8710.4750 TEACHERS OF SCIENCE: General Science Grades 5-8 FORM I-D GRID

Professional Education Program Evaluation Report (PEPER II)	**FORM I-D** **EVIDENCE OF LEARNING & ASSESSMENT OPPORTUNITIES**	**COMPLETE THIS FORM**

8710.4750 TEACHERS OF SCIENCE: General Science Grades 5-8	**Course ID Number**	**Any and all referenced experiences must be verifiable in the course syllabi submitted. Use specific references to activities* in the syllabi that evidence learning opportunities & assessments that align to the standard. (*readings, activities, topics of discussion, assignments, experiences, etc.)**
Subp. 3. Subject matter standards for science in grades five through eight. A candidate for licensure as a teacher of science in grades 5 through 8 must complete a preparation program under subpart 2, item C, that must include the candidate's demonstration of the knowledge and skills in items A to E.		
A. A teacher of science must demonstrate science perspectives, including:		
(1) understanding and conducting science inquiry as evidenced by the ability to:		
(a) ask appropriate theoretical or empirical questions about a given system or event that build on current scientific knowledge and can be answered scientifically;		
(b) design and conduct, using appropriate methods, technology, and mathematical tools, a scientific investigation to answer a given question;		
(c) develop, using appropriate sources of information, qualitative and quantitative solutions to problems;		
(d) communicate clearly and concisely, using words, diagrams, tables, graphs, and mathematical relationships, the methods and procedures, results, and conclusions for a given empirical question or problem;		
(e) justify a scientific explanation of a given system or event, compared to alternative explanations, based on the available empirical evidence, current scientific understanding, and logical arguments; and		
(f) criticize, using knowledge of common errors of evidence and logic, a given science-related claim or argument; and		
(2) understanding the history and nature of scientific knowledge as evidenced by the ability to:		
(a) describe the evolution of scientific knowledge in a given historical context in terms of the contributions of male and female individuals from various cultures; the influence of society, culture, and personal beliefs of the scientists involved; and the accumulating empirical evidence and logical arguments used to develop the new knowledge;		
(b) explain why scientists disagree on a given contemporary controversy in terms of the different assumptions made by the scientists, the different values the scientists place on a particular piece of evidence, and the limitations of the available data or theories, or both; and		
(c) explain, using knowledge of the role of empirical evidence and logical argument in science and the assumption that the universe is a vast single system in which the basic rules are everywhere the same, why a given contemporary or historical belief is		

nonscience.		
B. A teacher of science must have the knowledge and ability to make conceptual connections within and across the domains of science and between science and technology. The teacher of science must understand:		
(1) connections across the domains of science as evidenced by the ability to:		
(a) describe, using words and diagrams, a given technological, biological, physical, earth, or space system in terms of its components, inputs, outputs, and control or feedback;		
(b) describe, using a specific example, the use of a given unifying theme or principle in the physical sciences, life sciences, and earth and space sciences; and		
(c) explain, using unifying scientific principles, a given set of seemingly unrelated systems or events, both within a science domain and across science domains;		
(2) connections between science and technology as evidenced by the ability to:		
(a) describe the similarities and differences between the goals and processes of scientific inquiry and the goals and processes of technological design;		
(b) explain how the availability of new technology influenced the development of scientific knowledge in a given contemporary or historical context and how the development of new scientific knowledge led to technological advances in a given contemporary or historical context;		
(c) explain and predict the possible unexpected benefits and the negative side effects and unintended consequences of a given technological advance;		
(d) explain why the contributions of individuals from different scientific disciplines and of technology were necessary for the success of a given contemporary or historical scientific investigation; and		
(e) design a modification or use of a system to meet certain needs or criteria in either chemistry, earth and space science, biology, or physics; and		
(3) connections between science and other school subjects as evidenced by the ability to:		
(a) communicate clearly and precisely, using words, physical models, computer models, demonstrations, diagrams, flow charts, numbers, tables, graphs, and appropriate mathematical relationships, the observations, methods and procedures, results, and conclusions for a given empirical question or problem; explanations of how or why something happens; predictions of what will happen when a change is made; the design for modifying or using a system; and the evaluation of the design against the needs or criteria it was designed to meet;		
(b) interpret a given text, physical or computer model, demonstration, diagram, flow chart, set of numbers, table, graph, and appropriate mathematical relationships;		
(c) use computer software or graphing calculators to display and analyze data and to model solutions to a prediction or design problem;		
(d) explain how mathematics influenced the development of scientific knowledge in a given contemporary or historical context, and how the development of new scientific knowledge led to new mathematics in a given contemporary or historical context; and		
(e) describe the impact on society and culture of a given historical development of scientific ideas.		
C. A teacher of science understands how knowledge of concepts and principles of science and technology and knowledge of factors influencing personal and community health, population growth, natural resources, environmental quality, and natural and		

