Nevada's Academic Content Standards Alignment Form: Science

Directions

1) Download or make a copy of this document.
2) Save this document using the following naming convention: Vendor-Name_ContentArea_StandAlign_Year_Purpose (*example:* NDE-Publishing_SocialStudies_2025_DistanceEducation)
3) Complete the "Information" section below.
4) Complete the worksheet(s) for the grade level(s) of the course(s) you are submitting by selecting the appropriate tab below. Columns 'B' and 'C' should be completed in their entirety.
5) Please leave columns 'E' and 'F' blank. These columns are reserved for the Nevada Department of Education to leave feedback on whether or not a standard has been met.

Information	
Vendor or Entity Name:	OpenSciEd Physics and ECA Science Kit
Submission Date:	June 2026
Content Area:	Physics
Course Name(s) and Number(s):	Physics-3200/Physics Honors-32004
Grade Level(s) or Band(s):	Grades 9-12

Nevada's Academic Content Standards Alignment Form for Physics-Physical Science (HS)

Nevada Academic Content Standards for Physics-Physical	Provide Direct Links or Specific Locations Where the Standard is Located in Your Materials.	Provide Direct Links or Specific Locations Where the Standard is Assessed.	**For NDE Use Only** Determination (Meets/Does Not Meet)	**For NDE Use Only** Reviewer Comments/Justification
HS-PS1 Matter and Its Interactions				
HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** **See Physics Unit 2 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1ne5PtvKzu9qUnqOu9n0pafy9x2e_0CfE/view?usp=drive_link **Unit 2 Teacher Guide**: https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?usp=drive_link In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** **Unit 2 Teacher Guide "Assessment System":** https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?tab=t.0#bookmark=id.wb8hcvo1qmgv In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	Meets Standard	There is clear evidence in this instructional material where students use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 2: https://drive.google.com/file/d/1wFBnbR-BbmMBip-J0_-po8W5qMF1GbcT/view?usp=sharing In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 2: https://drive.google.com/file/d/1wFBnbR-BbmMBip-J0_-po8W5qMF1GbcT/view?usp=sharing In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	Meets Standard	There is clear evidence in this instructional material where students construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	See Physics Unit 2 Elements of NGSS Dimensions In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	**See Physics Unit 2 Assessment System Overview:** https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?tab=t.0#bookmark=id.wb8hcvo1qmgv In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	Meets Standard	There is clear evidence in this instructional material where students plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.
HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCuIo4Oq7W8Q/edit?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	Meets Standard	There is clear evidence in this instructional material where students develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	Meets Standard	There is clear evidence in this instructional material where students apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
HS-PS1-6. Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	Meets Standard	There is clear evidence in this instructional material where students refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.
HS-PS2 Motion and Stability: Forces and Interactions				
