/or describe common objects made from earth materials and why earth materials are conserved and recycled.</p> <p><i>Key concepts:</i> Types of human activities—surface mining, construction and urban development, farming, dams, landfills, restoring natural areas.</p> <p><i>Real-world contexts:</i> Understanding the impact of home care, jobs, and leisure activities on surface changes included in the Key concepts; local examples of negative consequences of these changes, such as groundwater pollution, destruction of habitat and scenic land; local examples of positive consequences, such as soil conservation, reforestation, restoring wetlands.</p> |
| <p style="text-align: center;">Supported Independence Extended Benchmark</p> | <p>N/A</p> | <p>N/A</p> | <p>N/A</p> |

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|-------------------------------------|-----|-----|-----|
| Participation Extended Benchmark | N/A | N/A | N/A |
|-------------------------------------|-----|-----|-----|

| SCIENCE | | | |
|--|-------------------|---------------|-------------|
| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: GEOSPHERE (GE) | | | |
| <i>All students will analyze effects of technology on the earth's surface and resources.</i> | | | |
| Level of Independence (Full, FI, SI, P) | Elementary School | Middle School | High School |

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| Assessable at: (Classroom/LEA/ISD, State) | | | |
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| MCF v.2000 Science Benchmark | <p>V.1.e.6 Demonstrate ways to conserve natural resources and reduce pollution through reduction, reuse, and recycling of manufactured materials.</p> <p><i>Key concepts:</i> Materials that can be recycled—paper, metal, glass, plastic. Conservation and anti-pollution activities—reduce, reuse, recycle.</p> <p><i>Real-world contexts:</i> Collections of recyclable materials, plans for recycling at home and school, composting, ways of reusing or reducing the use of paper.</p> | None | <p>V.1.h.4 Evaluate alternative long range plans for resource use and by-product disposal in terms of environmental and economic impact.</p> <p><i>Key concepts:</i> Understanding of limitations of knowledge and technology (see R-II.1 h.2), side effects of resource use (see PME-IV.1 h.1, risk/benefit analysis). Also see R-II.1 h.5 (new technologies), EAW-V.3 h.4 (air pollution),</p> <p><i>Real-world contexts:</i> Industries for mining, energy production, manufacturing, transportation, housing. Resources including fossil fuels, metals, wood, water. Pollution prevention and events, such as catalytic converters, Love Canal, Superfund waste sites.</p> |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.FI.EB.V.1.e.6a Identify routines related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water, fuel) and recycled (paper, metal, glass, plastic).</p> <p><i>Real-world contexts:</i> Making responsible choices in daily living; being involved in conservation (such as turning off lights, watering grass less, carpooling) and recycling (such as recycling soda pop cans) activities at home, in school, and in the community.</p> | <p>E.GE.FI.EB.V.1.e.6ADDm Identify reasons why it is important to conserve and/or recycle.</p> <p><i>Key concepts:</i> Waste Management, limited resources.</p> <p><i>Real-world contexts:</i> Making responsible choices in daily living that impact dump sites, landfills, and limited resources; being involved in conservation (such as turning off light, watering grass less, carpooling) and recycling (such as recycling soda pop cans) activities at home, in school, and in the community; appropriate disposal of used materials.</p> | <p>E.GE.FI.EB.V.1.h.4a Identify and design a plan to conserve and/or recycle at home, work, or school.</p> <p><i>Key concepts:</i> Resources—renewable vs. nonrenewable; conservation, anti-pollution activities. Reduce, recycle, reuse.</p> <p><i>Real-world contexts:</i> Taking an active role in anti-pollution and conservation activities at home, at school, and in the community, such as in consumer choices, yard care, composting, recycling, proper automotive care.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.SI.EB.V.1.e.6a Identify everyday routines and/or materials related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water) or recycled (paper, plastic, metal, glass).</p> | <p>E.GE.SI.EB.V.1.e.6ADDm Identify and/or demonstrate everyday routines related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water) or recycled (paper, plastic, metal, glass).</p> | <p>E.GE.SI.EB.V.1.e.6ADDh Identify and/or demonstrate everyday routines related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water, fuel) or recycled (paper, plastic metal, glass).</p> |

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| | <i>Real-world contexts:</i> Being involved in conservation and recycling activities at home, in school, and in the community. | <i>Real-world contexts:</i> Being involved in conservation (such as turning off lights, watering grass less) and recycling activities (such as recycling soda pop cans) at home, in school, and in the community; handling recycling materials safely and appropriately. | <i>Real-world contexts:</i> Being involved in conservation (such as turning off lights, watering grass less, carpooling) and recycling (such as recycling soda pop cans and composting) activities at home, in school, and in the community; handling recycling materials appropriately and safely. |
| Participation Extended Benchmark Classroom/LEA/ISD and State | <p>E.GE.P.EB.V.1.e.6a Identify and/or demonstrate everyday routines related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water) or recycled (paper, plastic).</p> <p><i>Real-world contexts:</i> Being involved in conservation and recycling activities at home, in school, and in the community.</p> | <p>E.GE.P.EB.V.1.e.6ADDm Identify and/or demonstrate everyday routines related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water) or recycled (paper, plastic, metal).</p> <p><i>Real-world contexts:</i> Being involved in conservation (such as turning off lights, watering grass less) and recycling activities (such as recycling soda pop cans) at home, in school, and in the community; handling recycling materials safely and appropriately.</p> | <p>E.GE.P.EB.V.1.e.6ADDh Identify and/or demonstrate everyday routines related to the conservation of natural resources.</p> <p><i>Key concepts:</i> Materials that can be conserved (power, water, fuel) or recycled (paper, plastic, metal, glass).</p> <p><i>Real-world contexts:</i> Being involved in conservation (such as turning off lights, watering grass less, carpooling) and recycling (such as recycling soda pop cans) activities at home, in school, and in the community; handling recycling materials appropriately and safely.</p> |

| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: HYDROSPHERE (HY) | | | |
| <i>All students will describe the characteristics of water and demonstrate where water is found on earth.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: | Elementary School | Middle School | High School |