human-induced hazards influence decisions about personal and societal issues. The teacher of science must:		
(1) predict the scientific, economic, political, and ethical factors that could influence a course of action to address a given personal issue or local, national, or global challenge;		
(2) design, using the systematic approaches of science and scientific knowledge, a course of action to address a personal issue or a given local, national, or global challenge; and		
(3) justify and defend a given design for a course of action in terms of an assessment of alternatives, risks, costs, and benefits, and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them.		
D. A teacher of science must be able to understand and apply fundamental principles, laws, and concepts of earth and space science, life science, and physical science. The teacher of science must:		
(1) know and apply the fundamental principles, laws, and concepts of earth and space science including understanding:		
(a) the components and evolution of the Earth system as evidenced by the ability to:		
i. describe, using words, diagrams, pictures, and graphs, the physical properties of a given Earth material;		
ii. explain, from observation of its composition, texture, and physical state using physical, geological, or biological processes, a plausible way in which a given rock formed through time;		
iii. explain, in terms of environmental changes, structural events, plate tectonics, and sedimentary, igneous, metamorphic, and biologic processes, how observed differences within a given rock sequence are related to the various processes that may have formed the rocks;		
iv. explain, in terms of environmental changes, structural events, plate tectonics, and sedimentary, igneous, metamorphic, and biologic processes, a plausible way in which a given rock sequence formed through time;		
v. explain, in terms of the physical processes that formed it, the origin and development of a given Earth structure;		
vi. predict, in terms of known rock sequences, how a given geologic or biologic event might be recorded in a rock sequence; and		
vii. explain, using the fossil record and decay rates of radioactive isotopes, how the age of a given rock is determined;		
(b) matter and energy in the Earth system as evidenced by the ability to:		
i. explain, using convection, conduction, and radiation, how matter is transported and how energy drives the process of transportation of matter within and between given Earth subsystems or structures;		
ii. explain, using convection, conduction, radiation, and conservation of energy, how energy is transmitted and transformed within and between given Earth subsystems or structures;		
iii. design a simple physical model that mimics the behavior of a given Earth system; and		
iv. describe, using words, diagrams, and chemical equations, the processes involved in the movement of chemical elements or compounds among different given chemical reservoirs in the Earth;		
(c) the Earth in the solar system and the universe as evidenced by the ability to:		

i. explain how the properties and organization of galaxies provide evidence that the universe is continuously changing;	PHY 102	The Cosmic Perspective, 6th Ed., J. Bennett *et al*: Ch. 19-23*
ii. explain qualitatively, using fundamental processes of chemical, physical, and geological change, how processes of change on a given solar system object are different or similar to Earth;	PHY 102	The Cosmic Perspective, 6th Ed., J. Bennett *et al*: Ch. 8-14*
iii. describe, using words, diagrams, and physical models, the motion of objects in our solar system; and	PHY 102	The Cosmic Perspective, 6th Ed., J. Bennett *et al*: Ch. 19-23*
iv. explain qualitatively, using Earth's axial rotation, tilt of its rotational axis, and changing position with respect to the sun, the seasonal variations in the length of a day and sun angle at various latitudes on Earth; and	PHY 102	The Cosmic Perspective, 6th Ed., J. Bennett *et al*: Ch. 2*
(d) human interactions with the earth system as evidenced by the ability to:		
i. describe, using words, diagrams, pictures, graphs, historic records, and physical models, the scientific basis for predicting the occurrence of a given environmental hazard on a human time frame;		
ii. describe, using words, diagrams, pictures, maps, and physical or computer models, the observed changes in a given Earth system that are due directly or indirectly to human activity; and		
iii. predict, using words, diagrams, pictures, maps, and physical or computer models, the probable movement of pollutants in a given Earth system;		
(2) know and apply the fundamental principles, laws, and concepts of life science including understanding:		
(a) structural and functional relationships in living systems and environments as evidenced by the ability to:		
i. perform observations to describe the macroscopic structures of a given common organism;		
ii. describe, using words, pictures, and diagrams, the conditions required to sustain life for a given common organism;		
iii. describe, using words and diagrams, the characteristics of what determines life in a given common organism;		
iv. design a system to support, sustain, and continue the life of a given set of common organisms;		
v. describe, using words, pictures, dioramas, and physical or computer models, the structure and function of the components of a given living system in relation to its overall function;		
vi. explain, in terms of the function of the organs of that system, the structure of a given plant and animal system;		
vii. explain, using structure-function relationships, how and why the structures for a given function are different in different given species;		
viii. describe the origins, transmission, prevention, management, or cure of a given disease; and		
ix. explain and predict, in terms of the defense mechanism and the method by which the immunity is established, how a given active or passive immunity functions in a human;		
(b) molecular and cellular life processes as evidenced by the ability to:		
i. perform observations to describe cellular structures and physiological processes;		
ii. describe, using words, pictures, and models, the components of a given cell;		

iii. explain, in terms of the structure and function of the cell components, the differences between prokaryotic and eukaryotic cells and between given eukaryotic cells;		
iv. describe, using words, pictures, and diagrams, the cellular processes of a given plant or animal cell;		
v. explain, using the process of photosynthesis, how plants transform solar energy into cellular energy;		
vi. explain, using the process of cellular respiration, how energy stored in food molecules is released;		
vii. explain, using the process of DNA replication, how proteins are synthesized in a cell;		
viii. explain, using the structure-function relationships between cells, tissues, organs, and systems, how cells function as primary building blocks of an organism;		
ix. describe, using words, pictures, and models, the physical changes at each given stage of cellular asexual reproduction;		
x. describe, using words, diagrams, and charts, how traits are inherited and sex is determined in a given animal; and		
xi. explain, using the relationships between genetic change and expression, how a mutation occurs and predict the effect an environmental change will have on the expression of a trait;		
(c) diversity and biological evolution as evidenced by the ability to:		
i. describe, using words, pictures, and diagrams, the range of physical and behavioral adaptations that can occur in response to environmental stresses for a given species;		
ii. describe, using words, diagrams, charts, and graphs, the range of observable characteristics of a given species in a given environment;		
iii. explain the speciation process in a given fossil record; and		
iv. design, based only on observable structure, a classification key for a given set of organisms; and		
(d) the interdependence among living things as evidenced by the ability to:		
i. collect and analyze data to describe the diversity and number of species in a given ecosystem;		
ii. describe, using words, pictures, and diagrams, the biotic and abiotic components of a given niche, habitat, ecosystem, or biome;		
iii. explain, in terms of environmental adaptations and development, the diversity of a given species;		
iv. describe, using words and diagrams, the cycling of matter and the flow of energy within a given system;		
v. explain and predict the behavioral responses of an animal to a given set of environmental changes; and		
vi. design, using environmental changes, an experiment to elicit a specific behavioral response from a given animal; and		
(3) know and apply the fundamental principles, laws, and concepts of the physical sciences including understanding:		
(a) one-dimensional and two-dimensional linear motion and forces as evidenced by the ability to:		
i. perform measurements and calculations to determine the position, average speed, and direction of motion of a given object;	PHY 100/101	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 1* or

	or PHY 120/122	Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 2-3*
ii. describe, using words, pictures or diagrams, graphs, vectors, and simple mathematical relationships, the vertical and horizontal components of the motion of a given object;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 1* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 2-3*
iii. describe, using words and free body vector diagrams, the forces acting on an object in a given system of interacting objects, and explain qualitatively, using Newton's Second and Third Laws, the relationships between all the forces;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 2* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 4-5*
iv. describe, using words, energy diagrams or graphs, and simple mathematical relationships, the change of energy of a system and any transfer of energy into or out of a given system of interacting objects; and	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 3* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 6-7*
v. explain qualitatively, in terms of balanced and unbalanced forces and the conservation of energy, the observed motion of an object in a given system of interacting objects;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 3* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 4-7*
(b) vibrations and wave motion as evidenced by the ability to:		
i. perform measurements and calculations to describe the wavelength, amplitude, period, and frequency of a given oscillating object or wave;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 2,6* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 12-14*
ii. describe, using words, diagrams, and graphs, the frequency and amplitude of a given simple pendulum or vibrating object;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 2* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 12*
iii. describe, using words, diagrams, and graphs, the wave motion of a traveling or standing wave in a given medium; and	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 6* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 13-14*
iv. explain qualitatively, in terms of the changes in the frequency amplitude, wavelength, or wave velocity, the observed changes in the pitch or intensity of a sound when given changes are made to the source, the medium through which the sound travels, or the relative motion of the source or detector;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 6* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 13-14*
(c) the behavior of light as evidenced by the ability to:		
i. explain qualitatively, using the directionality and chromatic composition of light, how we see a given object and its color;	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 9* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 25-27*
ii. explain and predict, using ray diagrams, the observed shadows in a simple geometrical system of objects and point or extended light sources;	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 9* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 25*
iii. describe, using words and ray diagrams, the reflection, refraction, transmission, and absorption of light when it encounters an ordinary object, a plain or curved mirror, a prism, and thin concave or convex lenses; and	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 9* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 25*
iv. explain qualitatively, using ray diagrams and the laws of reflection and refraction of light, the observed location and magnification of the real or virtual images for a given pinhole system, simple system of mirrors, or simple system of thin lenses;	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 9* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 26*
(d) electricity and magnetism as evidenced by the ability to:		
i. perform measurements to determine the type of charge of a given charged object, and	PHY 100/101	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 7,8* or

the north and south poles of an unmarked magnet;	or PHY 170/172	Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 19,22*
ii. explain qualitatively, in terms of the movement of electrons, observed changes in the charge of an object in a given system of interacting charged and uncharged objects;	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 7* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 19-20*
iii. describe, using words and diagrams, the magnetic field around a straight current carrying wire and a current-carrying solenoid; and	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 8* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 22*
iv. design a circuit using batteries, bulbs, and switches to meet given criteria for the brightness and control of the bulbs;	PHY 100/101 or PHY 170/172	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 7* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 21*
(e) the properties and structure of matter as evidenced by the ability to:		
i. perform measurements and calculations to describe the mass, volume, density, concentration, melting and boiling temperatures, and solubility limits of a given substance;		
ii. describe, using words and diagrams, common substances as pure elements or compounds, solutions, suspensions, or colloids;		
iii. perform procedures of distillation, precipitation, extraction, or chromatography to separate the substances in a given mixture;		
iv. describe, using words and diagrams, the basic atomic and subatomic constituents of matter;		
v. describe, using the kinetic-molecular theory or intermolecular forces, or both, the arrangement and motion of the atoms, ions, or molecules in a given gas, liquid, or solid substance, and explain the characteristic properties of the substance;		
vi. explain and predict, using the principles for filling the electron orbital of atoms and the Periodic Table, the periodic trends in electrical conductivity, ionization, and metallic character of a given set of elements;		
vii. predict, using the Periodic Table, whether the bonding in a given substance is primarily covalent, metallic, or ionic;		
viii. describe, with words and diagrams, the electrical conductivity of a given conductor, insulator, or semiconductor using periodic trends;		
ix. describe, in words and diagrams using conservation of mass and energy, the changes in matter and energy that occur in the nuclear processes of radioactive decay, fission, and fusion; and		
x. describe, with words, structural and chemical diagrams and formulas, and physical and computer models, the unique structure of carbon, and explain how that structure results in the large variety of organic molecules;		
(f) chemical reactions as evidenced by the ability to:		
i. describe, using words, diagrams, physical or computer models, and a balanced chemical equation, changes in the energy and arrangement of atoms for a given chemical reaction;		
ii. describe, using words, diagrams, and chemical symbols, a given chemical reaction as oxidation-reduction, acid-base, free radical, precipitation, metathesis, or a combination of these; and		
iii. explain and predict qualitatively, using solubility rules, the common oxidation states of elements, the activity series of metals and nonmetals, the stability of radicals, and the		

