

Science

CCRS	Foundation Subjects		Enrichment
	Science	Social Studies	CTE
I. Nature of Science: Scientific Ways of Learning and Thinking			
A. Cognitive skills in science			
I.A.1. Utilize skepticism, logic, and professional ethics in science.	Grades 3-12: (3)(A) Aquatic Science: (2)(A), (2)(D), (3)(A) Astronomy: (2)(A), (2)(D), (3)(A) Biology: (2)(A), (2)(D), (3)(A) Chemistry: (2)(A), (2)(D), (3)(A) Earth and Space Science: (2)(A), (2)(D), (3)(A) Environmental Systems: (2)(A), (2)(D), (3)(A), (9)(G)-(I) IPC: (2)(A), (3)(A) Physics: (2)(A), (2)(D), (3)(A)		Anatomy and Physiology: (3)(B), (4)(A), (6)(C) Advanced Animal Science: (3)(B), (4)(A), (6)(A)-(B), (13)(A) Advanced Plant and Soil Science: (3)(B), (4)(A), (9)(B), (10)(B), (10)(E), (11)(D), (18)(D) Medical Microbiology: (3)(B), (4)(A), (7)(F) Pathophysiology: (3)(B), (4)(A) Engineering Design and Problem Solving: (3)(B), (4)(A), (5)(A), (5)(D)-(E), (6)(F), (8)(A)-(C), (8)(E)-(H), (9)(G)-(H) Engineering Science: (3)(B), (4)(A), (6)(B)-(C), (9)(B), (13)(D)-(E) Scientific Research and Design: (3)(B), (4)(A) Principles of Technology: (3)(B), (3)(I), (4)(A), (5)(G) Biotechnology I: (3)(B), (4)(A) Biotechnology II: (3)(B), (4)(A), (5)(B), (8)(C), (9)(C), (10)(B) Forensic Science: (3)(B), (4)(A), (6)(C), (12)(D) Food Science: (3)(B), (4)(A)
I.A.2. Use creativity and insight to recognize and describe patterns in natural phenomena.	Kindergarten-Grade 2: (3)(B) Grades 3-8: (2)(D) Grade 7: (5)(A)-(C) Grade 8: (7)(A)-(B), (10)(B) Aquatic Science: (2)(B) Astronomy: (2)(B), (4)(C) Biology: (2)(B) Chemistry: (2)(B) Earth and Space Science: (2)(B) Environmental Systems: (2)(B), (4)(D) IPC: (4)(A) Physics: (2)(B)		Anatomy and Physiology: (4)(A)-(D), (6)(C), (10)(A)-(B), (12)(B)-(C) Advanced Animal Science: (4)(A)-(D) Advanced Plant and Soil Science: (4)(A)-(D), (9)(B), (10)(B), (10)(E), (15)(E) Medical Microbiology: (4)(A)-(D), (6)(A), (6)(D), (7)(B), (7)(F) Pathophysiology: (4)(A)-(D) Engineering Design and Problem Solving: (4)(A)-(D), (5)(A), (5)(D), (6)(F), (8)(A)-(C), (8)(E)-(H) Engineering Science: (4)(A)-(D) Scientific Research and Design: (4)(A)-(D) Principles of Technology: (4)(A)-(D) Biotechnology I: (4)(A)-(D) Biotechnology II: (4)(A)-(D), (6)(C), (9)(A), (13)(B) Forensic Science: (4)(A)-(D), (5)(A), (6)(A), (6)(C)-(D), (6)(F), (6)(J), (14)(A), (16)(C), (17)(C) Food Science: (4)(A)-(D)
I.A.3. Formulate appropriate questions to test understanding of natural phenomena.	Kindergarten-Grade 8: (2)(A) Grades 5-8: (2)(B) Aquatic Science: (2)(E) Astronomy: (2)(E) Biology: (2)(E) Chemistry: (2)(E) Environmental Systems: (2)(E) IPC: (2)(B) Physics: (2)(E)		Anatomy and Physiology: (3)(B), (3)(E), (10)(B), (11)(A) Advanced Animal Science: (3)(B), (3)(E) Advanced Plant and Soil Science: (3)(B), (3)(E), (7)(A), (9)(B), (10)(B), (10)(E) Medical Microbiology: (3)(B), (3)(E), (6)(D), (7)(F); Pathophysiology: (3)(B), (3)(E) Engineering Design and Problem Solving: (3)(B), (3)(E), (5)(A), (5)(D), (6)(F), (8)(A)-(C), (8)(E)-(H) Engineering Science: (3)(B), (3)(E) Scientific Research and Design: (3)(B), (3)(E) Principles of Technology: (3)(B), (3)(E) Biotechnology I: (3)(B), (3)(E) Biotechnology II: (3)(B), (3)(E), (7)(C) Forensic Science: (3)(B), (3)(E), (16)(C) Food Science: (3)(B), (3)(E)
I.A.4. Rely on reproducible observations of empirical evidence when constructing, analyzing, and evaluating explanations of natural events and processes.	Kindergarten-Grade 5: (2)(D) Grades 3-4: (2)(B) Grade 5: (2)(C) Grades 6-8: (2)(A)-(B), (2)(D)-(E), (3)(A) Aquatic Science: (2)(C), (3)(A), (5)(A) Astronomy: (2)(C), (2)(G), (3)(A) Biology: (2)(C), (2)(G), (3)(A) Chemistry: (2)(C), (2)(H), (3)(A) Earth and Space Science: (2)(C), (2)(G), (3)(A) Environmental Systems: (2)(C), (2)(I), (3)(A), (9)(F) IPC: (2)(D), (3)(A) Physics: (2)(C), (2)(J), (3)(A)		Anatomy and Physiology: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (10)(A)-(B), (11)(A), (12)(B)-(C) Advanced Animal Science: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D) Advanced Plant and Soil Science: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (7)(A), (7)(C), (9)(B), (10)(B), (10)(E) Medical Microbiology: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (6)(C)-(D), (7)(F) Pathophysiology: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D) Engineering Design and Problem Solving: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (5)(A), (5)(D), (6)(F), (8)(A)-(C), (8)(E)-(H), (9)(A), (9)(G)-(H) Engineering Science: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (6)(B)-(C), (13)(D)-(E) Scientific Research and Design: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (6)(D), (9)(A) Principles of Technology: (2)(J), (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (5)(B) Biotechnology I: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D) Biotechnology II: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D), (6)(D), (9)(B), (12)(C), (13)(B) Forensic Science: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D) Food Science: (3)(B)-(C), (3)(E), (3)(G), (4)(A)-(D)

B. Scientific inquiry			
I.B.1. Design and conduct scientific investigations in which hypotheses are formulated and tested.	Kindergarten-Grade 8: (2)(A)-(B) Kindergarten-Grade 3: (2)(C) Aquatic Science: (2)(E) Astronomy: (2)(E) Biology: (2)(E) Chemistry: (2)(E) Environmental Systems: (2)(E) IPC: (2)(B) Physics: (2)(E)		Anatomy and Physiology: (3)(B), (3)(D)-(E) Advanced Animal Science: (3)(B), (3)(D)-(E), (5)(A), (5)(E) Advanced Plant and Soil Science: (3)(B), (3)(D)-(E), (5)(A), (5)(E), (7)(A), (8)(A), (10)(E), (18)(D) Medical Microbiology: (3)(B), (3)(D)-(E), (6)(D) Pathophysiology: (3)(B), (3)(D)-(E) Engineering Design and Problem Solving: (3)(B), (3)(D)-(E), (8)(B)-(C), (8)(F), (9)(A)-(B) Engineering Science: (3)(B), (3)(D)-(E), (7)(F), (10)(A), (11)(A), (12)(A), (12)(C) Scientific Research and Design: (3)(B), (3)(D)-(E), (5)(B), (7)(B)-(D) Principles of Technology: (3)(B), (3)(D)-(E), (5)(A), (5)(C) Biotechnology I: (3)(B), (3)(D)-(E) Biotechnology II: (3)(B), (3)(D)-(E), (7)(D), (14)(D) Forensic Science: (3)(B), (3)(D)-(E), (13)(B) Food Science: (3)(B), (3)(D)-(E)
C. Collaborative and safe working practices			
I.C.1. Collaborate on joint projects.	Aquatic Science: (2)(F) Astronomy: (2)(H)		Anatomy and Physiology: (1)(B) Advanced Animal Science: (5)(E) Advanced Plant and Soil Science: (5)(E) Medical Microbiology: (1)(B) Pathophysiology: (1)(B) Engineering Design and Problem Solving: (1)(B), (9)(C)-(D) Engineering Science: (1)(B), (6)(A), (6)(E) Scientific Research and Design: (1)(B) Principles of Technology: (1)(B) Biotechnology I: (1)(B) Biotechnology II: (1)(B), (7)(A) Forensic Science: (1) Food Science: (1)(B)
I.C.2. Understand and apply safe procedures in the laboratory and field, including chemical, electrical, and fire safety and safe handling of live or preserved organisms.	Kindergarten-Grade 12: (1)(A) Kindergarten-Grade 8: (1)(B) Kindergarten-Grade 2: (1)(C) Grades 6-8: (4)(B) Aquatic Science: (1)(A) Astronomy: (1)(A) Biology: (1)(A) Chemistry: (1)(A) Earth and Space Science: (1)(A) Environmental Systems: (1)(A) IPC: (1)(A) Physics: (1)(A)		Anatomy and Physiology: (2)(A)-(B), (3)(E) Advanced Animal Science: (1)(C), (2)(A)-(B), (3)(E), (5)(E), (7)(D), (14)(C) Advanced Plant and Soil Science: (1)(C), (2)(A)-(B), (3)(E), (5)(E), (7)(A), (15)(D), (18)(D) Medical Microbiology: (2)(A)-(B), (3)(E), (3)(J) Pathophysiology: (2)(A)-(B), (3)(E) Engineering Design and Problem Solving: (2)(A)-(B), (3)(E), (8)(D), (9)(B), (9)(D)-(E) Engineering Science: (2)(A)-(B), (3)(E), (7)(F), (10)(A), (11)(A), (12)(A), (12)(C) Scientific Research and Design: (2)(A)-(B), (3)(E) Principles of Technology: (2)(A)-(B), (3)(E), (5)(D), (6)(A)-(D) Biotechnology I: (2)(A)-(B), (3)(E), (3)(J), (9)(A), (9)(C)-(E), (11)(A)-(B), (12)(B)-(I), (13)(A)-(B) Biotechnology II: (2)(A)-(B), (3)(E), (3)(J), (14)(A)-(B) Forensic Science: (2)(A)-(B), (3)(E), (3)(J), (6)(C)-(D), (6)(J), (12)(D), (16)(C) Food Science: (2)(A)-(B), (3)(E), (3)(J)
I.C.3. Demonstrate skill in the safe use of a wide variety of apparatuses, equipment, techniques, and procedures.	Kindergarten-Grade 12: (1)(A)-(B) Kindergarten-Grade 2: (2)(B) Kindergarten-Grade 8: (4)(A) Grades 5-8: (2)(B) Grades 6-8: (4)(B) Aquatic Science: (1)(B), (2)(E),(G) Astronomy: (2)(E)-(F), (2)(I), (11)(F) Biology: (1)(A)-(B), (2)(F) Chemistry: (1)(A), (1)(C), (2)(E)-(F) Earth and Space Science: (1)(A)-(C), (2)(E)-(F) Environmental Systems: (1)(B), (2)(F)-(H) IPC: (1)(A)-(B), (2)(B) Physics: (1)(A)-(B), (2)(F)-(G)		Anatomy and Physiology: (2)(A)-(B), (3)(E)-(F) Advanced Animal Science: (1)(C), (2)(A)-(B), (3)(E)-(F), (5)(E), (7)(D), (14)(C) Advanced Plant and Soil Science: (1)(C), (2)(A)-(B), (3)(E)-(F), (5)(E), (7)(A), (15)(D), (18)(D) Medical Microbiology: (2)(A)-(B), (3)(E)-(F), (3)(J) Pathophysiology: (2)(A)-(B), (3)(E)-(F), (6)(A) Engineering Design and Problem Solving: (2)(A)-(B), (3)(E)-(F), (9)(B), (9)(D)-(E) Engineering Science: (2)(A)-(B), (3)(E)-(F), (7)(F), (10)(A), (11)(A), (12)(A), (12)(C) Scientific Research and Design: (2)(A)-(B), (3)(E)-(F) Principles of Technology: (2)(A)-(B), (3)(E)-(F), (5)(D), (6)(A)-(D) Biotechnology I: (2)(A)-(B), (3)(E)-(F), (3)(J), (11)(A)-(B), (12)(B)-(I), (13)(A)-(B) Biotechnology II: (2)(A)-(B), (3)(E)-(F), (3)(J), (14)(A)-(B) Forensic Science: (2)(A)-(B), (3)(E)-(F), (6)(D), (6)(H), (6)(J), (8)(D), (12)(D), (14)(C), (16)(C) Food Science: (2)(A)-(B), (3)(E)-(F), (3)(J)
D. Current scientific technology			
I.D.1. Demonstrate literacy in computer use.	Kindergarten-Grade 8: (4)(A) Biology: (2)(F) Chemistry: (2)(F) Earth and Space Science: (1)(C), (2)(E) Environmental Systems: (2)(G)-(H) Physics: (2)(F)		Anatomy and Physiology: (3)(H) Advanced Animal Science: (3)(H), (13)(D) Advanced Plant and Soil Science: (3)(H) Medical Microbiology: (3)(H) Pathophysiology: (3)(H) Engineering Design and Problem Solving: (3)(H), (6)(C) Engineering Science: (3)(H), (13)(A)-(C) Scientific Research and Design: (3)(H), (8)(C), (10)(A) Principles of Technology: (3)(H) Biotechnology I: (3)(H) Biotechnology II: (3)(H) Forensic Science: (3)(H) Food Science: (3)(H) Introduction to Culinary Arts: (5)(A); Culinary Arts (10)(A-D)

