

Curriculum Grades 6–8

BENCHMARKS Revision 2005

There are five content strands in the MICLIMB Science Benchmarks. The first two, "constructing" and "reflecting" should be included as an integral part of all science classes. They are used simultaneously with strands 305 at all levels.

In Strands III, IV and V: I=Introduce, M=Major Emphasis and R=Review.

Strand I

CONSTRUCT NEW SCIENTIFIC AND PERSONAL KNOWLEDGE

Benchmark

1. Generate scientific questions about the world based on observation.
2. Design and conduct scientific investigations.
3. Use tools and equipment appropriate to scientific investigations.
4. Use metric measurement devices to provide consistency in an investigation.
5. Use sources of information in support of scientific investigations.
6. Write and follow procedures in the form of step-by-step instructions, formulas, flow diagrams and sketches.

Strand II

REFLECT ON THE NATURE, ADEQUACY, AND CONNECTIONS ACROSS SCIENTIFIC KNOWLEDGE

Benchmark

1. Evaluate the strengths and weaknesses of claims, arguments, or data.
2. Describe limitations in personal knowledge.
3. Show how common themes of science, mathematics, and technology apply in real world contexts.
4. Describe the advantages and risks of new technologies.
5. Develop an awareness of and sensitivity to the natural world.
6. Recognize the contributions made in science by cultures and individuals of diverse backgrounds.

**BENCHMARKS Revision 2005
USING SCIENCE KNOWLEDGE**

Strand III Life Science	6th	7th	8th
CELLS (LC) III.1			
1. Demonstrate evidence that all parts of living things are made of cells. 8c	I		M
2. Explain why and how selected specialized cells are needed by plants and animals.			M
ORGANIZATION (LO) III.2			
1. Compare and classify organisms into major groups.			M
2. Describe the life cycle of a flowering plant. 8A			M
3. Describe evidence that plants make and store food. 8A	I		M
4. Explain how selected systems and processes work together in animals. (Dissection/models/references)			M
HEREDITY (LH) III.3			
1. Describe how the characteristics of living things are passed on through generations. 8A			M
2. Describe how heredity and environment may influence/ determine characteristics of an organism. 8C			M
EVOLUTION (LE) III.4			
1. Describe how scientific theory traces possible Evolutionary relationships among present and past life. 8C			M
2. Explain how new traits might become established in a population and how species become extinct. 8C	I		M
ECOSYSTEMS (LEC) III.5			
1. Describe common patterns of relationships among populations. 6E	M		R
2. Describe how organisms acquire energy directly or indirectly from sun.	M		R
3. Predict the effects of changes in one population in a food web on other populations. 6E	M		R
4. Describe the likely succession of given ecosystem over time. 6E	M		R
5. Explain how humans use and benefit from plant and animal materials (not addressed specifically but easily integrated w/red).	M	R	
6. Describe ways in which humans alter the environment. 6E	M		R

Strand IV Physical Science	6th	7th	8th
MATTER AND ENERGY (PME)			
IV. I			
1. Describe and compare objects in terms of mass, volume, and density. 7K		M	R
2. Explain when lengths, mass, weight, density, area, volume or temperature are appropriate to describe the properties of an object or substance. 7K		M	R
3. Classify substances as elements, compounds, or mixtures and justify classifications in terms of atoms and molecules. 7K	I	M	
4. Describe the arrangement and motion of molecules in solids, liquids, and gases. 7K		M	R
5. Construct simple circuits and explain how they work in terms of the flow of current. 7N	I	M	
6. Investigate electrical devices and explain how they work, using instructions and appropriate safety precautions. 7N		I	R
CHANGES IN MATTER (PCM) IV. 2			
1. Describe common physical changes in matter: evaporation, condensation, sublimation, thermal expansion and contraction. 7K	I	M	R
2. Describe common chemical changes in terms of properties of reactions and products. 7K		M	R
3. Explain physical changes in terms of the arrangement and motion of atoms and molecules. 7K	I	M	
4. Describe common energy transformations in everyday situations. 8M		I	M
MOTION OF OBJECTS (PMO) IV. 3			
1. Qualitatively describe and compare motion in two dimensions. 8M			M
2. Relate motion of objects to unbalanced forces in two dimensions. 8M			M
3. Describe the non-contact forces exerted by magnets, electrically charged objects, and gravity. 7N		M	R
4. Use electric currents to create magnetic fields, and explain applications of this principle 7N		M	R
5. Design strategies for moving objects by application of forces, including the use of simple machines. 8M			M

	6 th	7 th	8 th
WAVES AND VIBRATIONS (PVWV) IV.4			
1. Explain how sound travels through different media. 80		I	M
2. Explain how echoes occur and how they are used. 80	I		M
3. Explain how light is required to see objects, 80	I		M
4. Describe ways in which light interacts with matter. 80	I		M
5. Describe the motion of vibrating objects. 80			M
6. Explain how mechanical waves transfer energy. 80			M
Strand V Earth Science			
GEOSPHERE (EG) V.1			
1. Describe and identify surface features using maps. 6G	M		R
2. Explain how rocks are formed. 6G	M		
3. Explain how rocks are broken down, how soil is formed, and how surface features change. 6G	M		R
4. Explain how rocks and fossils are used to understand the age and geological history of the earth. 6F	M		
5. Explain how technology changes the surface of the earth. 6F	M		R
HYDROSPHERE (EH) V.2			
1. Use maps of the earth to locate water in its various forms and describe conditions under which they exist. 7I	I		M
2. Describe how surface water in Michigan reaches the ocean and returns. 7H (ref. Mi)	I		M
3. Explain how water exists below the earth's surface and how it is replenished. 7H			M
4. Describe the origins of pollution in the hydrosphere. 7H		M	
ATMOSPHERE AND WEATHER (EAW) V.3			
1. Explain patterns of changing weather and how they are measured. 7I	I	M	
2. Describe the composition and characteristics of the atmosphere. 7I	I	M	R
3. Explain the behavior of water in the atmosphere. 7I	I	M	R
4. Describe health effects of polluted air. 7I		M	R
SOLAR SYSTEM, GALAXY AND UNIVERSE (ES) V.4			
1. Compare the earth to other planets and moons in terms of supporting life. 6J	M		
2. Describe, compare, and explain the motions of solar system objects. 6J	M		R
3. Describe and explain common observations of the night skies. 6J	M		R