

**WEST JEFFERSON HILLS SCHOOL DISTRICT  
ANATOMY AND PHYSICS CURRICULUM**

**GRADE 12**

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<p>3.2 Inquiry and Design</p>						
<p>A. Evaluate the nature of scientific and technological knowledge.</p>	<ul style="list-style-type: none"> <li>• Know and use the ongoing scientific processes to continually improve and better understand how things work.</li> <li>• Integrate new information into existing theories and explain implied results.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> <li>• Dissections</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Model Kits</li> <li>• Microscopes</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Computer (lab)</li> <li>• Preserved and Living Specimens</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> <li>• Rubric</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>

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<p>B. Apply process knowledge and organize scientific and technological phenomena in varied ways.</p>	<ul style="list-style-type: none"> <li>• Describe materials using precise quantitative and qualitative skills based on observations.</li> <li>• Judge that conclusions are consistent and logical with experimental conditions.</li> <li>• Interpret results of experimental research to predict new information or improve a solution.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> <li>• Dissections</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Microscopes</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Computer (lab)</li> <li>• Preserved and Living Specimens</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> <li>• Rubric</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>

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<p>3.2 Inquiry and Design</p>						
<p>C. Apply the elements of scientific inquiry to solve problems.</p>	<ul style="list-style-type: none"> <li>• Generate questions about objects, organisms, and/or events that can be answered through scientific investigations.</li> <li>• Evaluate the appropriateness of questions.</li> <li>• Conduct a multiple step experiment.</li> <li>• Judge the significance of experimental information in answering the question.</li> <li>• Suggest additional steps that might be done experimentally.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> <li>• Dissections</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Model Kits</li> <li>• Microscopes</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Preserved and Living Specimens</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> <li>• Rubric</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>

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<p>3.2 Inquiry and Design</p>						
<p>D. Identify and apply the technological design process to solve problems.</p>	<ul style="list-style-type: none"> <li>• Examine the problem, rank all necessary information and all questions that must be answered.</li> <li>• Propose and analyze a solution.</li> <li>• Evaluate the solution, test, redesign, and improve as necessary.</li> <li>• Communicate the process and evaluate and present the impacts of the solution.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> <li>• Rubric</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>

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<p>3.3 Biological Sciences</p>						
<p>A. Explain the relationship between structure and function at all levels of organization.</p>	<ul style="list-style-type: none"> <li>• Identify and explain interactions among organisms (e.g., mutually beneficial, harmful relationships).</li> <li>• Explain and analyze the relationship between structure and function at the molecular, cellular and organ-system level.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> <li>• Dissections</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Model Kits</li> <li>• Microscopes</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Computer (lab)</li> <li>• Preserved and Living Specimens</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>

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3.3 Biological Sciences						
B. Analyze the chemical and structural basis of living organisms.	<ul style="list-style-type: none"> <li>• Identify and describe factors affecting metabolic function (e.g., temperature, acidity, hormones).</li> <li>• Evaluate relationships between structure and functions of different anatomical parts given their structure.</li> <li>• Describe potential impact of genomic research on the biochemistry and physiology of life.</li> <li>• Identify the specialized structures and regions of the cell and the functions of each.</li> <li>• Explain how cells store and use information to guide their functions.</li> <li>• Explain cell functions and processes in terms of chemical reactions and energy change.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> <li>• Dissections</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Model Kits</li> <li>• Microscopes</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Computer (lab)</li> <li>• Preserved and Living Specimens</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> <li>• Rubric</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>

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3.3 Biological Sciences						
C. Describe how genetic information is inherited and expressed.	<ul style="list-style-type: none"> <li>• Describe mutations' effects on a trait's expression.</li> <li>• Explain the relationship among DNA, genes, and chromosomes.</li> <li>• Explain different types of inheritance (e.g., multiple allele, sex-influenced traits).</li> <li>• Describe the role of DNA in protein synthesis as it relates to gene expression.</li> <li>• Explain birth defects from the standpoint of embryological development and/or changes in genetic makeup.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Group Work</li> <li>• Lab Work</li> <li>• Demonstrations</li> <li>• Movie Clips</li> <li>• Computer Projects</li> <li>• Cooperative Learning</li> <li>• Independent Reading</li> <li>• Brainstorming</li> <li>• Class discussions</li> <li>• Note guides</li> </ul>	<ul style="list-style-type: none"> <li>• Textbook/ Supplements</li> <li>• Transparencies</li> <li>• PowerPoint</li> <li>• Lab Manual Diagrams</li> <li>• Handouts Lab Equipment</li> <li>• Model Kits</li> <li>• Measuring Devices</li> <li>• Computer (classroom)</li> <li>• Preserved and Living Specimens</li> <li>• Chemicals</li> <li>• Videos</li> <li>• Testing Kits/materials</li> <li>• Magazines and Journals</li> <li>• Instructional CD's</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Tests</li> <li>• Quizzes</li> <li>• Problem Solving</li> <li>• In-Class Work</li> <li>• Homework</li> <li>• Lab write-ups</li> <li>• Midterms</li> <li>• Final</li> <li>• Critical Thinking</li> <li>• Case Studies</li> <li>• Essays</li> <li>• Rubric</li> </ul>	<ul style="list-style-type: none"> <li>• Review</li> <li>• Small Group Instructions</li> <li>• Tutoring</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Reading</li> <li>• Science Competition</li> <li>• Science Fairs</li> <li>• Independent Projects</li> <li>• Field Trips</li> <li>• Science Clubs</li> <li>• Summer Assignments</li> <li>• Internships</li> <li>• Science Honors Institute</li> <li>• Shadowing Programs</li> </ul>