<p>I.D.2. Use computer models, applications, and simulations.</p>	<p>Kindergarten-Grade 8: (4)(A) Biology: (2)(F), (2)(H) Chemistry: (2)(F), (2)(I) Earth and Space Science: (1)(C), (2)(E), (15)(B) Environmental Systems: (2)(H) Physics: (2)(F), (2)(K)</p>		<p>Anatomy and Physiology: (3)(H) Advanced Animal Science: (3)(H), (13)(D) Advanced Plant and Soil Science: (3)(H) Medical Microbiology: (3)(H) Pathophysiology: (3)(H) Engineering Design and Problem Solving: (3)(H), (6)(C)-(D) Engineering Science: (3)(H), (13)(A)-(C) Scientific Research and Design: (3)(H), (8)(C), (10)(A) Principles of Technology: (2)(K), (3)(H) Biotechnology I: (3)(H), (7)(A) Biotechnology II: (3)(H) Forensic Science: (3)(H) Food Science: (3)(H)</p>
<p>I.D.3. Demonstrate appropriate use of a wide variety of apparatuses, equipment, techniques, and procedures for collecting quantitative and qualitative data.</p>	<p>Kindergarten-Grade 2: (2)(B) Kindergarten-Grade 5: (4)(A)-(B) Grades 3-5: (3)(C) Grades 6-8: (2)(B), (4)(A) Aquatic Science: (2)(E), (2)(G) Astronomy: (2)(E), (14)(C)-(D) Biology: (2)(E)-(F) Chemistry: (2)(E)-(F), (2)(I) Earth and Space Science: (2)(E)-(F) Environmental Systems: (2)(E), (2)(G)-(H) IPC: (2)(B), (4)(C)-(D) Physics: (2)(F)-(G), (2)(K)</p>		<p>Anatomy and Physiology: (3)(E)-(F) Advanced Animal Science: (3)(E)-(F) Advanced Plant and Soil Science: (3)(E)-(F), (7)(A), (18)(D) Medical Microbiology: (3)(E)-(F) Pathophysiology: (3)(E)-(F), (6)(A) Engineering Design and Problem Solving: (3)(E)-(F), (5)(J), (6)(A), (8)(I) Engineering Science: (3)(E)-(F), (10)(A), (11)(A) Scientific Research and Design: (3)(E)-(F), (8)(C), (10)(A) Principles of Technology: (2)(K), (3)(E)-(F), (5)(D)-(E) Biotechnology I: (3)(E)-(F) Biotechnology II: (3)(E)-(F) Forensic Science: (3)(E)-(F), (7)(A), (7)(E), (14)(A) Food Science: (3)(E)-(F)</p>
<p>E. Effective communication of scientific information</p>			
<p>I.E.1. Use several modes of expression to describe or characterize natural patterns and phenomena. These modes of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic.</p>	<p>Kindergarten: (8)(A), (8)(C) Kindergarten-Grade 2: (2)(E), (3)(A)-(B) Kindergarten-Grade 4: (2)(D) Grade 1: (6)(B) Grade 2: (2)(F), (8)(D) Grade 3: (8)(C), (9)(A), (9)(C), Grades 3-5: (2)(F), (3)(C) Grade 4: (2)(C), (6)(C), (8)(B), (9)(B), (10)(B) Grade 5: (2)(G), (6)(B)-(C), (8)(B)-(C), (9)(B), (10)(C) Grades 6-8: (2)(D)-(E), (3)(B) Grade 6: (8)(B), (8)(D), (10)(D), (11)(A), (11)(C), (12)(E)-(F) Grade 7: (5)(B)-(C), (11)(B), (12)(A) Grade 8: (10)(B) Aquatic Science: (2)(H), (8)(A), (8)(C), (10)(B) Astronomy: (2)(H), (8)(B), (10)(C), (12)(A), (14)(E) Biology: (2)(H), (4)(B)-(C), (5)(A), (5)(C), (6)(A), (6)(C), (10)(A)-(B), (11)(A), (11)(D), (12)(E) Chemistry: (2)(I), (7)(D), (10)(A) Earth and Space Science: (2)(I), (4)(B), (9)(D), (10)(B)-(C), (11)(B), (12)(B), (14)(C), (15)(A), (15)(D) Environmental Systems: (2)(K), (4)(H), (6)(B)-(D), (8)(A)-(B), (8)(D), (9)(D) IPC: (2)(E), (4)(B), (4)(F), (7)(E)-(F) Physics: (2)(J)-(L), (4)(A), (5)(A)-(C), (5)(G), (6)(E), (6)(G), (7)(A), (8)(A)-(C)</p>		<p>Anatomy and Physiology: (3)(F), (3)(H), (4)(B), (4)(E) Advanced Animal Science: (3)(F), (4)(B), (4)(E), (6)(C), (13)(A), (13)(D), (14)(A)-(D) Advanced Plant and Soil Science: (3)(F), (4)(B), (4)(E), (7)(D), (8)(A), (10)(E), (18)(D) Medical Microbiology: (3)(F), (3)(H), (4)(B), (4)(E), (7)(C) Pathophysiology: (3)(F), (3)(H), (4)(B), (4)(E), (6)(B), (8)(B)-(D) Engineering Design and Problem Solving: (3)(F), (3)(H), (4)(B), (4)(E), (6)(A) Engineering Science: (3)(F), (3)(H), (4)(B), (4)(E), (10)(A) Scientific Research and Design: (3)(F), (3)(H), (4)(B), (4)(E), (7)(A), (10)(B) Principles of Technology: (2)(K), (3)(F), (3)(H), (3)(J)-(L), (4)(B), (4)(E), (5)(H)-(J), (8)(A)-(C), (8)(H), (10)(A), (10)(C), (11)(A) Biotechnology I: (3)(F), (3)(H), (4)(B), (4)(F) Biotechnology II: (3)(F), (3)(H), (4)(B), (4)(E) Forensic Science: (3)(F), (3)(H), (4)(B), (4)(E), (6)(C)-(D), (6)(H), (16)(C) Food Science: (3)(F), (3)(H), (4)(B), (4)(E)</p>
<p>I.E.2. Use essential vocabulary of the discipline being studied.</p>	<p>Kindergarten-Grade 5: (b)(1)-(10) Grade 6: (b)(1)-(12) Grade 7: (b)(1)-(14) Grade 8: (b)(1)-(11) Aquatic Science: (c)(1)-(12) Astronomy: (c)(1)-(14) Biology: (c)(1)-(12) Chemistry: (c)(1)-(12) Earth and Space Science: (c)(1)-(15) Environmental Systems: (c)(1)-(9) IPC: (c)(1)-(7) Physics: (c)(1)-(8)</p>		<p>Anatomy and Physiology: (c)(1)-(13) Advanced Animal Science: (c)(1)-(15) Advanced Plant and Soil Science: (c)(1)-(20) Medical Microbiology: (c)(1)-(7) Pathophysiology: (c)(1)-(8) Engineering Design and Problem Solving: (c)(1)-(9) Engineering Science: (c)(1)-(16) Scientific Research and Design: (c)(1)-(10) Principles of Technology: (c)(1)-(12) Biotechnology I: (c)(1)-(13) Biotechnology II: (c)(1)-(14) Forensic Science: (c)(1)-(17) Food Science: (c)(1)-(21)</p>

