

Readopt with amendment Ed 507.33, effective 10/16/09 (Doc #9566), to read as follows:

Ed 507.33 Physics Teacher For Grades 7-12.

(a) To be certified as a physics teacher for grades 7-12, the candidate shall:

- (1) Meet the qualifications for certification as a science teacher as provided in Ed 507.29;
- (2) Meet the qualifications for certification as a physical science teacher as provided in Ed 507.51; and
- (3) 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 physics teachers 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 physics teacher for grades 7-12 shall have skills, competencies, and knowledge in the following areas:

(1) In the area of fundamental content knowledge, the candidate shall have the ability to:

a. Comprehend, apply, quantify, evaluate, analyze, and synthesize specific physics knowledge of:

1. Energy, including kinetic, potential, heat, and rest;
2. Newtonian principles and laws as they apply to statics and dynamics, including, but not limited to, friction, inclines, circular motion, the rotation of rigid bodies, and fluid mechanics and knowledge of how these principles are used in engineering applications;
3. Thermodynamics, including the ideal gas law, entropy, heat engines, and thermodynamic cycles, kinetic, and ensemble theory;
4. Conservation laws and the relationships between conserved quantities, including the conservation of energy, mass, linear and angular momentum, and charge;
5. Classical wave theory-of sound and electromagnetism, including the electromagnetic spectrum, optics, and light behavior;
6. Electricity, electrostatics, electrodynamics, and magnetism, including, but not limited to, circuit theory and the propagation and generation of electric and magnetic fields;
7. Fundamental forces of gravity, electromagnetism, weak nuclear force, and strong nuclear force including, but not limited to, the spectrum of known fundamental particles, the standard model, and its known shortcomings;

- 8. Nuclear physics, including, but not limited to reactivity, radioactivity, nuclear reactors, fission, and fusion;
 - 9. Quantum mechanics, including wave-particle duality and special relativity, Lorentz transformations, time dilations, length contraction, and conversion of rest mass into energy;
 - 10. Applications of physics in environmental quality and to personal and community health;
- b. Applications of physics for design, engineering, and technology in society, business, industry, and health fields;
 - c. Apply knowledge of physics and physical science concepts through full and partial inquiries, laboratory investigations, and the use of scientific models; and
 - d. Understand and be able to apply mathematical concepts and techniques, including, but not limited to modeling and vector and variable analysis at least through the level of college calculus and statistics.

Readopt with amendment Ed 612.27, effective 10/16/09 (Doc #9566), to read as follows:

Ed 612.27 Physics For Grades 7-12. In addition to meeting the program requirements under Ed 612.23, the physics program for grades 7-12 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 507.33(c).

Appendix I

RULE	STATUTE
Ed 507.33	RSA 186:8, III- IV, RSA 186:11,X(a)
Ed 612.27	RSA 186:8, IV; RSA 186:11, X(c)