

ACCESS SCIENCE © 2005

correlated to

Michigan
Curriculum Framework
Science Benchmarks
Middle School



YOUR MICHIGAN GREAT SOURCE REPRESENTATIVES

BARBARA BATDORFF

(Barry, Clinton, Eaton, Genesee, Gratiot, Huron, Ingham, Ionia,
Lapeer, Macomb, Montcalm, Saginaw, Sanilac, Shiawassee, St. Clair,
Tuscola, & Wayne Counties)

800-289-4490, OPTION 4

Barbara_Batdorff@hmco.com

JANICE BRATEL

(Upper Peninsula)

800-289-4490, OPTION 4

Janice_Bratel@hmco.com

JERRY SUDDETH-LOTT

(All other counties except those listed above & the Upper Peninsula)

800-289-4490, OPTION 4

Jerry_Suddeth-Lott@hmco.com



ACCESS Science © 2005

correlated to

Michigan Curriculum Framework Science Benchmarks Middle School

Strand I. Constructing New Scientific Knowledge

Standard I.1 Constructing New Scientific Knowledge (C)

Middle School Benchmarks	ACCESS Science
<p>All students will ask questions that help them learn about the world:</p> <p>1. Generate scientific questions about the world based on observation.</p>	<p>Student Book: 26, 27, 38, 39, 50, 51, 62, 63, 74, 75, 86, 87, 98, 99, 110, 111, 122, 123, 134, 135, 146, 147, 158, 159, 170, 171, 182, 183, 194, 195, 206, 207, 218, 219, 230, 231, 242, 243, 254, 255, 266, 267, 271, 278, 279, 283, 290, 291, 295, 302, 303</p>
<p>All students will design and conduct investigations using appropriate methodology and technology:</p> <p>2. Design and conduct scientific investigations.</p>	<p>Student Book: 26, 27, 38, 39, 50, 51, 62, 63, 74, 75, 86, 87, 98, 99, 110, 111, 122, 123, 134, 135, 146, 147, 158, 159, 170, 171, 182, 183, 194, 195, 206, 207, 218, 219, 230, 231, 242, 243, 254, 255, 266, 267, 271, 278, 279, 283, 290, 291, 295, 302, 303</p>
<p>3. Use tools and equipment appropriate to scientific investigations.</p>	<p>Student Book: 19, 27, 38, 39, 50-51, 62, 63, 74, 75, 86, 87, 91, 98, 99, 110, 111, 122, 123, 134, 135, 146, 147, 158, 159, 163, 170, 171, 182, 183, 194, 195, 202, 206, 207, 218, 219, 230, 231, 242, 243, 254, 255, 266, 267, 271, 278, 279, 283, 290, 291, 295, 296, 302, 303</p>
<p>4. Use metric measurement devices to provide consistency in an investigation.</p>	<p>Student Book: 26, 305</p>
<p>All students will communicate findings of investigations, using appropriate technology:</p> <p>6. Write and follow procedures in the form of step-by-step instructions, formulas, flow diagrams, and sketches.</p>	<p>Student Book: 19, 26, 31, 43, 50, 55, 62, 67, 74, 79, 86, 91, 98, 103, 110, 115, 122, 127, 134, 146, 151, 158, 170, 182, 194, 199, 206, 211, 218, 230, 242, 247, 254, 259, 266, 271, 278, 283, 290, 295, 302</p>

Strand II. Reflecting on Scientific Knowledge

Standard II.1 Reflecting on Scientific Knowledge (R)

Middle School Benchmarks	ACCESS Science
<p>All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge:</p> <p>1. Evaluate the strengths and weaknesses of claims, arguments, or data.</p>	<p>Student Book: 62, 63, 103, 146, 147, 302, 303</p>
<p>All students will show how science is related to other ways of knowing:</p> <p>3. Show how common themes of science, mathematics, and technology apply in real-world contexts.</p>	<p>Student Book: 36, 37, 48, 49, 57, 58, 59, 60, 61, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 81, 82, 83, 84, 85, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 102, 104, 105, 106, 107, 108, 109, 114, 115, 116, 117, 118, 119, 120, 121, 132, 144, 152, 153, 154, 155, 156, 157, 162, 163, 164, 165, 166, 167, 168, 169, 176, 177, 178, 179, 180, 181, 192, 202, 214, 252, 264, 277, 287</p>
<p>All students will show how science and technology affect our society:</p> <p>4. Describe the advantages and risks of new technologies.</p>	<p>Student Book: 22</p>
<p>5. Develop an awareness of and sensitivity to the natural world.</p>	<p>Student Book: 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 100, 101, 102, 103, 104, 105, 106, 107, 109, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181</p>
<p>All students will show how people of diverse cultures have contributed to and influenced developments in science:</p> <p>6. Recognize the contributions made in science by cultures and individuals of diverse backgrounds.</p>	<p>Student Book: 16, 17, 20, 132</p>