II. Foundation Skills: Scientific Applications of Mathematics			
A. Basic mathematics conventions			
II.A.1. Understand the real number system and its properties.	Kindergarten-Grade 2: (2)(D), (4)(B) Grades 3-4: (2)(B) Grade 5: (3)(C) Grade 6: (6)(B), (8)(C) Grade 8: (6)(A) Aquatic Science: (5)(B) Astronomy: (2)(F), (6)(A) Chemistry: (8)(A), (9)(A) Earth and Space Science: (2)(H) Environmental Systems: (7)(B) IPC: (4)(A)-(B), (7)(C) Physics: (2)(H), (6)(D)		Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Engineering Science: (7)(D)-(E), (7)(G), (8)(B)-(C), (9)(G), (10)(A)-(D), (10)(G)-(J), (11)(B), (14)(E)-(F), (15)(E)-(H), (16)(A)-(C) Principles of Technology: (7)(A)(i)-(ii), (9)(D) Biotechnology II: (8)(E) Forensic Science: (9)(A)
II.A.2. Use exponents and scientific notation.	Grade 8: (8)(D) Aquatics: (2)(F), (6)(A) Astronomy: (6)(B)-(C), (6)(E) Chemistry: (2)(G), (6)(C) Earth and Space Science: (2)(H) Environmental Systems: (2)(J), (7)(B) Physics: (2)(H)		Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Principles of Technology: (5)(F) Biotechnology I: (11)(C) Forensic Science: (9)(A)
II.A.3. Understand ratios, proportions, percentages, and decimal fractions, and translate from any form to any other.	Astronomy: (2)(F), (6)(D) Chemistry: (8)(B)-(C), (9)(A), (10)(C) Earth and Space Science: (2)(H) Environmental Systems: (4)(E), (9)(C) Physics: (5)(B)-(C), (6)(A), (6)(C)		Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Principles of Technology: (8)(B)-(C) Biotechnology I: (11)(C) Biotechnology II: (8)(B), (8)(D), (14)(C), (14)(E) Forensic Science: (9)(A) Introduction to Culinary Arts: (2)(C); Culinary Arts: (2)(C)(F)(G)
II.A.4. Use proportional reasoning to solve problems.	Biology: (10)(C) Chemistry: (8)(B), (10)(D) Earth and Space Science: (2)(H) Physics: (3)(F), (6)(C)		Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Biotechnology I: (11)(C) Biotechnology II: (4)(G) Forensic Science: (9)(A)
II.A.5. Simplify algebraic expressions.	Biology: (10)(C) Chemistry: (8)(C) Earth and Space Science: (2)(H) Physics: (2)(L), (4)(A), (5)(B)-(C), (6)(A), (6)(C)		Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Principles of Technology: (7)(A)(i)-(ii), (8)(B)-(C)
II.A.6. Estimate results to evaluate whether a calculated result is reasonable.	Kindergarten-Grade 5: (4)(A) Grade 6: (6)(B), (8)(C) Grade 8: (6)(A) Aquatics: (2)(F), (9)(C) Biology: (3)(A) Chemistry: (2)(I), (9)(A)(B) Earth and Space Science: (2)(H)		Anatomy and Physiology: (4)(A) Advanced Animal Science: (4)(A) Advanced Plant and Soil Science: (4)(A) Medical Microbiology: (4)(A) Pathophysiology: (4)(A) Engineering Design and Problem Solving: (4)(A), (5)(B)-(E), (5)(I), (5)(K) Engineering Science: (4)(A), (7)(D)-(E), (7)(G), (8)(B)-(C), (9)(G), (10)(A)-(D), (10)(G)-(J), (11)(B), (12)(D)-(E), (14)(E)-(F), (15)(E)-(H), (16)(A)-(C) Scientific Research and Design: (4)(A) Forensic Science: (4)(A) Culinary Arts: (2)(C)
II.A.7. Use calculators, spreadsheets, computers, etc., in data analysis.	Kindergarten-Grade 5: (4)(A) Grade 6: (6)(B), (8)(C) Grade 8: (6)(A) Chemistry: (2)(E) Physics: (4)(A)		Advanced Plant and Soil Science: (7)(B) Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Engineering Science: (7)(D)-(E), (7)(G), (8)(B)-(C), (9)(G), (10)(A)-(D), (10)(G)-(J), (11)(B), (12)(A), (14)(E)-(F), (15)(E)-(H), (16)(A)-(C) Principles of Technology: (7)(B), (9)(B)-(C) Culinary Arts: (10)(F);
B. Mathematics as a symbolic language			
II.B.1. Carry out formal operations using standard algebraic symbols and formulae.	Grade 6: (6)(B), (8)(C) Grade 8: (6)(A) Chemistry: (11)(D) Earth and Space Science: (2)(H), (7)(B) Environmental Systems: (7)(B) IPC: (4)(A)-(E)		Anatomy and Physiology: (3)(G) Advanced Animal Science: (3)(G) Advanced Plant and Soil Science: (3)(G), (7)(C), (18)(D) Medical Microbiology: (3)(G) Pathophysiology: (3)(G) Engineering Design and Problem Solving: (3)(G), (5)(B)-(D) Engineering Science: (3)(G), (7)(D)-(E), (7)(G), (8)(B)-(C), (9)(G), (10)(A)-(D), (10)(G)-(J), (11)(B), (12)(A), (14)(E)-(F), (15)(E)-(H), (16)(A)-(C) Scientific Research and Design: (3)(G) Principles of Technology: (3)(G), (7)(A)(i)-(ii), (7)(B), (9)(B)-(C) Forensic Science: (3)(D), (3)(G)

II.B.2. Represent natural events, processes, and relationships with algebraic expressions and algorithms.	Chemistry: (10)(C), (11)(D) Earth and Space Science: (2)(H), (7)(B) Environmental Systems: (7)(B) IPC: (4)(A)-(E), (5)(A)-(B) Physics: (5)(B)-(C)		Anatomy and Physiology: (3)(G) Advanced Animal Science: (3)(G) Advanced Plant and Soil Science: (3)(G) Medical Microbiology: (3)(G) Pathophysiology: (3)(G) Engineering Design and Problem Solving: (3)(G), (5)(B)-(D) Engineering Science: (3)(G), (7)(D)-(E), (7)(G), (8)(B)-(C), (9)(G), (10)(A)-(D), (10)(G)-(J), (11)(B), (12)(A), (14)(E)-(F), (15)(E)-(H), (16)(A)-(C) Scientific Research and Design: (3)(G) Principles of Technology: (3)(G), (7)(A)(i)-(ii), (8)(B)-(C) Forensic Science: (3)(G)
C. Understand relationships among geometry, algebra, and trigonometry			
II.C.1. Understand simple vectors, vector notations, and vector diagrams, and carry out simple calculations involving vectors.	Chemistry: (4)(E) IPC: (4)(A)-(B) Physics: (3)(F), (5)(E)		Engineering Design and Problem Solving: (5)(B)-(D), (6)(A) Engineering Science: (10)(E)-(G) Principles of Technology: (7)(A)(iii), (8)(F)
II.C.2. Understand that a curve drawn on a defined set of axes is fully equivalent to a set of algebraic equations.	Astronomy: (6)(A) Chemistry: (9)(A) Earth and Space Science: (10)(D) IPC: (4)(B) Physics: (4)(A)		Engineering Design and Problem Solving: (5)(B)-(D) Engineering Science: (10)(E)-(G), (12)(D)-(E) Biotechnology II: (4)(G)
II.C.3. Understand basic trigonometric principles, including definitions of terms such as sine, cosine, tangent, cotangent, and their relationship to triangles.			Engineering Design and Problem Solving: (5)(B)-(D) Engineering Mathematics: (5)(A)-(B)
II.C.4. Understand basic geometric principles.	Chemistry: (7)(E)		Engineering Design and Problem Solving: (5)(B)-(D) Engineering Science: (16)(D)
D. Scientific problem solving			
II.D.1. Use dimensional analysis in problem solving.	Aquatics: (2)(I) Chemistry: (2)(G), (8)(E) Environmental Systems: (2)(J)		Advanced Animal Science: (5)(B) Advanced Plant and Soil Science: (5)(B), (7)(B) Engineering Design and Problem Solving: (5)(B)-(D), (5)(I), (5)(K) Forensic Science: (8)(A), (8)(G)
E. Scientific application of probability and statistics			
II.E.1. Understand descriptive statistics.	Grades 3-5: (2)(E) Grades 6-8: (2)(E) Aquatics: (2)(F) Chemistry: (12)(B) Earth and Space Science: (2)(H)		Anatomy and Physiology: (3)(G) Advanced Animal Science: (3)(G) Advanced Plant and Soil Science: (3)(G), (7)(C), (18)(D) Medical Microbiology: (3)(G) Pathophysiology: (3)(G) Engineering Design and Problem Solving: (3)(G), (5)(B)-(D) Engineering Science: (3)(G), (15)(A)-(B), (15)(E)-(H) Scientific Research and Design: (3)(G), (8)(D)-(E), (8)(G) Principles of Technology: (3)(G) Biotechnology II: (8)(G), (13)(B) Forensic Science: (3)(G)
F. Scientific measurement			
II.F.1. Select and use appropriate Standard International (SI) units and prefixes to express measurements for real world problems.	Grades 6-8: (2)(C) Aquatics: (9)(C) Chemistry: (10)(C) Earth and Space Science: (2)(H) Physics: (2)(H)		Anatomy and Physiology: (3)(F) Advanced Animal Science: (3)(F) Advanced Plant and Soil Science: (3)(F) Medical Microbiology: (3)(F) Pathophysiology: (3)(F) Engineering Design and Problem Solving: (3)(F), (5)(B)-(D), (5)(I), (5)(J)-(K) Engineering Science: (3)(F), (11)(B), (12)(B) Scientific Research and Design: (3)(F) Principles of Technology: (3)(F), (5)(F) Biotechnology II: (8)(B), (11)(B) Forensic Science: (3)(F), (8)(C)
II.F.2. Use appropriate significant digits.	Aquatics: (2)(I) Chemistry: (2)(G) Earth and Space Science: (2)(H) Environmental Systems: (2)(J)		Anatomy and Physiology: (3)(F) Advanced Animal Science: (3)(F) Advanced Plant and Soil Science: (3)(F) Medical Microbiology: (3)(F) Pathophysiology: (3)(F) Engineering Design and Problem Solving: (3)(F), (5)(I) Engineering Science: (3)(F) Scientific Research and Design: (3)(F) Principles of Technology: (3)(F) Forensic Science: (3)(F)
II.F.3. Understand and use logarithmic notation (base 10).	Chemistry: (10)(L), (10)(I)		