HS-PS2-1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	**See Physics Unit 2 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1ne5PtvKzu9qUnqOu9n0pafy9x2e_0CfE/view?usp=drive_link **See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link Unit 2 lays the foundation for Newton's 2nd Law of Motion as students understand the conceptual relationship between matter and force as they figure out that unbalanced forces cause changes in the structure or motion of matter. Lesson 2 - In Investigations A&B students explore the relations between the magnitude of the forces acting on a system and the observed stability and change in motion. Lesson 12 - In the Measuring Forces on Inclines Investigation, students create free-body diagrams to make sense of how the forces change with the angle, connect that to mass, and consider what would happen if the forces become unbalanced. Unit 3 applies mathematics to the relationship established in Unit 2. Lesson 4 - Students explore graphical relationships between mass, force, and acceleration in a Braking Variables Investigation. Lesson 5 - Assesses Newton's 2nd Law in an Electronic Exit Ticket	**See Physics Unit 2 Assessment System Overview**: https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?tab=t.0#bookmark=id.wb8hcvo1qmgv **See Physics Unit 3 Assessment System Overview**: https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 Unit 2 lays the foundation for Newton's 2nd Law of Motion as students understand the conceptual relationship between matter and force as they figure out that unbalanced forces cause changes in the structure or motion of matter. Lesson 2 - In Investigations A&B students explore the relations between the magnitude of the forces acting on a system and the observed stability and change in motion. Lesson 12 - In the Measuring Forces on Inclines Investigation, students create free-body diagrams to make sense of how the forces change with the angle, connect that to mass, and consider what would happen if the forces become unbalanced. Unit 3 applies mathematics to the relationship established in Unit 2. Lesson 4 - Students explore graphical relationships between mass, force, and acceleration in a Braking Variables Investigation. Lesson 5 - Assesses Newton's 2nd Law in an Electronic Exit Ticket	Meets Standard	There is clear evidence in this instructional material where students analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
HS-PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	**See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link Unit 3 continues with a student phenomenon on collisions to address momentum. In Lesson 6 - Student make predictions, investigate collisions, and analyze graphical data on collisions as shown in Teacher Edition In Lesson 6 - Students explore Different Momentum Cases In Lesson 6 - Students complete Momentum Self Assessment	**See Physics Unit 3 Assessment System Overview**: https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 Unit 3 continues with a student phenomenon on collisions to address momentum. In Lesson 6 - Student make predictions, investigate collisions, and analyze graphical data on collisions as shown in Teacher Edition In Lesson 6 - Students explore Different Momentum Cases In Lesson 6 - Students complete Momentum Self Assessment	Meets Standard	There is clear evidence in this instructional material where students use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
HS-PS2-3. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.	**See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	**See Physics Unit 3 Assessment System Overview:** https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	Meets Standard	There is clear evidence in this instructional material where students apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
HS-PS2-4. Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.	**See Physics Unit 4 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1lItvZiqYfbhXGiuNoEttJ4UcPIYDgpJp/view?usp=drive_link	**See Physics Unit 4 Assessment System Overview:** https://docs.google.com/document/d/1IXv5GyP4ZYsWjRuq6OEk-786gmFthgEL60l4CsVtNVk/edit?tab=t.0#bookmark=id.r9ppoi28n6d0	Meets Standard	There is clear evidence in this instructional material where students use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.

