



Standard #: SC.912.P.8.8

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Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.

General Information

Subject Area: Science

Grade: 912

Body of Knowledge: Physical Science

Idea: Level 2: Basic Application of Skills & Concepts

Standard: [Matter](#) -

Date Adopted or Revised: 02/08

A. A working definition of matter is that it takes up space, has mass, and has measurable properties. Matter is comprised of atomic, subatomic, and elementary particles.

B. Electrons are key to defining chemical and some physical properties, reactivity, and molecular structures. Repeating (periodic) patterns of physical and chemical properties occur among elements that define groups of elements with similar properties. The periodic table displays the repeating patterns, which are related to the atom's outermost electrons. Atoms bond with each other to form compounds.

C. In a chemical reaction, one or more reactants are transformed into one or more new products. Many factors shape the nature of products and the rates of reaction.

D. Carbon-based compounds are building-blocks of known life forms on earth and numerous useful natural and synthetic products.

Content Complexity Rating: [Level 2: Basic Application of Skills & Concepts](#) - [More Information](#)

Date of Last Rating: 05/08

Status: State Board Approved

Related Courses

Course Number	Course Title
2003340:	Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003350:	Chemistry 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002490:	Forensic Sciences 2 (Specifically in versions: 2014 - 2015, 2015 - 2017, 2017 - 2022 (current), 2022 and beyond)
2002420:	Integrated Science 2 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002430:	Integrated Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003310:	Physical Science (Specifically in versions: 2015 - 2022 (current), 2022 and beyond)
2003320:	Physical Science Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003800:	Florida's Preinternational Baccalaureate Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
7920011:	Access Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
2002425:	Integrated Science 2 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
2003345:	Chemistry 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
7920022:	Access Physical Science (Specifically in versions: 2016 - 2018, 2018 and beyond (current))

Related Access Points

Access Points Number	Access Points Title
SC.912.P.8.In.2:	Compare characteristics of physical and chemical changes of matter.
SC.912.P.8.Su.2:	Identify examples of physical and chemical changes.
SC.912.P.8.Pa.2:	Recognize a common chemical change, such as cooking, burning, rusting, or decaying.

Related Resources

Lesson Plans

Name	Description
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The Mystery of the Chemistry Lab Explosion:	This lesson requires the students to use their observation skills and their knowledge of single-replacement and double-replacement reactions to solve a mystery. The students will be performing a laboratory experiment to solve the mystery; therefore, groups of two working in stations are ideal for completing this activity.
Behind the Scenes with Double-Replacement Reactions:	In this lesson plan the students will engage in a laboratory experiment that requires them to identify the precipitate that forms when two aqueous solutions react together. The students will apply solubility rules to determine the chemical formula and name of the precipitate that forms during the laboratory experiment.
Distinguishing between Single-Replacement and Double-Replacement Reactions:	The teacher will perform a demonstration that requires the students to use their knowledge of single-replacement and double-replacement reactions to distinguish between the two types of reactions. The students will also make predictions, observations, and explanations about the products that will form when a chemical reaction takes place.
Predicting the Products of Double-Replacement Reactions:	This is a General Lesson Plan that introduces double-replacement reactions. The students will learn how to predict the products when two aqueous solutions react together and use solubility rules to predict the states of matter of the products. During the Teaching Phase, the teacher uses direct instruction to introduce double-replacement reactions. During the direct instruction, the students will record their notes on a Notes Template. The Teaching Phase is followed by Guided Practice where the educator models how to predict the products of a double-replacement reaction and the states of matter of the products. The last phase is the Independent Practice where the students use the cooperative learning strategy RallyCoach to practice predicting the products and states of matter for double replacement reactions.
Metallic Single-Replacement Reactions:	This lesson requires students to investigate and analyze metallic single-replacement reactions during a laboratory experiment.
Reactivity of Metals:	This resource introduces students to single-replacement reactions. The students will learn to use the activity series to predict whether or not a single-replacement reaction will take place. This introduction includes a P.O.E. Reactivity of Metals activity, Cornell Notes reading activity, and a Summative Assessment activity. The order of instruction is as follows: <ol style="list-style-type: none"> 1. Complete the P.O.E Reactivity of Metals Activity, 2. Then have the students read the textbook or the Single-Replacement Reactions handout (see attachments) to obtain a mini lecture of single-replacement reactions. The students should use the Cornell Notes Template to record their notes, 3. Complete the summative assessment, the Re-P.O.E Reactivity of Metals activity, to check for student understanding of single-replacement reactions.
Chemical Reactions Word Sort:	This is meant to be a review/extension lesson about chemical reactions. Students will use a card sort to distinguish chemical reactions in various forms of representation.
Double Replacement Reaction Lab:	Students will perform a set of double replacement reactions. They will be given the opportunity to record observations, write formulas for compounds, and balance the chemical equations for a set of double replacement reactions. The student lab instruction sheet includes an introduction to chemical equations, student instructions, and post lab questions in a foldable booklet format.

Perspectives Video: Expert

Name	Description
Plastic Polymers:	Watch as chemists make environmentally friendly plastics in the lab! Download the CPALMS Perspectives video student note taking guide .

Perspectives Video: Professional/Enthusiast

Name	Description
The Science and Math Behind Sour Fizzy Candy:	Master candymaker Wes Raley describes the process and science behind making sour fizzy candy. Download the CPALMS Perspectives video student note taking guide .

Teaching Idea

Name	Description
Zip-lock Bag Reactions:	Students conduct and observe a chemical reaction in a sealable plastic bag. Students then devise and conduct their own experiments to determine the identity of two unknown substances used in the reaction.

Virtual Manipulative

Name	Description
Precipitation Reaction Systems:	Precipitation reactions occur when cations and anions of aqueous solutions combine to form an insoluble ionic solid, called a precipitate. This simulation explores systems for which precipitation reactions are possible. A precipitation reaction is controlled by the magnitude of the solubility product, solubility product constant and the concentrations of the ions in solution.

Student Resources

Virtual Manipulative

Name	Description
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[Precipitation Reaction Systems:](#) Precipitation reactions occur when cations and anions of aqueous solutions combine to form an insoluble ionic solid, called a precipitate. This simulation explores systems for which precipitation reactions are possible. A precipitation reaction is controlled by the magnitude of the solubility product, solubility product constant and the concentrations of the ions in solution.

Parent Resources

Virtual Manipulative

Name	Description
Precipitation Reaction Systems:	Precipitation reactions occur when cations and anions of aqueous solutions combine to form an insoluble ionic solid, called a precipitate. This simulation explores systems for which precipitation reactions are possible. A precipitation reaction is controlled by the magnitude of the solubility product, solubility product constant and the concentrations of the ions in solution.