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| (Classroom/LEA/ISD, State) | | | |
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| MCF v.2000 Science Benchmark | <p>V.2.e.1 Describe how water exists on earth in three states.</p> <p><i>Key concepts:</i> Liquid (K-2)—visible, flowing, melting, dew. Solid (K-2)—hard, visible, freezing, ice. Gas (3-5)—invisible, water vapor, moisture, evaporating. See PCM-IV.2 e.1.</p> <p><i>Real-world contexts:</i> Examples of water in each state, including dew, rain, snow, ice, evidence of moisture in the air, such as “fog” on cold bathroom mirrors; examples of melting, freezing, and evaporating.</p> | <p>V.2.m.1 Use maps of the earth to locate water in its various forms and describe conditions under which they exist.</p> <p><i>Key concepts:</i> Liquid water forms—lakes, rivers, oceans, springs. Frozen water forms—continental glacier, valley glacier, snow on mountains, polar cap. Gaseous water in atmosphere.</p> <p><i>Tools:</i> Relief and elevation maps; satellite images.</p> <p><i>Real-world contexts:</i> Local lakes, rivers, streams, ponds, springs; examples of frozen water, including snow, glaciers, icebergs, polar regions, frozen Great Lakes shorelines.</p> | None |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.HY.FI.EB.V.2.e.1a Identify the three states of water on earth.</p> <p><i>Key concepts:</i> Liquid, solid, gas.</p> <p><i>Real-world contexts:</i> Building prior knowledge for communication; safety implications of the three states.</p> | <p>E.HY.FI.EB.V.2.m.1a Use maps of the earth to locate water in its various forms and describe conditions under which they exist.</p> <p><i>Key concepts:</i> Liquid water forms—lakes, rivers, oceans. Frozen water forms—snow on mountains.</p> <p><i>Real-world contexts:</i> Safe and recreational uses of local lakes, rivers, streams, ponds; examples of frozen water, including snow, frozen Great Lakes shorelines, frozen lakes.</p> | <p>E.HY.FI.EB.V.2.e.1ADDh Identify safety precautions with the three states of water.</p> <p><i>Key concepts:</i> Solid—icy roadways, thin ice; liquid—drowning; gas—burns.</p> <p><i>Real-world contexts:</i> Safe and recreational uses of the three states.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.HY.SI.EB.V.2.e.1a Recognize that water exists in liquid and solid forms.</p> <p><i>Key concepts:</i> Liquid and solid.</p> <p><i>Real-world contexts:</i> Daily living and leisure activities.</p> | <p>E.HY.SI.EB.V.2.e.1ADDm Identify safety precautions with liquid and solid forms of water.</p> <p><i>Key concepts:</i> Solid—icy roadways and sidewalks, thin ice. Liquid—drowning, burns, slippery roadways.</p> <p><i>Real-world contexts:</i> Daily living and leisure activities.</p> | <p>E.HY.SI.EB.V.2.e.1ADDh Identify safety precautions with liquid and solid forms of water.</p> <p><i>Key concepts:</i> Solid—icy roadways and sidewalks, thin ice. Liquid—drowning, burns, slippery roadways.</p> <p><i>Real-world contexts:</i> Daily living and leisure activities.</p> |
| Participation Extended Benchmark Classroom/LEA/ISD and State | <p>E.HY.P.EB.V.2.e.1a Identify where water is found in the home and school.</p> <p><i>Key concepts:</i> Water, sink, drinking fountain.</p> <p><i>Real-world contexts:</i> Daily living and functional activities.</p> | <p>E.HY.P.EB.V.2.m.1a Identify where water is found in the home, school, and community.</p> <p><i>Key concepts:</i> Water, sink, drinking fountain, swimming pool.</p> <p><i>Real-world contexts:</i> Daily living, functional, and leisure activities; washing machine.</p> | <p>E.HY.P.EB.V.2.m.1ADDh Identify sources of water for functional tasks in the home, school, and community.</p> <p><i>Key concepts:</i> Sink, drinking fountain.</p> <p><i>Real-world contexts:</i> Daily living and vocational activities; washing machine.</p> |

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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: HYDROSPHERE (HY) | | | |
| <i>All students will describe how water moves.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: | Elementary School | Middle School | High School |

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| (Classroom/LEA/ISD, State) | | | |
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| MCF v.2000 Science Benchmark | <p>V.2.e.2 Trace the path that rain water follows after it falls.</p> <p><i>Key concepts:</i> Precipitation—see EAW-V.3 e.1. Flow—downhill, to rivers, into the ground. Bodies of water—streams, rivers, lakes, oceans. See EG-V.1e.1 (earth features).</p> <p><i>Real-world contexts:</i> Examples of water flowing locally, including gutters, drains, streams, wetlands.</p> | <p>V.2.m.2 Describe how surface water in Michigan reaches the ocean and returns.</p> <p><i>Key concepts:</i> Water path—run-off, creeks, streams, wetlands, rivers, Great Lakes. Sources—snow melt, rain fall. Gravity. Water cycles—see EAW-V.3 m.3. (See EH-V.2 m.3 about groundwater.)</p> <p><i>Real-world contexts:</i> Maps showing streams, lakes, rivers, oceans; examples of motions of rivers and lakes; investigations of rivers and lake temperatures; saltiness of ocean.</p> | <p>V.2.h.1 Identify and describe regional watersheds.</p> <p><i>Key concepts:</i> drainage basins, divides, reservoirs, tributaries, run-off.</p> <p><i>Tools:</i> Maps.</p> <p><i>Real-world contexts:</i> Local and regional watersheds, Great Lakes Basin, Continental Divide; planning water management, evaluating potential disposal sites, analyzing pollution events which concern both surface and ground water.</p> |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.HY.FI.EB.V.2.e.2a Trace the path that rain water follows after it falls.</p> <p><i>Key concepts:</i> Precipitation—rain, snow, hail, freezing rain. Flow—downhill, to rivers, into the ground. Bodies of water—streams, rivers, lakes, oceans.</p> <p><i>Real-world contexts:</i> Examples of water flowing locally, including gutters, drains, streams, wetlands.</p> | <p>E.HY.FI.EB.V.2.m.2a Explain the behavior of water on the surface.</p> <p><i>Key concepts:</i> Water cycle—collection and run off.</p> <p><i>Real-world contexts:</i> Aspects of the water cycle, including precipitation, flooding, evaporating puddles, droughts.</p> | <p>E.HY.FI.EB.V.2.m.2ADDh Describe how surface water in Michigan reaches the ocean and returns.</p> <p><i>Key concepts:</i> Water path—run-off, creeks, streams, wetlands, rivers, Great Lakes. Sources—snow melt, rain fall. Gravity. Water cycle.</p> <p><i>Real-world contexts:</i> Maps showing streams, lakes, rivers, oceans; examples of motions of rivers and lakes; investigations of rivers and lake temperatures; saltiness of ocean.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.HY.SI.EB.V.2.e.2a Recognize that water flows.</p> <p><i>Key concepts:</i> Rivers, streams, drains, parking lots.</p> <p><i>Real-world contexts:</i> Building knowledge of the world around them.</p> | <p>E.HY.SI.EB.V.2.m.2a Identify safety precautions associated with water flowing downhill.</p> <p><i>Key concepts:</i> Rivers, streams, drains, parking lots, roadways, flooding.</p> <p><i>Real-world contexts:</i> Making safe personal choices.</p> | <p>E.HY.SI.EB.V.2.m.2ADDh Identify safety precautions associated with water flowing downhill.</p> <p><i>Key concepts:</i> Rivers, streams, drains, parking lots, roadways, flooding.</p> <p><i>Real-world contexts:</i> Making safe personal choices.</p> |
| Participation Extended Benchmark | N/A | N/A | N/A |

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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: HYDROSPHERE (HY) | | | |
| <i>All students will analyze the interaction of human activities with the hydrosphere.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | V.2.e.3 | V.2.m.3 | V.2.h.2 |

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| | <p>Identify sources of water and its uses.</p> <p><i>Key concepts:</i> Water sources—wells, springs, Great Lakes, rivers. Household uses—drinking, cleaning, food preparation. Public uses—generate electricity, recreation, irrigation, transportation, industry.</p> <p><i>Real-world contexts:</i> Examples of local sources of drinking water, including wells, rivers, lakes. Examples of local occasions when water is used, including car wash, swimming, fire hydrants, drinking, food preparation, cleaning, watering lawn, bathing, fishing, boating, shipping on the Great Lakes.</p> | <p>Explain how water exists below the earth's surface and how it is replenished.</p> <p><i>Key concepts:</i> Ground water—water table, spring, porous, saturate, filtration. Sources—snow melt, rain fall.</p> <p><i>Real-world contexts:</i> Examples of groundwater, including springs, wells, water soaking into the ground.</p> | <p>Describe how human activities affect the quality of water in the hydrosphere.</p> <p><i>Key concepts:</i> Human activities—agriculture, fishing, manufacturing, energy production. Quantity of water—rate of use, urbanization. Oceans—oil spills, garbage, global warming, marine life. Fresh water pollution—industrial waste disposal, agricultural runoff, herbicides, pesticides, sewage, acid rain, nutrient levels. Ground water—landfills, leaching, disposal of toxic wastes. Purification technology—filtering, chlorination. Limits to natural resources.</p> <p><i>Real-world contexts:</i> Examples of local and regional human activities that have measurable effects on water, including farming, industry, sewage disposal, toxic waste disposal.</p> |
| <p style="text-align: center;">Functional Independence Extended Benchmark</p> <p style="text-align: center;">Classroom/LEA/ISD and State</p> | <p>E.HY.FI.EB.V.2.e.3a Identify sources of water and its household/personal uses.</p> <p><i>Key concepts:</i> Water sources—wells, Great Lakes, rivers, groundwater. Household/personal uses—drinking, cleaning, food preparation, hygiene.</p> <p><i>Real-world contexts:</i> Understanding the relationship of the water in the world around them to their own lives, such as in examples of local sources of drinking water, including wells, rivers, lakes; examples of household/personal uses of water, including drinking, food preparation, cleaning, bathing, watering lawn, dishwasher, washing machine, heating systems, toilet.</p> | <p>E.HY.FI.EB.V.2.e.3ADDm Identify public uses of water.</p> <p><i>Key concepts:</i> Public uses—generate electricity, recreation, irrigation, transportation, industry, wells and reservoirs.</p> <p><i>Real-world contexts:</i> Understanding the relationship of the water in the world around them to their own lives, such as in examples of public uses of water, including fire hydrants, car wash, swimming, fishing, boating, shipping on the Great Lakes, irrigation systems (farming), sewer system.</p> | <p>E.HY.FI.EB.V.2.h.2a Identify and/or describe how human activities affect the quality of water.</p> <p><i>Key concepts:</i> Human activities—agriculture, fishing, manufacturing, energy production.</p> <p><i>Real-world contexts:</i> Understanding the impact of pollution on the water around them.</p> |
| <p style="text-align: center;">Supported Independence Extended Benchmark</p> <p style="text-align: center;">Classroom/LEA/ISD and State</p> | <p>E.HY.SI.EB.V.2.e.3a Identify household/personal uses of water.</p> <p><i>Key concepts:</i> Household/personal uses—drinking, cleaning, food preparation, personal hygiene (bathing, hand washing); hot vs. cold water.</p> <p><i>Real-world contexts:</i> Understanding the relationship of the water in the world around them to their own lives, such as examples of household/personal uses of water, including drinking, food preparation,</p> | <p>E.HY.SI.EB.V.2.e.3ADDm Identify sources of water and its household/personal uses.</p> <p><i>Key concepts:</i> Water sources—wells, water towers, reservoirs, Great Lakes, rivers, groundwater. Household/personal uses—drinking, cleaning, food preparation, personal hygiene (bathing, hand washing); hot vs. cold water.</p> <p><i>Real-world contexts:</i> Understanding the relationship of the water in the world around</p> | <p>E.HY.SI.EB.V.2.h.2a Identify and/or describe sources of safe vs. unsafe drinking water.</p> <p><i>Key concepts:</i> Safe—drinking fountains, faucets, bottled water, water coolers. Unsafe—puddles, pet dishes, unattended liquids, pools.</p> <p><i>Real-world contexts:</i> Making safe choices at home, in school, and in the community.</p> |

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| | cleaning, bathing, watering lawn, dishwasher, washing machine, heating systems, toilet. | them to their own lives, such as in examples of local sources of drinking water, including wells, rivers, lakes; examples of household/personal uses of water, including drinking, food preparation, cleaning, bathing, watering lawn, dishwasher, washing machine, heating systems, toilet. | |
| Participation Extended Benchmark Classroom/LEA/ISD and State | <p>E.HY.P.EB.V.2.e.3a Identify routines involving the use of water in various personal and household situations.</p> <p><i>Key concepts:</i> Household/personal uses—drinking, cleaning, food preparation, personal hygiene (bathing, hand washing); hot vs. cold water.</p> <p><i>Real-world contexts:</i> Daily living activities.</p> | <p>E.HY.P.EB.V.2.e.3ADDm Identify routines involving the use of water in various personal, household, and recreational situations.</p> <p><i>Key concepts:</i> Household/personal uses—drinking, cleaning, food preparation, personal hygiene (bathing, hand washing); recreational uses—swimming; hot vs. cold water.</p> <p><i>Real-world contexts:</i> Daily living and leisure activities.</p> | <p>E.HY.P.EB.V.2.h.2a Identify clean vs. unclear water.</p> <p><i>Key concepts:</i> Clean—drinking fountains, faucets, bottled water, water coolers. Unclean—puddles, pet dishes, pools.</p> <p><i>Real-world contexts:</i> Making safe choices at home, in school, and in the community.</p> |

| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: HYDROSPHERE (HY) | | | |
| <i>All students will analyze the interaction of human activities with the hydrosphere.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | None | V.2.m.4 | None |

