# CONNECTICUT
# Content Standards and Expected Performances
# Core Science for Grades 6-8
# *Science Level Green* © 2008

| OBJECTIVES | PAGE REFERENCES |
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| **Grade 6**<br>**Core Themes, Content Standards, and Expected Performances** | |
| *Properties of Matter – How does the structure of matter affect the properties and uses of materials?*<br>**6.1 - Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties.**<br>♦ Mixtures are made of combinations of elements and/or compounds, and they can be separated by using a variety of physical means.<br>♦ Pure substances can be either elements or compounds, and they cannot be broken down by physical means. | SE: 30-34, 36-40, 41-47, 58, 64-65, 246-251, 620-626<br>*Integrate Environment* 627<br>TWE: DIN 623<br>QD 249 |
| **C1.** Describe the properties of common elements, such as oxygen, hydrogen, carbon, iron and aluminum. | SE: 34, 45, 91, 166, 247, 255, 262-263, 549<br>*Reference Handbooks* 800-801<br>TWE: FYI 264 |
| **C 2.** Describe how the properties of simple compounds, such as water and table salt, are different from the properties of the elements of which they are made. | SE: 30, 75, 248-249, 597<br>*Integrate Physics* 253<br>TWE: LD 596 |
| **C 3.** Explain how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility and boiling point. | SE: 621-625<br>TWE: FF 624<br>VL 249, 621 |
| *Matter and Energy in Ecosystems – How do matter and energy flow through ecosystems?*<br>**6.2** - **An ecosystem is composed of all the populations that are living in a certain space and the physical factors with which they interact.**<br>♦ Populations in ecosystems are affected by biotic factors, such as other populations, and abiotic factors, such as soil and water supply.<br>♦ Populations in ecosystems can be categorized as producers, consumers and decomposers of organic matter. | SE: 532-537, 539-543, 544-549<br>*Lab* 538, 550-551<br>*Launch Lab* 531<br>TWE: DI 549<br>FYI 533 |

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| **C4.** Describe how abiotic factors, such as temperature, water and sunlight, affect the ability of plants to create their own food through photosynthesis. | SE: 262, 532-534, 544<br>*Lab* 266-267, 550-551<br>TWE: TPK 544 |
| **C 5.** Explain how populations are affected by predator-prey relationships. | SE: 543<br>*Applying Science* 546<br>*National Geographic* 545<br>TWE: D 543<br>DIN 542 |
| **C 6.** Describe common food webs in different Connecticut ecosystems. | The following examples are not specific to Connecticut ecosystems.<br>SE: 544, 546<br>*National Geographic* 545<br>TWE: IL 546 |
| *Energy in the Earth's Systems – How do external and internal sources of energy affect the Earth's systems?*<br>**6.3 - Variations in the amount of the sun's energy hitting the Earth's surface affect daily and seasonal weather patterns.**<br>♦ Local and regional weather are affected by the amount of solar energy these areas receive and by their proximity to a large body of water. | SE: 99-107, 118, 122, 126, 132, 148-151, 156-157, 181-182<br>*National Geographic* 158-159<br>TWE: CUR 149<br>FYI 132 |
| **C 7.** Describe the effect of heating on the movement of molecules in solids, liquids and gases. | SE: 652-656, 657-658, 662-664, 717<br>*National Geographic* 660<br>TWE: D 661<br>FYI 662<br>IM 659<br>LD 655 |
| **C 8.** Explain how local weather conditions are related to the temperature, pressure and water content of the atmosphere and the proximity to a large body of water. | SE: 106-107, 118-121, 124, 126-130, 132-133, 150-151<br>*National Geographic* 131, 158-159<br>TWE: CUR 149<br>FF 150 |
| **C 9.** Explain how the uneven heating of the Earth's surface causes winds. | SE: 99-101, 103-107, 119, 132<br>*Integrate Physics* 150<br>*National Geographic* 131<br>TWE: D 100<br>DI 107<br>TC 88<br>TPK 99 |

