

# EarthComm Correlation to Colorado Content Standards for Science

|  | Earth's Dynamic Geosphere |    |    | Understanding Your Environment |    |    | Earth's Fluid Spheres |    |    | Earth's Natural Resources |    |    | Earth System Evolution |    |    |
|--|---------------------------|----|----|--------------------------------|----|----|-----------------------|----|----|---------------------------|----|----|------------------------|----|----|
|  | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |
| <b>STANDARD 1: Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.</b>   |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| <b>As students in grades 9-12 extend their knowledge, what they know and are able to do includes:</b>  |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Asking questions and stating hypotheses, using prior scientific selecting and using appropriate technologies to gather, process, and analyze data and to report information related to an investigation; knowledge to help guide their development | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Creating and defending a written plan of action for a scientific investigation   | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Identifying major sources of error or uncertainty within an investigation (for example, particular measuring devices and experimental procedures)  | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Constructing and revising scientific explanations and models, using evidence, logic, and experiments that include identifying and controlling variables  | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Communicating and evaluating scientific thinking that leads to particular conclusions  | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Recognizing and analyzing alternative explanations and models  | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Explaining the difference between a scientific theory and a scientific hypothesis  | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |

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|  | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |

For students continuing their science education beyond the standards, what they know and are able to do **may** include

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Designing and completing an advanced scientific investigation-either individually or as part of a student team-that extends over several days or weeks | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Continuing to practice and apply inquiry skills as they extend their understanding of science content through further study.                           | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

**STANDARD 4:Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)**

**4.1 Students know and understand the composition of Earth, its history, and the natural processes that shape it.**

|  |   |   |   |   |   |   |   |   |  |  |  |  |   |   |   |
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| Describing the composition and structure of Earth's interior   | X | X | X |   |   |   |   |   |  |  |  |  |   |   |   |
| Using the theory of plate tectonics to explain relationships among earthquakes, volcanoes, mid- ocean ridges, and deep-sea trenches  | X | X | X |   |   |   |   |   |  |  |  |  |   | X |   |
| Using evidence (for example, fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time (for example, Mount St. Helens' eruption); | X | X | X |   |   |   | X |   |  |  |  |  |   | X | X |
| Evaluating the feasibility of predicting and controlling natural events (for example, earthquakes, floods, landslides)   | X | X | X | X | X | X | X | X |  |  |  |  | X | X | X |

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|  | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |

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| Analyzing the costs, benefits, and consequences of natural resource exploration, development, and consumption. |  |  |  | X | X | X |  |  |  | X | X | X |  |  |  |
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**4.2 Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.**

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| Analyzing the structure of, and changes in, the atmosphere, and its significance for life on Earth |  |  |  |  |  |  | X | X | X |  |  |  | X | X | X |
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| Explaining and analyzing general weather patterns by collecting, plotting, and interpreting data |  |  |  |  |  |  | X | X | X |  |  |  |  | X |  |
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| Describing how energy transfer within the atmosphere influences weather (for example, the role of conduction, radiation, convection, and heat of condensation in clouds, precipitation, winds, storms) |  |  |  |  |  |  | X | X | X |  |  |  | X |  |  |
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| Investigating and explaining the occurrence and effects of storms on human populations and the environment |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |
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| Describing and explaining factors that may influence weather and climate (for example, proximity to oceans, prevailing winds, fossil fuel burning, volcanic eruptions) | X | X | X |  |  |  |  | X |  | X | X |  | X | X | X |
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**4.3 Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment.**

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| Identifying and explaining factors that influence the quality of water needed to sustain life |  |  |  |  | X | X | X | X | X |  |  | X |  |  |  |
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| Identifying and analyzing the costs, benefits, and |  |  |  |  | X | X |  |  |  |  |  | X |  |  |  |
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|   | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |
| consequences of using water resources   |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Explaining interactions between water and other Earth systems (for example, the biosphere, lithosphere, and atmosphere)                                 |                           |    | X  |                                | X  | X  | X                     | X  | X  |                           |    | X  |                        |    |    |
| Explaining interrelationships between the circulation of oceans and weather and climate   |                           |    |    |                                |    |    | X                     |    | X  |                           |    |    |                        | X  |    |
| <b>4.4 Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.</b>         |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Explaining the causes of and modeling the varied lengths of days, seasons, and phases of the Moon   |                           |    |    |                                |    |    |                       |    |    |                           |    |    | X                      |    |    |
| Describing the effect of gravitation on the motions observed in the solar system and beyond   |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        | X  |    |
| Describing electromagnetic radiation produced by the Sun and other stars (for example, X-ray, ultraviolet, visible light, infrared, radio)              |                           |    |    |                                |    |    |                       |    |    |                           |    |    | X                      |    |    |
| Comparing the Sun with other stars (for example, size, color, temperature)  |                           |    |    |                                |    |    |                       |    |    |                           |    |    | X                      |    |    |
| Identifying and describing the everyday impact of recent space technology (for example, more sophisticated computers, remote sensing, medical imaging). | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| For students continuing their science education beyond the standards, what they know and are able to do <b>may</b> include                              |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Explaining relationships and interactions between living things and Earth systems (for example.   | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |

