

## NSTA Science Content Analysis Form: Elementary Science Specialists or Middle School Science Teachers

### Instructions

Tables provided below include, in the left column, the 2011 NSTA subject matter for the Elementary Science Specialist or Middle School Science Teacher. Include the tables relevant to your licensure area to be reviewed by NSTA. Use this table to decide on that mix.

If the preparation program:	Then the candidates must demonstrate:
Prepares a teacher as a Science Specialist in the elementary level (up to the middle level) OR Prepares a teacher to teach science in the middle level.	Competency Requirements in Biology, Physical, Earth/Space, and Interdisciplinary in Tables A, B, C, and D.

Use this table to report the alignment of course or advising requirements for elementary science specialists and middle level science teachers. A 90% alignment between the NSTA content standards and program coursework is expected within each content table.

Report alignments for secondary science teachers on the Secondary Science Content Analysis forms available from the NSTA website: [www.nsta.org/preservice](http://www.nsta.org/preservice).

Name of program: \_\_\_\_\_

(e.g.: undergraduate middle level science or elementary science specialist)

### Instructions for Completing the Forms

For each program, complete the curriculum evaluation as follows:

- If your institution prescribes the coursework in science, enter in column B the numbers and titles of the required courses that address the subject matter identified in column A. Include advising sheets of your course requirements in the appendix as well.
- If you accept candidates with science coursework taken elsewhere, enter in Column C and state the advising requirement that ensures candidates have studied the subject matter content in column A. Include your advising sheets in the appendix.
- If most of the science content is covered by advising, but some content (such as unifying concepts) is covered by specific courses taught in the program, enter the number and title of the course(s) where it is taught in column C.
- If you have candidates in both preparation categories, use both of the columns, B and C.

- DO NOT provide syllabi. Include brief content descriptions for courses ONLY when the course titles are not reasonably descriptive of the content. (“Ecology” is reasonably descriptive, while “Middle school science” is not descriptive). Be sure to refer reviewers to the descriptor.
- Note that the same courses or advising requirements may appear multiple times in these tables.
- If you do not have a requirement that covers a particular topic, simply enter “not covered.” Do not leave the space blank unless you are not using one or the other of the columns. Don’t enter anything into a space in a column not being used. To be safe, if it may be wise to enter a tag like “Not Relevant to Our Program” in the first box of an unused column.

NOTE: Science content may be in science courses or in education courses

Table A: Biology Competency Requirements

A: Competency (numbers 1 to 16)	B: Required Courses or advising requirements
1. Features distinguishing living from nonliving systems.	
2. Characteristics distinguishing plants, animals, and other living things.	
3. Multiple ways to order and classify living things.	
4. Ways organisms function and depend on their environments	
5. Ways organisms are interdependent.	
6. Reproductive patterns and life cycles of common organisms.	
7. Growth, change, and interactions of populations to form communities.	
8. Factors governing the structures, functions, and behaviors of living systems.	
9. Multiple systems of classification of organisms.	
10. Cycles of matter, and flow of energy, through living and nonliving pathways.	
11. Natural selection, adaptation, diversity, and speciation.	
12. Structure, function, and reproduction of cells, including microorganisms.	
13. Levels of organization from cells to biomes.	
14. Reproduction and heredity, including human reproduction and contraception.	
15. Behavior of living systems and the role of feedback in their regulation.	
16. Hazards related to living things including allergies, poisons, disease, and aggression.	

Table B: Physical Sciences Competency Requirements

A: Competency (numbers 1-8)	B: Required Courses or advising requirements
1. Properties of matter such as mass, solubility, and density.	
2. Combinations of matter to form solutions, mixtures, and compounds with different properties.	
3. Variations in the physical and chemical states of matter and changes among states.	
4. Ordering and classification of matter and energy and their behaviors.	
5. Factors affecting the position, motion and behavior of objects.	
6. Properties of simple machines and tools, such as levers and screws.	
7. Properties of light, electricity, sound, and magnetism.	
8. Types of energy, energy sources, and simple transformations of energy.	
9. Properties and applications of sound, light, magnetism, and electricity.	
10. Potential and kinetic energies and concepts of work.	
11. Energy flow in physical and chemical systems, including simple machines	
12. States of matter and bonding in relation to molecular behavior and energy.	
13. Conservation of matter and energy.	
14. Classifications of elements and compounds.	
15. Solvents (especially water) and solutions.	
16. Chemical nature of the earth and its living organisms.	
17. Chemical, electrical and radiation hazards.	

Table C: Earth and Space Sciences Competency Requirements

A: Competency (numbers 1-6)	B: Required Courses or advising requirements
1. Natural objects in the sky and why they change in position and appearance.	
2. Causes of the seasons and seasonal changes.	
3. Changes in the atmosphere resulting in weather and climate.	
4. Changes in the Earth creating and eroding landforms.	
5. Basic properties of rocks, minerals, water, air, and energy.	
6. Differences between renewable and nonrenewable natural resources.	
7. Structures of objects and systems in space.	
8. Earth's structure, evolution, history, and place in the solar system.	
9. Characteristics and importance of oceans, lakes, rivers, and the water cycle.	

10. Characteristics of the atmosphere including weather and climate.	
11. Changes in the Earth caused by chemical, physical, and biological forces.	
12. Causes and occurrences of hazards such as tornados, hurricanes, and earthquakes.	
13. Characteristics and importance of cycles of matter such as oxygen, carbon, and nitrogen.	
14. Characteristics of renewable and nonrenewable natural resources and implications for their use.	
15. Interactions among populations, resources, and environments.	

Table D: Interdisciplinary Perspectives Competency Requirements

A: Competency (numbers 1-4)	B: Required Courses or advising requirements
1. Differences between science, as investigation, and technology as design.	
2. Impact of science and technology on themselves and their community, and on personal and community health.	
3. How to use observation, experimentation, data collection, and inference to test ideas and construct concepts scientifically.	
4. How to use metric measurement and mathematics for estimating and calculating, collecting and transforming data, modeling, and presenting results.	
5. Interrelationships of pure and applied sciences, and technology.	
6. Applications of science to local and regional problems and the relationship of science to one's personal health, well-being, and safety.	
7. Historical development and perspectives on science including contributions of underrepresented groups and the evolution of major ideas and theories.	
8. Applications of science to the investigation of individual and community problems.	
9. Use of technological tools in science, including calculators and computers.	
10. Applications of basic statistics and statistical interpretation to the analysis of data.	