



## SCIENCE

# Wisconsin

GRADE SCORES TOTAL SCORE

F

Content and Rigor 0/7  
Clarity and Specificity 0/3

0/10

### REPORT CARD

#### Content & Rigor 0.2

Scientific Inquiry & Methodology	0
Physical Science	0
Physics	0
Chemistry	0
Earth & Space Science	0
Life Science	1

#### Clarity & Specificity 0.0

Average numerical evaluations

## Overview

Wisconsin's science standards—unchanged since 1998, in spite of much earlier criticism, ours included—are simply worthless. No real content exists to evaluate. In lieu of content, the “authors” have passed the buck by merely citing unelaborated references to the now outdated National Science Education Standards (NSES). Rather than using the NSES as building blocks for a comprehensive set of science standards, however, Wisconsin has used them as an escape hatch to avoid hard work and careful thought.

## Organization of the Standards

Wisconsin divides its science expectations into eight strands: science connections, nature of science, science inquiry, physical science, earth and space science, life and environmental science, science applications, and science in personal and social perspectives. For each strand, the state provides a one-sentence content standard and a rationale that notes its importance. For instance, the physical science standard requires that:

**Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.**

And the rationale explains:

**Knowledge of the physical and chemical properties of matter and energy is basic to an understanding of the earth and space, life and environmental, and physical sciences. The properties of matter can be explained in terms of the atomic structure of matter. Chemical reactions can be explained and predicted in terms of the atomic structure of matter. Natural events are the result of interactions of matter and energy. When students understand how matter and energy interact, they can explain and predict chemical and physical changes that occur around them.**

Finally, performance standards are presented for fourth, eighth, and twelfth grades. Wisconsin delineates no content expectations for any other grades.

### Document(s) Reviewed<sup>1</sup>

► *Wisconsin's Model Academic Standards for Science*. 1998. Accessed from: <http://www.dpi.state.wi.us/standards/sciintro.html>

<sup>1</sup> Fordham's 2005 evaluation also reviewed Wisconsin's 1998 content-standards document. Since 2005, we have updated and improved the evaluation criteria used to judge the standards. (See Appendix A for a complete explanation of criteria used in this review.) Even with these changes, Wisconsin's science standards still earn an F. The complete 2005 review can be found here: <http://www.edexcellence.net/publications-issues/publications/sossience05.html>.

## Content and Rigor

Any educator who might hope to create a curriculum from the Wisconsin science material would be stranded in a dismal, content-free desert. True standards are provided for just three grades, and the content provided for those grades is almost nonexistent.

### Scientific Inquiry and Methodology

Like most of the content standards, the standards for inquiry and methodology are devoid of any real substance. For example, a fourth-grade standard tells students, “When studying a science-related problem, decide what changes over time are occurring or have occurred.” What this is meant to signify—or what skills are intended for mastery—is impossible to know.

Similarly, in twelfth grade, students are asked to “apply the underlying themes of science to develop defensible visions of the future.” Again, what this means for curriculum development, instruction, or assessment is anyone’s guess. Woefully, such examples are the rule, not the exception.

Historical and social aspects of science (beyond technological concerns) are given the slightest of mentions. This may be a mercy, given how process and inquiry have been covered.

### All Content Areas

It’s virtually impossible to evaluate the content of the Wisconsin science standards because almost none is presented. Of the eight strands, only three—physical science, earth and space science, and life and environmental science—address bona fide scientific content. (The other five are devoted to process and inquiry.) Moreover, all the content that students are expected to learn at each grade is presented in less than a page. Thus, all the science content Wisconsin students are expected to learn is presented in fewer than ten pages.

To add insult to injury, the standards themselves are vacuous. A twelfth-grade physical science standard, for example, tells students:

**Using the science themes\*, illustrate\* the law of conservation of energy\* during chemical and nuclear reactions. (grade 12)**

No further information is provided. In fact, while the state claims that “terms with an asterisk (\*) are defined and/or exemplified in the *Science Glossary of Terms*,” that is only occasionally true. For instance, only two of the three terms

with an asterisk in the twelfth-grade standard above can be found in the glossary.

Sad to say, this standard exemplifies the scant guidance that the state provides across grade levels and disciplines. In short, the writers have picked up boilerplate “themes” (change, constancy, equilibrium, etc.) that they only partially understand and have applied them to subject matter they clearly don’t understand; the result is embarrassing. Consequently, the Badger State earns a zero out of seven for content and rigor. (See Appendix A: Methods, Criteria, and Grading Metric.)

## Clarity and Specificity

The introduction to Wisconsin’s science standards claims that “the standards set clear and specific goals for teaching and learning,” and that, while “they are not meant to supplant curriculum...they should help school districts to develop curriculum units that focus on specific academic results.”

Alas, that statement couldn’t be further from the truth. For instance, the content standard for earth and space science explains that, by the time they graduate, students will “demonstrate an understanding of the structure and systems of earth and other bodies in the universe and of their interactions.” Yet there are only twenty-one performance objectives provided for this standard across all grades and none delineates meaningful content. Take, for example, the following expectations:

**Develop descriptions of the land and water masses of the earth and of Wisconsin’s rocks and minerals, using the common vocabulary of earth and space science. (grade 4)**

**Analyze the geologic and life history of the earth, including change over time, using various forms of scientific evidence. (grade 8)**

**Using the science themes\*, understand\* that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin. (grade 12)**

Again, such vacuity is the norm, not the exception.

In the introduction to each of the three content strands, the state includes the following note (tailored for physical, earth and space, and life and environmental sciences) that directs readers to the 1996 National Science Education Standards:

**Note: For more details of the content of physical sciences, see *National Science Education Standards\** (1996, p. 115 - 201).**

The NSES is now fifteen years old—two years older than the Wisconsin standards. Surely, educators in Wisconsin would want to revisit these standards and supplement them with more specific content and performance expectations? Alas, no. Consequently, the state earns a zero out of three for clarity and specificity. (See Appendix A: Methods, Criteria, and Grading Metric.)