WEST JEFFERSON HILLS SCHOOL DISTRICT
EARTH SCIENCE CURRICULUM

GRADE 8

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
3.1 Unifying Themes 3.1.7 Grade 8						
A. Explain the parts of a simple system and their relationship to each other • Describe a system as a group of related parts that work together to achieve a desired result (e.g., digestive system). • Explain the importance of order in a system. • Distinguish between systems, inputs, system processes, and system outputs. • Distinguish between open loop and closed loop systems. • Apply systems analysis to solve problems.	• Describe how sea floor spreading creates balance on the Earth's surface (construction, destruction). • Explain how ocean currents contribute to climate changes.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.1 Unifying Themes 3.1.7 Grade 8						
B. Describe the use of models as an application of scientific or technological concepts. • Identify and describe different types of models and their functions. • Apply models to predict specific results and observations (e.g., population growth, effects of infectious organisms). • Explain systems by outlining a system's relevant parts and its purpose and/or designing a model that illustrates its function.	• Utilize models to explain geologic processes (i.e., plate tectonics), solar system, water systems, geologic time, etc.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.1 Unifying Themes 3.1.7 Grade 8						
C. Identify patterns as repeated processes or recurring elements in science and technology. • Identify repeating structure patterns. • Identify and describe patterns that occur in physical systems (e.g., construction, manufacturing, transportation), informational systems, and biochemical-related systems. • Identify different forms of patterns and use them to group and classify specific objects.	• Identify patterns found within the periodic table of elements. • Identify patterns found within crystal systems of minerals, weather patterns, ocean currents, and seasons.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.1 Unifying Themes 3.1.7 Grade 8						
D. Explain scale as a way of relating concepts and ideas to one another by some measure. • Apply various applications of size and dimensions of scale to scientific mathematical, and technological applications. • Describe scale as a form of ratio and apply to a life situation.	•Develop and draw appropriate scale models for large-scale systems/processes (e.g., geologic time, earth layers). •Develop an appropriate scale for topographic maps.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.1 Unifying Themes 3.1.7 Grade 8						
E. Identify change as a variable in describing natural and physical systems. • Describe fundamental science and technology concepts that could solve practical problems. • Explain how ratio is used to describe change. • Describe the effect of making a change in one part of a system on the system as a whole.	• Describe the effect specific geologic events have on the planet as a whole (e.g., plate tectonics, continental drift, climate changes)	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.2 Inquiry and Design 3.2.7 Grade 8						
A. Explain and apply scientific and technological knowledge. • Distinguish between a scientific theory and a belief. • Answer "What if" questions based on observation, inference, or prior knowledge or experience. • Explain how skepticism about an accepted scientific explanation led to a new understanding. • Explain how new information may change existing theories and practice.	• Explain the difference between a theory and a law. • Describe the steps in the scientific method. • Explain how a hypothesis is developed and tested. • List and describe the branches of earth science. • Explain how scientists use scientific inquiry to explain the natural world.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.2 Inquiry and Design 3.2.7 Grade 8						
B. Apply process knowledge to make and interpret observations. • Measure materials using a variety of scales. • Describe relationships by making inferences and predictions. • Communicate, use space/time relationships, define operationally, raise questions, formulate hypotheses, test, and experiment. • Design controlled experiments, recognize variables, and manipulate variables.	• Explain observations and inferences. • Identify the metric units used in scientific measurement. • Describe laboratory tools used to measure length, mass, volume, and temperature. • Define mass and gravity. • Identify the general properties of matter. • Define volume and give the metric units used to measure volume.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.2 Inquiry and Design 3.2.7 Grade 8						
• Interpret data, formulate models, design models, and produce solutions.	• Define density and compare the densities of various objects. • Design a controlled experiment with appropriate variables. • Develop appropriate graphs (based on variables) to display data. • Present experimental data in report form. • Describe and use the steps in the scientific method. • Develop and explain appropriate models (e.g., plate tectonics, solar system).	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.2 Inquiry and Design 3.2.7 Grade 8						