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| | | <p>Describe the origins of pollution in the hydrosphere.</p> <p><i>Key concepts:</i> Sources of pollution—sewage, household dumping, industrial wastes, agricultural run-off. See EG-V.1 m.5, LEC-III.5 m.6.</p> <p><i>Real-world contexts:</i> Examples of polluted water; examples of occasions when water supply is restricted, such as during droughts.</p> | |
| <p align="center">Functional Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p>E.HY.FI.EB.V.2.m.4ADDe Identify sources of safe vs. unsafe drinking water.</p> <p><i>Key concepts:</i> Safe—drinking fountains, faucets, bottled water, water coolers. Unsafe—puddles, pet dishes, unattended liquids, pools.</p> <p><i>Real-world contexts:</i> Making safe choices at home, in school, and in the community.</p> | <p>E.HY.FI.EB.V.2.m.4a Identify sources of pollution in the water.</p> <p><i>Key concepts:</i> Sources of pollution—sewage, household dumping, industrial wastes, agricultural run-off.</p> <p><i>Real-world contexts:</i> Understanding what daily living activities contribute to water pollution.</p> | <p>N/A</p> |
| <p align="center">Supported Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p>E.HY.SI.EB.V.2.m.4ADDe Identify sources of safe vs. unsafe drinking water.</p> <p><i>Key concepts:</i> Safe—drinking fountains, faucets, bottled water, water coolers. Unsafe—puddles, pet dishes, unattended liquids, pools.</p> <p><i>Real-world contexts:</i> Making safe choices at home, in school, and in the community.</p> | <p>E.HY.SI.EB.V.2.m.4a Identify sources of safe vs. unsafe drinking water.</p> <p><i>Key concepts:</i> Safe—drinking fountains, faucets, bottled water, water coolers. Unsafe—puddles, pet dishes, unattended liquids, pools.</p> <p><i>Real-world contexts:</i> Making safe choices at home, in school, and in the community.</p> | <p>N/A</p> |
| <p align="center">Participation Extended Benchmark Classroom/LEA/ISD and State</p> | <p>N/A</p> | <p>E.HY.P.EB.V.2.m.4a Identify clean vs. unclean water.</p> <p><i>Key concepts:</i> Clean—drinking fountains, faucets, bottled water, water coolers. Unclean—puddles, pet dishes, pools.</p> <p><i>Real-world contexts:</i> Making safe choices at home, in school, and in the community.</p> | <p>N/A</p> |

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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: ATMOSPHERE AND WEATHER (AW) | | | |
| <i>All students will investigate and describe what makes up weather and how it changes from day to day, from season to season and over long periods of time.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |

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| <p style="text-align: center;">MCF v.2000 Science Benchmark</p> | <p>V.3.e.1 Describe weather conditions.</p> <p><i>Key concepts:</i> Atmosphere is a blanket of air around the earth, air is a substance; see PME-IV.1 e.1 (attributes of substances). Air has temperature— cold, hot, warm, cool. Cloud cover—cloudy, partly cloudy; foggy. Precipitation—rain, snow, hail, freezing rain. Wind—breezy, windy, calm. Severe weather— thunderstorms, lightning, tornadoes, high winds, blizzards.</p> <p><i>Tools:</i> Thermometer, wind sock, rain gauge.</p> <p><i>Real-world contexts:</i> Daily changes in weather; examples of severe weather.</p> | <p>V.3.m.1 Explain patterns of changing weather and how they are measured.</p> <p><i>Key concepts:</i> Weather patterns—cold front, warm front, stationary front, air mass, humidity.</p> <p><i>Tools:</i> Thermometer, rain gauge, wind direction indicator, anemometer, weather maps, satellite weather images.</p> <p><i>Real-world contexts:</i> Sudden temperature and cloud formation changes; records, charts, and graphs of weather changes over periods of days; lake effect snow.</p> | <p>V.3.h.1 Explain how interactions of the atmosphere, hydrosphere, and geosphere create climates and how climates change over time.</p> <p><i>Key concepts:</i> Average yearly temperatures; ice ages, volcanic dust in atmosphere, greenhouse effect, global air circulation, effects of latitude, effects of landforms, ocean currents.</p> <p><i>Real-world contexts:</i> Causes of short-term climate changes, such as catastrophic volcanic eruptions and impact of solar system objects; evidence of long-term climate changes, such as ice ages, global warming. El Niño, La Niña.</p> |
| <p style="text-align: center;">Functional Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p>E.AW.FI.EB.V.3.e.1a Identify and/or describe weather conditions.</p> <p><i>Key concepts:</i> Air has temperature—cold, hot, warm, cool. Cloud cover—cloudy, partly cloudy, sunny, foggy. Precipitation—rain, snow, hail, freezing rain. Wind—breezy, windy, calm. Severe weather—thunderstorms, lightning, tornadoes, high winds, blizzards.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> | <p>E.AW.FI.EB.V.3.m.1a Interpret temperature, precipitation, and cloud cover information; identify how they are measured; and relate the weather information to daily activities.</p> <p><i>Key concepts:</i> Air has temperature—cold, hot, warm, cool. Cloud cover—cloudy, partly cloudy; sunny, foggy. Precipitation—rain, snow, hail, freezing rain. Wind—breezy, windy, calm. Severe weather—thunderstorms, lightning, tornadoes, high winds, blizzards.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> | <p>E.AW.FI.EB.V.3.m.1ADDh Identify the uses of weather tools, such as thermometer, rain gauge, weather maps, or the like found on Internet, to compare predicted weather to actual observed weather conditions, and relate to daily activities.</p> <p><i>Key concepts:</i> Weather tools—thermometer (temperature), rain gauge (inches of rain), wind direction indicator, weather maps (read and interpret key); view predictions made in the newspaper, on the Internet, and on television.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> |
| <p style="text-align: center;">Supported Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p>E.AW.SI.EB.V.3.e.1a Identify weather conditions.</p> <p><i>Key concepts:</i> Cold, hot, warm, sunny, cloudy, foggy, rain, snow, hail, windy, thunderstorms, lightning, tornadoes.</p> <p><i>Real-world contexts:</i> Implications of weather conditions to daily activities.</p> | <p>E.AW.SI.EB.V.3.m.1a Identify and/or chart temperature, precipitation, and cloud cover, and relate to daily activities.</p> <p><i>Key concepts:</i> Cold, hot, warm, cloudy, foggy, rain, snow, windy; tables, graphs.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> | <p>E.AW.SI.EB.V.3.m.1ADDh Identify and/or chart temperature, precipitation, and cloud cover, and relate to daily activities.</p> <p><i>Key concepts:</i> Cold, hot, warm, cloudy, foggy, rain, snow, windy; tables, graphs.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> |

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| <p align="center">Participation Extended Benchmark</p> <p align="center">Classroom/LEA/ISD and State</p> | <p>E.AW.P.EB.V.3.e.1a Identify appropriate activities related to weather conditions.</p> <p><i>Key concepts:</i> Cold, hot, warm, sunny, cloudy, rain, snow.</p> <p><i>Real-world contexts:</i> Awareness of world around them; appropriate clothing for daily activities.</p> | <p>E.AW.P.EB.V.3.e.1ADDm Identify appropriate clothing and/or activities related to particular weather conditions.</p> <p><i>Key concepts:</i> Cold, hot, warm, sunny, cloudy, rain, snow.</p> <p><i>Real-world contexts:</i> Awareness of world around them; appropriate clothing for daily activities.</p> | <p>E.AW.P.EB.V.3.e.1ADDh Identify appropriate clothing and/or activities related to particular weather conditions.</p> <p><i>Key concepts:</i> Cold, hot, warm, sunny, cloudy, rain, snow.</p> <p><i>Real-world contexts:</i> Awareness of world around them; appropriate clothing for daily activities.</p> |
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| <p align="center">SCIENCE</p> <p align="center">STRAND: USING EARTH SCIENCE KNOWLEDGE (E)</p> | | | |
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| <p>STANDARD: ATMOSPHERE AND WEATHER (AW) <i>All students will investigate and describe what makes up weather and how it changes from day to day, from season to season and over long periods of time.</i></p> | | | |
| <p>Level of Independence (Full, FI, SI, P) Assessable at:</p> | <p align="center">Elementary School</p> | <p align="center">Middle School</p> | <p align="center">High School</p> |

