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Curriculum Units by Fellows of the National Initiative
2016 Volume IV: Energy Sciences

Náhasdzaán Níłchi Binaadohígíí - Carbon Dioxide

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Air, like water, is essential for life. Unfortunately, in today's world, that fresh air we so desperately rely on daily is contaminated; therefore, it is not exactly fresh. Regrettably, the power of air pollution has reshaped our lives. We need an increased awareness of the air we breathe, how it affects our health and everything within the universe and how we can change our behavior to ensure that clean air is available to everyone.

Air pollution has been with us for a long time. As cities expand and population increases at an alarming rate, we realize that air pollution stems out of human activities. Burning fossil fuels (natural gases, coal and oil), factories and motor vehicles all emit harmful substances. In recent years, air pollution has reached such a critical stage where it affects the earth's atmosphere as it traps more harmful radiation from the sun. This has put stress on our planet.

The purpose of this unit is to empower students to get involved with the real problems of air pollution. We need to ensure that what we are breathing will not harm us or future generations. For this reason, students should look for "green" solutions for energy such as solar, wind power, and thermal energy. Despite the costs and challenges of renewable energy, we need to continue to look into other abundant sources of energy such as natural photosynthesis and sunlight energy.

This is a fifth grade unit. The unit plan is divided into 4 weeks commencing with building key background concepts, learning the causes and effects of air pollution, and caring about the environment. The lessons consist of extensive background information to engage students through multiple modes: reading and discussion of content topic books and articles, video viewing, group work, hands-on activities, inquiry-based learning, on-site educational experiences, participation in community events, and opinion writing.

Students will use cause and effect as they brainstorm key background concepts to build vocabulary, and design and conduct surveys. Reading of non-fiction books on air and carbon dioxide, and simple hands-on experiments, will be used to understand the basic concepts of air and carbon dioxide. Reading of informational texts about air pollution and a kinetic activity will demonstrate the importance of the respiratory system. Storytelling of Diné culture and history and a folktale story with timelines will be used to connect students to their environment. The scientific process will be used to perform inquiry-based learning; students will write an opinion composition and participate in Earth Week events for character development. Direct instruction, audio-visuals, work with a Discussion Group or a partner, Field Trips, Guided Discovery and Discussion, Inductive Inquiry, Journaling, Keyword Strategies, Note-Taking, and Scaffolding are instructional strategies incorporated into the lessons. Differentiated instruction will drive the unit to meet the needs of all learners.

(Developed for Integrated Science and Diné Culture, grade 5; recommended for Science and Diné Culture, grade 5)

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