III. Foundation Skills: Scientific Applications of Communication			
A. Scientific writing			
III.A.1. Use correct applications of writing practices in scientific communication.	Biology: (2)(H) Chemistry: (2)(I) IPC: (2)(E) Physics: (2)(K)		Anatomy and Physiology: (3)(H), (4)(B) Advanced Animal Science: (3)(H), (4)(B), (13)(D) Advanced Plant and Soil Science: (3)(H), (4)(B), (7)(D) Medical Microbiology: (3)(H), (4)(B), (6)(G), (6)(I) Pathophysiology: (3)(H), (4)(B) Engineering Design and Problem Solving: (3)(H), (4)(B), (6)(C)-(D) Engineering Science: (3)(H), (4)(B), (5)(D) Scientific Research and Design: (3)(H), (4)(B), (7)(A) Principles of Technology: (3)(H), (4)(B) Biotechnology I: (10)(F) Biotechnology II: (8)(F) Forensic Science: (3)(H), (4)(B)
B. Scientific reading			
III.B.1. Read technical and scientific articles to gain understanding of interpretations, apparatuses, techniques or procedures, and data.	Grades 3-5: (3)(A) Aquatics: (3)(A), (3)(C) Astronomy: (3)(A), (3)(C) Biology: (3)(A), (3)(C), (3)(F) Chemistry: (3)(A), (3)(C), (3)(F) Earth and Space Science: (3)(A), (3)(C) Environmental Systems: (3)(A), (3)(C) IPC: (3)(A), (3)(C), (3)(F) Physics: (3)(A), (3)(C), (3)(E)		Anatomy and Physiology: (4)(A)-(C) Advanced Animal Science: (4)(A)-(C) Advanced Plant and Soil Science: (4)(A)-(C) Medical Microbiology: (4)(A)-(C) Pathophysiology: (4)(A)-(C) Engineering Design and Problem Solving: (4)(A)-(C), (6)(B) Engineering Science: (4)(A)-(C) Scientific Research and Design: (4)(A)-(C), (5)(A), (6)(A)-(C) Principles of Technology: (4)(A)-(C), (12)(A)-(C) Biotechnology II: (6)(A)-(B) Forensic Science: (4)(A) - (C), (5)(E), (11)(D)
III.B.2. Set up apparatuses, carry out procedures, and collect specified data from a given set of appropriate instructions.	Kindergarten-Grade 2: (2)(D) Aquatics: (2)(A), (2)(C) Astronomy: (2)(E) Biology: (2)(F) Chemistry: (2)(E) Earth and Space Science: (2)(E) Environmental: (2)(G)-(H) Physics: (2)(F)		Anatomy and Physiology: (3)(E)-(F) Advanced Animal Science: (3)(E)-(F) Advanced Plant and Soil Science: (3)(E)-(F), (7)(A) Medical Microbiology: (3)(E)-(F), (6)(G), (6)(I) Pathophysiology: (3)(E)-(F) Engineering Design and Problem Solving: (3)(E)-(F) Engineering Science: (3)(E)-(F) Scientific Research and Design: (3)(E)-(F) Principles of Technology: (3)(E)-(F) Biotechnology I: (6)(E), (8)(D)-(E), (9)(A)-(E), (11)(B), (12)(A)-(I), (13)(A)-(B) Biotechnology II: (11)(C)-(D), (12)(A)-(C), (13)(C) Forensic Science: (3)(E)-(F), (6)(D)-(F) Food Science: (11)(D), (15)(F)
III.B.3. Recognize scientific and technical vocabulary in the field of study and use this vocabulary to enhance clarity of communication.	Kindergarten-Grade 1: (7)(B) Kindergarten-Grade 2: (7)(A) Kindergarten-Grade 5: (3)(A) Grade 2: (8)(D) Grade 3: (5)(B), (9)(A)-(C) Grades 3-5: (8)(B), (9)(B) Grade 5: (10)(B) Grade 6: (8)(B), (10)(D), (11)(A), (11)(C), (12)(E) Grade 7: (5)(B), (8)(A), (10)(A)-(C), (11)(B), (12)(A), (13)(B) Grade 8: (5)(A), (5)(C), (6)(C), (8)(A), (8)(D)-(E), (9)(A), (11)(A), (11)(D) Aquatics: (2)(J), (8)(C), (10)(B) Astronomy: (2)(H), (4)(A)-(D), (8)(B), (10)(C), (12)(A), (13)(A)-(C), (14)(A) Biology: (2)(H), (4)(B)-(C), (5)(A), (5)(C), (6)(A), (6)(C), (6)(H), (10)(A)-(B), (11)(A), (11)(D), (12)(E)-(F) Chemistry: (2)(I), (5)(A)-(C), (7)(D), (9)(A), (9)(C), (10)(A), (12)(A)-(B) Earth and Space Science: (2)(I), (4)(B), (5)(F), (8)(B), (9)(C)-(D), (10)(B)-(C), (11)(B), (12)(B), (14)(C), (15)(A), (15)(D) Environmental Systems: (2)(K) IPC: (2)(H) Physics: (2)(K), (4)(B)-(C), (4)(F), (5)(A)-(C), (5)(G)-(H), (6)(E), (6)(G), (7)(A), (7)(E)-(F), (8)(A)-(C)		Anatomy and Physiology: (1)(A), (3)(H), (4)(A)-(B), (6)(B) Advanced Animal Science: (1)(C), (3)(H), (4)(A)-(B), (6)(A)-(C), (8)(A)-(B), (8)(E)-(F), (9)(A)-(D), (11)(G), (12)(A)-(C), (13)(A), (13)(D), (14)(A)-(D) Advanced Plant and Soil Science: (1)(C), (3)(H), (4)(A)-(B), (5)(C), (7)(D), (8)(A), (14)(A), (17)(A)-(B), (18)(A), (18)(D), (19)(A)-(B), (20)(C) Medical Microbiology: (1)(A), (3)(H), (4)(A)-(B), (6)(B), (6)(G)-(J) Pathophysiology: (1)(A), (3)(H), (4)(A)-(B) Engineering Design and Problem Solving: (3)(H), (4)(A)-(B), (5)(H), (6)(B), (7)(D)-(E), (9)(I) Engineering Science: (3)(H), (4)(A)-(B), (5)(D), (6)(D), (7)(B), (9)(C)-(D) Scientific Research and Design: (3)(H), (4)(A)-(B), (5)(A), (6)(A)-(C), (9)(B) Principles of Technology: (2)(K), (3)(H), (4)(A)-(B), (7)(C), (8)(A)-(C), (8)(H)-(I), (10)(A), (10)(C), (11)(A), (11)(F)-(G) Biotechnology I: (7)(A) Biotechnology II: (7)(B), (8)(A) Forensic Science: (1), (3)(H), (4)(A)-(B), (6)(D)-(G), (11)(D) Culinary Arts: (2)(D)
III.B.4. List, use, and give examples of specific strategies before, during, and after reading to improve comprehension.			Medical Microbiology: (6)(G), (6)(I) Scientific Research and Design: (6)(A)-(C) Forensic Science: (14)(E)

C. Presentation of scientific/technical information			
III.C.1. Prepare and present scientific/technical information in appropriate formats for various audiences.	Kindergarten-Grade 2: (2)(E) Grades 3-5: (2)(F) Grades 6-8: (2)(E) Aquatic Science: (3)(B) Astronomy: (2)(H), (3)(B) Biology: (2)(H), (3)(B) Chemistry: (2)(I)-(J), (3)(B) Earth and Space Science: (2)(I), (3)(B) Environmental Systems: (2)(K), (3)(B) IPC: (2)(H), (3)(B) Physics: (2)(K), (3)(B)		Anatomy and Physiology: (3)(E), (3)(H), (4)(B), (6)(B) Advanced Animal Science: (3)(E), (3)(H), (4)(B), (13)(D) Advanced Plant and Soil Science: (3)(E), (3)(H), (4)(B), (7)(A), (7)(D) Medical Microbiology: (3)(E), (3)(H), (4)(B), (6)(G), (6)(I) Pathophysiology: (3)(E), (3)(H), (4)(B) Engineering Design and Problem Solving: (1)(C), (3)(E), (3)(H), (4)(B), (6)(C)-(D), (8)(I) Engineering Science: (1)(C), (3)(E), (3)(H), (4)(B), (5)(D) Scientific Research and Design: (1)(C), (3)(E), (3)(H), (4)(B), (7)(A), (8)(B)-(C), (8)(F), (9)(B) Principles of Technology: (1)(C), (3)(E), (3)(H), (3)(K)-(L), (4)(B), (5)(I)-(J) Biotechnology I: (10)(F) Biotechnology II: (10)(A) Forensic Science: (3)(E), (3)(H), (4)(B), (5)(D), (11)(D)
D. Research skills/information literacy			
III.D.1. Use search engines, databases, and other digital electronic tools effectively to locate information.	Kindergarten-5: (4)(A) Grade 6: (7)(A) Grade 8: (8)(E) Aquatic Science: (2)(J) Astronomy: (13)(A)-(C) Biology: (2)(F) Chemistry: (2)(E) Earth and Space Science: (2)(F) Environmental Systems: (2)(K) IPC: (2)(B) Physics: (2)(F)		Anatomy and Physiology: (4)(F), (6)(B) Advanced Animal Science: (1)(F) Advanced Plant and Soil Science: (14)(A) Medical Microbiology: (5)(B) Engineering Design and Problem Solving: (7)(A), (7)(C) Engineering Science: (6)(E) Scientific Research and Design: (4)(F), (5)(A) Principles of Technology: (4)(F) Biotechnology I: (5)(A), (5)(C)-(D), (6)(A), (10)(G) Biotechnology II: (5)(A) Forensic Science: (4)(A), (4)(E) Introduction to Culinary Arts: (5)(C)
III.D.2. Evaluate quality, accuracy, completeness, reliability, and currency of information from any source.	Grades 3-8: (3)(A) Aquatic Science: (3)(A) Astronomy: (3)(A) Biology: (3)(A) Chemistry: (3)(A) Earth and Space Science: (3)(A) Environmental Systems: (3)(A) IPC: (3)(A) Physics: (3)(A)		Anatomy and Physiology: (3)(H), (4)(A)-(B), (4)(E) Advanced Animal Science: (3)(H), (4)(A)-(B), (4)(E), (13)(D) Advanced Plant and Soil Science: (3)(H), (4)(A)-(B), (4)(E), (7)(D) Medical Microbiology: (3)(H), (4)(A)-(B), (4)(E) Pathophysiology: (3)(H), (4)(A)-(B), (4)(E) Engineering Design and Problem Solving: (3)(H), (4)(A)-(B), (4)(E), (6)(E), (7)(A), (7)(C), (8)(D), (8)(I) Engineering Science: (3)(H), (4)(A)-(B), (4)(E), (6)(E) Scientific Research and Design: (3)(H), (4)(A)-(B), (4)(E), (5)(A), (6)(C), (9)(C) Principles of Technology: (3)(H), (4)(A)-(B), (4)(E) Biotechnology I: (5)(A), (5)(C)-(D), (6)(A) Forensic Science: (3)(H), (4)(B), (11)(D)
IV. Science, Technology, and Society			
A. Interactions between innovations and science			
IV.A.1. Recognize how scientific discoveries are connected to technological innovations.	Grades 3-5: (3)(D) Grade 6: (11)(C) Aquatic Science: (3)(D) Astronomy: (3)(D), (4)(A), (14)(A)-(E) Biology: (3)(D) Chemistry: (3)(D) Earth and Space Science: (3)(D) Environmental Systems: (3)(D) IPC: (3)(D) Physics: (3)(D)	U.S. History Studies: (27)(A)-(B) World History Studies: (8)(A)	Anatomy and Physiology: (4)(D), (4)(F), (8)(C), (11)(C), (13)(A)-(B) Advanced Animal Science: (4)(D), (4)(F), (6)(B)-(C) Advanced Plant and Soil Science: (4)(D), (4)(F), (10)(E), (18)(D) Medical Microbiology: (4)(D), (4)(F), (5)(A), (6)(G), (6)(I), (7)(G) Pathophysiology: (4)(D), (4)(F), (7)(B) Engineering Design and Problem Solving: (4)(D), (4)(F), (7)(D)-(E) Engineering Science: (4)(D), (4)(F) Scientific Research and Design: (4)(D), (4)(F) Principles of Technology: (4)(D), (4)(F) Forensic Science: (4)(D), (4)(F)
B. Social ethics			
IV.B.1. Understand how scientific research and technology have an impact on ethical and legal practices.	Kindergarten-Grade 2: (1)(C) Grades 3-5: (1)(B) Aquatic Science: (3)(D) Astronomy: (3)(D) Biology: (1)(B), (3)(D) Chemistry: (1)(C), (3)(D) Earth and Space Science: (3)(D) Environmental Systems: (3)(D), (9)(I) IPC: (3)(D) Physics: (3)(D)		Anatomy and Physiology: (4)(D), (4)(F) Advanced Animal Science: (4)(D), (4)(F), (6)(B)-(C), (7)(D) Advanced Plant and Soil Science: (4)(D), (4)(F), (10)(E) Medical Microbiology: (4)(D), (4)(F), (5)(A), (7)(E), (7)(G) Pathophysiology: (4)(D), (4)(F), (7)(B) Engineering Design and Problem Solving: (4)(D), (4)(F), (7)(B), (8)(D) Engineering Science: (4)(D), (4)(F) Scientific Research and Design: (4)(D), (4)(F) Principles of Technology: (4)(D), (4)(F) Forensic Science: (4)(D), (4)(F)
IV.B.2. Understand how commonly held ethical beliefs impact scientific research.	Aquatic Science: (1)(B) Environmental Systems: (9)(G)		Anatomy and Physiology: (4)(D), (4)(F) Advanced Animal Science: (4)(D), (4)(F), (6)(B)-(C), (7)(D) Advanced Plant and Soil Science: (4)(D), (4)(F), (10)(E) Medical Microbiology: (4)(D), (4)(F), (7)(E), (7)(G) Pathophysiology: (4)(D), (4)(F) Engineering Design and Problem Solving: (4)(D), (4)(F), (7)(B), (8)(D) Engineering Science: (4)(D), (4)(F) Scientific Research and Design: (4)(D), (4)(F) Principles of Technology: (4)(D), (4)(F) Forensic Science: (4)(D), (4)(F)