C. Identify and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms, and/or events that can be answered through scientific investigations. • Evaluate the appropriateness of questions. • Design an investigation with limited variables to investigate a question. • Conduct a two-part experiment. • Judge the significance of experimental information in answering the question. • Communicate appropriate conclusions from the experiment.	• Identify and understand current scientific events. • Design an experiment and communicate their responses.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.2 Inquiry and Design 3.2.7 Grade 8						
D. Know and use the technological design process to solve problems. • Define different types of problems. • Define all aspects of the problem, necessary information, and questions that must be answered. • Propose the best solution. • Design and propose alternative methods to achieve solutions. • Apply a solution. • Explain the results, present improvements, identify, and infer the impacts of the solution.	• Describe some problem-solving strategies. • Use knowledge of science and scientific equipment to solve and explain specific problems.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.3 Biological Sciences 3.3.7 Grade 8						
A. Describe the similarities and differences that characterize diverse living things. • Describe how the structures of living things help them function in unique ways. • Explain how to use a dichotomous key to identify plants and animals. • Account for adaptations among organisms that live in a particular environment.	• Draw conclusions about how organisms have adapted to changing environments (e.g., Geologic time). • Predict what might happen to the diversity of life on Earth if habitats are not protected.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.3 Biological Sciences 3.3.7 Grade 8						
B. Describe the cell as the basic structural and functional unit of living things. • Identify the levels of organization from cell to organism. • Compare life processes at the organism level with life processes at the cell level. • Explain that cells and organisms have particular structures that underlie their functions. • Describe and distinguish among cell cycles, reproductive cycles, and life cycles. • Explain disease effects on structures or functions of an organism.		• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.3 Biological Sciences 3.3.7 Grade 8						
C. Know that every organism has a set of genetic instructions that determines it inherited traits. •Identify and explain inheritable characteristics. •Identify that the gene is the basic unit of inheritance. •Identify basic patterns of inheritance (e.g., dominance, recessive, co-dominance). •Describe how traits are inherited. •Distinguish how different living things reproduce (e.g., vegetative budding, sexual). •Recognize that mutations can alter a gene.	• Explain how certain species/organisms have advantages to survive/ reproduce over time.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.3 Biological Sciences 3.3.7 Grade 8						
•Describe how selective breeding, natural selection and genetic technologies can change genetic makeup of organisms.		•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.3 Biological Sciences 3.3.7 Grade 8						
D. Explain basic concepts of natural selection. • Identify adaptations that allow organisms to survive in their environment. • Describe how an environmental change can affect the survival of organisms and entire species. • Know that differences in individuals of the same species may give some advantage in surviving and reproducing. • Recognize that populations of organisms can increase rapidly. • Explain how biologic extinction is a natural process.	• Identify and describe the major developments (i.e., adaptations on earth). • Describe what fossils tell how organisms have changed over time. • Describe the relationship(s) between Earth changes (i.e., Plate tectonics) t species/ organism changes. • Decide what can be done (problem-solve) to stop or slow species extinction. • Explain how certain species/organisms have advantages to survival/ reproduce over time.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.4 Physical Science, Chemistry and Physics 3.4.7 Grade 8						
A. Describe 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.	• Explain the relation between atoms and elements. • Describe a pure substance. • Identify the chemical symbols for some common elements in Earth materials. • Classify the three main subatomic particles. • Explain the structure of an atom. • Explain the concepts of atomic mass and atomic number. • Describe how a compound differs from an element in earth materials. • Distinguish between chemical and physical properties.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.4 Physical Science, Chemistry and Physics 3.4.7 Grade 8						
	• Explain how and why a chemical reaction must balance.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.4 Physical Science, Chemistry and Physics 3.4.7 Grade 8						
