



Active Chemistry Correlation to the Oregon Science Standards, Grades 9-12

Physical Science

Content Standards/Performance Expectations	Location/Page where Standard is found
<p>H.1 <u>Structure and Function</u>: A system's characteristics, form, and function are attributed to the quantity, type, and nature of its components.</p>	
H.1P.1 Explain how atomic structure is related to the properties of elements and their position in the Periodic Table. Explain how the composition of the nucleus is related to isotopes and radioactivity.	2, 3, 6, 7, 10, 13, 19-23, 24, 26-28, 29-33, 32-34, 39, 42-44, 48-52, 54, 56, 66, 77-78, 89-91, 93, 96, 159, 196-197, 199, 250, 292, 297, 304, 356, 366, 448, 499, 595, 611, 641, 643-647, 763, 772-774, 851
H.1P.2 Describe how different types and strengths of bonds affect the physical and chemical properties of compounds.	19, 62, 68-74 105, 106, 153-155, 164, 196, 200, 228, 241-242, 250, 258, 280, 312, 362, 366, 450-453, 463, 452, 596, 643-644, 672, 722, 723, 725, 751-753, 760, 761, 765, 772-774, 758-759, 772-774, 798, 801, 808, 810, 818, 838, 851-852
<p>H.2 <u>Interaction and Change</u>: The components in a system can interact in dynamic ways that may result in change. In systems, changes occur with a flow of energy and/or transfer of matter.</p>	
H.2P.1 Explain how chemical reactions result from the making and breaking of bonds in a process that absorbs or releases energy. Explain how the rate of a chemical reaction is affected by temperature, pressure, and concentration.	21, 96, 102, 154, 163, 166, 170, 186-190, 213-218, 222, 228-232, 256-258, 266-273, 276, 325, 341 356-360, 392-397, 445, 456-463, 470, 478-481, 525-528, 538-539, 608, 613, 616, 619, 626-629, 636, 642-647, 672, 680-682, 706, 725, 738, 761, 838
H.2P.2 Explain how physical and chemical changes demonstrate the law of conservation of mass.	21, 78, 82, 96, 102, 154, 163, 166, 186-190, 213-218, 222, 228-232, 256-258, 266-273, 276,

	278-279, 280-283, 286, 325, 356-360, 392-397, 411, 412, 445, 456-463, 525-526, 570, 608, 613, 616, 619, 626-629, 636, 642-647, 672, 680-682, 725, 738, 761, 838, 885
H.2P.3 Describe the interactions of energy and matter including the law of conservation of energy.	79-91, 114-116, 159, 165, 259-263, 321-325, 327, 330-307, 318-328, 373, 383, 384, 411, 468-476, 511-531, 535-536, 555, 563, 588, 696-698, 715-716, 738, 863,
H.2P.4 Apply the laws of motion and gravitation to describe the interaction of forces acting on an object and the resultant motion.	N/A
<u>H.3 Scientific Inquiry:</u> Scientific inquiry is the investigation of the natural world by a systematic process that includes proposing a testable question or hypothesis and developing procedures for questioning, collecting, analyzing, and interpreting multiple forms of accurate and relevant data to produce justifiable evidence-based explanations and new explorations.	
H.3S.1 Based on observations and science principles formulate a question or hypothesis that can be investigated through the collection and analysis of relevant information.	119, 125, 131, 143, 151,156, 240, 286, 297, 307,317,328, 343,360, 400, 440, 476, 484, 541, 574, 617, 640, 649, 658, 667, 709, 778, 833, 901, 909,
H.3S.2 Design and conduct a controlled experiment, field study, or other investigation to make systematic observations about the natural world, including the collection of sufficient and appropriate data.	7-10, 15-18, 35-37, 101-103, 113-113, 120-121, 126-127, 134-137, 144-146, 152-153, 157-158, 162-164, 182-184, 193-195, 201-203, 210-214, 224-227, 233-236, 241-242, 255-258, 287-291, 300-301, 308-311, 318-320, 329-332, 353-356, 369-371, 379-382, 390-392, 401-404, 408-410, 416-418, 433-435, 441-444, 448-451, 456-460, 468-469, 477-479, 485-488, 496-497, 511-513, 522-524, 532-535, 544-545, 551-554, 560-562, 568-569, 575-577, 599-602, 608-610, 618-520, 632-634, 641-643, 659-661, 677-679, 685-686, 693-697, 703-704, 712-713, 727-728, 743-745, 766-768, 779-783, 790-792, 799-803, 812-816, 843-848, 857-858, 867-869, 877-882, 892-896, 902-904, 910-912, 919-921

<p>H.3S.3 Analyze data and identify uncertainties. Draw a valid conclusion, explain how it is supported by the evidence, and communicate the findings of a scientific investigation.</p>	<p>7-10, 26-28, 46-50, 58-62, 101-103, 113-113, 120-121, 134-137, 144-146, 182-184, 193-195, 201-203, 210-214, 224-227, 233-236, 241-242, 255-258, 287-291, 300-301, 308-311, 329-332, 353-356, 361-364, 369-371, 379-382, 390-392, 401-404, 416-418, 433-435, 441-444, 448-451, 456-460, 468-469, 477-479, 485-488, 496-497, 511-513, 522-524, 532-535, 544-545, 560-562, 575-577, 599-602, 608-610, 618-520, 632-634, 641-643, 659-661, 677-679, 685-686, 693-697, 703-704, 712-713, 727-728, 743-745, 779-783, 790-792, 799-803, 812-816, 843-848, 857-858, 867-869, 877-882, 892-896, 902-904, 910-912, 919-921</p>
<p>H.3S.4 Identify examples from the history of science that illustrate modification of scientific knowledge in light of challenges to prevailing explanations.</p>	<p>5-14, 15-22, 26-34, 35-43, 46-56, 58-67, 182-190, 308-315, 416-421, 766-776, 826-832, 910-912</p>
<p>H.3S.5 Explain how technological problems and advances create a demand for new scientific knowledge and how new knowledge enables the creation of new technologies.</p>	<p>15-18, 19-22, 29-32, 34, 35-37, 39-40, 54, 63-64, 82, 101-103, 152-153, 182-184, 416-418, 568-569, 608-610, 618-620, 703-704, 712-713, 919-921</p>
<p>H.4 <u>Engineering Design</u>: Engineering design is a process of formulating problem statements, identifying criteria and constraints, proposing and testing possible solutions, incorporating modifications based on test data, and communicating the recommendations.</p>	
<p>H.4D.1 Define a problem and specify criteria for a solution within specific constraints or limits based on science principles. Generate several possible solutions to a problem and use the concept of trade-offs to compare them in terms of criteria and constraints.</p>	<p>44-45, 95, 119, 125, 131, 132, 143, 151, 156, 173, 222-223, 240, 286, 297, 298-299, 317, 343, 360, 378, 388, 400, 423, 440, 466-467, 476, 485, 542-543, 574, 617, 630631, 649, 709, 710-711, 778, 788, 814, 833, 890-891, 901</p>
<p>H.4D.2 Create and test or otherwise analyze at least one of the more promising solutions. Collect and process relevant data. Incorporate modifications based on data from testing or other analysis.</p>	<p>7-10, 15-18, 35-37, 101-103, 113-113, 120-121, 126-127, 134-137, 144-146, 152-153, 157-158, 162-164, 182-184, 193-195, 201-203, 210-214, 224-227, 233-236, 241-242, 255-258, 287-291, 300-301, 308-311, 318-320, 329-332, 353-356, 369-371, 379-382, 390-392, 401-404, 408-410, 416-418, 433-435, 441-444, 448-451, 456-460, 468-469, 477-479, 485-488, 496-497, 511-513, 522-524, 532-535, 544-545, 551-554, 560-562, 568-569, 575-577, 599-602, 608-610, 618-520, 632-634, 641-643, 659-661, 677-679, 685-686, 693-697, 703-704, 712-713, 727-728, 743-745, 766-768, 779-783, 790-792,</p>

	<p>799—803, 812-816, 843-848, 857-858, 867-869, 877-882, 892-896, 902-904, 910-912, 919-921</p>
<p>H.4D.3 Analyze data, identify uncertainties, and display data so that the implications for the solution being tested are clear.</p>	<p>7-10, 26-28, 46-50, 58-62, 101-103, 113-113, 120-121, 134-137, 144-146, 182-184, 193-195, 201-203, 210-214, 224-227, 233-236, 241-242, 255-258, 287-291, 300-301, 308-311, 329-332, 353-356, 361-364, 369-371, 379-382, 390-392, 401-404, 416-418, 433-435, 441-444, 448-451, 456-460, 468-469, 477-479, 485-488, 496-497, 511-513, 522-524, 532-535, 544-545, 560-562, 575-577, 599-602, 608-610, 618-520, 632-634, 641-643, 659-661, 677-679, 685-686, 693-697, 703-704, 712-713, 727-728, 743-745, 779-783, 790-792, 799-803, 812-816, 843-848, 857-858, 867-869, 877-882, 892-896, 902-904, 910-912, 919-921</p>
<p>H.4D.4 Recommend a proposed solution, identify its strengths and weaknesses, and describe how it is better than alternative designs. Identify further engineering that might be done to refine the recommendations.</p>	<p>7-10, 26-28, 46-50, 58-62, 101-103, 113-113, 120-121, 134-137, 144-146, 182-184, 193-195, 201-203, 210-214, 224-227, 233-236, 241-242, 255-258, 287-291, 300-301, 308-311, 329-332, 353-356, 361-364, 369-371, 379-382, 390-392, 401-404, 416-418, 433-435, 441-444, 448-451, 456-460, 468-469, 477-479, 485-488, 496-497, 511-513, 522-524, 532-535, 544-545, 560-562, 575-577, 599-602, 608-610, 618-520, 632-634, 641-643, 659-661, 677-679, 685-686, 693-697, 703-704, 712-713, 727-728, 743-745, 779-783, 790-792, 799-803, 812-816, 843-848, 857-858, 867-869, 877-882, 892-896, 902-904, 910-912, 919-921</p>
<p>H.4D.5 Describe how new technologies enable new lines of scientific inquiry and are largely responsible for changes in how people live and work.</p>	<p>102, 111, 121, 135, 145, 158, 163, 194-5, 202, 211, 225, 234, 242, 256, 288, 309, 311, 330, 354, 370, 391, 402, 434,442, 450, 459, 468, 477, 486, 512, 523,533, 545, 553, 576, 600, 609, 618, 633, 642, 651, 660, 679, 686, 694, 703, 712, 727, 766, 802, 845, 858, 868, 878, 893, 903, 910, 920,</p>

H.4D.6 Evaluate ways that ethics, public opinion, and government policy influence the work of engineers and scientists, and how the results of their work impact human society and the environment.	92, 170, 246, 344, 424, 502, 584, 668, 734, 834, 928