C. History of science			
IV.C.1. Understand the historical development of major theories in science.	Grade 8: (8)(E), (9)(A) Aquatic Science: (3)(F) Astronomy: (4)(A), (4)(C) Biology: (3)(F) Chemistry: (3)(F), (6)(A) Earth and Space Science: (3)(F) Environmental Systems: (3)(F) IPC: (3)(F) Physics: (3)(D)	World History Studies: (27)(A)	Anatomy and Physiology: (3)(C)-(D), (4)(D), (4)(F) Advanced Animal Science: (3)(C)-(D), (4)(D), (4)(F) Advanced Plant and Soil Science: (3)(C)-(D), (4)(D), (4)(F), (18)(C) Medical Microbiology: (3)(C)-(D), (4)(D), (4)(F) Pathophysiology: (3)(C)-(D), (4)(D), (4)(F) Engineering Design and Problem Solving: (3)(C)-(D), (4)(D), (4)(F), (7)(D)-(E) Engineering Science: (3)(C)-(D), (4)(D), (4)(F) Scientific Research and Design: (3)(C)-(D), (4)(D), (4)(F) Principles of Technology: (3)(C)-(D), (4)(D), (4)(F) Forensic Science: (3)(C)-(D), (4)(D), (4)(F), (5)(F)
IV.C.2. Recognize the role of people in important contributions to scientific knowledge.	Kindergarten-Grade 2: (3)(C) Grades 3-8: (3)(D) Aquatic Science: (3)(E)-(F) Astronomy: (3)(E)-(F), (4)(A)-(B), (4)(D) Biology: (3)(F) Chemistry: (3)(E)-(F) Earth and Space Science: (3)(E)-(F) Environmental Systems: (3)(E)-(F) IPC: (3)(E)-(F) Physics: (3)(D)-(E)	World History Studies: (27)(E), (28)(E)	Anatomy and Physiology: (4)(D), (4)(F) Advanced Animal Science: (4)(D), (4)(F) Advanced Plant and Soil Science: (4)(D), (4)(F) Medical Microbiology: (4)(D), (4)(F), (5)(A) Pathophysiology: (4)(D), (4)(F) Engineering Design and Problem Solving: (4)(D), (4)(F), (7)(C)-(E), (9)(C) Engineering Science: (4)(D), (4)(F), (5)(B), (6)(A) Scientific Research and Design: (4)(D), (4)(F) Principles of Technology: (4)(D), (4)(F) Forensic Science: (4)(D), (4)(F)
V. Cross-Disciplinary Themes			
A. Matter/states of matter			
V.A.1. Know modern theories of atomic structure.	Grade 8: (5)(A) Aquatic Science: (6)(A)		
V.A.2. Understand the typical states of matter (solid, liquid, gas) and phase changes among these.	Kindergarten-Grade 5: (5)(B) Chemistry: (10)(A)		
B. Energy (thermodynamics, kinetic, potential, energy transfers)			
V.B.1. Understand the Laws of Thermodynamics.	Chemistry: (11)(B)-(D) Environmental Systems: (6)(D) Physics: (6)(E)-(G)		Principles of Technology: (10)(A)-(C)
V.B.2. Know the processes of energy transfer.	Grade 6: (9)(A)-(C) Grade 7: (5)(A), (5)(C), (7)(B) Biology: (12)(C) Chemistry: (11)(B)-(D) Environmental Systems: (6)(C), (6)(E) IPC: (5)(A)-(C), (5)(H), (7)(D) Physics: (6)(A)-(B), (6)(D), (6)(F)-(G)		Principles of Technology: (9)(A), (9)(D), (10)(B), (10)(C)
C. Change over time/equilibrium			
V.C.1. Recognize patterns of change.	Kindergarten-Grade 3: (6)(D) Grade 7: (13)(B) Grade 8: (7)(A)-(C), (10)(A)-(C) Aquatic Science: (6)(B) Astronomy: (5)(A)-(C) Biology: (4)(B), (11)(A) Earth and Space Science: (7)(B), (10)(D)-(E) Environmental Systems: (4)(C)-(D), (8)(D)		Anatomy and Physiology: (11)(D), (12)(A), (12)(C) Advanced Animal Science: (1)(B) Advanced Plant and Soil Science: (1)(B), (15)(E) Pathophysiology: (5)(B), (6)(D)-(E)
D. Classification			
V.D.1. Understand that scientists categorize things according to similarities and differences.	Kindergarten-Grade 6: (5)(A) Grade 6: (5)(C), (6)(A), (6)(C) Grade 7: (11)(A) Grade 8: (5)(C), (8)(A)-(B) Aquatic Science: (10)(A) Astronomy: (11)(G) Biology: (4)(A), (8)(A)-(C), (10)(C) Chemistry: (4)(D), (5)(A)-(C), (11)(C) Environmental Systems: (4)(A)-(B) IPC: (6)(D), (7)(D) Physics: (5)(E), (7)(B)-(C)		Advanced Plant and Soil Science: (6)(A)-(B), (8)(A)-(D), (9)(D)-(E), (10)(D)-(E), (12)(B), (15)(A)-(B), (16)(A) Medical Microbiology: (6)(F), (7)(C) Pathophysiology: (7)(F) Engineering Science: (5)(A), (5)(C), (8)(A) Principles of Technology: (8)(F), (11)(B), (11)(D) Biotechnology I: (5)(B)-(C) Forensic Science: (13)(A), (16)(D)-(E), (17)(A), (17)(C)
E. Measurements and models			
V.E.1. Use models to make predictions.	Grade 8: (7)(B), (9)(C) Aquatic Science: (2)(H) Earth and Space Science: (15)(B) Environmental Systems: (2)(I)		Anatomy and Physiology: (3)(G), (4)(E) Advanced Animal Science: (3)(G), (4)(E) Advanced Plant and Soil Science: (3)(G), (4)(E), (7)(C), (12)(A) Medical Microbiology: (3)(G), (4)(E) Pathophysiology: (3)(G), (4)(E) Engineering Design and Problem Solving: (3)(G), (4)(E), (5)(C), (5)(E) Engineering Science: (3)(G), (4)(E) Scientific Research and Design: (3)(G), (4)(E) Principles of Technology: (3)(G), (4)(E) Forensic Science: (3)(E), (4)(E), (16)(D)

V.E.2. Use scale to relate models and structures.	Grades 3-8: (3)(C) Grade 6: (3)(B), (10)(A) Grades 7-8: (3)(B) Astronomy: (6)(A) Biology: (3)(E)		Anatomy and Physiology: (4)(E) Advanced Animal Science: (4)(E) Advanced Plant and Soil Science: (4)(E) Medical Microbiology: (4)(E) Pathophysiology: (4)(E) Engineering Design and Problem Solving: (4)(E), (5)(C) Engineering Science: (4)(E) Scientific Research and Design: (4)(E) Principles of Technology: (4)(E) Forensic Science: (4)(E)
V.E.3. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.	Grades 1-2: (4)(B) Grade 8: (8)(D) Astronomy: (6)(A)-(C)		Engineering Design and Problem Solving: (5)(C)
VI. Biology			
A. Structure and function of cells			
VI.A.1. Know that although all cells share basic features, cells differentiate to carry out specialized functions.	Grade 7: (12)(D)-(F) Biology: (4)(A)-(B), (5)(B)-(C), (9)(D)		Anatomy and Physiology: (11)(B)-(D), (12)(A)-(C), (13)(A)-(B) Advanced Animal Science: (12)(A)-(B) Advanced Plant and Soil Science: (19)(A), (19)(C) Medical Microbiology: (6)(D), (6)(F) Engineering Design and Problem Solving: (5)(F) Biotechnology I: (6)(A)-(B)
VI.A.2. Explain how cells can be categorized into two major types: prokaryotic and eukaryotic, and describe major features that distinguish one from the other.	Grade 6: (12)(B), (12)(D) Biology: (4)(A)		Anatomy and Physiology: (11)(B), (12)(A), (13)(A)-(B) Advanced Animal Science: (12)(A)-(B) Advanced Plant and Soil Science: (19)(A), (19)(C) Engineering Design and Problem Solving: (5)(F) Biotechnology I: (6)(A)-(B)
VI.A.3. Describe the structure and function of major sub-cellular organelles.	Grade 6: (12)(B) Grade 7: (12)(D) Biology: (4)(A)-(C), (5)(B)		Anatomy and Physiology: (11)(B), (12)(A), (13)(A)-(B) Advanced Animal Science: (12)(A)-(B) Advanced Plant and Soil Science: (19)(A), (19)(C) Medical Microbiology: (6)(C), (6)(F) Engineering Design and Problem Solving: (5)(F) Biotechnology I: (6)(A)-(D)
VI.A.4. Describe the major features of mitosis and relate this process to growth and asexual reproduction.	Grade 7: (14)(B) Biology: (5)(A)		Anatomy and Physiology: (11)(B), (12)(A)-(C), (13)(A)-(B) Advanced Animal Science: (7)(A), (12)(A)-(B) Advanced Plant and Soil Science: (17)(D), (19)(A), (19)(C) Medical Microbiology: (6)(D) Engineering Design and Problem Solving: (5)(F)
VI.A.5. Understand the process of cytokinesis in plant and animal cells and how this process is related to growth.	Biology: (5)(A), (5)(D)		Anatomy and Physiology: (11)(B), (12)(A), (13)(A)-(B) Advanced Animal Science: (12)(A)-(B) Advanced Plant and Soil Science: (19)(A), (19)(C) Engineering Design and Problem Solving: (5)(F)
VI.A.6. Know the structure of membranes and how this relates to permeability.	Grade 7: (12)(D) Biology: (4)(C)		Anatomy and Physiology: (11)(B), (12)(A), (13)(A)-(B) Advanced Animal Science: (12)(A)-(B) Advanced Plant and Soil Science: (19)(A), (19)(C) Medical Microbiology: (6)(B)-(C), (6)(F) Engineering Design and Problem Solving: (5)(F) Forensic Science: (13)(A)
B. Biochemistry			
VI.B.1. Understand the major categories of biological molecules: lipids, carbohydrates, proteins, and nucleic acids.	Grade 7: (6)(C) Biology: (5)(A), (5)(C), (6)(A), (9)(A)		Anatomy and Physiology: (11)(B)-(C), (13)(A)-(B) Advanced Animal Science: (13)(C) Pathophysiology: (5)(A) Engineering Design and Problem Solving: (5)(F) Forensic Science: (5)(C), (13)(A) Food Science: (14)(B)
VI.B.2. Describe the structure and function of enzymes.	Biology: (9)(C)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (13)(C) Engineering Design and Problem Solving: (5)(F) Biotechnology I: (8)(F), (8)(I) Food Science: (9)(A)-(D)
VI.B.3. Describe the major features and chemical events of photosynthesis.	Grade 4: (9)(A) Grade 5: (9)(B) Grade 7: (5)(A) Biology: (9)(B)		Advanced Animal Science: (13)(C) Engineering Design and Problem Solving: (5)(F) Food Science: (14)(A)
VI.B.4. Describe the major features and chemical events of cellular respiration.	Biology: (9)(B)		Anatomy and Physiology: (9)(A)-(C), (11)(B), (13)(A)-(B) Advanced Animal Science: (13)(C) Engineering Design and Problem Solving: (5)(F)
VI.B.5. Know how organisms respond to presence or absence of oxygen, including mechanisms of fermentation.	Aquatic Science: (11)(B) Biology: (9)(B)		Anatomy and Physiology: (11)(B), (11)(D), (13)(A)-(B) Advanced Animal Science: (13)(C) Medical Microbiology: (6)(C), (6)(F) Engineering Design and Problem Solving: (5)(F) Food Science: (10)(B), (11)(A)

