

# Unit 5 - Chemical Reactions

Content Area: **Template**  
Course(s):  
Time Period: **Full Year**  
Length: **Full Year**  
Status: **Published**

## Unit Overview

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To identify a mysterious reddish-brown substance appearing in the pipes of a fictional town, students use digital and physical models and hands-on observations to investigate how atoms are rearranged into different patterns to form new substances during chemical reactions (scale, proportion, and quantity; patterns). Students apply their understanding to construct explanations about how the reddish-brown substance formed as a result of a chemical reaction between the pipes and fertilizer in the water supply.

## Enduring Understandings

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How do substances change into different substances during chemical reactions?

## Essential Questions

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How do new substances form?

How can you tell one substance from another?

Why do different substances have different properties?

Can substances change into different substances?

How do substances change into different substances during chemical reactions?

What happens to atoms during a chemical reaction?

## Learning Objectives

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Different substances have different properties.

Things that are too small (or too large) to see can be studied with models.

Substances have different properties because they are made of different groups of atoms. These groups vary in the type or number of atoms that make up the group.

Groups of atoms repeat to make up a substance.

During a chemical reaction, one or more starting substances (reactants) change into one or more different substances (products).

During a chemical reaction, atoms do not change from one type to another.

During a chemical reaction, atoms rearrange to form different groups of atoms.

During a chemical reaction, all of the atoms that make up the reactants rearrange to form the products.

During a chemical reaction, atoms cannot be created or destroyed.

Identify and measure physical and chemical properties of matter

Describe and model the difference between atoms, molecules, and compounds

Use the periodic table to identify similarities in elements

Conduct physical changes and chemical reactions and use signs of a chemical reaction to identify them

Model how matter is not created or destroyed in a chemical reaction through experiments, measurements, and chemical formulas

Create heat or cold packs to demonstrate chemical reactions gaining or losing energy

Determine the difference between a natural resource and a synthetic material and identify the chemical reactions that create synthetic materials

Science Innovators Scrapbook Project. (Lessons satisfy the following legislative requirements: DEI, LGBTQIA+ & People w/ Disabilities, AAPI, Climate Change, and Amistad.

## Standards: Content

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SCI.MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.
SCI.MS-PS1-2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
SCI.MS-PS1-3	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
SCI.MS-PS1-5	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.
SCI.MS-PS1-6	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

## Standards: Interdisciplinary

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### Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Warm Ups, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research
Summative	In correlation with the NJSL, students must demonstrate the following as summative assessments: MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. MS-PS1-5. 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. MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

	Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, vocabulary quizzes, and Science Fair projects.
Alternative & Benchmark	Alternative assessments as required by student IEP/504/I&RS- Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, orally administered assessments, and anecdotal notes. Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments
<a href="#">Assessment Evidence Resource</a>	

## **Instructional Resources**

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Amplify Digital Curriculum, Generation Genius, BrainPop, Microsoft 365, Primary and Secondary Source Documents, Lab Materials as needed, [Amplify Readings, Labs, Simulations](#)

[Instructional Resource List](#)

## **Curricular Mandates**

*Below are the curricular requirements as defined in NJ Administrative Code and Statute*

X	Amistad	X	Diversity, Equity, and Inclusion
X	Holocaust	X	LGBT and Disabilities (Grades 6-12)
X	Climate Change	X	Asian American & Pacific Islander

## **Social Emotional Learning (SEL) Competencies**

[NJ Social and Emotional Learning Competencies & Sub-Competencies](#)

	Self-Awareness		Relationship Skills
X	Responsible Decision-Making	X	Social Awareness
	Self-Management		

## 21st Century Skills & Themes

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X	Global and Cultural Awareness	X	Technology Literacy	Planning and Budgeting
X	Creativity and Innovation		Financial Institutions	Risk Management and Insurance
X	Information and Media Literacy		Digital Citizenship	Economic and Government Influences
X	Critical Thinking and Problem Solving		Credit Profile	Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology	