WEST JEFFERSON HILLS SCHOOL DISTRICT
ACADEMIC PHYSICAL SCIENCE CURRICULUM

GRADE 10

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, trade books, workbooks, software, hardware, etc.	***Assessment Procedures** *Additional adaptations, modifications, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/acceleration will be provided per IEP
3.2 Inquiry and Design						
B. Apply process knowledge and organize scientific and technological phenomena in varied ways.	• Develop appropriate scientific experiments: raising questions, formulating hypotheses, testing, controlled experiments, recognizing variables, manipulating variables, interpreting data, and producing solutions.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet • Instructional CD's	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.2 Inquiry and Design						
C. Apply the elements of scientific inquiry to solve problems.	• Generate questions about objects and events that can be answered through scientific investigations. • Design an investigation with adequate control and limit variables to investigate a question. • Conduct a multiple step experiment. • Organize experimental information using a variety of analytic methods.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet • Instructional CD's	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.4 Physical Science, Chemistry and Physics						
A. Describe concepts about the structure and properties of matter. Explain concepts about the structure and properties of matter. Apply concepts about the structure and properties of matter.	• Identify elements as basic building blocks of matter that cannot be broken down chemically. • Distinguish compounds from mixtures. • Describe and conduct experiments that identify chemical and physical properties. • Describe reactants and products of simple chemical reactions. • Know that atoms are composed of even smaller sub-atomic structures whose properties are measurable.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet • Instructional CD's	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.4 Physical Science, Chemistry and Physics						
A. Describe concepts about the structure and properties of matter. Explain concepts about the structure and properties of matter. Apply concepts about the structure and properties of matter.	• Explain the repeating pattern of chemical properties by using the repeating patterns of atomic structure within the periodic table. • Predict the behavior of gases through the use of Boyle's, Charles' or the ideal gas law. • Explain the formation of compounds and their resulting properties using bonding theories (ionic and covalent). • Recognize formulas	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet • Instructional CD's	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.4 Physical Science, Chemistry and Physics						
A. Describe concepts about the structure and properties of matter. Explain concepts about the structure and properties of matter. Apply concepts about the structure and properties of matter.	• Describe various types of chemical reactions by applying the laws of conservation of mass and energy. • Apply knowledge of mixtures to appropriate separation techniques. • Understand that carbon can form several types of compounds. • Apply rules of systematic nomenclature and formula writing to chemical substances. • Classify and describe, in equation form, types of chemical reactions.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet • Instructional CD's	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.4 Physical Science, Chemistry and Physics						
A. Describe concepts about the structure and properties of matter. Explain concepts about the structure and properties of matter. Apply concepts about the structure and properties of matter.	• Explain how radioactive isotopes that are subject to decay can be used to estimate the age of materials. • Characterize and identify important classes of compounds (e.g., acids, bases, salts). • Quantify the properties of matter (e.g. density) by applying mathematical formulas.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet • Instructional CD’s	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.4 Physical Science, Chemistry and Physics						
B. Analyze energy sources and transfers of heat.	• Evaluate energy changes in chemical reactions. • Use knowledge of conservation of energy and momentum to explain common phenomena.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials • Internet	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

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3.4 Physical Science, Chemistry and Physics						
C. Identify and explain the principles of force and motion. Distinguish among the principles of force and motion. Apply the principles of force and motion.	• Describe the motion of an object based on its position, direction, and speed. • Identify elements of simple machines in compound machines. • Calculate efficiency of machines • Analyze the principles of motion, velocity, & acceleration as they relate to free fall and 2D motion. • Know Newton's laws of motion and gravity and apply them to solve problems related to forces and mass. • Determine the efficiency of mechanical systems by	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing Kits/materials	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

	applying mathematical formulas.		• Internet • Instructional CD's			

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3.4 Physical Science, Chemistry and Physics						
D. Explain essential ideas about the composition and structure of the universe.	• Describe the nuclear processes involved in energy production in a star.	• Diagrams • Direct Instruction • Partner Work • Group Work • Lab Work • Study Skills • Demonstrations (chemical) • Movie Clips • Graphing/Analysis • Computer Projects • Cooperative Learning • Brainstorming • Class discussions • Note guides	• Textbook/ Supplements • Transparencies • PowerPoint • Lab Manual Diagrams • Periodic Table • Calculators • Handouts • Lab Equipment • Measuring Devices • Computer (classroom) • Computer (lab) • Chemicals • Videos • Testing	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Homework • Lab write-ups (handouts) • Midterms • Final • Notebook check • Critical Thinking • Essays • Rubric • Peer Evaluation	• Review and Re-teach • Small Group Instructions • Access to Learning Support Teachers • Adapted Lessons • Extended Time • Tutoring • Technology • Extended Time	• Additional Reading • Science Competition • Science Fairs • Independent Projects • Field Trips • Science Clubs • Summer Assignments • Internships • Science Honors Institute • Shadowing Programs

			Kits/materials • Internet • Instructional CD’s			