



Coordinated Science for the 21st Century Correlation to the Connecticut Core Science Curriculum Framework, Grades 9-10

Core Scientific Inquiry, Literacy and Numeracy

Standards and Expected Performances	Location/Page where Standard is found
D INQ.1 Identify questions that can be answered through scientific investigation.	113-118, 119-123, 296-301, 328-337, 647-653, 888-897, 898-906, 958-968, 979-983
D INQ.2 Read, interpret and examine the credibility and validity of scientific claims in different sources of information.	Throughout, for example: 113-118, 119-123, 296-301, 328-337, 647-652, 862-871, 872-883, 888-897, 898-906, 958-968, 979-988
D INQ.3 Formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.	328-337, 591-596, 597-605, 693-702, 781-791, 792-799, 843-852
D INQ.4 Design and conduct appropriate types of scientific investigations to answer different questions.	Throughout, for example: 113-118, 119-123, 296-301, 328-337, 647-652, 862-871, 872-883, 888-897, 898-906, 958-968, 979-988
D INQ.5 Identify independent and dependent variables, including those that are kept constant and those used as controls.	82-87, 96-100, 119-123, 328-337, 752-760, 781-791, 907-914, 946-957, 958-968
D INQ.6 Use appropriate tools and techniques to make observations and gather data.	Throughout, for example: 328-337, 825-834, 862-871
D INQ.7 Assess the reliability of the data that was generated in the investigation.	684-692, 693-702

D INQ.8 Use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.	119-123, 131-136, 274-280, 350-359, 693-702, 703-713, 781-791, 862-871
D INQ.9 Articulate conclusions and explanations based on research data, and assess results based on the design of the investigation.	119-123, 131-136, 296-301, 647-653
D INQ.10 Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.	119-123, 328-337

Grade 9

Core Themes, Content Standards and Expected Performances

Strand I: Energy Transformations

Standards and Expected Performances	Location/Page where Standard is found
9.1 - Energy cannot be created or destroyed; however, energy can be converted from one form to another.	
D 1. Describe the effects of adding energy to matter in terms of the motion of atoms and molecules, and the resulting phase changes.	328-337, 496-502
D 2. Explain how energy is transferred by conduction, convection and radiation.	809-814
D 3. Describe energy transformations among heat, light, electricity and motion.	33-46, 101-106, 496-502, 703-713, 804-815, 816-824, 843-852, 872-883
9.2 - The electrical force is a universal force that exists between any two charged objects.	
D 4. Explain the relationship among voltage, current and resistance in a simple series circuit.	214-218, 219-222, 223-227, 228-234
D 5. Explain how electricity is used to produce heat and light in incandescent bulbs and heating elements.	816-824, 804-815, 877-883
D 6. Describe the relationship between current and magnetism.	214-218, 219-222, 223-227, 228-234, 235-240, 241-243, 250-256

9.3 - Various sources of energy are used by humans and all have advantages and disadvantages.	
D 7. Explain how heat is used to generate electricity.	816-824, 805-815, 872-883, 825-834
D 8. Describe the availability, current uses and environmental issues related to the use of fossil and nuclear fuels to produce electricity.	816-824, 825-834, 835-842
D 9. Describe the availability, current uses and environmental issues related to the use of hydrogen fuel cells, wind and solar energy to produce electricity.	843-852, 816-824, 835-842, 853-861, 872-883

Strand II: Chemical Structures and Properties

Standards and Expected Performances	Location/Page where Standard is found
9.4 - Atoms react with one another to form new molecules.	
D 10. Describe the general structure of the atom, and explain how the properties of the first 20 elements in the Periodic Table are related to their atomic structures.	360-366, 372-376, 390-395, 425-433, 434-441, 396-406, 407-414
D 11. Describe how atoms combine to form new substances by transferring electrons (ionic bonding) or sharing electrons (covalent bonding).	475-489
D 12. Explain the chemical composition of acids and bases, and explain the change of pH in neutralization reactions.	473-478, 510-519
9.5 – Due to its unique chemical structure, carbon forms many organic and inorganic compounds.	
D 13. Explain how the structure of the carbon atom affects the type of bonds it forms in organic and inorganic molecules.	377-382, 544-551, 552-558, 591-596
D 14. Describe combustion reactions of hydrocarbons and their resulting by-products.	377-382, 544-551, 552-558, 591-596
D 15. Explain the general formation and structure of carbon-based polymers, including synthetic polymers, such as polyethylene, and biopolymers, such as carbohydrate.	377-382, 544-551, 552-558, 591-596

9.6 - Chemical technologies present both risks and benefits to the health and well-being of humans, plants and animals.	
D 16. Explain how simple chemical monomers can be combined to create linear, branched and/or cross-linked polymers.	377-382, 544-551, 552-558, 591-596
D 17. Explain how the chemical structure of polymers affects their physical properties.	377-382, 544-551, 552-558, 591-596
D 18. Explain the short- and long-term impacts of landfills and incineration of waste materials on the quality of the environment.	597-605, 583-590

