



Chemistry

The main intent of science instruction in Davis School District is that students will value and use science as a process of obtaining knowledge based upon observable evidence. The Intended Learning Outcomes (ILOs) describe the skills and attitudes students should learn and demonstrate as a result of science instruction.

Intended Learning Outcomes

1. Use Science Process and Thinking Skills
2. Manifest Scientific Attitudes and Interests
3. Demonstrate Understanding of Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning
5. Demonstrate Awareness of Social and Historical Aspects of Science
6. Demonstrate Understanding of the Nature of Science.

Students will understand that all matter in the universe has a common origin and is made of atoms, which have structure and can be systematically arranged on the periodic table.

1. Recognize the origin and distribution of elements in the universe.
2. Relate the structure, behavior, and scale of an atom to the particles that compose it.
3. Correlate atomic structure and the physical and chemical properties of an element to the position of the element on the periodic table.

Students will understand the relationship between energy changes in the atom specific to the movement of electrons between energy levels in an atom resulting in the emission or absorption of quantum energy. They will also understand that the emission of high-energy particles results from nuclear changes and that matter can be converted to energy during nuclear reactions.

1. Evaluate quantum energy changes in the atom in terms of the energy contained in light emissions.
2. Evaluate how changes in the nucleus of an atom result in emission of radioactivity.



Students will understand chemical bonding and the relationship of the type of bonding to the chemical and physical properties of substances.

1. Analyze the relationship between the valence (outermost) electrons of an atom and the type of bond formed between atoms.
2. Explain that the properties of a compound may be different from those of the elements or compounds from which it is formed.
3. Explain that the properties of a compound may be different from those of the elements or compounds from which it is formed.

Students will understand that in chemical reactions matter and energy change forms, but the amounts of matter and energy do not change.

1. Identify evidence of chemical reactions and demonstrate how chemical equations are used to describe them.
2. Analyze evidence for the laws of conservation of mass and conservation of energy in chemical reactions.

Students will understand that many factors influence chemical reactions and some reactions can achieve a state of dynamic equilibrium.

1. Evaluate factors specific to collisions (e.g., temperature, particle size, concentration, and catalysts) that affect the rate of chemical reaction.
2. Recognize that certain reactions do not convert all reactants to products, but achieve a state of dynamic equilibrium that can be changed.

Students will understand the properties that describe solutions in terms of concentration, solutes, solvents, and the behavior of acids and bases.

1. Describe factors affecting the process of dissolving and evaluate the effects that changes in concentration have on solutions.
2. Summarize the quantitative and qualitative effects of colligative properties on a solution when a solute is added.
3. Differentiate between acids and bases in terms of hydrogen ion concentration.