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|   | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |
| the atmosphere, geosphere, and hydrosphere)   |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Predicting possible climatic changes and their effects based on past and present climatic data  |                           |    |    |                                |    | X  | X                     | X  | X  |                           | X  |    | X                      | X  | X  |
| Identifying and predicting natural hazards, using historical data   | X                         | X  | X  |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Describing the life cycle of a star   |                           |    |    |                                |    |    |                       |    |    |                           |    |    | X                      |    |    |
| Describing evidence that supports past and current scientific theories of the origin of the universe  |                           |    |    |                                |    |    |                       |    |    |                           |    |    | X                      | X  | X  |
| <b>STANDARD 5: Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.</b>                                 |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Analyzing benefits, limitations, costs, and consequences involved in using technology or resources (for example, X-rays, agricultural chemicals, natural gas reserves)              |                           |    |    |                                |    |    |                       |    |    |                           | X  | X  | X                      |    |    |
| Analyzing how the introduction of a new technology has affected or could affect human activity (for example, invention of the telescope, applications of modern telecommunications) | X                         |    | X  |                                | X  | X  | X                     | X  |    |                           | X  |    | X                      |    |    |
| Demonstrating the interrelationships between science and technology (for example, building a bridge, designing a better running shoe)   | X                         |    | X  |                                |    | X  |                       |    | X  |                           |    | X  |                        |    |    |
| Explaining the use of technology in an occupation   |                           |    | X  |                                |    | X  |                       |    | X  |                           |    | X  |                        |    | X  |
| For students continuing their science education beyond the standards, what they know and are able to do <b>may</b> include  |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Applying their knowledge and  | X                         |    | X  |                                | X  | X  | X                     | X  |    |                           | X  |    | X                      |    |    |

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|  | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |
| understanding of chemical and physical interactions to explain present and anticipated technologies (for example, lasers, ultrasound, superconducting materials, photocopy machines) |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Exploring the scientific and technological aspects of contemporary problems (for example, issues related to nutrition, air quality, natural resources).                              | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| <b>STANDARD 6: Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.</b>                             |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Evaluating print and visual media for scientific evidence, bias, or opinion  |                           |    | X  | X                              | X  |    | X                     |    | X  | X                         |    | X  |                        | X  |    |
| Explaining that the scientific way of knowing uses a critique and consensus process (for example, peer review, openness to criticism, logical arguments, skepticism)                 | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Using graphs, equations, or other models to analyze systems involving change and constancy (for example, comparing the geologic time scale to shorter time frames)                   | X                         | X  | X  | X                              | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Analyzing and comparing models of cyclic change as used within and among scientific disciplines (for example, water cycle, circular motion, sound waves, weather cycles)             |                           |    |    |                                | X  |    | X                     |    | X  |                           |    | X  | X                      |    | X  |
| Identifying and predicting cause-effect relationships within a system (for example   | X                         |    | X  |                                | X  |    | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |

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|  | G1                        | G2 | G3 | U1                             | U2 | U3 | F1                    | F2 | F3 | N1                        | N2 | N3 | E1                     | E2 | E3 |
| the effect of temperature on gas volume, effect of carbon dioxide level on the greenhouse effect, effects of changing nutrients at the base of a food pyramid)                                   |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Identifying and describing the dynamics of natural systems (for example, weather systems, ecological systems, body systems, systems at dynamic equilibrium)                                      | X                         |    | X  |                                | X  | X  | X                     | X  | X  | X                         | X  | X  | X                      | X  | X  |
| Identifying and testing a model to analyze systems involving change and constancy (for example, a mathematical expression for gas behavior; constructing a closed ecosystem such as an aquarium) |                           |    |    | X                              | X  | X  | X                     | X  | X  | X                         |    |    |                        | X  |    |
| Explaining an exponential model (for example, pH scale, population growth, Richter scale)  |                           |    | X  |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Refining a hypothesis based on an accumulation of data over time (for example, Alvarez's theory on dinosaur extinction).   | X                         | X  | X  |                                |    |    |                       |    |    |                           |    |    |                        | X  | X  |
| For students continuing their science education beyond the standards, what they know and are able to do <b>may</b> include   |                           |    |    |                                |    |    |                       |    |    |                           |    |    |                        |    |    |
| Relating small-scale phenomena to large-scale properties (for example, intermolecular forces related to physical properties)   | X                         |    |    |                                | X  |    |                       | X  | X  |                           |    |    |                        |    |    |
| Tracing the development of an invention, theory, or discovery to demonstrate the dynamic nature of science   | X                         |    | X  |                                |    |    |                       |    | X  |                           |    |    |                        |    | X  |