

# Middle Grades Content Area Standards

## Standards for Science Teacher Candidates

**Standard 1. Science teacher candidates understand safety and liability concerns in science and advocate for the provision and use of appropriate safety materials and enforcement practices in the classroom, laboratory, and field.**

Science teacher candidates know and are able to:

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- Ensure that safety precautions and procedures are included in instruction and provide supervision during laboratory and field experiences.
- Analyze the lab/activities for safety and research materials/chemicals, including use of MSDS (Material Safety Data Sheets), to identify safety concerns before they are used.
- Have a working knowledge of, and comply with, science safety laws, codes, standards, and procedures.
- Model and enforce appropriate safety behaviors.
- Collaborate with colleagues to develop a short- and long-term plan for improvement of science safety.

**Standard 2. Science teacher candidates understand and are able to use the unifying concepts of science in their instruction.**

Science teacher candidates:

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Understand the following unifying concepts of science, and organize their instruction around them:

- Systems, Order and Organization
- Evidence, Models and Explanation
- Constancy, Change, and Measurement
- Evolution and Equilibrium
- Form and Function

Teacher candidates should possess the content knowledge of life sciences, physical sciences, and earth and environmental sciences as outlined in the North Carolina Standard Course of Study.

**Standard 3. Science teacher candidates demonstrate an understanding of the nature of science, the historical development of scientific thought, the process of scientific inquiry, and the reciprocal relationship between science and society.**

Science teacher candidates:

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Understand the following tenets of science, and organize their instruction around them:

- Science is universal, multidisciplinary, cumulative and self-revising.
- Science represents a way to answer questions based on observations, confirmable evidence and logical thinking.
- The development of scientific thought is not necessarily linear.
- Modern science is based on contributions, both past and present, from diverse cultures.
- Scientific knowledge and applications affect and change human society.
- Science progresses through communication within the scientific community, as well as with the public, allowing for feedback, challenges, and peer review.

### **Standard 4. Science teacher candidates understand and are able to apply scientific skills and math concepts, using appropriate equipment and tools.**

Science teacher candidates know and are able to:

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- Demonstrate proficiency in using measurement tools to perform investigations and gather accurate quantitative information.
- Employ principles and applications of mathematics appropriate to the science content they teach.
- Demonstrate proficiency in using scientific equipment commonly used in a given science discipline.

### **Standard 5. Science teacher candidates plan and implement lessons that engage students in the process of hands-on, minds-on scientific inquiry.**

Science teacher candidates know and are able to:

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- Plan for acquisition, dissemination and management of materials and equipment.
- Incorporate appropriate field investigations and field trips.
- Identify ‘real world’ questions and facilitate scientific investigations of these questions to teach science content.
- Incorporate appropriate authentic assessment techniques to gauge student progress through inquiry based instruction.