

Readopt with amendment Ed 507.28, effective 10-16-09 (Doc #9566), as amended effective 1-17-14 (Doc #10506), to read as follows:

Ed 507.28 Science Teacher For Grades 5-8.

(a) To be certified as a science teacher for grades 5-8, the candidate shall:

- (1) Meet the qualifications for certification as a science teacher as provided in Ed 507.29; and
- (2) Meet the requirements of (c) below.

(b) For candidates seeking certification under an alternative 3, 4, or 5 pathway, the department of education shall assess the skills, competencies, and knowledge of candidates for certification as science teachers for grades 5-8 by reviewing evidence, such as, but not limited to, college course work, documented professional experience, letters of recommendation, professional development hours or CEU's, and artifacts of professional practice.

(c) A candidate for certification as a science teacher for grades 5-8 shall have skills, competencies, and knowledge the following areas:

(1) The candidate shall have the ability to comprehend, apply, evaluate, analyze, and synthesize, and communicate knowledge in earth and space science, life science, and physical science as follows:

a. In the area of earth and space science, earth's place in the universe, including, but not limited to:

1. Earth-sun-moon relationships, including origins, structure, and resultant effects on earth;
2. Origin, components, characteristics, and motions of the solar system;
3. Relationships among the solar system, milky way galaxy, and the universe;
4. Instruments to observe space and the information gained to determine scale properties; and
5. History of the earth, including, but not limited to, age as determined by rock strata, and the geological time scale;

b. In the area of earth and space science, earth's systems, including, but not limited to:

1. Materials cycles through the earth driven by a flow of energy;
2. Geoscience processes that reshape the earth's surface;
3. Weather and climate, including, but not limited to:
  - (i) Role of the water cycle and how it's driven by energy from the sun and gravity;

(ii) Role of air masses in changing weather conditions; and

(iii) Role of uneven heating causes circulating patterns in the oceans and atmosphere that determine regional climates;

c. In the area of earth science, earth and human activity, including, but not limited to:

1. The uneven distribution of Earth's natural resources resulting from geoscience processes;
2. Natural events showing patterns and providing data for prediction and mitigation;
3. The role of human impact on the environment, methods for monitoring, and minimizing the resulting effects;
4. Evidence of increased human population and its relationship to consumption of natural resources and impact on the earth's systems; and
5. Evidence and factors that have caused global temperature changes over time;

d. In the area of life science, the structure and processes from molecules to organisms, including, but not limited to:

1. Structure and function of unicellular organisms, multicellular organisms, and interactions of subsystems within an organism;
2. Growth and reproduction including genetic, behavioral, and environmental conditions and how they influence reproduction of plants and animals;
3. Cycling of matter and flow of energy including chemical processes of photosynthesis, and respiration; and
4. Information processing: how organisms respond to stimuli in the environments;

e. In the area of life science, ecosystems, their interactions, energy and dynamics, including, but not limited to:

1. Independent relationships in ecosystems including biotic and abiotic influences, competition, or symbiosis among organisms based on limited resources, and cycling of matter and flow of energy to determine changes in population; and
2. Human impact and influences on the ecosystem;

f. In the area of life science, heredity, and the inheritance and variation of traits, growth and development of organisms including asexual and sexual reproduction, inheritance, and variation of genetic traits in resulting offspring and alterations to genes;

g. In the area of life science, biological evolution regarding unity and diversity, including, but not limited to:

1. Evidence of common ancestry diversity including fossil record, comparing anatomical characteristics of past to present organisms, and embryological development of different species;
  2. Natural and artificial selection including the role of each on traits and changes in population over time; and
  3. Adaptation and the impact on the distribution of traits in a population over time;
- h. In the area of physical science, matter and its interactions, including but not limited to:
1. Structure and properties of matter, including, but not limited to:
    - (i) Atomic structure of molecules;
    - (ii) Physical and chemical properties and changes;
    - (iii) Characteristics and properties of solids, liquids, and gases; and
    - (iv) Relationship among states of matter, molecular motion, and temperature; and
  2. Chemical reactions including the process of chemical reactions, law of conservation of mass and law of conservation of energy;
- i. In the area of physical science, motion and stability regarding forces and interactions, including, but not limited to:
1. Forces and motion, including Newton's laws of motion; and
  2. Interactions including characteristics, behavior, and influencing factors of electromagnetic and gravitational forces and fields;
- j. In the area of physical science, energy, including, but not limited to:
1. The relationships of potential and kinetic energy;
  2. Energy transfer; and
  3. Relationship between energy and forces; and
- k. In the area of physical science, waves and their applications in technologies for information transfer, including, but not limited to:
1. Properties and behaviors of different types of waves; and
  2. Role of digital signals in communication; and

1. Understand and be able to apply mathematical concepts and techniques including, but not limited to variable analysis as related to physical science at least through the level of college statistics.

Readopt with amendment Ed 612.22, effective 10-16-09 (Doc #9566), to read as follows:

Ed 612.22 Science For Grades 5-8. In addition to meeting the program requirements under Ed 612.23 the science program for grades 5-8 shall provide the teaching candidate with the skills, competencies, and knowledge gained through a combination of academic and supervised practical experience as outlined in Ed 507.28 (c).

**Appendix I**

<b>RULE</b>	<b>STATUTE</b>
Ed 507.28	RSA 186:8, III- IV, RSA 186:11,X(a)
Ed 612.22	RSA 186:8, IV; RSA 186:11, X(c)