HS-PS2-5. Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.
HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in **Physics** Unit 5, Lesson 7, when students use molecular modeling to understand why materials used in a microwave must not contain metal. They then must evaluate and communicate the information they figure out. (https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link)	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly assessed in **Physics** Unit 5, Lesson 7, when students use molecular modeling to understand why materials used in a microwave must not contain metal. They then must evaluate and communicate the information they figure out. (https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link)	Meets Standard	There is clear evidence in this instructional material where students communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.
HS-PS3 Energy				
HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 4 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1IltvZiqYfbhXGiuNoEttJ4UcPIYDgpJp/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 4 Assessment System Overview:** https://docs.google.com/document/d/1IXv5GyP4ZYsWjRuq6OEk-786gmFthgEL60l4CsVtNVk/edit?tab=t.0#bookmark=id.r9ppoi28n6d0	Meets Standard	There is clear evidence in this instructional material where students create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 4 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1IltvZiqYfbhXGiuNoEttJ4UcPIYDgpJp/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 4 Assessment System Overview:** https://docs.google.com/document/d/1IXv5GyP4ZYsWjRuq6OEk-786gmFthgEL60l4CsVtNVk/edit?tab=t.0#bookmark=id.r9ppoi28n6d0	Meets Standard	There is clear evidence in this instructional material where students develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).
HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768	Meets Standard	There is clear evidence in this instructional material where students design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_linkIn Unit 1, students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	**See Physics Unit 1 Assessment System Overview**: https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 In Unit 1, students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. In Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	Meets Standard	There is clear evidence in this instructional material where students plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
HS-PS3-5. Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 1 Elements of NGSS Dimensions ((https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link) Unit 1: Students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly assessed in Physics Unit 1 Elements of NGSS Dimensions ((https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link) Unit 1: Students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	Meets Standard	There is clear evidence in this instructional material where students develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.
HS-PS4 Waves and Their Applications in Technologies for Information Transfer				
HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students evaluate questions about the advantages of using a digital transmission and storage of information.
HS-PS4-3. Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.
HS-PS4-4. Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
HS-ETS1 Engineering Design				
HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 3 Assessment System Overview:** https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	Meets Standard	There is clear evidence in this instructional material where students analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 1 and Unit 3 via the Elements of NGSS Dimensions - Unit 1: https://drive.google.com/file/d/1mxp2vUZPVCqnX0bg8MlDxpawhuRJwYrf/view?usp=drive_link Unit 3: https://drive.google.com/file/d/1G30zYHEjjhRRmLIwttv3Ao9vvfr7KrlQ/view?usp=drive_link And unit materials - Unit 1: https://docs.google.com/document/d/1yn2RKbH6VCUkFBRBqVLSsYFhxlo92AlwrPn0htCqyJw/edit?usp=drive_link Unit 3:https://docs.google.com/document/d/13MfaHhDqr8ckSNQARtQOFCiZs_pprV6ktQXhH-T6gBM/edit?usp=drive_link	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly assessed in Physics Unit 1 and Unit 3 via the Elements of NGSS Dimensions - Unit 1: https://drive.google.com/file/d/1mxp2vUZPVCqnX0bg8MlDxpawhuRJwYrf/view?usp=drive_link Unit 3: https://drive.google.com/file/d/1G30zYHEjjhRRmLIwttv3Ao9vvfr7KrlQ/view?usp=drive_link See "ASSESSMENT SYSTEM OVERVIEW" materials - Unit 1: https://docs.google.com/document/d/1yn2RKbH6VCUkFBRBqVLSsYFhxlo92AlwrPn0htCqyJw/edit?usp=drive_link Unit 3:https://docs.google.com/document/d/13MfaHhDqr8ckSNQARtQOFCiZs_pprV6ktQXhH-T6gBM/edit?usp=drive_link	Meets Standard	There is clear evidence in this instructional material where students design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 3 Assessment System Overview:** https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	Meets Standard	There is clear evidence in this instructional material where students evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	**See Physics Unit 1 Elements of NGSS Dimensions**: https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768	Meets Standard	There is clear evidence in this instructional material that students use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

