

**GET WET!**  
**Applicable National Science Education Standards**  
**January 2008**

**I. Science Teaching Standards**

**A. TEACHING STANDARD A:**

*Get WET!* is an inquiry-based science program for students. The program:

- Develops a framework of yearlong and short-term goals for students (fall introduction, winter testing, spring presentation)
- Selects science content and adapt and design curricula to meet the interests, knowledge, understanding, abilities, and experiences of students (state standards listed in curriculum).
- Selects teaching and assessment strategies that support the development of student understanding and nurture a community of science learners (group performance of HACH tests & discussion of results)
- Allows colleagues and schools to work together within and across disciplines and grade levels (high school chemistry & math teachers working with middle grade teaching teams).

**B. TEACHING STANDARD B:**

The program curriculum encourages teachers to:

- Focus and support inquiries while interacting with students.
- Orchestrate discourse among students about scientific ideas.
- Challenge students to accept and share responsibility for their own learning.
- Recognize and respond to student diversity and encourage all students to participate fully in science learning.
- Encourage and model the skills of scientific inquiry, as well as the curiosity, openness to new ideas and data, and skepticism that characterize science.

**C. TEACHING STANDARD C:**

- Use student data, observations of teaching, and interactions with colleagues to reflect on and improve teaching practice.
- Use student data, observations of teaching, and interactions with colleagues to report student achievement and opportunities to learn to students, teachers, parents, policy makers, and the general public.

**D. TEACHING STANDARD D:**

- Create a setting for student work that is flexible and supportive of science inquiry.
- Ensure a safe working environment.
- Make the available science tools, materials, media, and technological resources accessible to students.
- Identify and use resources outside the school.

**E. TEACHING STANDARD E:**

- Enable students to have a significant voice in decisions about the content and context of their work and require students to take responsibility for the learning of all members of the community.
- Nurture collaboration among students.
- Structure and facilitate ongoing formal and informal discussion based on a shared understanding of rules of scientific discourse.
- Model and emphasize the skills, attitudes, and values of scientific inquiry.

**II. Professional Development Standards**

**A. PROFESSIONAL DEVELOPMENT STANDARD A:**

- Involve teachers in actively investigating phenomena that can be studied scientifically, interpreting results, and making sense of findings consistent with currently accepted scientific understanding.
- Address issues, events, problems, or topics significant in science and of interest to participants.

- Introduce teachers to scientific literature, media, and technological resources that expand their science knowledge and their ability to access further knowledge.
  - Build on the teacher's current science understanding, ability, and attitudes.
  - Incorporate ongoing reflection on the process and outcomes of understanding science through inquiry.
  - Encourage and support teachers in efforts to collaborate.
- B. PROFESSIONAL DEVELOPMENT STANDARD B:**
- Occur in a variety of places where effective science teaching can be illustrated and modeled, permitting teachers to struggle with real situations and expand their knowledge and skills in appropriate contexts.
  - Address teachers' needs as learners and build on their current knowledge of science content, teaching, and learning.
  - Use inquiry, reflection, interpretation of research, modeling, and guided practice to build understanding and skill in science teaching.
- C. PROFESSIONAL DEVELOPMENT STANDARD C:**
- Support the sharing of teacher expertise by preparing and using mentors, teacher advisers, coaches, lead teachers, and resource teachers to provide professional development opportunities.
  - Provide opportunities to know and have access to existing research and experiential knowledge.
  - Provide opportunities to learn and use the skills of research to generate new knowledge about science and the teaching and learning of science.
- D. PROFESSIONAL DEVELOPMENT STANDARD D:**
- Clear, shared goals based on a vision of science learning, teaching, and teacher development congruent with the *National Science Education Standards*.
  - Integration and coordination of the program components so that understanding and ability can be built over time, reinforced continuously, and practiced in a variety of situations.
  - Options that recognize the developmental nature of teacher professional growth and individual and group interests, as well as the needs of teachers who have varying degrees of experience, professional expertise, and proficiency.
  - Collaboration among the people involved in programs, including teachers, teacher educators, teacher unions, scientists, administrators, policy makers, members of professional and scientific organizations, parents, and business people, with clear respect for the perspectives and expertise of each.
  - Continuous program assessment that captures the perspectives of all those involved, uses a variety of strategies, focuses on the process and effects of the program, and feeds directly into program improvement and evaluation.