B. Relate energy sources and transfers to heat and temperature. • Know that the sun is a major source of energy that emits wavelengths of visible light, infrared and ultraviolet radiation. • Identify and describe sound changes in moving objects. • Explain the conversion of one form of energy to another by applying knowledge of each form of energy. • Explain the parts and functions in an electrical current.		• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.4 Physical Science, Chemistry and Physics 3.4.7 Grade 8						
C. Identify and explain the principles of force and motion. • Describe the motion of an object based on its position, direction, and speed. • Explain various motions using models. • Explain how sounds and light travel in waves of differing speeds, sizes, and frequencies.	• Analyze and explain Kepler's Laws of Motion (planetary motion). • Explain retrograde motion (planetary motion). • Explain the movement of the moon. • Identify the characteristics of waves. • Define the function of waves as transporting energy but not matter. • Demonstrate that the color of objects is a function of the interaction of the object with light (electromagnetic spectrum).	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.4 Physical Science, Chemistry and Physics 3.4.7 Grade 8						
D. Describe essential ideas about the composition and structure of the universe and the earth's place in it. • Identify gravity as the force that keeps planets in orbit around the sun and governs the rest of the movement of the solar system and the universe. • Identify equipment and instruments that explore the universe. • Identify the accomplishments and contributions provided by selected past and present scientists in the field of astronomy. • Identify and articulate space program efforts to investigate possibilities of living in space and on other planets.	• Explain the factors that keep planets in orbit. • Compare/contrast black holes, novae, and neutron stars. • Illustrate the three main types of galaxies. • Describe and differentiate comets, asteroids, and meteors. • Compare various planets' characteristics. • Describe and evaluate various space exploration programs. • Explain various astronomical tools (e.g., telescopes, astrolabe)	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.5 Earth Sciences 3.5.7 Grade 8						
A. Describe earth features and processes. • Describe major layers of the earth. • Identify living plants and animals that are similar to fossil forms. • Describe the processes involved in the creation of geologic features and that these processes seen today are similar to those in the past. • Explain how the rock cycle affected rock formations in the state of Pennsylvania. • Distinguish between examples of rapid surface changes.	• Discuss the three main features of earth: Lithosphere, atmosphere, and hydrosphere. • Describe the four main layers of the atmosphere. • Explain how rocks are recycled over time. • Describe how some changes on the Earth's surface are due to slow processes (i.e., weathering, erosion) and some due to rapid processes (earth quakes, volcanoes, etc.). • Explain how fossils provide evidence of Earth's biologic and geologic history.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.5 Earth Sciences 3.5.7 Grade 8						
A. Describe earth features and processes. • Describe major layers of the earth. • Identify living plants and animals that are similar to fossil forms. • Describe the processes involved in the creation of geologic features and that these processes seen today are similar to those in the past. • Explain how the rock cycle affected rock formations in the state of Pennsylvania. • Distinguish between examples of rapid surface changes.	• Illustrate how fossils can be used to correlate rock layers. • Interact topographic maps to identify/ describe significant geologic features/ history. • Explain several methods of dating earth materials/ structures. • Describe glaciers and mountain formations.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.5 Earth Sciences 3.5.7 Grade 8						
B. Recognize earth resources and how the affect everyday life. • Identify and locate significant earth resources (e.g., rock types, oil, gas, coal deposits) in Pennsylvania. • Explain the processes involved in the formation of oil and coal in Pennsylvania. • Explain the value and uses of different earth resources (e.g., selected minerals, ores, fuel sources, agricultural uses). • Compare the location of human settlements as related to available resources.	• Identify characteristics of minerals and rocks. • Explain how minerals and rocks are identified. • Describe processes through which minerals and rocks are formed. • Discuss how minerals are used. • Explain the processes involved in coal and oil formation. • Describe positive and negative aspects to mineral/rock mining. • Evaluate the impact of geologic occurrences/hazards (e.g., earthquakes, landslides, volcanoes).	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.5 Earth Sciences 3.5.7 Grade 8						