Strand III. Using Scientific Knowledge in Life Science

Standard III.1 Cells (LC)

Middle School Benchmarks	ACCESS Science
<p>All students will apply an understanding of cells to the functioning of multi-cellular organisms, including how cells grow, develop and reproduce:</p> <p>1. Demonstrate evidence that all parts of living things are made of cells.</p>	<p>Student Book: 129, 130, 131, 132, 133, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 156, 157</p>
<p>2. Explain why and how selected specialized cells are needed by plants and animals.</p>	<p>Student Book: 129, 130, 131, 132, 133, 140, 141, 142, 164, 165, 188, 189, 190, 191</p>

Standard III.2 The Organization of Living Things (LO)

Middle School Benchmarks	ACCESS Science
<p>All students will use classification systems to describe groups of living things:</p> <p>1. Compare and classify organisms into major groups on the basis of their structure.</p>	<p>Student Book: 124, 125, 126, 127, 128, 129, 130, 131, 132, 133</p>
<p>All students will compare and contrast differences in the life cycles of living things:</p> <p>2. Describe the life cycle of a flowering plant.</p>	<p>Student Book: 187, 189</p>
<p>All students will investigate and explain how living things obtain and use energy:</p> <p>3. Describe evidence that plants make and store food.</p>	<p>Student Book: 165</p>
<p>All students will analyze how parts of living things are adapted to carry out specific functions:</p> <p>4. Explain how selected systems and processes work together in animals.</p>	<p>Student Book: 139, 149, 154, 155, 156, 157, 158, 176, 177, 178, 179, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195</p>

Standard III.3 Heredity (LH)

Middle School Benchmarks	ACCESS Science
<p>All students will investigate and explain how characteristics of living things are passed on through generations:</p> <p>1. Describe how the characteristics of living things are passed on through generations.</p>	<p>Student Book: 184, 185, 186, 187, 188, 189, 190, 191, 192, 193</p>
<p>All students will explain why organisms within a species are different from one another:</p> <p>2. Describe how heredity and environment may influence/determine characteristics of an organism.</p>	<p>Student Book: 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205</p>

Standard III.4 Evolution (LE)

Middle School Benchmarks	ACCESS Science
<p>All students will explain how scientists construct and scientifically test theories concerning the origin of life and evolution of species:</p> <p>1. Describe how scientific theory traces possible evolutionary relationships among present and past life forms.</p>	<p>Student Book: 202, 203, 204, 205</p>
<p>All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time:</p> <p>2. Explain how new traits might become established in a population and how species become extinct.</p>	<p>Student Book: 196, 197, 198, 199, 200, 201, 202, 203, 204, 205</p>

Standard III.5 Ecosystems (LEC)

Middle School Benchmarks	ACCESS Science
<p>All students will explain how parts of an ecosystem are related and how they interact:</p> <p>1. Describe common patterns of relationships among populations.</p>	<p>Student Book: 113, 114, 116, 117, 118, 119, 120, 121, 122, 123, 201</p>
<p>All students will explain how energy is distributed to living things in an ecosystem:</p> <p>2. Describe how organisms acquire energy directly or indirectly from sunlight.</p>	<p>Student Book: 121, 150, 164, 165, 166, 167, 168, 169</p>

