

NORTH CAROLINA ESSENTIAL STANDARDS



STANDARDS COVERED

High School Chemistry

Chm.1.1.1 Analyze the structure of atoms, isotopes, and ions.

Chm.1.1.2 Analyze an atom in terms of the location of electrons.

Chm.1.1.3 Explain the emission of electromagnetic radiation in spectral form in terms of the Bohr model.

Chm.1.3.1 Classify the components of a periodic table (period, group, metal, metalloid, nonmetal, transition).

Chm.1.3.2 Infer the physical properties (atomic radius, metallic and nonmetallic characteristics) of an element based on its position on the Periodic Table

High School Physical Science

PSc.2.1.4 Interpret data presented in Bohr model diagrams and dot diagrams for atoms and ions of elements 1 through 18.

PSc.2.2.1 Infer valence electrons, oxidation number, and reactivity of

an element based on its location in the Periodic Table.

PSc.3.2.1 Explain the relationships among wave frequency, wave period, wave velocity



VIDEOS



BOHR MODEL



NOBLE GAS

LASER

STANDARDS COVERED

Middle School

6.P.3.2 Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.

7.P.2.2 Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).

8.P.1.2 Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.

8.P.1.3 Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.



LASER



VIDEOS



BOHR MODEL



NOBEL GAS

ARMOR



VIDEOS



HEATING CURVE



PERIODIC TRENDS

STANDARDS COVERED

High School Chemistry

Chm.1.1.1 Analyze the structure of atoms, isotopes, and ions.

Chm.1.3.1 Classify the components of a periodic table (period, group, metal, metalloid, nonmetal, transition).

Chm.1.3.2 Infer the physical properties (atomic radius, metallic and nonmetallic characteristics) of an element based on its position on the Periodic Table

Chm.2.1.1 Explain the energetic nature of phase changes.

Chm.2.1.2 Explain heating and cooling curves (heat of fusion, heat of vaporization, heat, melting point, and boiling point).

High School Physical Science

Psc.2.1.1 Classify matter as: homogeneous or heterogeneous; pure substance or mixture; element or compound; metals, nonmetals or metalloids; solution, colloid or suspension.

Psc.2.1.2 Explain the phases of matter and the physical changes that matter undergoes.

Psc.2.1.3 Compare physical and chemical properties of various types of matter.

Psc.2.2.2 Infer the type of chemical bond that occurs, whether covalent, ionic or metallic, in a given substance

Psc.3.1.1 Explain thermal energy and its transfer.

VIDEOS



HEATING CURVE



PERIODIC TRENDS



ARMOR

STANDARDS COVERED

Middle School

- 6.P.2.1** Recognize that all matter is made up of atoms and atoms of the same element are all alike, but are different from the atoms of other elements.
- 6.P.2.2** Explain the effect of heat on the motion of atoms through a description of what happens to particles during a change in phase.
- 6.P.2.3** Compare the physical properties of pure substances that are independent of the amount of matter present including density, melting point, boiling point, and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight.
- 6.P.3.3** Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).
- 7.P.2.2** Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).
- 8.P.1.2** Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.
- 8.P.1.3** Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.

STANDARDS COVERED

High School Chemistry

Chm.1.1.3 Explain the emission of electromagnetic radiation in spectral form in terms of the Bohr model.

High School Physical Science

PSc.3.2.1 Explain the relationships among wave frequency, wave period, wave velocity

PSc.3.2.4 Illustrate the wave interactions of reflection, refraction, diffraction, and interference.

Middle School

6.P.3.2 Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.

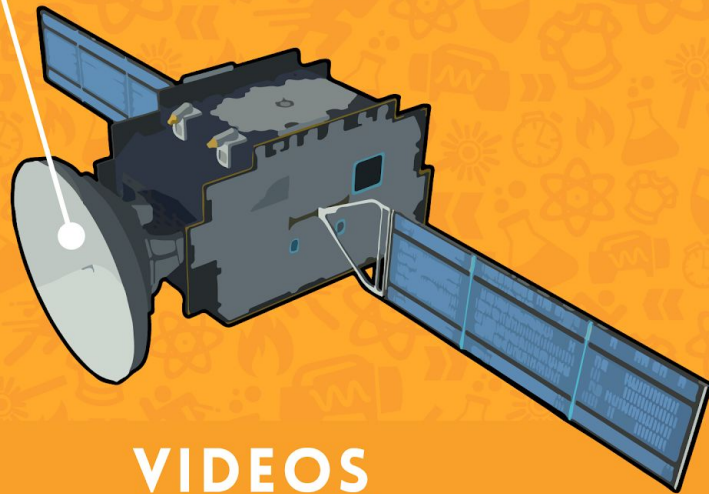
6.P.3.3 Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).

7.P.2.2 Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).

8.P.1.3 Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.