C. Describe basic elements of meteorology. • Explain weather forecasts by interpreting weather data and symbols. • Explain the oceans' impact on local weather and the climate of a region. • Identify how cloud types, wind directions, and barometric pressure changes are associated with weather patterns in different regions of the country. • Explain and illustrate the processes of cloud formation and precipitation. • Describe and illustrate the major layers of the earth's atmosphere. • Identify different air masses and global wind patterns and how they relate to the weather patterns in different regions of the U.S.	• Interpret a weather map and make predictions. • Explain the effects of both temperature and pressure differences in the atmosphere. • Compare methods of heat transfer. • Explain the layers of the Earth's atmosphere. • Explain how the ocean's activity can be related to local weather/climate. • Analyze the effect of the water cycle on weather patterns.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.5 Earth Sciences 3.5.7 Grade 8						
D. Explain the behavior and impact of the earth's water system. • Explain the water cycle using the processes of evaporation and condensation. • Describe factors that affect evaporation and condensation. • Distinguish salt from fresh water (e.g., density, electrical conduction). • Compare the effect of water type (e.g., polluted, fresh, salt water) and the life contained in them. • Identify ocean and shoreline features, (e.g., bays, inlets, spit, tidal, and marshes).	• Diagram/understand how H_20 is recycled in nature. • Analyze major H_20 systems. • Analyze densities of different H_20 types/systems. • Describe how ocean conditions (e.g., temperature, pressure) change according to depth. • Identify forces that cause surface and depth currents.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.6 Technology Education 3.6.7 Grade 8						
A. Explain biotechnologies that relate to related technologies of propagating, growing, maintaining, adapting, treating, and converting. • Identify the environmental, societal, and economic impacts that waste has in the environment. • Identify and group basic plant and animal production processes. • Explain the impact that agricultural science has had on biotechnology. • Define and describe how fuels and energy can be generated through the process of biomass conversion.	•Identify waste and pollution resulting from mineral and/or rock mining.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.6 Technology Education 3.6.7 Grade 8						
B. Explain information technologies of encoding, transmitting, receiving, storing, retrieving, and decoding. • Demonstrate the effectiveness of image generating technique to communicate a story (e.g., photography, video). • Analyze and evaluate the effectiveness of a graphic object designed and produced to communicate a thought or concept. • Apply basic technical drawing techniques to communicate an idea or solution to a problem. • Apply the appropriate method of communications technology to communicate a thought.	• Demonstrate knowledge of a specific scientific topic by communicating researched facts and/or appropriate data.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.6 Technology Education 3.6.7 Grade 8						
C. Explain physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design. •Use knowledge of material effectiveness to solve specific construction problems (e.g., steel vs. wood bridges). •Differentiate among the different types of construction applications (e.g., microwave tower, power plants, and aircrafts). •Explain basic material processes that manufactured objects undergo during production. (e.g., separating, forming, combining).		•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.6 Technology Education 3.6.7 Grade 8						
•Evaluate a construction activity by specifying task analysis and necessary resources. •Explain the relationships among the basic resources needed in the production process for a specific manufactured object. •Explain the difference between design engineering and production engineering processes •Analyze manufacturing steps that affect waste and pollutants. •Explain transportation technologies of propelling, structuring, suspending, guiding, controlling and supporting. •Identify and explain the workings of several mechanical power systems.		•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.6 Technology Education 3.6.7 Grade 8						
•Model and explain examples of vehicular propulsion, control, guidance, structure, and suspension systems. •Explain the limitations of land, marine, air and space transportation systems.	• Explain limitations of space transportation and/or exploration systems.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.7 Technology Device 3.7.7 Grade 8						
A. Describe the safe and appropriate use of tools, materials, and techniques to answer questions and solve problems. • Identify uses of tools, machines, materials, information, people, money, energy, and time that meet specific design criteria. • Describe safe procedures for using tools and materials. • Assess materials for appropriateness of use.	• Identify appropriate bus safety procedures. • Identify the metric units used in scientific measurement. • Identify general properties of water. • Define mass, weight, volume, density, temperature and give the metric units used to measure.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.7 Technology Device 3.7.7 Grade 8						