### **III. Assessment Standards**

- A. ASSESSMENT STANDARD A:**
- Assessments are deliberately designed.
  - Assessments have explicitly stated purposes.
  - The relationship between the decisions and the data is clear.
  - Assessment procedures are internally consistent.
- B. ASSESSMENT STANDARD B:**
- Achievement data collected focus on the science content that is most important for students to learn.
  - Opportunity-to-learn data collected focus on the most powerful indicators.
  - Equal attention must be given to the assessment of opportunity to learn and to the assessment of student achievement.
- C. ASSESSMENT STANDARD C:**
- The technical quality of the data collected is well matched to the decisions and actions taken on the basis of their interpretation.
  - The feature that is claimed to be measured is actually measured.

- Assessment tasks are authentic.
  - An individual student's performance is similar on two or more tasks that claim to measure the same aspect of student achievement.
  - Students have adequate opportunity to demonstrate their achievements.
  - Assessment tasks and methods of presenting them provide data that are sufficiently stable to lead to the same decisions if used at different times.
- D. ASSESSMENT STANDARD D:
- Large-scale assessments must use statistical techniques to identify potential bias among subgroups.
  - Assessment tasks must be appropriately modified to accommodate the needs of students with physical disabilities, learning disabilities, or limited English proficiency.
  - Assessment tasks must be set in a variety of contexts, be engaging to students with different interests and experiences, and must not assume the perspective or experience of a particular gender, racial, or ethnic group.
- E. ASSESSMENT STANDARD E:
- The inferences made from assessments about student achievement and opportunity to learn must be sound.
  - When making inferences from assessment data about student achievement and opportunity to learn science, explicit reference needs to be made to the assumptions on which the inferences are based.

#### **IV. Science Content Standards**

- A. STANDARD A: UNIFYING CONCEPTS AND PROCESSES K-12
- Systems, order, and organization
  - Evidence, models, and explanation
  - Change, constancy, and measurement
  - Evolution and equilibrium
- B. STANDARD B: SCIENCE AS INQUIRY K-12
- Abilities necessary to do scientific inquiry
  - Understanding about scientific inquiry
- C. STANDARD C: PHYSICAL SCIENCE
- Chemical Reactions (9-12)
  - Interactions of energy and matter (9-12)
- D. STANDARD D: LIFE SCIENCE
- Organisms and environment (K-4)
  - Populations and ecosystems (5-8)
  - Interdependence of Organisms (9-12)
- E. STANDARD E: EARTH AND SPACE SCIENCE
- Properties of earth materials (K-4)
  - Structure of the earth system (5-8)
  - Earth's history (5-8)
  - Energy in the earth system (9-12)
  - Geochemical cycles (9-12)
- F. STANDARD F: SCIENCE AND TECHNOLOGY
- Abilities of technological design (K-12)
  - Understanding about science and technology (K-12)
  - Abilities to distinguish between natural objects and objects made by humans (K-4)
- G. STANDARD G: SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES
- Personal health (K-8)
  - Personal and community health (9-12)
  - Populations, resources, and environments (5-8)
  - Population growth (9-12)

- Types of resources (K-4)
  - Natural Resources (9-12)
  - Environmental quality (9-12)
  - Changes in environments (K-4)
  - Natural hazards (5-8)
  - Natural and human induced hazards (9-12)
  - Science and technology in local challenges (K-4)
  - Risks and benefits (5-8)
  - Science and technology in society (5-8)
  - Science and technology in local, national, and global challenges (9-12)
- H. STANDARD H: HISTORY AND NATURE OF SCIENCE
- Science as a human endeavor (K-12)
  - Nature of science (K-8)
  - Nature of scientific knowledge (9-12)
  - Historical Perspectives