ORBITAL STRIKE



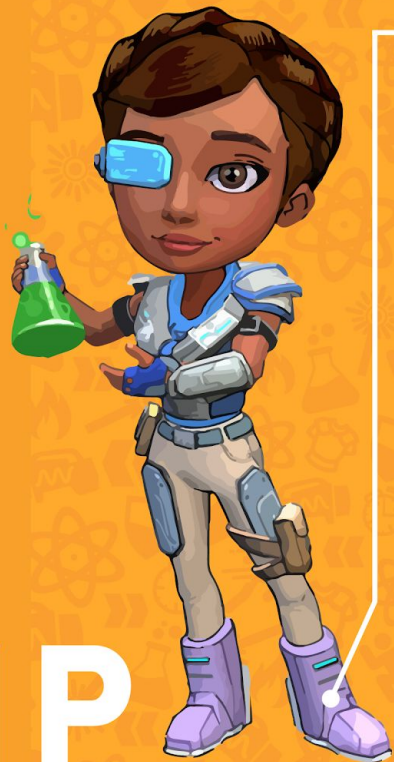
VIDEOS



VIDEOS



JUMP BOOTS



JUMP BOOTS

STANDARDS COVERED

High School Chemistry

Chm.2.1.4 Infer simple calorimetric calculations based on the concepts of heat lost equals heat gained and specific heat.

Chm.2.1.5 Explain the relationships between pressure, temperature, volume, and quantity of gas both qualitative and Quantitative.

High School Physical Science

PSc.3.1.1 Explain thermal energy and its transfer.

PSc.3.1.2 Explain the law of conservation of energy in a mechanical system in terms of kinetic energy, potential energy and heat.

PSc.2.1.2 Explain the phases of matter and the physical changes that matter undergoes

Middle School

6.P.3.1 Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.

6.P.3.3 Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).

7.P.2.1 Explain how kinetic and potential energy contribute to the mechanical energy of an object.

7.P.2.2 Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).

8.P.1.3 Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.

STANDARDS COVERED

High School Chemistry

Chm.1.1.3 Explain the emission of electromagnetic radiation in spectral form in terms of the Bohr model.

Chm.3.1.2 Explain the conditions of a system at equilibrium.

High School Physical Science

PSc.2.2.4 Exemplify the law of conservation of mass by balancing chemical equations.

PSc.3.2.1 Explain the relationships among wave frequency, wave period, wave velocity

Middle School

6.P.3.2 Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.

6.P.3.3 Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).

7.P.2.2 Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).

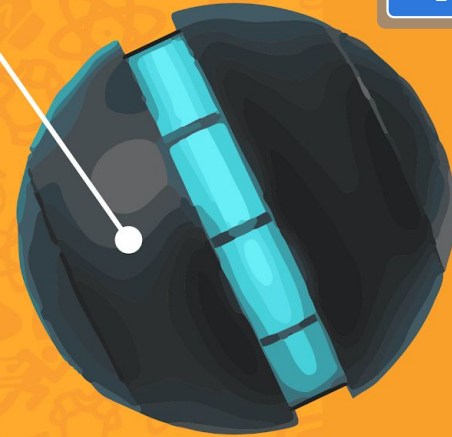
8.P.1.4 Explain how the idea of atoms and a balanced chemical equation support the law of conservation of mass.



VIDEOS



EMAG BURST



EMAG BURST

VIDEOS



DASH BOOTS



DASH BOOTS

STANDARDS COVERED

High School Chemistry

Chm.2.1.4 Infer simple calorimetric calculations based on the concepts of heat lost equals heat gained and specific heat.

Chm.2.1.5 Explain the relationships between pressure, temperature, volume, and quantity of gas both qualitative and quantitative.

High School Physical Science

Psc.3.1.1 Explain thermal energy and its transfer.

Psc.3.1.3 Explain work in terms of the relationship among the applied force to an object, the resulting displacement of the object and the energy transferred to an object.

Psc.2.1.2 Explain the phases of matter and the physical changes that matter undergoes.

Middle School

6.P.3.1 Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.

7.P.2.3 Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass.

7.P.2.4 Explain how simple machines such as inclined planes, pulleys, levers and wheel and axles are used to create mechanical advantage and increase efficiency.

8.P.1.3 Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.

+ EXCITING STEM CAREER PATHS

- SAVE SCIENTISTS TO UNCOVER DESCRIPTIONS OF REAL COLLEGES AND STEM MAJORS
- REAL JOB DESCRIPTIONS ABOUT REAL JOB POSTINGS FROM INDEED AND MONSTER.COM
- REAL SALARY INFORMATION FROM THE US DEPARTMENT OF LABOR



DR. ANKITA
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Education:

Southern Methodist University
BS, Physics

University of North Carolina, Chapel Hill
MS, Biological and Medical Physics

Experience:

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Environmental Health & Safety Specialist

The University of North Carolina
Cancer Care Center at Rockingham
Medical Physicist

Miami Cancer Institute
Chief of Clinical Physics

