

<b>Nanotechnology: What's the Big Deal? exhibit correlation to AR Science Curriculum Frameworks</b>	
Kindergarten	<p>NS.1.K.1 Record observations pictorially, orally, and in writing</p> <p>NS.1.K.2 Ask questions based on observations</p> <p>NS.1.K.3 Conduct scientific investigations as a class and in teams: lab activities and field studies</p> <p>NS.1.K.6 Collect empirical evidence as a class</p> <p>NS.1.K.7 Use age-appropriate equipment and tools in scientific investigations (e.g., balances and hand lenses)</p> <p>NS.1.K.8 Apply appropriate rules of safety related to daily activities</p> <p>LS.2.K.1 Classify living and non-living things</p> <p>LS.2.K.2 Differentiate between plants and animals</p> <p>PS.5.K.1 List and classify objects according to the single properties of size, color, and shape</p> <p>PS.6.K.1 Demonstrate spatial relationships, including but not limited to over, under, left, and right</p> <p>PS.6.K.2 Demonstrate various ways that objects can move, including but not limited to: straight, zig-zag, back and forth, round and round, fast and slow</p> <p>PS.7.K.2 Identify uses of electricity</p>
1st Grade	<p>NS.1.1.1 Communicate observations orally, in writing, and in graphic organizers: T-charts or pictographs</p> <p>NS.1.1.2 Ask questions based on observations</p> <p>NS.1.1.3 Conduct scientific investigations as a class and in teams: lab activities and field studies</p> <p>NS.1.1.5 Collect measurable empirical evidence as a class and in teams</p> <p>NS.1.1.6 Make predictions as a class and in teams based upon empirical evidence (e.g., predict which object is heavier)</p> <p>NS.1.1.7 Use age appropriate equipment and tools in scientific investigations (e.g., balances, hand lenses, rulers, and thermometers)</p> <p>NS.1.1.8 Apply appropriate rules of safety related to daily activities</p> <p>PS.5.1.1 Compare and contrast objects according to the single properties of size, color, shape, texture, magnetism</p> <p>PS.6.1.1 List orally the various ways that objects can move, including but not limited to: straight, zig-zag, back and forth, round and round, fast and slow</p>
2nd Grade	<p>NS.1.2.1 Communicate observations orally, in writing, and in graphic organizers: T-charts, pictographs, Venn diagrams, and bar graphs</p> <p>NS.1.2.2 Develop questions that guide scientific inquiry</p> <p>NS.1.2.3 Conduct scientific investigations individually and in teams: lab activities and field studies</p> <p>NS.1.2.5 Collect measurable empirical evidence in teams and as individuals</p> <p>NS.1.2.6 Make predictions in teams and as individuals based upon empirical evidence</p> <p>NS.1.2.7 Use age appropriate equipment and tools in scientific investigations (e.g., balances, hand lenses, rulers, and thermometers)</p> <p>PS.5.2.1 Classify objects based on two or more properties</p> <p>PS.5.2.2 Investigate the effect of physical phenomena on various materials (e.g., heat absorption by different colored materials)</p>

3rd Grade	<p>NS.1.3.1 Communicate observations orally, in writing, and in graphic organizers: T-charts, pictographs, Venn diagrams, bar graphs, and frequency tables</p> <p>NS.1.3.2 Develop questions that guide scientific inquiry</p> <p>NS.1.3.3 Conduct scientific investigations individually and in teams: lab activities and field studies</p> <p>NS.1.3.4 Communicate the results of scientific investigations (e.g., age-appropriate graphs, charts, and writings)</p> <p>NS.1.3.5 Estimate and measure length, mass, temperature, and elapsed time using International System of Units (SI)</p> <p>NS.1.3.6 Collect and analyze measurable empirical evidence as a team and/or as individuals</p> <p>NS.1.3.7 Make and explain predictions based on prior knowledge</p> <p>NS.1.3.8 Use simple equipment, age appropriate tools, technology, and mathematics in scientific investigations (e.g., balances, hand lenses, microscopes, rulers, thermometers, calculators, computers)</p> <p>PS.5.3.1 Compare and contrast objects based on two or more properties</p> <p>PS.7.3.1 Classify materials as those which can reflect, refract, or absorb light</p>
4th Grade	<p>NS.1.4.1 Communicate observations orally, in writing, and in graphic organizers: T-charts, pictographs, Venn diagrams, bar graphs, frequency tables, and line graphs</p> <p>NS.1.4.2 Refine questions that guide scientific inquiry</p> <p>NS.1.4.3 Conduct scientific investigations individually and in teams: lab activities and field studies</p> <p>NS.1.4.5 Communicate the designs, procedures, and results of scientific investigations (e.g., age-appropriate graphs, charts, and writings)</p> <p>NS.1.4.6 Estimate and measure length, mass, temperature, capacity/volume, and elapsed time using International System of Units (SI)</p> <p>NS.1.4.7 Collect and interpret measurable empirical evidence in teams and as individuals</p> <p>NS.1.4.8 Develop a hypothesis based on prior knowledge and observations</p> <p>NS.1.4.9 Identify variables that affect investigations</p> <p>NS.1.4.10 Identify patterns and trends in data</p> <p>NS.1.4.11 Generate conclusions based on evidence</p> <p>NS.1.4.12 Evaluate the quality and feasibility of an idea or project</p> <p>NS.1.4.13 Use simple equipment, age appropriate tools, technology, and mathematics in scientific investigations (e.g., balances, hand lenses, microscopes, rulers, thermometers, calculators, computers)</p> <p>LS.2.4.3 Identify major parts and functions of the following systems: digestive, circulatory, nervous</p> <p>PS.5.4.1 Demonstrate multiple ways to classify objects</p>
5th Grade	<p>NS.1.5.1 Make accurate observations</p> <p>NS.1.5.2 Identify and define components of experimental design used to produce empirical evidence: Hypothesis, replication, sample size, appropriate use of control, use of standardized variables</p> <p>NS.1.5.4 Interpret scientific data using data tables/charts, bar graphs, circle graphs, line graphs, stem and leaf plots, and Venn diagrams</p> <p>NS.1.5.5 Communicate results and conclusions from scientific inquiry</p> <p>NS.1.5.7 Summarize the characteristics of science</p> <p>NS.1.5.8 Explain the role of observation in the development of a theory</p> <p>NS.1.5.9 Define and give examples of hypotheses</p> <p>LS.2.5.11 Investigate careers, scientists, and historical breakthroughs related to cells</p> <p>PS.5.5.2 Conduct scientific investigations on physical properties of objects</p> <p>PS.5.5.3 Identify common examples of physical properties: length, mass, area, perimeter, texture, taste, odor, color, and elasticity</p> <p>PS.5.5.8 Model the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy</p> <p>PS.7.5.1 Summarize how light can interact with matter through absorption, refraction, and reflection</p> <p>PS.7.5.2 Investigate how light travels and interacts with an object or material</p>