Strand III: Global Interdependence

Standards and Expected Performances	Location/Page where Standard is found
9.7 - Elements on Earth move among reservoirs in the solid earth, oceans, atmosphere and organisms as part of biogeochemical cycles.	
D 19. Explain how chemical and physical processes cause carbon to cycle through the major earth reservoirs	591-596, 781-791, 843-851
D 20. Explain how solar energy causes water to cycle through the major earth reservoirs.	583-590, 781-791, 843-851
D 21. Explain how internal energy of the Earth causes matter to cycle through the magma and the solid earth.	898-906, 927-934, 888-897, 946-957, 969-978
9.8 - The use of resources by human populations may affect the quality of the environment.	
D 22. Explain how the release of sulfur dioxide (SO ₂) into the atmosphere can form acid rain, and how acid rain affects water sources, organisms and human-made structures.	843-852, 922-926
D 23. Explain how the accumulation of carbon dioxide (CO ₂) in the atmosphere increases Earth's "greenhouse" effect and may cause climate changes.	781-791, 922-926, 591-596
D 24. Explain how the accumulation of mercury, phosphates and nitrates affects the quality of water and the organisms that live in rivers, lakes and oceans.	597-605, 583-590
9.9 - Some materials can be recycled, but others accumulate in the environment and may affect the balance of the Earth systems.	

D 25. Explain how land development, transportation options and consumption of resources may affect the environment.	576-582, 583-590, 804-815, 843-852, 853-861, 872-883, 781-791, 792-799, 915-921, 922-926
D 26. Describe human efforts to reduce the consumption of raw materials and improve air and water quality.	576-582, 583-590, 843-852

Strand IV: Cell Chemistry and Biotechnology

Standards and Expected Performances	Location/Page where Standard is found
10.1 - Fundamental life processes depend on the physical structure and the chemical activities of the cell.	
D 27. Describe significant similarities and differences in the basic structure of plant and animal cells.	610-619
D 28. Describe the general role of DNA and RNA in protein synthesis.	620-626
D 29. Describe the general role of enzymes in metabolic cell processes.	503-509
D 30. Explain the role of the cell membrane in supporting cell functions.	583-590
10.2 - Microorganisms have an essential role in life processes and cycles on Earth.	
D 31. Describe the similarities and differences between bacteria and viruses.	610-619
D 32. Describe how bacterial and viral infectious diseases are transmitted, and explain the roles of sanitation, vaccination and antibiotic medications in the prevention and treatment of infectious diseases.	610-619
D 33. Explain how bacteria and yeasts are used to produce foods for human consumption	610-619
10.3 - Similarities in the chemical and structural properties of DNA in all living organisms allow the transfer of genes from one organism to another.	
D 34. Describe, in general terms, how the genetic information of organisms can be altered to make them produce new materials.	620-626, 627-636

D 35. Explain the risks and benefits of altering the genetic composition and cell products of existing organisms.	620-626, 627-636
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Strand V: Genetics, Evolution and Biodiversity

Standards and Expected Performances	Location/Page where Standard is found
10.4 - In sexually reproducing organisms, each offspring contains a mix of characteristics inherited from both parents.	
D 36. Explain how meiosis contributes to the genetic variability of organisms.	620-626
D 37. Use the Punnet Square technique to predict the distribution of traits in mono- and di-hybrid crossings.	620-626
D 38. Deduce the probable mode of inheritance of traits (e.g., recessive/dominant, sex-linked) from pedigree diagrams showing phenotypes.	620-626
D 39. Describe the difference between genetic disorders and infectious diseases.	620-626
10.5 - Evolution and biodiversity are the result of genetic changes that occur over time in constantly changing environments.	
D 40. Explain how the processes of genetic mutation and natural selection are related to the evolution of species.	532-543, 544-551, 627-636
D 41. Explain how the current theory of evolution provides a scientific explanation for fossil records of ancient life forms.	610-619, 620-626, 627-636, 637-646, 647-653
D 42. Describe how structural and behavioral adaptations increase the chances for organisms to survive in their environments.	532-543, 544-551, 627-636
10.6 - Living organisms have the capability of producing populations of unlimited size, but the environment can support only a limited number of individuals from each species.	
D 43. Describe the factors that affect the carrying capacity of the environment.	532-543, 544-551, 552-558, 559-567, 568-575, 576-582, 804-815
D 44. Explain how change in population density is affected by emigration, immigration, birth rate and death rate, and relate these factors to the exponential growth of human populations.	544-551, 552-558, 559-567, 568-575, 804-815

D 45. Explain how technological advances have affected the size and growth rate of human populations throughout history.	77, 137, 209, 244, 313, 526, 606, 654, 736, 800, 884, 942, 1002