B. Use appropriate instruments and apparatus to study materials. • Select appropriate instruments to measure the size, weight, shape, and temperature of living and non-living objects. • Apply knowledge of different measurement systems to measure and record objects' properties.	• Utilize appropriate scientific instruments to collect data (i.e. mass, volume, etc.).	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.7 Technology Device 3.7.7 Grade 8						
C. Explain and demonstrate basic computer operations and concepts. •Know specialized computer applications used in the community. •Describe the function of advanced input and output devices (e.g., scanners, video images, plotters, projectors) and demonstrate their use. •Demonstrate age appropriate keyboarding skills and techniques.		•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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3.7 Technology Device 3.7.7 Grade 8						
D. Apply computer software to solve specific problems. • Identify software designed to meet specific needs (e.g., Computer Aided Drafting, design software, tutorial, financial, presentation software). • Identify and solve basic software problems relevant to specific software applications. • Identify basic multimedia applications. • Demonstrate a basic knowledge of desktop publishing applications. • Apply intermediate skills in utilizing word processing, database, and spreadsheet software. • Apply basic graphic manipulation techniques.		• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.7 Technology Device 3.7.7 Grade 8						
E. Explain basic computer communication systems. • Describe the organization and functions of the basic parts that make up the World Wide Web. • Apply advanced electronic mail functions. • Apply basic on-line research techniques to solve a specific problem.	• Apply technological skills to various scientific research projects.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

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3.8 Science Technology and Human Endeavor 3.8.7 Grade 8						
A. Explain how sciences and technologies are limited in their effect and influences on society. • Identify and describe the unavoidable constraints of technological design. • Identify changes in society as a result of a technological development. • Identify and explain improvements in transportation, health, sanitation, and communications as a result of advancements in science and technology and how they affect our lives.	• Identify/describe society's attitude to scientific and technological advances.	•Hands-on activities •Written assignments •Lecture •Computers •Open-ended activities •Lab activities •Science News •Oral presentations •Cooperative learning	•Textbook with supplements •Computer access •Videos •Teacher designed activities •Science News •World Wide Web •Multi media technology •Research	•Homework •Written work •Rubric •Tests/Quizzes •Group discussions •Experiment projects •Research	•Computer availability •Access to learning support teachers (IEP based) •Tutoring opportunities •Extended time •Guided practice •Peer mentoring	•Science and Engineering Fair •Guest speakers •Field trips •Contacts with universities •Opportunities through gifted program •Research

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EARTH SCIENCE CURRICULUM

GRADE 8

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
3.8 Science Technology and Human Endeavor 3.8.7 Grade 8						
B. Explain how human ingenuity and technological resources satisfy specific human needs and improve the quality of life. • Identify interrelationships between systems and resources. • Identify and describe the resources necessary to solve a selected problem in a community and improve the quality of life. • Identify and explain specific examples of how agricultural science has met human needs and has improved the quality of life.	• Describe resources necessary to solve selected community problems.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research

WEST JEFFERSON HILLS SCHOOL DISTRICT
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3.8 Science Technology and Human Endeavor 3.8.7 Grade 8						
C. Identify the pros and cons of applying technological and scientific solutions to address problems and the effect upon society. • Describe the positive and negative expected and unexpected effects of specific technology. • Describe ways technology extends and enhances human abilities.	• Describe pros and cons to specific scientific solutions.	• Hands-on activities • Written assignments • Lecture • Computers • Open-ended activities • Lab activities • Science News • Oral presentations • Cooperative learning	• Textbook with supplements • Computer access • Videos • Teacher designed activities • Science News • World Wide Web • Multi media technology • Research	• Homework • Written work • Rubric • Tests/Quizzes • Group discussions • Experiment projects • Research	• Computer availability • Access to learning support teachers (IEP based) • Tutoring opportunities • Extended time • Guided practice • Peer mentoring	• Science and Engineering Fair • Guest speakers • Field trips • Contacts with universities • Opportunities through gifted program • Research