Middle School Benchmarks	ACCESS Science
<p>All students will investigate and explain how communities of living things change over a period of time:</p> <p>3. Predict the effects of changes in one population in a food web on other populations.</p>	<p>Student Book: 121</p>
<p>4. Describe the likely succession of a given ecosystem over time.</p>	<p>Student Book: 116, 117, 118, 119, 120, 121, 122</p>
<p>All students will analyze how humans and the environment interact:</p> <p>5. Explain how humans use and benefit from plant and animal materials.</p>	<p>Student Book: 93, 160, 162, 163, 167, 168, 169</p>
<p>6. Describe ways in which humans alter the environment.</p>	<p>Student Book: 102, 103, 104, 105, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181</p>

Strand IV. Using Scientific Knowledge in Physical Science

Standard IV.1 Matter and Energy (PME)

Middle School Benchmarks	ACCESS Science
<p>All students will measure and describe the things around us:</p> <p>1. Describe and compare objects in terms of mass, volume, and density.</p>	<p>Student Book: 210, 212, 228, 229, 231, 236</p>
<p>2. Explain when length, mass, weight, density, area, volume or temperature are appropriate to describe the properties of an object or substance.</p>	<p>Student Book: 18-19, 210, 212, 228, 229, 231, 236</p>
<p>All students will explain what the world around us is made of:</p> <p>3. Classify substances as elements, compounds, or mixtures and justify classifications in terms of atoms and molecules.</p>	<p>Student Book: 209, 215, 216, 217, 229, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 251</p>
<p>4. Describe the arrangement and motion of molecules in solids, liquids, and gases.</p>	<p>Student Book: 221, 224-227, 289</p>

Middle School Benchmarks	ACCESS Science
<p>All students will explain how electricity (and magnetism; see PMO) interact with matter:</p> <p>5. Construct simple circuits and explain how they work in terms of the flow of current.</p>	<p>Student Book: 210-211, 258-259</p>

Standard IV.2 Changes in Matter (PCM)

Middle School Benchmarks	ACCESS Science
<p>All students will investigate, describe and analyze ways in which matter changes:</p> <p>1. Describe common physical changes in matter: evaporation, condensation, sublimation, thermal expansion and contraction.</p>	<p>Student Book: 70-71, 75, 226-227, 252, 257, 262, 263, 264</p>
<p>2. Describe common chemical changes in terms of properties of reactants and products.</p>	<p>Student Book: 240, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253</p>
<p>All students will explain how visible changes in matter are related to atoms and molecules:</p> <p>3. Explain physical changes in terms of the arrangement and motion of atoms and molecules.</p>	<p>Student Book: 177, 209, 216, 289</p>
<p>All students will explain how changes in matter are related to changes in energy and how living things and human technology change matter and transform energy:</p> <p>4. Describe common energy transformations in everyday situations.</p>	<p>Student Book: 92, 94, 95, 164, 165, 166, 222, 223, 253, 258, 261, 262, 284, 285</p>

Standard IV.3 Motion of Objects (PMO)

Middle School Benchmarks	ACCESS Science
<p>All students will describe how things around us move, explain why things move as they do, and demonstrate and explain how we control the motions of objects:</p> <p>1. Qualitatively describe and compare motion in two dimensions.</p>	<p>Student Book: 258, 261, 269, 275, 276, 277</p>
<p>2. Relate motion of objects to unbalanced forces in two dimensions.</p>	<p>Student Book: 269, 270, 271, 272, 273, 274, 275, 276, 277, 278</p>
<p>3. Describe the non-contact forces exerted by magnets, electrically charged objects, and gravity.</p>	<p>Student Book: 59, 84, 210, 211, 258, 269, 274, 275, 294, 298</p>
<p>4. Use electric currents to create magnetic fields, and explain applications of this principle.</p>	<p>Student Book: 211, 253, 258, 259, 262</p>
<p>5. Design strategies for moving objects by application of forces, including the use of simple machines.</p>	<p>Student Book: 270, 271, 274, 298</p>

Standard IV.4 Waves and Vibrations (PWV)

Middle School Benchmarks	ACCESS Science
<p>All students will describe sounds and sound waves:</p> <p>1. Explain how sound travels through different media.</p>	<p>Student Book: 280, 281, 282, 283, 284, 285, 288, 289, 291</p>
<p>2. Explain how echoes occur and how they are used.</p>	<p>Student Book: 287</p>
<p>All students will explain shadows, color, and other light phenomena:</p> <p>3. Explain how light is required to see objects.</p>	<p>Student Book: 282, 283, 286, 287</p>
<p>4. Describe ways in which light interacts with matter.</p>	<p>Student Book: 287</p>
<p>All students will measure and describe vibrations and waves:</p> <p>5. Describe the motion of vibrating objects.</p>	<p>Student Book: 283, 284, 285, 288</p>