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| (Classroom/LEA/ISD, State) | | | |
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| MCF v.2000 Science Benchmark | <p>V.3.e.2 Describe seasonal changes in Michigan's weather.</p> <p><i>Key concepts:</i> Seasons and types of weather—fall, cool nights and warm days; winter—snowy and constantly cold, getting dark early in the evening; spring—warmer days, often rainy with thunderstorms; summer—hot days and warm nights, daylight lasting until late in the evening.</p> <p><i>Real-world contexts:</i> Examples of visible seasonal changes in nature.</p> | None | None |
| <p align="center">Functional Independence Extended Benchmark</p> <p align="center">Classroom/LEA/ISD and State</p> | <p>E.AW.FI.EB.V.3.e.2a Identify and/or describe seasonal changes in Michigan's weather.</p> <p><i>Key concepts:</i> Seasons and types of weather: fall-cool nights and warm days; winter-snowy and constantly cold, getting dark early in the evening; spring-warmer days, often rainy with thunderstorms; summer-hot days and warm nights, daylight lasting until late in the evening, storms.</p> <p><i>Real-world contexts:</i> Implications of seasonal weather conditions on daily living activities.</p> | <p>E.AW.FI.EB.V.3.e.2ADDm Identify and/or describe seasonal changes in Michigan's weather.</p> <p><i>Key concepts:</i> Seasons and types of weather: fall-cool nights and warm days; winter-snowy and constantly cold, getting dark early in the evening; spring-warmer days, often rainy with thunderstorms; summer-hot days and warm nights, daylight lasting until late in the evening, storms.</p> <p><i>Real-world contexts:</i> Implications of seasonal weather conditions on daily living activities.</p> | <p>E.AW.FI.EB.V.3.e.2ADDh Identify and/or describe seasonal changes in Michigan's weather.</p> <p><i>Key concepts:</i> Seasons and types of weather: fall-cool nights and warm days; winter-snowy and constantly cold, getting dark early in the evening; spring-warmer days, often rainy with thunderstorms; summer-hot days and warm nights, daylight lasting until late in the evening, storms.</p> <p><i>Real-world contexts:</i> Implications of seasonal weather conditions on daily living activities.</p> |

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| <p align="center">Supported Independence Extended Benchmark</p> <p align="center">Classroom/LEA/ISD and State</p> | N/A | <p>E.AW.SI.EB.V.3.e.2ADDm Identify seasonal changes in Michigan's weather.</p> <p><i>Key concepts:</i> Seasons and types of weather: fall—getting cooler, winter—snowy and cold, spring—getting warmer, summer—hot; differences in hours of sunlight.</p> <p><i>Real-world contexts:</i> Implications of seasonal weather conditions on daily living</p> | <p>E.AW.SI.EB.V.3.e.2ADDh Identify seasonal changes in Michigan's weather.</p> <p><i>Key concepts:</i> Seasons and types of weather: fall—getting cooler, winter—snowy and cold, spring—getting warmer, summer—hot; differences in hours of sunlight.</p> <p><i>Real-world contexts:</i> Implications of</p> |
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| | | activities. | seasonal weather conditions on daily living activities. |
| Participation Extended Benchmark | N/A | N/A | N/A |

| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: ATMOSPHERE AND WEATHER (AW) | | | |
| <i>All students will explain what causes different kinds of weather.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |

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| MCF v.2000 Science Benchmark | None | <p>V.3.m.2 Describe the composition and characteristics of the atmosphere.</p> <p><i>Key concepts:</i> Composition—air, molecules, gas, water vapor, dust particles, ozone. Characteristics— air pressure and temperature changes with altitude, humidity.</p> <p><i>Real-world contexts:</i> Examples of characteristics of the atmosphere, including pressurized cabins in airplanes, demonstrations of air pressure; examples of air-borne particulates, such as smoke, dust, pollen, bacteria; effects of humidity, such as condensation, dew on surfaces, comfort level of humans.</p> | <p>V.3.h.2 Describe patterns of air movement in the atmosphere and how they affect weather conditions.</p> <p><i>Key concepts:</i> Air movement—air masses, fronts, pressure systems, prevailing winds, jet stream.</p> <p><i>Real-world contexts:</i> Reports of local weather patterns influenced by the jet stream and prevailing winds.</p> |
| Functional Independence Extended Benchmark | N/A | N/A | N/A |
| Supported Independence Extended Benchmark | N/A | N/A | N/A |
| Participation Extended Benchmark | N/A | N/A | N/A |

| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: ATMOSPHERE AND WEATHER (AW) | | | |
| <i>All students will explain what causes different kinds of weather.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |

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| <p>MCF v.2000 Science Benchmark</p> | <p align="center">None</p> | <p>V.3.m.3 Explain the behavior of water in the atmosphere.</p> <p><i>Key concepts:</i> Water cycle—evaporation, water vapor, warm air rises, cooling, condensation, clouds. Precipitation—rain, snow, hail, sleet, freezing rain. Relative humidity, dew point, fog. See PCM-IV.2 m.1 (changes of state), EH-V.2 m.2 (water on the earth’s surface).</p> <p><i>Real-world contexts:</i> Aspects of the water cycle in weather, including clouds, fog, precipitation, evaporating puddles, flooding, droughts.</p> | <p>V.3.h.3 Explain and predict general weather patterns and storms.</p> <p><i>Key concepts:</i> Weather patterns—cold front, warm front, stationary front, air mass, high and low pressure systems. Storms—thunderstorms, lightning and thunder, tornadoes, hurricanes, winds, blizzards. Buoyancy, thermal expansion, convection. See PCM-IV.2 m.1 (thermal expansion) and PME-IV.1 m.1 (density).</p> <p><i>Tools:</i> Weather maps, thermometer, hygrometer, barometer, anemometer, wind vane, rain gauge, satellite and radar monitoring (see PWV-IV.4 h.4).</p> <p><i>Real-world contexts:</i> Observable daily weather patterns; examples of weather reports from TV, radio, newspapers, including representations on weather maps. Reports of local weather patterns influenced by the jet stream and prevailing winds.</p> |
| <p align="center">Functional Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p align="center">N/A</p> | <p>E.AW.FI.EB.V.3.m.3a Identify and/or use weather information about water from a variety of sources, such as weather reports from television, radio, and newspapers, and relate them to daily activities.</p> <p><i>Key concepts:</i> Rain, fog, snow.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> | <p>E.AW.FI.EB.V.3.h.3a Identify and/or use weather information from a variety of sources, such as weather reports from television, radio, and newspapers, and relate them to daily activities.</p> <p><i>Key concepts:</i> View predictions made in the newspaper, on the Internet, and on television.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> |
| <p align="center">Supported Independence Extended Benchmark Classroom/LEA/ISD and State</p> | <p align="center">N/A</p> | <p>E.AW.SI.EB.V.3.m.3a Identify and/or use weather information about water from a variety of sources, such as weather reports from television, radio, and newspapers, and relate them to daily activities.</p> <p><i>Key concepts:</i> Rain, fog, snow.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> | <p>E.AW.SI.EB.V.3.h.3a Identify and/or use weather information from a variety of sources, such as weather reports from television, radio, and newspapers, and relate them to daily activities.</p> <p><i>Key concepts:</i> Thermometer, newspaper, Internet, television, radio.</p> <p><i>Real-world contexts:</i> Implications of weather conditions on daily living activities.</p> |