6th Grade	<p>NS.1.6.1 Verify accuracy of observations          NS.1.6.2 Apply components of experimental design used to produce empirical evidence: hypothesis, replication, sample size, appropriate use of control, and use of standardized variables          NS.1.6.5 Communicate results and conclusions from scientific inquiry          NS.1.6.7 Distinguish between scientific fact and opinion          NS.1.6.8 Explain the role of prediction in the development of a theory          L.2.6.8 Investigate careers, scientists, and historical breakthroughs related to tissues and organs</p>
7th Grade	<p>NS.1.7.1 Interpret evidence based on observations          NS.1.7.2 Analyze components of experimental design used to produce empirical evidence: hypothesis, replication, sample size, appropriate use of control, and use of standardized variables.          NS.1.7.5 Communicate results and conclusions from scientific inquiry          NS.1.7.7 Distinguish between questions that can and cannot be answered by science</p>
8th Grade	<p>NS.1.8.1 Justify conclusions based on appropriate and unbiased observations          NS.1.8.2 Evaluate the merits of empirical evidence based on experimental design: hypothesis, replication, sample size, appropriate use of control, use of standardized independent and dependent variables.          NS.1.8.3 Formulate a testable problem using experimental design          NS.1.8.9 Generate questions that can and cannot be answered by science          LS.2.8.9 Investigate careers, scientists, and historical breakthroughs related to organisms          PS.5.8.5 Investigate scientists, careers, and historical breakthroughs related to the atomic theory</p>
9th-12th Grade Anatomy and Physiology	<p>NS.18.AP.1 Understand that scientific theories may be modified or expanded based on additional empirical data, verification, and peer review          NS.18.AP.2 Relate the development of the cell theory to current trends in cellular biology          NS.18.AP.5 Research current events and topics in human biology          NS.20.AP.2 Discuss why scientists should work within ethical parameters          NS.20.AP.3 Explain how the cyclical relationship between science and technology results in reciprocal advancements in science and technology          NS.21.AP.1 Research and evaluate health science careers using the following criteria: educational requirements, salary, availability of jobs, and working conditions          BS.6.AP.4 Describe disorders associated with the skeletal system          BS.8.AP.4 Describe disorders associated with the nervous system          BS.10.AP.4 Describe disorders associated with the cardiovascular system          BS.11.AP.4 Describe disorders associated with the immune and lymphatic systems          BS.12.AP.4 Describe disorders associated with the respiratory system</p>
9th-12th Grade Biology	<p>NS.12.B.7 Research current events and topics in biology          NS.14.B.2 Discuss why scientists should work within ethical parameters          NS.14.B.4 Explain how the cyclical relationship between science and technology results in reciprocal advancements in science and technology          NS.15.B.1 Research and evaluate science careers using the following criteria: educational requirements, salary, availability of jobs, working conditions</p>

Key: NS.1 .x. 1= Nature of Science. Standard 1. Grade level x. 1<sup>st</sup> Student Learning Expectation.

LS: Life Science. PS: Physical Science. NS: Nature of Science. BS: Body Systems. AP: Anatomy and Physiology. B: Biology