Middle School Benchmarks	ACCESS Science
<p>All students will explain how waves and vibrations transfer energy:</p> <p>6. Explain how mechanical waves transfer energy.</p>	<p>Student Book: 37, 282, 283, 284, 285, 288, 289, 290, 291</p>

Strand V. Using Scientific Knowledge in Earth Science

Standard V.1 The Geosphere (EG)

Middle School Benchmarks	ACCESS Science
<p>All students will describe the earth's surface:</p> <p>1. Describe and identify surface features using maps.</p>	<p>Student Book: 29, 30, 32, 33, 34, 41, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61</p>
<p>All students will describe and explain how the earth's features change over time:</p> <p>2. Explain how rocks are formed.</p>	<p>Student Book: 40, 41, 42, 43, 44, 45, 46, 47, 48, 49</p>
<p>3. Explain how rocks are broken down, how soil is formed and how surface features change.</p>	<p>Student Book: 46, 47, 48, 49, 56, 57, 58, 59, 60</p>
<p>4. Explain how rocks and fossils are used to understand the age and geological history of the earth.</p>	<p>Student Book: 196, 197, 198, 199, 204</p>
<p>All students will analyze effects of technology on the earth's surface and resources:</p> <p>5. Explain how technology changes the surface of the earth.</p>	<p>Student Book: 100, 101, 102, 103, 104, 105, 106, 107, 108, 109</p>

Standard V.2 The Hydrosphere (EH)

Middle School Benchmarks	ACCESS Science
<p>All students will describe the characteristics of water and demonstrate where water is found on earth:</p> <p>1. Use maps of the earth to locate water in its various forms and describe conditions under which they exist.</p>	<p>Student Book: 33, 54-55, 70, 71</p>

Middle School Benchmarks	ACCESS Science
<p>All students will describe how water moves:</p> <p>2. Describe how surface water in Michigan reaches the ocean and returns.</p>	<p>Student Book: 31, 54, 70</p>
<p>All students will analyze the interaction of human activities with the hydrosphere:</p> <p>3. Explain how water exists below the earth's surface and how it is replenished.</p>	<p>Student Book: 54, 55, 70, 71</p>
<p>4. Describe the origins of pollution in the hydrosphere.</p>	<p>Student Book: 101, 106-107</p>

Standard V.3 The Atmosphere and Weather (EAW)

Middle School Benchmarks	ACCESS Science
<p>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:</p> <p>1. Explain patterns of changing weather and how they are measured.</p>	<p>Student Book: 64, 65, 66, 67, 68, 69, 70, 71, 72, 73</p>
<p>All students will explain what causes different kinds of weather:</p> <p>2. Describe the composition and characteristics of the atmosphere.</p>	<p>Student Book: 68, 69, 70, 71</p>
<p>3. Explain the behavior of water in the atmosphere.</p>	<p>Student Book: 69, 70, 71, 75, 107, 226, 227</p>
<p>All students will analyze the relationships between human activities and the atmosphere:</p> <p>4. Describe health effects of polluted air.</p>	<p>Student Book: 101, 107</p>

Standard V.4 The Solar System, Galaxy and Universe (ES)

Middle School Benchmarks	ACCESS Science
<p>All students will compare and contrast our planet and sun to other planets and star systems:</p> <p>1. Compare the earth to other planets and moons in terms of supporting life.</p>	<p>Student Book: 293, 299, 300, 301</p>
<p>All students will describe and explain how objects in the solar system move:</p> <p>2. Describe, compare, and explain the motions of solar system objects.</p>	<p>Student Book: 294, 295, 299</p>
<p>3. Describe and explain common observations of the night skies.</p>	<p>Student Book: 80, 81, 84, 85, 293, 294, 295, 298, 299</p>



TOLL FREE: **800-289-4490**

VISIT OUR WEB SITE: **WWW.GREATSOURCE.COM**
