



## SCIENCE

# North Dakota

GRADE SCORES TOTAL SCORE

F

Content and Rigor 1/7  
Clarity and Specificity 0/3

1/10

### REPORT CARD

#### Content & Rigor 1.3

Scientific Inquiry & Methodology	2
Physical Science	2
Physics	0
Chemistry	0
Earth & Space Science	3
Life Science	1

#### Clarity & Specificity 0.3

Average numerical evaluations

## Overview

The North Dakota science standards contain nothing of scientific or pedagogical utility. They are, in essence, worthless, and could not possibly serve as the basis for supplying young Peace Gardeners with a proper science education.

## Organization of the Standards

North Dakota's *Science Content and Achievement Standards* are divided into eight content standards: unifying concepts, science inquiry, physical science, life science, earth and space science, science and technology, science and other areas, and history and nature of science. Grade-specific benchmarks are then provided grade-by-grade in grades K-8, and by grade band for grades 9-10 and 11-12.

The state also supplies “proficiency descriptors” for each benchmark, though these do not add much to the benchmarks themselves. Instead, they state that students at each of four levels of proficiency—advanced proficient, proficient, partially proficient, and novice—will show comprehension that is “insightful,” “reasonable,” “superficial,” or “unreasonable,” respectively.

## Content and Rigor

There is nothing good to say about the scientific content of the North Dakota standards. Indeed, there is little point in unfolding the scientific disciplines one by one, and we do not do so here. Instead, we review all content areas together to illustrate the significant problems that are found across disciplines.

### Scientific Inquiry and Methodology

These standards appear to have changed little since our 2005 review (at which time only a draft version of the standards was available). They are still plagued by vagueness and a lack of guidance for teachers seeking to achieve the benchmark expectations in the classroom. Expectations are keyed to instructionally useless “proficiency descriptors.” For example, the expectation that students in ninth and tenth grades “maintain clear and accurate records of scientific investigations” has descriptors that claim that “advanced proficient” students should “always” do so, while “novice” students “rarely” do. The time spent on generating these trivial descriptors would

### Document(s) Reviewed

► *North Dakota Science Content and Achievement Standards*. 2006. Accessed from: <http://www.dpi.state.nd.us/standard/content/science/index.shtm>

have been better spent in developing a fuller and clearer set of expectations. As we noted in 2005, an expectation that students “use appropriate tools and techniques” offers little guidance to the teacher—or for that matter, anyone else.

### All Content Areas

Remarkably, not one of the thirty-three members of the content-standards writing team represented a university science department or came from the scientific or engineering community. The entire team consists of persons connected with K-12 schools and school districts. Two consultants, an evaluator, and two coordinators hailed from Mid-continent Research for Learning and Education and the state Department of Public Instruction. Among the twenty members of the achievement-standards writing team, we do find one botanist from a small college and a geologist from the state geological survey. (This last person may account for the relatively better presentation of earth science.)

This astonishing lack of real expertise in science shows in the empty—if bulky—documents. Throughout the physical science sections, for example, about three-quarters of the major subjects we would expect to be covered are missing. What is present is sketchy to the point of uselessness. For instance, here is all that is said about force and motion in eleventh and twelfth grades:

**Identify the principles and relationships influencing forces and motion (e.g., gravitational force, vectors, velocity, friction). (grades 11-12)**

And at the same grade level, this is the sum total of the coverage of chemical equations:

**Balance chemical equations. (grades 11-12)**

Sadly, such examples are the rule, not the exception. In seventh-grade life science, the only time either genetics or reproduction is even mentioned is in the following vague standard:

**Identify the characteristics of reproduction (e.g., sexual, asexual). (grade 7)**

At the same level, two standards lay out all the state expects students to know about diversity and unity among organisms:

**Classify organisms (e.g., taxonomic groups).**

**Explain how different adaptations help organisms survive. (grade 7)**

A quick scan of any discipline at any grade level would turn up similarly useless standards. As such, North Dakota barely ekes out an average score of one out of seven for content

and rigor. (See Appendix A: Methods, Criteria, and Grading Metric.)

## Clarity and Specificity

The language is not muddled but the content is negligible; this unusable pair of documents earns a zero out of three for clarity and specificity. (See Appendix A: Methods, Criteria, and Grading Metric.)