## V. **Science Education Program Standards**

### A. PROGRAM STANDARD A:

- In an effective science program, a set of clear goals and expectations for students must be used to guide the design, implementation, and assessment of all elements of the science program.
- Curriculum frameworks should be used to guide the selection and development of units and courses of study.
- Teaching practices need to be consistent with the goals and curriculum frameworks.
- Assessment policies and practices should be aligned with the goals, student expectations, and curriculum frameworks.
- Support systems and formal and informal expectations of teachers must be aligned with the goals, student expectations and curriculum frameworks.
- Responsibility needs to be clearly defined for determining, supporting, maintaining, and upgrading all elements of the science program.

### B. PROGRAM STANDARD B:

- The program of study should include all of the content standards.
- Science content must be embedded in a variety of curriculum patterns that are developmentally appropriate, interesting, and relevant to students' lives.
- The program of study must emphasize student understanding through inquiry.
- The program of study in science should connect to other school subjects.

### C. PROGRAM STANDARD C:

- The science program should be coordinated with the mathematics program to enhance student use and understanding of mathematics in the study of science and to improve student understanding of mathematics.
  1. GRADES K-4
    - Measure , collect, and organize data
    - Explore chance
    - Recognize and describe patterns
    - Use variables to express relationships
    - Develop skills of estimation and judgment
  2. GRADES 5-8
    - Represent situations verbally, numerically, graphically, geometrically, or symbolically
    - Use estimations
    - Identify and use functional relationships
    - Develop and use tables, graphs, and rules to describe situation s
    - Use statistical methods to describe, analyze, evaluate, and make decisions

- Create experimental and theoretical models of situations involving probabilities
3. GRADES 9-12
- Understand connections within a problem situation, its model as a function in symbolic form, and the graph of that function
  - Use functions that are constructed as models of real-world problems
  - Know how to use statistics and probability
- D. PROGRAM STANDARD D:
- The most important resource is professional teachers.
  - Time is a major resource in a science program.
  - Conducting scientific inquiry requires that students have easy, equitable, and frequent opportunities to use a wide range of equipment, materials, supplies, and other resources for experimentation and direct investigation of phenomena.
  - Collaborative inquiry requires adequate and safe space.
  - Good science programs require access to the world beyond the classroom.
- E. PROGRAM STANDARD E:
- All students in the K-12 science program must have equitable access to opportunities to achieve the *National Science Education Standards*.
- F. PROGRAM STANDARD F:
- Schools must explicitly support reform efforts in an atmosphere of openness and trust that encourages collegiality.
  - Regular time needs to be provided and teachers encouraged to discuss, reflect, and conduct research around science education reform.
  - Teachers must be supported in creating and being members of networks of reform.
  - An effective leadership structure that includes teachers must be in place.

**VI. Science Education System Standards (*GET WET!* as a Subsystem)**

- A. SYSTEM STANDARD A:
- Policies that influence the practice of science education must be congruent with the program, teaching, professional development, assessment, and content standards while allowing for adaptation to local circumstances.
- B. SYSTEM STANDARD B:
- Policies that influence science education should be coordinated within and across agencies, institutions, and organizations.
- C. SYSTEM STANDARD C:
- Policies need to be sustained over sufficient time to provide the continuity necessary to bring about the changes required by the *Standards*.
- D. SYSTEM STANDARD D:
- Policies must be supported with resources.
- E. SYSTEM STANDARD E:
- Science education policies must be equitable.
- F. SYSTEM STANDARD F:
- All policy instruments must be reviewed for possible unintended effects on the classroom practice of science education.
- G. SYSTEM STANDARD G:
- Responsible individuals must take the opportunity afforded by the standards-based reform movement to achieve the new vision of science education portrayed in the *Standards*.