VI.B.6. Understand coupled reaction processes and describe the role of ATP in energy coupling and transfer.	Biology: (4)(B)		Anatomy and Physiology: (5)(A), (11)(D), (13)(A)-(B) Advanced Animal Science: (13)(C) Engineering Design and Problem Solving: (5)(F)
C. Evolution and populations			
VI.C.1. Know multiple categories of evidence for evolutionary change and how this evidence is used to infer evolutionary relationships among organisms.	Grade 4: (10)(A) Grade 5: (7)(D) Grade 7: (11)(C) Biology: (7)(A)-(B), (7)(D)-(E), (7)(G) Earth and Space Science: (7)(A), (8)(A)-(B)		Anatomy and Physiology: (11)(B)-(C), (13)(A)-(B) Pathophysiology: (5)(B) Engineering Design and Problem Solving: (5)(F)
VI.C.2. Recognize variations in population sizes, including extinction, and describe mechanisms and conditions that produce these variations.	Grade 3: (9)(C) Grade 4: (10)(A) Grade 5: (7)(D), (9)(A) Grade 7: (11)(C) Aquatic Science: (11)(B) Biology: (7)(C)-(D), (12)(D) Earth and Space Science: (8)(C) Environmental Systems: (4)(G)-(H)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Plant and Soil Science: (8)(A) Pathophysiology: (5)(B) Engineering Design and Problem Solving: (5)(F)
D. Molecular genetics and heredity			
VI.D.1. Understand Mendel's laws of inheritance.	Grades 3-5: (10)(B) Grade 7: (14)(A)-(B) Biology: (6)(A)-(B), (6)(D)-(F)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (7)(C), (8)(A)-(B), (8)(F) Advanced Plant and Soil Science: (18)(B) Engineering Design and Problem Solving: (5)(F) Forensic Science: (11)(C)
VI.D.2. Know modifications to Mendel's laws.	Biology: (6)(F)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (7)(C), (8)(A)-(B), (8)(F), (9)(B) Advanced Plant and Soil Science: (18)(B) Engineering Design and Problem Solving: (5)(F) Forensic Science: (11)(C)
VI.D.3. Understand the molecular structures and functions of nucleic acids.	Biology: (5)(A), (5)(C), (6)(A), (6)(C), (6)(E)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (7)(C), (8)(A), (8)(C)-(D) Advanced Plant and Soil Science: (18)(B) Engineering Design and Problem Solving: (5)(F) Biotechnology I: (7)(A)-(I), (8)(A)-(C), (8)(F)-(I)
VI.D.4. Understand simple principles of population genetics and describe characteristics of a Hardy-Weinberg population.	Biology: (12)(F) Environmental Systems: (4)(F), (4)(H)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (7)(B)-(C), (8)(A)-(B), (8)(F) Advanced Plant and Soil Science: (18)(B) Engineering Design and Problem Solving: (5)(F)
VI.D.5. Describe the major features of meiosis and relate this process to Mendel's laws of inheritance.	Biology: (6)(G)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (7)(B)-(C), (8)(A)-(B), (8)(F) Advanced Plant and Soil Science: (17)(D), (18)(B) Engineering Design and Problem Solving: (5)(F)
E. Classification and taxonomy			
VI.E.1. Know ways in which living things can be classified based on each organism's internal and external structure, development, and relatedness of DNA sequences.	Kindergarten-Grade 2: (10)(B) Kindergarten-Grade 3: (10)(A) Grade 6: (12)(D) Grade 7: (11)(A) Aquatic Science: (10)(A) Biology: (8)(A), (8)(C), (10)(C) Environmental Systems: (4)(A)		Anatomy and Physiology: (11)(B), (13)(A)-(B) Advanced Animal Science: (8)(E), (9)(A)-(D) Advanced Plant and Soil Science: (6)(A)-(B), (8)(A)-(D), (9)(D)-(E), (10)(D)-(E), (15)(A)-(B), (16)(A) Medical Microbiology: (7)(B) Engineering Design and Problem Solving: (5)(F) Forensic Science: (12)(A)-(C), (17)(A)-(D), (16)(E)-(F)
F. Systems and homeostasis			
VI.F.1. Know that organisms possess various structures and processes (feedback loops) that maintain steady internal conditions.	Grade 7: (13)(B) Aquatic Science: (4)(B) Biology: (4)(B), (11)(A)		Anatomy and Physiology: (7)(A)-(B), (11)(A)-(B), (12)(C), (13)(A)-(B) Advanced Animal Science: (9)(B), (11)(B), (11)(G), (12)(A)-(B) Advanced Plant and Soil Science: (17)(C)-(D), (19)(A), (19)(C) Medical Microbiology: (7)(D) Pathophysiology: (5)(D)-(E) Engineering Design and Problem Solving: (5)(F)
VI.F.2. Describe, compare, and contrast structures and processes that allow gas exchange, nutrient uptake and processing, waste excretion, nervous and hormonal regulation, and reproduction in plants, animals, and fungi; give examples of each.	Grade 7: (12)(A)-(B), (12)(E) Biology: (10)(A)-(B)		Anatomy and Physiology: (5)(B)-(D), (7)(A), (8)(A)-(B), (9)(A)-(C), (11)(A)-(B), (13)(A)-(B) Advanced Animal Science: (7)(A), (9)(B)-(D), (11)(B), (11)(G), (12)(A)-(B) Advanced Plant and Soil Science: (17)(C)-(D), (19)(A), (19)(C) Pathophysiology: (5)(D) Engineering Design and Problem Solving: (5)(F)
G. Ecology			
VI.G.1. Identify Earth's major biomes, giving their locations, typical climate conditions, and characteristic organisms.			Advanced Plant and Soil Science: (9)(A), (10)(B), (10)(E) Engineering Design and Problem Solving: (5)(F)

VI.G.2. Know patterns of energy flow and material cycling in Earth's ecosystems.	Kindergarten-Grade 2: (8)(C) Grade 1: (9)(C) Grades 1-2, 4-5: (8)(B) Grades 3-5: (9)(B) Grade 5: (7)(A), (9)(D) Grade 7: (5)(C) Grade 8: (11)(B) Aquatic Science: (6)(A), (11)(A) Biology: (12)(C), (12)(E) Earth and Space Science: (5)(C), (6)(A)-(B), (13)(F), (15)(D) Environmental Systems: (4)(C)-(D)		Advanced Plant and Soil Science: (9)(A), (10)(B), (10)(E) Engineering Design and Problem Solving: (5)(F)
VI.G.3. Understand typical forms of organismal behavior.	Grades 1-3: (9)(C) Grade 7: (13)(A) Grade 8: (11)(A) Aquatic Science: (5)(A), (5)(D) Biology: (11)(B), (12)(A)		Advanced Animal Science: (13)(C) Advanced Plant and Soil Science: (9)(A), (10)(B), (10)(E) Medical Microbiology: (6)(G), (6)(I) Engineering Design and Problem Solving: (5)(F)
VI.G.4. Know the process of succession.	Grade 7: (10)(C) Biology: (11)(D) Environmental Systems: (8)(C)		Advanced Plant and Soil Science: (9)(A), (10)(B), (10)(E) Engineering Design and Problem Solving: (5)(F)
VII. Chemistry			
A. Matter and its properties			
VII.A.1. Know that physical and chemical properties can be used to describe and classify matter.	Kindergarten-Grade 5: (5)(A) Grade 2: (5)(C) Grade 6: (6)(A), (6)(C) Grade 8: (5)(B) Chemistry: (4)(A)-(D) IPC: (6)(B)		Engineering Design and Problem Solving: (5)(F) Forensic Science: (10)(A), (11)(A) Food Science: (13)(A)
VII.A.2. Recognize and classify pure substances (elements, compounds) and mixtures.	Grades 3-4: (5)(D) Grade 6: (5)(C) Chemistry: (4)(D)		Engineering Design and Problem Solving: (5)(F) Food Science: (7)(A)-(B)
B. Atomic structure			
VII.B.1. Summarize the development of atomic theory. Understand that models of the atom are used to help understand the properties of elements and compounds.	Chemistry: (6)(A)-(C), (6)(E)		Engineering Design and Problem Solving: (5)(F)
C. Periodic table			
VII.C.1. Know the organization of the periodic table.	Grade 8: (5)(C)		Advanced Animal Science: (13)(C) Engineering Design and Problem Solving: (5)(F)
VII.C.2. Recognize the trends in physical and chemical properties as one moves across a period or vertically through a group.	Grade 8: (5)(C) Chemistry: (5)(A)-(C)		Advanced Animal Science: (13)(C) Engineering Design and Problem Solving: (5)(F)
D. Chemical bonding			
VII.D.1. Characterize ionic bonds, metallic bonds, and covalent bonds. Describe the properties of metals and ionic and covalent compounds.	Chemistry: (7)(A), (7)(C)-(D) IPC: (6)(D)		Engineering Design and Problem Solving: (5)(F)
E. Chemical reactions			
VII.E.1. Classify chemical reactions by type. Describe the evidence that a chemical reaction has occurred.	Grade 6: (5)(D) Grade 7: (6)(B) Grade 8: (5)(E) Chemistry: (10)(H)		Anatomy and Physiology: (7)(A) Medical Microbiology: (6)(C) Engineering Design and Problem Solving: (5)(F) Forensic Science: (8)(D), (9)(B) Food Science: (7)(C)-(D), (16)(A)
VII.E.2. Describe the properties of acids and bases, and identify the products of a neutralization reaction.	Chemistry: (10)(G)-(H), (10)(J)		Medical Microbiology: (6)(C) Engineering Design and Problem Solving: (5)(F) Forensic Science: (9)(B) Food Science: (5)(A)-(B), (11)(B)
VII.E.3. Understand oxidation-reduction reactions.	Chemistry: (10)(H)		Medical Microbiology: (6)(C) Engineering Design and Problem Solving: (5)(F) Food Science: (15)(D)
VII.E.4. Understand chemical equilibrium.			Medical Microbiology: (6)(C) Engineering Design and Problem Solving: (5)(F)
VII.E.5. Understand energy changes in chemical reactions.	Chemistry: (11)(A)-(E) IPC: (7)(D)		Medical Microbiology: (6)(C) Engineering Design and Problem Solving: (5)(F)
VII.E.6. Understand chemical kinetics.	Chemistry: (9)(C), (11)(A) Earth and Space Science: (5)(B) IPC: (5)(A)		Medical Microbiology: (6)(C) Engineering Design and Problem Solving: (5)(F)
F. Chemical nomenclature			
VII.F.1. Know formulas for ionic compounds.	Grade 8: (5)(D) Chemistry: (7)(A)-(C)		Engineering Design and Problem Solving: (5)(F) Forensic Science: (10)(A)-(B)