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| *Science and Technology in Society – How do science and technology affect the quality of our lives?*<br>**6.4** - **Water moving across and through earth materials carries with it the products of human activities.**<br>♦ Most precipitation that falls on Connecticut eventually reaches Long Island Sound. | SE: 574<br>*Integrate Chemistry* 548<br>*Integrate History* 654<br>*National Geographic* 636<br>TWE: IM 548<br>VL 574 |
| **C 10.** Explain the role of septic and sewage systems on the quality of surface and ground water. | SE: 574-576<br>TWE: DIN 575<br>SJ 574 |
| **C 11.** Explain how human activity may impact water resources in Connecticut, such as ponds, rivers and the Long Island Sound ecosystem. | SE: 569, 573-574, 635, 732-733<br>*Integrate History* 654<br>*National Geographic* 636<br>TWE: A 534 |
| **Grade 7**<br>**Core Themes, Content Standards and Expected Performances** | |
| *Energy Transfer and Transformations – What is the role of energy in our world?*<br>**7.1** - **Energy provides the ability to do work and can exist in many forms.**<br>♦ Work is the process of making objects move through the application of force.<br>♦ Energy can be stored in many forms and can be transformed into the energy of motion. | SE: 443, 562-566, 717-720, 722-723, 725-727, 730-737<br>*Lab* 738-739<br>*National Geographic* 567, 724<br>TWE: D 726<br>MM 732 |
| **C 12.** Explain the relationship among force, distance and work, and use the relationship (W=F x D) to calculate work done in lifting heavy objects. | See Glencoe's *Science Level Blue* © 2008<br>SE: 582<br>*Lab* 585<br>*Mini LAB* 583<br>TWE: AS 599<br>D 583<br>DIN 582 |
| **C 13.** Explain how simple machines, such as inclined planes, pulleys and levers, are used to create mechanical advantage. | SE: *Integrate Physics* 440<br>*National Geographic* 441<br>TWE: QD 442 |
| **C 14.** Describe how different types of stored (potential) energy can be used to make objects move. | SE: 443, 562-566, 708, 716-718, 722-723, 732-737<br>*Lab* 738-739<br>*National Geographic* 724<br>TWE: D 726<br>MM 732 |

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| *Structure and Function – How are organisms structured to ensure efficiency and survival?*<br>**7.2 - Many organisms, including humans, have specialized organ systems that interact with each other to maintain dynamic internal balance.**<br>♦ All organisms are composed of one or more cells; each cell carries on life-sustaining functions.<br>♦ Multicellular organisms need specialized structures and systems to perform basic life functions. | SE: 224-230, 254-258, 261-265, 276-282, 284-289<br>*Lab* 231, 260, 266-267, 283<br>*National Geographic* 259 |
| **C 15.** Describe the basic structures of an animal cell, including nucleus, cytoplasm, mitochondria and cell membrane, and how they function to support life. | SE: 224-229, 254-258, 261-265, 278-282, 284-289<br>TWE: DIN 227<br>IL 226<br>MM 228 |
| **C 16.** Describe the structures of the human digestive, respiratory and circulatory systems, and explain how they function to bring oxygen and nutrients to the cells and expel waste materials. | SE: 371-376, 400-404, 412-415, 419-423<br>*Lab* 390-391<br>*Science and Society* 392<br>TWE: FF 373<br>FYI 374, 421<br>UA 409<br>VL 372 |
| **C 17.** Explain how the human musculo-skeletal system supports the body and allows movement. | SE: 439, 442-443, 444-448<br>*Integrate Physics* 440<br>*National Geographic* 441<br>TWE: FYI 447<br>LD 440<br>MM 446<br>QD 445<br>TPK 444 |
| *Energy in the Earth's Systems – How do external and internal sources of energy affect the Earth's systems?*<br>**7.3 - Landforms are the result of the interaction of constructive and destructive forces over time.**<br>♦ Volcanic activity and the folding and faulting of rock layers during the shifting of the Earth's crust affect the formation of mountains, ridges and valleys.<br>♦ Glaciation, weathering and erosion change the Earth's surface by moving earth materials from place to place. | SE: 62-63, 72-73, 162, 575<br>*Integrate Physics* 61<br>*Launch Lab* 559<br>*National Geographic* 60<br>*Science and Society* 80<br>TWE: FYI 575<br>TC 56 |
| **C 18.** Describe how folded and faulted rock layers provide evidence of the gradual up and down motion of the Earth's crust. | SE: 61, 69, 71<br>TWE: A 69 |

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| **C 19.** Explain how glaciation, weathering and erosion create and shape valleys and floodplains. | SE: 575<br>*Integrate Physics* 61<br>*National Geographic* 60<br>TWE: FYI 575<br>TC 56 |
| **C 20.** Explain how the boundaries of tectonic plates can be inferred from the location of earthquakes and volcanoes. | See Glencoe's *Science Level Blue* © 2008<br>SE: 182-188, 190-192, 194-199, 210-211, 219-223, 226-231<br>*Lab* 189, 225, 256<br>*National Geographic* 193<br>TWE: D 229 |
| *Science and Technology in Society – How do science and technology affect the quality of our lives?*<br>**7.4 - Technology allows us to improve food production and preservation, thus improving our ability to meet the nutritional needs of growing populations.**<br>♦ Various microbes compete with humans for the same sources of food. | This objective can be covered during class discussion with a local food science or public health representative.<br>Also see Glencoe's *Science Level Blue* © 2008<br>SE: *Integrate Health* 505<br>*Integrate History* 75<br>TWE: A 504 |
| **C 21.** Describe how freezing, dehydration, pickling and irradiation prevent food spoilage caused by microbes. | This objective can be covered during class discussion with a local food science or public health representative.<br>Also see Glencoe's *Science Level Blue* © 2008<br>SE: 504<br>*Integrate Health* 505<br>TWE: A 504 |
| **Grade 8**<br>**Core Themes, Content Standards and Expected Performances** | |
| *Forces and Motion – What makes objects move the way they do?*<br>**8.1 - An object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.**<br>♦ The motion of an object can be described by its position, direction of motion and speed.<br>♦ An unbalanced force acting on an object changes its speed and/or direction of motion.<br>♦ Objects moving in circles must experience force acting toward the center. | SE: 684-686, 690-693, 694-695<br>*Integrate Astronomy* 704<br>*Lab* 701, 706-707<br>*Mini LAB* 687<br>TWE: D 708<br>DIN 688 |
| **C 22.** Calculate the average speed of a moving object and illustrate the motion of objects in graphs of distance over time. | SE: 685-686<br>*Mini LAB* 687<br>TWE: A 687 |
| **C 23.** Describe the qualitative relationships among force, mass and changes in motion. | SE: 690-693, 694-695, 702-703<br>*Lab* 701, 706-707 |