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| Participation Extended Benchmark | N/A | N/A | N/A |
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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: ATMOSPHERE AND WEATHER (AW) | | | |
| <i>All students will analyze the relationships between human activities and the atmosphere.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | V.3.e.3 Explain appropriate safety precautions | V.3.m.4 Describe health effects of polluted air. | V.3.h.4 Explain the impact of human activities on |

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| | <p>during severe weather.</p> <p><i>Key concepts:</i> Safety precautions—safe locations, sirens, radio broadcasts, severe weather watch and warning.</p> <p><i>Real-world contexts:</i> Examples of local severe weather, including thunderstorms, tornadoes and blizzards, examples of local community safety precautions, including weather bulletins and tornado sirens.</p> | <p><i>Key concepts:</i> Effects—breathing difficulties, irritated eyes. Sources—car exhaust, industrial emissions. Acid rain.</p> <p><i>Real-world contexts:</i> Locations and times where air quality is poor; local sources of potential air pollution; ozone warnings.</p> | <p>the atmosphere and explain ways that individuals and society can reduce pollution.</p> <p><i>Key concepts:</i> Air pollution—car exhaust, industrial emissions, smog. Related effects—breathing problems, acid rain, global warming, deforestation, ozone depletion. See EG-V.1 h.4 (resource use).</p> <p><i>Real-world contexts:</i> Examples of human activities that affect the atmosphere, including use of aerosol spray cans, discharge from smoke stacks, car exhaust, burning leaves and wood in stoves and fireplaces, climate change, global warming; actions, including turning off lights, turning down heat, tuning-up cars, filling tires, driving at a consistent speed, mandating higher fuel efficiencies, energy savings from recycling.</p> |
| <p style="text-align: center;">Functional Independence Extended Benchmark</p> <p style="text-align: center;">Classroom/LEA/ISD and State</p> | <p>E.AW.FI.EB.V.3.e.3a Identify and explain appropriate safety precautions during severe weather.</p> <p><i>Key concepts:</i> Safety precautions—safe locations, sirens, radio broadcasts, severe weather watch and warning.</p> <p><i>Real-world contexts:</i> Safety implications of local severe weather, including thunderstorms, tornadoes, and blizzards; examples of local community safety precautions, including weather bulletins and tornado sirens.</p> | <p>E.AW.FI.EB.V.3.e.3ADDm Identify and explain appropriate safety precautions during severe weather.</p> <p><i>Key concepts:</i> Safety precautions—safe locations, sirens, radio broadcasts, severe weather watch and warning.</p> <p><i>Real-world contexts:</i> Safety implications of local severe weather, including thunderstorms, tornadoes, and blizzards; examples of local community safety precautions, including weather bulletins and tornado sirens.</p> | <p>E.AW.FI.EB.V.3.e.3ADDh Identify and explain appropriate safety precautions during severe weather.</p> <p><i>Key concepts:</i> Safety precautions—safe locations, sirens, radio broadcasts, severe weather watch and warning.</p> <p><i>Real-world contexts:</i> Safety implications of local severe weather, including thunderstorms, tornadoes, and blizzards; examples of local community safety precautions, including weather bulletins and tornado sirens.</p> |

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| <p align="center">Functional Independence Extended Benchmark</p> <p align="center">Classroom/LEA/ISD and State</p> | <p align="center">N/A</p> | <p>E.AW.FI.EB.V.3.m.4a Identify and/or describe health effects of polluted air.</p> <p><i>Key concepts:</i> Effects—breathing difficulties, irritated eyes. Sources—car exhaust, industrial emissions.</p> <p><i>Real-world contexts:</i> Understanding health implications of polluted air, such as locations and times where air quality is poor; local sources of potential air pollution.</p> | <p>E.AW.FI.EB.V.3.h.4a Identify and/or explain the impact of human activities on the atmosphere and explain ways that individuals and society can reduce pollution.</p> <p><i>Key concepts:</i> Air pollution—car exhaust, industrial emissions, smog; ways to reduce pollution.</p> <p><i>Real-world contexts:</i> Making responsible choices in daily living to prevent and reduce pollution in human activities that affect the atmosphere, including use of aerosol spray cans, discharge from smoke stacks, car exhaust, burning leaves and wood in stoves and fireplaces, climate change, global warming; actions, including turning off lights, turning down heat, tuning-up cars, filling tires, driving at a consistent speed, mandating high fuel efficiencies, energy savings from recycling.</p> |
| <p align="center">Supported Independence Extended Benchmark</p> <p align="center">Classroom/LEA/ISD and State</p> | <p>E.AW.SI.EB.V.3.e.3a Identify appropriate safety precautions during severe weather.</p> <p><i>Key concepts:</i> Safe locations, safety drills, radio broadcasts.</p> <p><i>Real-world contexts:</i> Safety implications of severe weather, including thunderstorms, tornadoes, and blizzards; understanding that severe weather is dangerous and knowledge of appropriate procedures.</p> | <p>E.AW.SI.EB.V.3.e.3ADDm Identify appropriate safety precautions during severe weather.</p> <p><i>Key concepts:</i> Safe locations, safety drills, sirens, radio broadcasts, severe weather watch and warning.</p> <p><i>Real-world contexts:</i> Safety implications of severe weather, including thunderstorms, tornadoes, and blizzards; understanding that severe weather is dangerous and knowledge of appropriate procedures; examples of local community safety precautions, including weather bulletins and tornado sirens.</p> | <p>E.AW.SI.EB.V.3.e.3ADDh Identify and/or explain appropriate safety precautions during severe weather.</p> <p><i>Key concepts:</i> Safe locations, safety drills, sirens, radio broadcasts, severe weather watch and warning.</p> <p><i>Real-world contexts:</i> Safety implications of severe weather, including thunderstorms, tornadoes, and blizzards; understanding that severe weather is dangerous and knowledge of appropriate procedures; examples of local community safety precautions, including weather bulletins and tornado sirens.</p> |
| <p align="center">Participation Extended Benchmark</p> <p align="center">Classroom/LEA/ISD and State</p> | <p>E.AW.P.EB.V.3.e.3a Identify and/or engage appropriately in safety procedures related to weather conditions.</p> <p><i>Key concepts:</i> Severe weather conditions (thunderstorm, cold, ice, blizzard), slippery sidewalks, safe locations, severe weather drills.</p> <p><i>Real-world contexts:</i> Daily living activities; reacting to changing routines due to severe weather.</p> | <p>E.AW.P.EB.V.3.e.3ADDm Identify and/or engage appropriately in safety procedures related to weather conditions.</p> <p><i>Key concepts:</i> Severe weather conditions (thunderstorm, cold, ice, blizzard), slippery sidewalks, safe locations, severe weather drills.</p> <p><i>Real-world contexts:</i> Daily living activities; reacting to changing routines due to severe weather.</p> | <p>E.AW.P.EB.V.3.e.3ADDh Identify and/or engage appropriately in safety procedures related to weather conditions.</p> <p><i>Key concepts:</i> Severe weather conditions (thunderstorm, cold, ice blizzard), slippery sidewalks, safe locations, severe weather drills.</p> <p><i>Real-world contexts:</i> Daily living activities; reacting to changing routines due to severe weather.</p> |

