# Unit 4 - Chemical Reactions

Content Area: **Science**
Course(s): **Science 7**
Time Period: **November**
Length: **~25 days**
Status: **Published**

## Unit Summary

Students provide molecular-level accounts of states of matters and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students also apply their understanding of optimization design and process in engineering to chemical reaction systems. The crosscutting concept of energy and matter provides a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in developing and using models, analyzing and interpreting data, designing solutions, and obtaining, evaluating, and communicating information. Students are also expected to use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

## Standards

## Student Learning Objectives

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| **SLO 1** | Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. [Clarification Statement: Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms, that represent atoms.] [Assessment Boundary: Assessment does not include the use of atomic masses, balancing symbolic equations, or intermolecular forces.] |
| **SLO 2** | Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.* [Clarification Statement: Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.] [Assessment Boundary: Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device.] |
| **SLO 3** | Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. |

## Driving Questions

**How do substances combine or change (react) to make new substances?**

**What happens to the atoms when I bake a cake?**

**How can a device be designed, constructed, tested, and modified that either releases or absorbs thermal energy by chemical processes?**