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| **C 24.** Describe the forces acting on an object moving in a circular path. | SE: 689<br>*Integrate Astronomy* 704<br>TWE: D 708<br>DIN 688 |
| *Heredity and Evolution – What processes are responsible for life's unity and diversity?*<br>**8.2 - Reproduction is a characteristic of living systems and it is essential for the continuation of every species.**<br>♦ Heredity is the passage of genetic information from one generation to another.<br>♦ Some of the characteristics of an organism are inherited and some result from interactions with the environment. | SE: 276-280, 284-287, 290-295, 306-312, 316-317<br>*Lab* 313<br>TWE: D 315<br>DIN 310<br>QD 293<br>TPK 306 |
| **C 25.** Explain the similarities and differences in cell division in somatic and germ cells. | SE: 276-280, 284-287<br>*Lab* 283<br>*Mini LAB* 281<br>TWE: DI 289<br>FF 278<br>FYI 279<br>QD 287<br>VL 281 |
| **C 26.** Describe the structure and function of the male and female human reproductive systems, including the process of egg and sperm production. | SE: 473-477, 479-483<br>*Lab* 478<br>TWE: AS 477<br>D 474<br>SJ 475<br>USW 480 |
| **C 27.** Describe how genetic information is organized in genes on chromosomes, and explain sex determination in humans. | SE: 290-295, 306-312, 316-318, 321-323<br>*Accidents in Science* 298<br>*Lab* 313<br>TWE: D 315<br>QD 293 |
| *Earth in the Solar System – How does the position of Earth in the solar system affect conditions on our planet?*<br>**8.3 - The solar system is composed of planets and other objects that orbit the sun.**<br>♦ Gravity is the force that governs the motions of objects in the solar system.<br>♦ The motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on Earth. | SE: 178-183, 194-201, 696<br>*Integrate Astronomy* 704<br>TWE: A 179<br>D 181<br>FYI 182, 696, 704<br>LD 180<br>TPK 178 |
| **C 28.** Explain the effect of gravity on the orbital movement of planets in the solar system. | SE: 179, 696<br>*Integrate Astronomy* 704<br>TWE: FYI 186, 696, 704 |

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| **C 29.** Explain how the regular motion and relative position of the sun, Earth and moon affect the seasons, phases of the moon and eclipses. | SE: 178-183, 186-190<br>*Lab* 202-203<br>TWE: A 179<br>D 181<br>FYI 182<br>LD 180<br>QD 187<br>TPK 178<br>VL 190 |
| *Science and Technology in Society – How do science and technology affect the quality of our lives?*<br>**8.4 - In the design of structures there is a need to consider factors such as function, materials, safety, cost and appearance.**<br>♦ Bridges can be designed in different ways to withstand certain loads and potentially destructive forces. | See Glencoe's *Science Level Blue* © 2008 to stimulate discussion to meet this objective.<br>SE: 217<br>*Science and History* 234<br>TWE: DI 217 |
| **C 30.** Explain how beam, truss and suspension bridges are designed to withstand the forces that act on them. | See Glencoe's *Science Level Blue* © 2008 to stimulate discussion to meet this objective.<br>SE: 217<br>TWE: DI 217 |

## Codes Used for TWE Pages

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|---|---|
| A | Activity |
| AS | Assessment |
| CUR | Curriculum Connection |
| D | Discussion |
| DI | Daily Intervention |
| DIN | Differentiated Instruction |
| FF | Fun Fact |
| FYI | Teacher FYI |
| IL | Inquiry Lab |
| IM | Identifying Misconceptions |
| LD | Lab Demonstration |
| MM | Make a Model |
| QD | Quick Demo |
| SJ | Science Journal |
| TC | Theme Connection |
| TPK | Tie to Prior Knowledge |
| UA | Use an Analogy |
| USW | Use Science Words |
| VL | Visual Learning |