properties of acids and bases, the most likely type of reaction for a given set of given reactants;		
(g) thermodynamics as evidenced by the ability to:		
i. describe, using words and pictures or diagrams, the characteristics of an ideal gas;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 5* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 16*
ii. describe and predict, using words, graphs, and mathematical relationships, changes in pressure, volume, or temperature of a given ideal gas;	PHY 100/101 or PHY 120/122	Inquiry into Physics, 6th Ed., V.J. Ostdiek & D.J. Bord: Ch. 5* or Principles of Physics, 5th Ed., R. A. Serway & J.W. Jewett: Ch. 16*
iii. describe, using words, diagrams, and energy graphs, the changes in the enthalpy and entropy during a given chemical reaction; and		
iv. explain qualitatively, using the First and Second Laws of Thermodynamics energy, changes in a given spontaneous or nonspontaneous reaction; and		
(h) chemical kinetics and equilibrium as evidenced by the ability to:		
i. explain, using the requirements for effective particle collisions and activation energy, why a given spontaneous reaction is fast or slow, and predict the conditions necessary to make the reaction occur more rapidly;		
ii. explain, using the concept of activation energy and the requirements for effective particle collisions, how a given catalyst increases the rate of a given reaction;		
iii. explain, using the kinetic-molecular model, how a given change in temperature, concentration, or particle surface area changes the rate of a given chemical reaction;		
iv. describe, using words, diagrams, chemical equations, and concentration graphs, the equilibrium of a given reaction;		
v. explain, in terms of changes in the number of effective collisions of the molecules in the forward and reverse reaction, why the chemical equilibrium of a given reaction is a dynamic process; and		
vi. explain and predict change in the equilibrium of a given chemical reaction when the temperature changes, the pressure changes, a catalyst is added, or the concentration of reactants or products changes.		
E. A teacher of science must have a broad-based knowledge of teaching science that integrates knowledge of science with knowledge of pedagogy, students, learning environments, and professional development. A teacher of science must understand:		
(1) curriculum and instruction in science as evidence by the ability to:		
(a) select, using local, state, and national science standards, appropriate science learning goals and content;		
(b) plan a coordinated sequence of lessons and instructional strategies that support the development of students' understanding and nurture a community of science learners including appropriate inquiry into authentic questions generated from students' experiences; strategies for eliciting students' alternative ideas; strategies to help students' understanding of scientific concepts and theories; and strategies to help students use their scientific knowledge to describe real-world objects, systems, or events;		
(c) plan assessments to monitor and evaluate learning of science concepts and methods of scientific inquiry; and		
(d) justify and defend, using knowledge of student learning, research in science education, and national science education standards, a given instructional model or		

curriculum;		
(2) safe environments for learning science as evidenced by the ability to:		
(a) use required safety equipment correctly in classroom, field, and laboratory settings;		
(b) describe, using knowledge of ethics and state and national safety guidelines and restrictions, how to make and maintain a given collection of scientific specimens and data;		
(c) describe, using knowledge of ethics and state and national safety guidelines and restrictions, how to acquire, care for, handle, and dispose of live organisms;		
(d) describe, using state and national guidelines, how to acquire, care for, store, use, and dispose of given chemicals and equipment used to teach science;		
(e) implement safe procedures during supervised science learning experiences in the public schools; and		
(f) develop a list of materials needed in an elementary science safety kit;		
(3) how to apply educational principles relevant to the physical, social, emotional, moral, and cognitive development of preadolescents and adolescents;		
(4) how to apply the research base for and the best practices of middle level and high school education;		
(5) how to develop curriculum goals and purposes based on the central concepts of science and how to apply instructional strategies and materials for achieving student understanding of the discipline;		
(6) the role and alignment of district, school, and department mission and goals in program planning;		
(7) the need for and how to connect students' schooling experiences with everyday life, the workplace, and further educational opportunities;		
(8) how to involve representatives of business, industry, and community organizations as active partners in creating educational opportunities;		
(9) the role and purpose of cocurricular and extracurricular activities in the teaching and learning process;		
(10) the impact of reading ability on student achievement in science, recognize the varying reading comprehension and fluency levels represented by students, and possess the strategies to assist students to read science content more effectively; and		
(11) how to apply the standards of effective practice in teaching through a variety of early and ongoing clinical experiences with middle level and high school students within a range of educational programming models.		

*For all physics courses, the students will be introduced to the material using a combination of one or more of the following: textbook and other assigned readings, lectures, demonstrations, recitations, and laboratory experiments. The students will be assessed using one or more of the following: written and/or computer graded homework, group problems, quizzes, hour exams, or final examinations. The textbook chapters listed are those used by the instructor for a recent course offering. Any other textbook used for these courses will cover these same standards at essentially the same level as the textbook listed above.