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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: SOLAR SYSTEM, GALAXY AND UNIVERSE (SS) | | | |
| <i>All students will compare and contrast our planet and sun to other planets and star systems.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | <p>V.4.e.1 Compare and contrast characteristics of the sun, moon, and earth.</p> <p><i>Key concepts:</i> Planet, star, sphere, space, solar system, larger/smaller, closer/farther, heat, light.</p> <p><i>Real-world contexts:</i> Observations of the moon, earth, and safe observations of the sun.</p> | <p>V.4.m.1 Compare the earth to other planets and moons in terms of supporting life.</p> <p><i>Key concepts:</i> Surface conditions—gravity, atmospheres, temperature. Relative distances, relative sizes. Sun produces the light and heat for each planet. Molecules necessary to support life—water, oxygen, nitrogen, carbon; see LC-III.1 m.2 (cell processes), LO-III.2 m.3 (photosynthesis), LEC-III.5 m.2 (light needed for energy).</p> <p><i>Real-world contexts:</i> Examples of local and extreme conditions on earth vs. conditions on other planets; exploration of planets and their satellites.</p> | <p>V.4.h.1 Compare our sun to other stars.</p> <p><i>Key concepts:</i> Temperatures, colors, sizes, apparent and absolute brightness; double stars.</p> <p><i>Real-world contexts:</i> Observing color and brightness of stars, observing double stars.</p> |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.SS.FI.EB.V.4.e.1a Identify characteristics of the sun, moon, and earth.</p> <p><i>Key concepts:</i> Planet, star, moon, space, solar system, larger/smaller, closer/farther, heat, light.</p> <p><i>Real-world contexts:</i> Observations of the moon and earth, and safe observations of the sun.</p> | <p>E.SS.FI.EB.V.4.m.1a Compare and contrast characteristics of the earth and other planets as they relate to supporting life.</p> <p><i>Key concepts:</i> Presence of atmosphere and water, temperature.</p> <p><i>Real-world contexts:</i> Local and extreme conditions on earth; exploration of other planets and their satellites.</p> | <p>E.SS.FI.EB.V.4.h.1a Compare the sun to other stars.</p> <p><i>Key concepts:</i> Size and distance.</p> <p><i>Real-world contexts:</i> Observations of the stars and safe observations of the sun.</p> |
| Supported Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.SS.SI.EB.V.4.e.1a Identify the sun, moon, and earth.</p> <p><i>Key concepts:</i> Planet, star, moon, space, larger/smaller, closer/farther, heat, light.</p> <p><i>Real-world contexts:</i> Observations of the moon and earth, and safe observations of the sun.</p> | <p>E.SS.SI.EB.V.4.m.1a Identify conditions on the earth that are necessary to support life.</p> <p><i>Key concepts:</i> Air to breathe, water, certain temperatures.</p> <p><i>Real-world contexts:</i> Conditions on earth.</p> | <p>E.SS.SI.EB.V.4.h.1a Compare the sun to other stars.</p> <p><i>Key concepts:</i> Distance.</p> <p><i>Real-world contexts:</i> Observations of the stars and safe observations of the sun.</p> |

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| <p>Participation Extended Benchmark Classroom/LEA/ISD and State</p> | <p>E.SS.P.EB.V.4.e.1a Identify activities involving the sun and moon. <i>Key concepts:</i> Sun, moon, day/night, sunrise, sunsets. <i>Real-world contexts:</i> Awareness of daily routines.</p> | <p>E.SS.P.EB.V.4.e.1ADDm Identify the moon. <i>Key concepts:</i> Moon, day/night. <i>Real-world contexts:</i> Awareness of daily routines related to day/night.</p> | <p>E.SS.P.EB.V.4.h.1a Identify effects of the sun. <i>Key concepts:</i> Heat, light. <i>Real-world contexts:</i> Awareness of daily routines related to day/night; sunburn.</p> |
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| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: SOLAR SYSTEM, GALAXY AND UNIVERSE (SS) | | | |
| <i>All students will describe and explain how objects in the solar system move.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | <p>V.4.e.2 Describe the motion of the earth around the sun and the moon around the earth.</p> <p><i>Key concepts:</i> Spin, orbit, length of day, nighttime, month, year, observed movement of the sun and stars across the sky, observed movement of the moon from day to day, calendar.</p> <p><i>Real-world contexts:</i> Outdoor observing of the sun's and star's motions during the night and moon's motions over several days.</p> | <p>V.4.m.2 Describe, compare, and explain the motions of solar system objects.</p> <p><i>Key concepts:</i> Orbit, rotation (spin), axis, gravity, planets, moons, comets, asteroids, seasons. Tilt of the earth on its axis, direct/indirect rays. See PMO-IV.3.m.2 (force and change in motion) and PMO-IV.3 m.3 (gravity).</p> <p><i>Real-world contexts:</i> Observations of comet motion over days and weeks, length of day and year on planets, changes in length of daylight and height of sun in sky; changes in daily temperature patterns; summer and winter solstices, spring and fall equinoxes.</p> | <p>V.4.h.2 Describe the position and motion of our solar system in our galaxy and the overall scale, structure and age of the universe.</p> <p><i>Key concepts:</i> Stars, galaxies, Milky Way, spiral structure, speed of light, light year, travel times, big bang, red shift.</p> <p><i>Tools:</i> Telescopes, binoculars, spectroscopes.</p> <p><i>Real-world contexts:</i> Observations of other stars, star clusters, nebulas, and galaxies, observations of other potential planetary systems, accounts of possible travel to other star systems.</p> |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | <p>E.SS.FI.EB.V.4.e.2a Identify differences between day and night and/or phases of the moon.</p> <p><i>Key concepts:</i> Full, new, quarter, and crescent moons, day/night, dark/light, warmer/cooler, sun/moon.</p> <p><i>Real-world contexts:</i> Observation of the moon.</p> | <p>E.SS.FI.EB.V.4.m.2a Demonstrate a basic and general awareness about the motion of the earth around the sun, the earth on its axis, and the moon around the earth.</p> <p><i>Key concepts:</i> Spin, orbit, length of day, nighttime, month, year, calendar.</p> <p><i>Real-world contexts:</i> Observation of the sun's and stars' motions during the night and moon's motions, using a telescope and binoculars.</p> | <p>E.SS.FI.EB.V.4.m.2ADDh Demonstrate a basic and general awareness about the motion of the earth around the sun, the earth on its axis, and the moon around the earth.</p> <p><i>Key concepts:</i> Orbit, rotations (spin), gravity, planets, moons, comets, seasons.</p> <p><i>Real-world contexts:</i> Basis for our calendar; changes in length of daylight and height of sun in sky; changes in daily temperature patterns, summer and winter solstices, spring and fall equinoxes; using a telescope and binoculars.</p> |