VII.F.2. Know formulas for molecular compounds.	Grade 8: (5)(D) Chemistry: (7)(B)-(C), (8)(C)		Engineering Design and Problem Solving: (5)(F) Forensic Science: (10)(B)
G. The mole and stoichiometry			
VII.G.1. Understand the mole concept.	Chemistry: (8)(A)-(B), (9)(A)		Engineering Design and Problem Solving: (5)(F) Biotechnology I: (11)(B), (14)(E)
VII.G.2. Understand molar relationships in reactions, stoichiometric calculations, and percent yield.	Chemistry: (8)(B)-(E), (9)(B)		Engineering Design and Problem Solving: (5)(F) Biotechnology I: (11)(B), (14)(E)
H. Thermochemistry			
VII.H.1. Understand the Law of Conservation of Energy and processes of heat transfer.	Grade 8: (10)(A) Chemistry: (11)(B) IPC: (5)(E)-(D) Physics: (6)(D), (6)(G)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (9)(D), (10)(C)
VII.H.2. Understand energy changes and chemical reactions.	Grade 6: (5)(D) Grade 8: (5)(E) Chemistry: (11)(C)-(E) IPC: (7)(A), (7)(D)		Engineering Design and Problem Solving: (5)(F) Food Science: (13)(B)-(D)
I. Properties and behavior of gases, liquids, and solids			
VII.I.1. Understand the behavior of matter in its various states: solid, liquid, and gas.	Grades 3-5: (5)(B) Chemistry: (4)(C) IPC: (5)(E), (6)(A), (6)(E)		Engineering Design and Problem Solving: (5)(F)
VII.I.2. Understand properties of solutions.	Chemistry: (10)(B), (10)(D)-(F) IPC: (6)(E)		Engineering Design and Problem Solving: (5)(F) Food Science: (8)(A)-(D), (8)(F), (17)(B), (18)(A), (18)(C)
VII.I.3. Understand principles of ideal gas behavior and kinetic molecular theory.	Chemistry: (9)(A)-(C)		Engineering Design and Problem Solving: (5)(F)
VII.I.4. Apply the concept of partial pressures in a mixture of gases.	Chemistry: (9)(A)		Engineering Design and Problem Solving: (5)(F)
VII.I.5. Know properties of liquids and solids.	Kindergarten-5: (5)(A) Chemistry: (4)(C) IPC: (6)(E)		Engineering Design and Problem Solving: (5)(F)
VII.I.6. Understand the effect of vapor pressure on changes in state; explain heating curves and phase diagrams.	Chemistry: (9)(A)-(B)		Engineering Design and Problem Solving: (5)(F)
VII.I.7. Describe intermolecular forces.	Chemistry: (7)(D) IPC: (6)(A)		Engineering Design and Problem Solving: (5)(F)
J. Basic structure and function of biological molecules: proteins, carbohydrates, lipids, and nucleic acids			
VII.J.1. Understand the major categories of biological molecules: proteins, carbohydrates, lipids, and nucleic acids.	Grade 7: (6)(C) Biology: (5)(A), (5)(C), (6)(A), (9)(A)		Engineering Design and Problem Solving: (5)(F) Forensic Science: (10)(B)-(C)
K. Nuclear chemistry			
VII.K.1. Understand radioactive decay.	Chemistry: (12)(A)-(C) Earth and Space Science: (7)(B) IPC: (7)(E)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(I), (12)(D)-(F) Food Science: (19)(A)
VIII. Physics			
A. Matter			
VIII.A.1. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.	Grades 1-2: (4)(B) Grade 8: (8)(D) Astronomy: (6)(A)-(C)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(H)
VIII.A.2. Understand states of matter and their characteristics.	Grades 2-5: (5)(A) Grades 3-4: (5)(B) Grade 3: (5)(C) Chemistry: (4)(C) IPC: (5)(E), (6)(A), (7)(A)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(H)
VIII.A.3. Understand the concepts of mass and inertia.	Grade 8: (6)(C) Physics: (4)(D)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (10)(B) Principles of Technology: (7)(B), (8)(H)
VIII.A.4. Understand the concept of density.	Grade 6: (6)(B) Aquatic Science: (8)(A) Earth and Space Science: (5)(E), (10)(B), (13)(B) IPC: (6)(B)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (11)(B) Principles of Technology: (8)(H)
VIII.A.5. Understand the concepts of gravitational force and weight.	Grade 3: (6)(C) Grade 4: (6)(D) Grade 6: (11)(B) Astronomy: (9)(C) Earth and Space Science: (5)(A)-(B), (9)(C) IPC: (4)(F)-(G), (5)(B) Physics: (5)(A)-(B)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(A)-(B), (8)(H) Forensic Science: (9)(A)

B. Vectors			
VIII.B.1. Understand how vectors are used to represent physical quantities.	Physics: (3)(F), (4)(E)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (10)(E)-(F) Principles of Technology: (7)(A)(iii), (7)(C), (8)(H) Engineering Mathematics: (4)(A)
VIII.B.2. Demonstrate knowledge of vector mathematics using a graphical representation.	Physics: (3)(F), (4)(E)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (10)(G)-(H) Principles of Technology: (7)(A)(ii), (8)(H) Engineering Mathematics: (4)(A)
VIII.B.3. Demonstrate knowledge of vector mathematics using a numerical representation.	Physics: (3)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (10)(G)-(H) Principles of Technology: (7)(A)(ii), (8)(H) Engineering Mathematics: (4)(A)
C. Forces and motion			
VIII.C.1. Understand the fundamental concepts of kinematics.	Kindergarten-Grade 5: (6)(D) Grade 3: (6)(B)-(C) Grade 6: (8)(B) Grade 8: (6)(B) IPC: (4)(A)-(D) Physics: (4)(A)-(B), (4)(F)		Anatomy and Physiology: (6)(E) Engineering Design and Problem Solving: (5)(F) Engineering Science: (7)(A)-(C) Principles of Technology: (7)(C), (8)(H) Forensic Science: (9)(A), (14)(B)
VIII.C.2. Understand forces and Newton's Laws.	Grade 6: (8)(B) Grade 8: (6)(A), (6)(C) Astronomy: (9)(C) IPC: (4)(D) Physics: (4)(D)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (10)(C), (10)(I)-(J) Principles of Technology: (7)(B), (8)(H) Forensic Science: (9)(A)
VIII.C.3. Understand the concept of momentum.	IPC: (4)(E) Physics: (6)(C)-(D)		Anatomy and Physiology: (6)(E) Engineering Design and Problem Solving: (5)(F) Engineering Science: (7)(A)-(C) Principles of Technology: (8)(H), (9)(C)-(D) Forensic Science: (9)(A)
D. Mechanical energy			
VIII.D.1. Understand potential and kinetic energy.	Grade 6: (8)(A) IPC: (5)(A)-(B) Physics: (6)(B)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (9)(A)-(C) Principles of Technology: (8)(H), (9)(A)-(C)
VIII.D.2. Understand conservation of energy.	Chemistry: (11)(B) IPC: (5)(D) Physics: (6)(D), (6)(G)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (9)(A)-(C)
VIII.D.3. Understand the relationship of work and mechanical energy.	Grade 3: (6)(A) Grade 7: (7)(A) Physics: (6)(A)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (9)(A)-(C) Principles of Technology: (8)(H), (9)(A)-(C) Engineering Mathematics: (10)(D)(E)
E. Rotating systems			
VIII.E.1. Understand rotational kinematics.			Engineering Design and Problem Solving: (5)(F) Engineering Science: (7)(A)-(C) Principles of Technology: (8)(H)
VIII.E.2. Understand the concept of torque.			Anatomy and Physiology: (6)(D) Engineering Design and Problem Solving: (5)(F) Engineering Science: (7)(A)-(C) Principles of Technology: (8)(H)
VIII.E.3. Apply the concept of static equilibrium.			Engineering Design and Problem Solving: (5)(F) Engineering Science: (7)(A)-(C), (10)(I)-(J) Principles of Technology: (8)(H)
VIII.E.4. Understand angular momentum.			Engineering Design and Problem Solving: (5)(F) Engineering Science: (7)(A)-(C) Principles of Technology: (8)(H)
F. Fluids			
VIII.F.1. Understand pressure in a fluid and its applications.	Aquatic Science: (8)(A), (8)(C)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (14)(A)-(F)
VIII.F.2. Understand Pascal's Principle.	Aquatic Science: (8)(A)		Engineering Design and Problem Solving: (5)(F) Engineering Mathematics: (3)(C), (8)(A)-(C) Engineering Science: (14)(A)-(F)
VIII.F.3. Understand buoyancy.	Aquatic Science: (8)(A) IPC: (6)(C)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (14)(A)-(F)
VIII.F.4. Understand Bernoulli's principle.	Aquatic Science: (8)(A)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (14)(A)-(F), (15)(C) Aircraft Powerplant Technology: (3)(B)(E)

G. Oscillations and waves			
VIII.G.1. Understand basic oscillatory motion and simple harmonic motion.	Earth and Space Science: (15)(A) Physics: (7)(A)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (11)(A)
VIII.G.2. Understand the difference between transverse and longitudinal waves.	Physics: (7)(C)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (11)(D)
VIII.G.3. Understand wave terminology: wavelength, period, frequency, and amplitude.	Grade 8: (8)(C) Chemistry: (6)(B)-(C) IPC: (5)(G) Physics: (7)(B)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (11)(B)-(C)
VIII.G.4. Understand the properties and behavior of sound waves.	Physics: (7)(C)-(D), (7)(F)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (11)(C)-(E), (11)(G)
H. Thermodynamics			
VIII.H.1. Understand the gain and loss of heat energy in matter.	Grade 6: (9)(A)-(B) Grade 8: (10)(A) Environmental Systems: (6)(D) IPC: (5)(D)-(E) Physics: (6)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (9)(E)-(F) Principles of Technology: (10)(B) Food Science: (13)(A)-(D), (19)(B)
VIII.H.2. Understand the basic laws of thermodynamics.	Environmental Systems: (6)(D) Physics: (6)(E), (6)(G)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (9)(E)-(F) Principles of Technology: (10)(A), (10)(C)
I. Electromagnetism			
VIII.I.1. Discuss electric charge and electric force.	Grades 4-5: (6)(C) IPC: (4)(G), (5)(C) Physics: (5)(C)-(D)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(C)-(E), (8)(H)
VIII.I.2. Gain qualitative and quantitative understandings of voltage, current, and resistance.	Physics: (5)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (8)(D) Principles of Technology: (8)(G)-(H)
VIII.I.3. Understand Ohm's Law.	Physics: (5)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (8)(D) Principles of Technology: (8)(G)-(H)
VIII.I.4. Apply the concept of power to electricity.	Grades 4-5: (6)(C) Physics: (5)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (9)(D) Principles of Technology: (8)(G)-(H)
VIII.I.5. Discuss basic DC circuits that include voltage sources and combinations of resistors.	IPC: (5)(F) Physics: (5)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (8)(D) Principles of Technology: (8)(G)-(H)
VIII.I.6. Discuss basic DC circuits that include voltage sources and combinations of capacitors.	IPC: (5)(F) Physics: (5)(F)		Engineering Design and Problem Solving: (5)(F) Engineering Science: (8)(D) Principles of Technology: (8)(G)-(H)
VIII.I.7. Understand magnetic fields and their relationship to electricity.	Physics: (5)(G)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(H)
VIII.I.8. Relate electricity and magnetism to everyday life.	Grade 5: (6)(B) IPC: (5)(C) Physics: (5)(D), (7)(F)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (8)(D)-(E), (8)(H)
J. Optics			
VIII.J.1. Know the electromagnetic spectrum.	Grade 8: (8)(C) Astronomy: (14)(D) Chemistry: (6)(B) Physics: (7)(C)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (11)(D)
VIII.J.2. Understand the wave/particle duality of light.	Physics: (8)(A)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (12)(A)
VIII.J.3. Understand concepts of geometric optics.	Physics: (8)(A)		Engineering Design and Problem Solving: (5)(F) Principles of Technology: (12)(A) Forensic Science: (7)(D)
IX. Earth and Space Sciences			
A. Earth systems			
IX.A.1. Know the major features and characteristics of atmosphere, geosphere, hydrosphere, and biosphere.	Grades 4-5: (8)(B) Grade 6: (10)(A) Aquatic Science: (6)(A), (9)(A) Biology: (12)(C), (12)(E) Earth and Space Science: (6)(A)-(D) Environmental Systems: (4)(C), (6)(H)		
IX.A.2. Understand relationships and interactions among atmosphere, geosphere, hydrosphere, and biosphere.	Grade 5: (8)(B) Grade 7: (8)(A) Aquatic Science: (6)(B) Earth and Space Science: (6)(B)-(C), (11)(C), (13)(A) Environmental Systems: (8)(D)		Advanced Plant and Soil Science: (10)(G)