Participation, Supported Independence, and Functional Independence Science Extended Benchmarks (EBs) FINAL VERSION 9/17/07

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| <p style="text-align: center;">Supported Independence Extended Benchmark</p> <p style="text-align: center;">Classroom/LEA/ISD and State</p> | <p>E.SS.SI.EB.V.4.e.2a Identify differences between day and night.</p> <p><i>Key concepts:</i> Day/night, dark/light, warmer/cooler, sun/moon.</p> <p><i>Real-world contexts:</i> Associating daily activities with day and night.</p> | <p>E.SS.SI.EB.V.4.m.2a Identify differences between day and night in terms of the relative orientation of the earth and the sun.</p> <p><i>Key concepts:</i> Day/night, dark/light, warmer/cooler, sun/moon.</p> <p><i>Real-world contexts:</i> Length of day and night.</p> | <p>E.SS.SI.EB.V.4.h.2a Explain differences between day and night in the winter and summer in terms of the relative orientation of the earth and sun.</p> <p><i>Key concepts:</i> Length of day and night through the seasons.</p> <p><i>Real-world contexts:</i> Associating daily activities with day and night.</p> |
| <p style="text-align: center;">Participation Extended Benchmark</p> | <p>N/A</p> | <p>N/A</p> | <p>N/A</p> |

**Participation, Supported Independence, and Functional Independence
Science Extended Benchmarks (EBs)
FINAL VERSION 9/17/07**

| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: SOLAR SYSTEM, GALAXY AND UNIVERSE (SS) | | | |
| <i>All students will describe and explain how objects in the solar system move.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | None | <p>V.4.m.3 Describe and explain common observations of the night skies.</p> <p><i>Key concepts:</i> Perceived and actual movement of the moon and planets across the sky, moon phases, eclipses, stars and constellations, planets, Milky Way, comets, comet tails, meteors. Sun is light source for all solar system objects (except meteors; friction with atmosphere), emitted light, reflected light (see PWVIV. 4 m.3 and m.4.)</p> <p><i>Real-world contexts:</i> Outdoor observing of the skies, using telescopes and binoculars when available, as well as "naked-eye" viewing; viewing with robotic telescopes via the World Wide Web; telescopic and spacecraft-based photos of planets, moons, and comets; news reports of planetary and lunar exploration.</p> | None |
| Functional Independence Extended Benchmark | N/A | N/A | N/A |
| Supported Independence Extended Benchmark | N/A | N/A | N/A |
| Participation Extended Benchmark | N/A | N/A | N/A |

**Participation, Supported Independence, and Functional Independence
Science Extended Benchmarks (EBs)
FINAL VERSION 9/17/07**

| SCIENCE | | | |
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| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: SOLAR SYSTEM, GALAXY AND UNIVERSE (SS) | | | |
| <i>All students will explain scientific theories as to the origin of the solar system.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | None | None | <p>V.4.h.3 Explain how stars and planetary systems form and how stars produce energy.</p> <p><i>Key concepts:</i> Processes of formation—coalescence from clouds of dust and gases by gravity; explosions of stars producing heavy elements; hydrogen, helium. Production of energy—fusion, radiation. Planetary systems may form during this process—heavy and light elements, hot interiors of earth-like planets. Age of the solar system.</p> <p><i>Real-world contexts:</i> Nebulas considered to be star-forming regions, supernovas, nuclear fusion research.</p> |
| Functional Independence Extended Benchmark | N/A | N/A | N/A |
| Supported Independence Extended Benchmark | N/A | N/A | N/A |
| Participation Extended Benchmark | N/A | N/A | N/A |

**Participation, Supported Independence, and Functional Independence
Science Extended Benchmarks (EBs)
FINAL VERSION 9/17/07**

| SCIENCE | | | |
|--|--------------------------|---|---|
| STRAND: USING EARTH SCIENCE KNOWLEDGE (E) | | | |
| STANDARD: SOLAR SYSTEM, GALAXY AND UNIVERSE (SS) | | | |
| <i>All students will explain how we learn about the universe.</i> | | | |
| Level of Independence (Full, FI, SI, P) Assessable at: (Classroom/LEA/ISD, State) | Elementary School | Middle School | High School |
| MCF v.2000 Science Benchmark | None | None | <p>V.4.h.4 Explain how technology and scientific inquiry have helped us learn about the universe.</p> <p><i>Key concepts:</i> Information—radiant energy, radio waves, light, spectra, color of stars, moon and meteor samples. Devices—radio, optical and other types of telescopes, space probes, satellites, computer imaging/modeling (see PWV-IV.4 h.4.) Problems for investigation—geology and weather of planets and moons, origins, extraterrestrial life.</p> <p><i>Real-world contexts:</i> Histories of discoveries, stories of exploration, visits to observatories and planetariums; videos showing space exploration; samples of space materials, including moon rocks and meteorites; remote sensing data; SETI—Search for Extraterrestrial Life.</p> |
| Functional Independence Extended Benchmark Classroom/LEA/ISD and State | N/A | <p>E.SS.FI.EB.V.4.h.4ADDm Demonstrate an awareness of tools used to learn about the universe.</p> <p><i>Key concepts:</i> NASA telescopes, astronauts, satellites, Space Shuttle.</p> <p><i>Real-world contexts:</i> Histories of discoveries, stories of exploration, visits to observatories and planetariums, videos showing space exploration.</p> | <p>E.SS.FI.EB.V.4.h.4a Investigate through print media (books and newspapers) and Internet, current events related to learning about the universe.</p> <p><i>Key concepts:</i> Use print media and Internet to research current events.</p> <p><i>Real-world contexts:</i> Histories of discoveries; stories of exploration; visits to observatories and planetariums; videos showing space exploration; samples of space materials, including moon rocks and meteorites.</p> |

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| Supported Independence Extended Benchmark | N/A | N/A | N/A |
| Participation Extended Benchmark | N/A | N/A | N/A |