IX.A.3. Possess a scientific understanding of the history of Earth's systems.	Astronomy: (4)(A) Biology: (7)(A) Earth and Space Science: (6)(A)-(D), (8)(A)-(C), (9)(A)-(C)		
IX.A.4. Utilize the tools scientists use to study and understand the Earth's systems.	Kindergarten-Grade 8: (4)(A) Grade 8: (9)(C) Aquatic Science: (4)(C), (5)(B) Biology: (2)(F) Earth and Space Science: (2)(E)-(F), (9)(C) Environmental Systems: (2)(G)-(H), (4)(E)		
B. Sun, Earth, and moon system			
IX.B.1. Understand interactions among the sun, Earth, and moon.	Kindergarten: (8)(B) Grade 1: (8)(C) Grade 2: (8)(C) Grade 3: (8)(B)-(C) Grade 4: (8)(B)-(C) Grade 5: (8)(B) Grade 6: (11)(A) Grade 8: (7)(A)-(C) Astronomy: (7)(A)-(D), (8)(A)-(D)		
IX.B.2. Possess a scientific understanding of the formation of the Earth and moon.	Earth and Space Science: (5)(D)		
C. Solar system			
IX.C.1. Describe the structure and motions of the solar system and its components.	Astronomy: (9)(B)-(C), (10)(A) Earth and Space Science: (5)(C), (5)(E)		
IX.C.2. Possess a scientific understanding of the formation of the solar system.	Astronomy: (9)(D) Earth and Space Science: (5)(A)		
D. Origin and structure of the universe			
IX.D.1. Understand scientific theories for the formation of the universe.	Grade 8: (8)(E) Astronomy: (11)(B), (13)(A)-(B) Earth and Space Science: (4)(A), (4)(C)		
IX.D.2. Know the current scientific descriptions of the components of the universe.	Grade 8: (8)(A)-(B) Astronomy: (11)(A)-(G), (12)(A)-(G) Earth and Space Science: (4)(C)		
E. Plate tectonics			
IX.E.1. Describe the evidence that supports the current theory of plate tectonics.	Grade 8: (9)(A) Earth and Space Science: (9)(A), (10)(A), (10)(D), (10)(F), (11)(B)		
IX.E.2. Identify the major tectonic plates.	Grade 6: (10)(C)		
IX.E.3. Describe the motions and interactions of tectonic plates.	Grade 6: (10)(D) Grade 8: (9)(B) Earth and Space Science: (10)(B)-(C), (10)(E) Environmental Systems: (8)(A)		
IX.E.4. Describe the rock cycle and its products.	Grade 5: (7)(A) Grade 6: (10)(B) Environmental Systems: (4)(C)		
F. Energy transfer within and among systems			
IX.F.1. Describe matter and energy transfer in the Earth's systems.	Grade 3: (9)(B) Grade 5: (9)(D) Grade 8: (10)(A) Aquatic Science: (6)(A) Earth and Space Science: (9)(A), (14)(C) Environmental Systems: (4)(C) IPC: (5)(G), (5)(I), (14)(C)		Principles of Technology: (12)(D)
IX.F.2. Give examples of effects of energy transfer within and among systems.	Grade 5: (9)(B), (9)(D) Grade 8: (10)(A)-(C) Aquatic Science: (11)(A) Biology: (9)(B), (12)(C) Earth and Space Science: (9)(A), (14)(C) Environmental Systems: (6)(C)-(E)		Engineering Science: (9)(F)-(G)
X. Environmental Science			
A. Earth systems			
X.A.1. Recognize the Earth's systems.	Aquatic Science: (4)(A) Earth and Space Science: (9)(B) Environmental Systems: (6)(A)		Advanced Plant and Soil Science: (6)(A)-(B), (10)(E)

X.A.2. Know the major features of the geosphere and the factors that modify them.	Grades 3-5: (7)(B) Grade 6: (10)(D) Grade 7: (8)(B) Grade 8: (9)(B)-(C) Aquatic Science: (4)(A) Environmental Systems: (6)(A), (8)(A)		Advanced Plant and Soil Science: (10)(E)-(F), (12)(C)
X.A.3. Know the major features of the atmosphere.	Kindergarten-Grade 5: (8)(A) Grade 8: (10)(A)-(C) Environmental Systems: (6)(A)		Advanced Plant and Soil Science: (10)(E)
X.A.4. Know the major features of the hydrosphere.	Kindergarten-Grade 2: (7)(B) Aquatic Science: (4)(A), (7)(A) Environmental Systems: (6)(A)		Advanced Plant and Soil Science: (10)(E)
X.A.5. Be familiar with Earth's major biomes.	Grade 5: (9)(A) Environmental Systems: (4)(B), (4)(D)		Advanced Plant and Soil Science: (6)(A)-(B), (10)(E)
X.A.6. Describe the Earth's major biogeochemical cycles.	Aquatic Science: (6)(A) Environmental Systems: (6)(A)		Advanced Plant and Soil Science: (10)(E)
B. Energy			
X.B.1. Understand energy transformations.	Grades 1,6: (9)(C) Grade 7: (5)(C) Grade 8: (11)(A) Biology: (12)(A), (12)(C) Environmental Systems: (6)(C), (6)(E)		Advanced Plant and Soil Science: (20)(A)-(D) Engineering Science: (9)(D), (9)(F)-(G)
X.B.2. Know the various sources of energy for humans and other biological systems.	Grades 1,4: (9)(C) Grade 7: (5)(C) Grade 8: (11)(A) Environmental Systems: (6)(C)-(D)		Advanced Plant and Soil Science: (20)(A)-(D) Engineering Science: (9)(D)
C. Populations			
X.C.1. Recognize variations in population sizes, including human population and extinction, and describe mechanisms and conditions that produce these variations.	Grade 3: (9)(C) Grade 7: (11)(B) Grade 8: (11)(C) Aquatic Science: (12)(B) Biology: (7)(D), (11)(B), (11)(D), (12)(D) Earth and Space Science: (11)(E) Environmental Systems: (4)(G), (7)(A)-(B), (7)(D), (8)(A)		Advanced Animal Science: (11)(G) Advanced Plant and Soil Science: (10)(E) Pathophysiology: (8)(D)
D. Economics and politics			
X.D.1. Name and describe major environmental policies and legislation.	Aquatic Science: (12)(E) Environmental Systems: (9)(I), (9)(K), (9)(L)		Advanced Animal Science: (13)(B), (14)(C) Medical Microbiology: (5)(B), (7)(H) Engineering Design and Problem Solving: (8)(D)
X.D.2. Understand the types, uses, and regulations of the various natural resources.	Aquatic Science: (1)(B), (12)(E)-(D) Astronomy: (1)(B) Biology: (1)(B), (12)(D) Chemistry: (1)(C) Earth and Space Science: (1)(B), (3)(D), (12)(A)-(E) Environmental Systems: (1)(B), (5)(C)-(F), (7)(C), (7)(K) IPC: (1)(B) Physics: (1)(C)		Advanced Animal Science: (2)(B), (13)(B), (14)(C) Advanced Plant and Soil Science: (2)(B) Medical Microbiology: (2)(B), (7)(H) Pathophysiology: (2)(B) Engineering Design and Problem Solving: (2)(B), (8)(D) Engineering Science: (2)(B) Scientific Research and Design: (2)(B) Principles of Technology: (2)(B)
E. Human practices and their impacts			
X.E.1. Describe the different uses for land (land management).	Environmental Systems: (5)(A), (9)(J)		Advanced Animal Science: (13)(B), (13)(E), (14)(B) Advanced Plant and Soil Science: (9)(C), (10)(A)-(C), (10)(E), (13)(B), (15)(B) Engineering Design and Problem Solving: (8)(D)
X.E.2. Understand the use and consequences of pest management.	Biology: (12)(F) Environmental Systems: (4)(F)-(G), (8)(B), (9)(A)-(B), (9)(J)		Advanced Animal Science: (11)(G), (13)(B) Advanced Plant and Soil Science: (8)(C), (9)(C), (10)(B), (10)(E), (13)(B) Engineering Design and Problem Solving: (8)(D)
X.E.3. Know the different methods used to increase food production.	Environmental Systems: (5)(E), (9)(G), (9)(J)		Advanced Animal Science: (6)(B)-(C), (7)(B), (8)(F), (13)(A), (13)(E), (14)(D) Advanced Plant and Soil Science: (9)(C), (10)(B), (10)(E), (13)(B) Engineering Design and Problem Solving: (8)(D)
X.E.4. Understand land and water usage and management practices.	Grade 7: (8)(C) Environmental Systems: (4)(E), (5)(A)-(B), (5)(F), (8)(C), (9)(A)-(C), (9)(J)		Advanced Plant and Soil Science: (9)(C), (10)(A)-(C), (10)(E), (13)(B), (14)(B) Engineering Design and Problem Solving: (8)(D)
X.E.5. Understand how human practices affect air, water, and soil quality.	Grade 5: (9)(C) Grades 6-8: (1)(B) Grade 7: (8)(C) Grade 8: (11)(D) Aquatic Science: (12)(A)-(D) Biology: (12)(F) Earth and Space Science: (11)(E) Environmental Systems: (4)(D)-(F), (5)(F), (8)(B), (9)(A)-(B), (9)(D)-(E), (9)(J) IPC: (5)(I), (7)(F)		Anatomy and Physiology: (2)(B) Advanced Animal Science: (2)(B) Advanced Plant and Soil Science: (2)(B), (8)(C), (9)(C), (10)(B), (10)(E)-(G), (13)(B)-(C) Medical Microbiology: (2)(B) Pathophysiology: (2)(B) Engineering Design and Problem Solving: (2)(B), (8)(D) Engineering Science: (2)(B) Scientific Research and Design: (2)(B) Principles of Technology: (2)(B)