Nevada's Academic Content Standards Alignment Form for Physics-Physical Science (HS)

Nevada Academic Content Standards for Physics-Physical	Provide Direct Links or Specific Locations Where the Standard is Located in Your Materials.	Provide Direct Links or Specific Locations Where the Standard is Assessed.	**For NDE Use Only** Determination (Meets/Does Not Meet)	**For NDE Use Only** Reviewer Comments/Justification
HS-PS1 Matter and Its Interactions				
HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** **See Physics Unit 2 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1ne5PtvKzu9qUnqOu9n0pafy9x2e_0CfE/view?usp=drive_link **Unit 2 Teacher Guide**: https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?usp=drive_link In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** **Unit 2 Teacher Guide "Assessment System":** https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?tab=t.0#bookmark=id.wb8hcvo1qmgv In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	Meets Standard	There is clear evidence in this instructional material where students use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 2: https://drive.google.com/file/d/1wFBnbR-BbmMBip-J0_-po8W5qMF1GbcT/view?usp=sharing In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 2: https://drive.google.com/file/d/1wFBnbR-BbmMBip-J0_-po8W5qMF1GbcT/view?usp=sharing In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	Meets Standard	There is clear evidence in this instructional material where students construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	See Physics Unit 2 Elements of NGSS Dimensions In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	**See Physics Unit 2 Assessment System Overview:** https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?tab=t.0#bookmark=id.wb8hcvo1qmgv In Physics Unit 2, Lessons 4-9, students investigate the relationship between energy, force, and matter as they investigate what is happening at particle level in the mantle and during radioactive decay. To understand atomic structure, they will use a periodic table as a model.	Meets Standard	There is clear evidence in this instructional material where students plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.
HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	Meets Standard	There is clear evidence in this instructional material where students develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	Meets Standard	There is clear evidence in this instructional material where students apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
HS-PS1-6. Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRlWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Unit 1: https://drive.google.com/file/d/1q9tvjzLyaWyIhYdfmQI29HxitBmVxUff/view?usp=sharing In Physics Unit 1, Lessons 9-11, students will optimize the design of an energy system by investigating properties, including chemical properties of coal, biomass, gas, and other sources.	Meets Standard	There is clear evidence in this instructional material where students refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.
HS-PS2 Motion and Stability: Forces and Interactions				
HS-PS2-1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	**See Physics Unit 2 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1ne5PtvKzu9qUnqOu9n0pafy9x2e_0CfE/view?usp=drive_link **See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link Unit 2 lays the foundation for Newton's 2nd Law of Motion as students understand the conceptual relationship between matter and force as they figure out that unbalanced forces cause changes in the structure or motion of matter. Lesson 2 - In Investigations A&B students explore the relations between the magnitude of the forces acting on a system and the observed stability and change in motion. Lesson 12 - In the Measuring Forces on Inclines Investigation, students create free-body diagrams to make sense of how the forces change with the angle, connect that to mass, and consider what would happen if the forces become unbalanced. Unit 3 applies mathematics to the relationship established in Unit 2. Lesson 4 - Students explore graphical relationships between mass, force, and acceleration in a Braking Variables Investigation. Lesson 5 - Assesses Newton's 2nd Law in an Electronic Exit Ticket	**See Physics Unit 2 Assessment System Overview**: https://docs.google.com/document/d/1yCxFaRsyBjCZq1QsUFliKmTaO0-HuvOkstcwlEW_8_c/edit?tab=t.0#bookmark=id.wb8hcvo1qmgv **See Physics Unit 3 Assessment System Overview**: https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 Unit 2 lays the foundation for Newton's 2nd Law of Motion as students understand the conceptual relationship between matter and force as they figure out that unbalanced forces cause changes in the structure or motion of matter. Lesson 2 - In Investigations A&B students explore the relations between the magnitude of the forces acting on a system and the observed stability and change in motion. Lesson 12 - In the Measuring Forces on Inclines Investigation, students create free-body diagrams to make sense of how the forces change with the angle, connect that to mass, and consider what would happen if the forces become unbalanced. Unit 3 applies mathematics to the relationship established in Unit 2. Lesson 4 - Students explore graphical relationships between mass, force, and acceleration in a Braking Variables Investigation. Lesson 5 - Assesses Newton's 2nd Law in an Electronic Exit Ticket	Meets Standard	There is clear evidence in this instructional material where students analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
HS-PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	**See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link Unit 3 continues with a student phenomenon on collisions to address momentum. In Lesson 6 - Student make predictions, investigate collisions, and analyze graphical data on collisions as shown in Teacher Edition In Lesson 6 - Students explore Different Momentum Cases In Lesson 6 - Students complete Momentum Self Assessment	**See Physics Unit 3 Assessment System Overview**: https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 Unit 3 continues with a student phenomenon on collisions to address momentum. In Lesson 6 - Student make predictions, investigate collisions, and analyze graphical data on collisions as shown in Teacher Edition In Lesson 6 - Students explore Different Momentum Cases In Lesson 6 - Students complete Momentum Self Assessment	Meets Standard	There is clear evidence in this instructional material where students use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
HS-PS2-3. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.	**See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	**See Physics Unit 3 Assessment System Overview:** https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	Meets Standard	There is clear evidence in this instructional material where students apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
HS-PS2-4. Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.	**See Physics Unit 4 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1lItvZiqYfbhXGiuNoEttJ4UcPIYDgpJp/view?usp=drive_link	**See Physics Unit 4 Assessment System Overview:** https://docs.google.com/document/d/1lXv5GyP4ZYsWjRuq6OEk-786gmFthgEL60l4CsVtNVk/edit?tab=t.0#bookmark=id.r9ppoi28n6d0	Meets Standard	There is clear evidence in this instructional material where students use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.
HS-PS2-5. Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.

HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in **Physics** Unit 5, Lesson 7, when students use molecular modeling to understand why materials used in a microwave must not contain metal. They then must evaluate and communicate the information they figure out. (https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link)	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly assessed in **Physics** Unit 5, Lesson 7, when students use molecular modeling to understand why materials used in a microwave must not contain metal. They then must evaluate and communicate the information they figure out. (https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link)	Meets Standard	There is clear evidence in this instructional material where students communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.
HS-PS3 Energy				
HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 4 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1IItvZiqYfbhXGiuNoEttJ4UcPlYDgpJp/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 4 Assessment System Overview:** https://docs.google.com/document/d/1lXv5GyP4ZYsWjRuq6OEk-786gmFthgEL60l4CsVtNVk/edit?tab=t.0#bookmark=id.r9ppoi28n6d0	Meets Standard	There is clear evidence in this instructional material where students create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 4 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1IItvZiqYfbhXGiuNoEttJ4UcPlYDgpJp/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 4 Assessment System Overview:** https://docs.google.com/document/d/1lXv5GyP4ZYsWjRuq6OEk-786gmFthgEL60l4CsVtNVk/edit?tab=t.0#bookmark=id.r9ppoi28n6d0	Meets Standard	There is clear evidence in this instructional material where students develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).
HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768	Meets Standard	There is clear evidence in this instructional material where students design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_linkIn Unit 1, students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	**See Physics Unit 1 Assessment System Overview**: https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 In Unit 1, students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. In Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	Meets Standard	There is clear evidence in this instructional material where students plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
HS-PS3-5. Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 1 Elements of NGSS Dimensions ((https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link) Unit 1: Students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly assessed in Physics Unit 1 Elements of NGSS Dimensions ((https://drive.google.com/file/d/1Ojp6-WGYWGZ7GvDCy4d9YZk7pMWNPbnu/view?usp=drive_link) Unit 1: Students build this understanding through modeling energy transfer, distribution, and heat in a generator system. Lesson 5 - Students build a generator and conduct investigations. They then build understandings about magnetism and then model energy transfer in the generator as shown in the Teacher Edition. Lesson 6 - Students read about fields and conduct a wire simulation as shown in the Teacher Edition.	Meets Standard	There is clear evidence in this instructional material where students develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.
HS-PS4 Waves and Their Applications in Technologies for Information Transfer				
HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students evaluate questions about the advantages of using a digital transmission and storage of information.
HS-PS4-3. Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.
HS-PS4-4. Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.	**See Physics Unit 5 Elements of NGSS Dimensions:** https://drive.google.com/file/d/1VSJE0OCeCrYiQQHQlDrlywUCHKWvlZXa/view?usp=drive_link	**See Physics Unit 5 Assessment System Overview:** https://docs.google.com/document/d/16dIxG_EYNFlLSk22daevs4lDaxMPg7adZAfFe8E4lks/edit?tab=t.0#bookmark=id.77baoclh4ho9	Meets Standard	There is clear evidence in this instructional material where students communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
HS-ETS1 Engineering Design				
HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 3 Assessment System Overview:** https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	Meets Standard	There is clear evidence in this instructional material where students analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	**This Performance Expectation will be addressed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly addressed in Physics Unit 1 and Unit 3 via the Elements of NGSS Dimensions - Unit 1: https://drive.google.com/file/d/1mxp2vUZPVCqnX0bg8MlDxpawhuRJwYrf/view?usp=drive_link Unit 3: https://drive.google.com/file/d/1G30zYHEjjhRRmLIwttv3Ao9vvfr7KrlQ/view?usp=drive_link And unit materials - Unit 1: https://docs.google.com/document/d/1yn2RKbH6VCUkFBRBqVLSsYFhxlo92AlwrPn0htCqyJw/edit?usp=drive_link Unit 3:https://docs.google.com/document/d/13MfaHhDqr8ckSNQARtQOFCiZs_pprV6ktQXhH-T6gBM/edit?usp=drive_link	**This Performance Expectation will be assessed in the Chemistry or Chemistry Honors course that students will take in Grade 10. (https://drive.google.com/file/d/1ExJq-kwzdcRIWuyuufwq4jTkKUch8fkz/view?usp=sharing)** Further, the elements of this Performance Expectation are explicitly assessed in Physics Unit 1 and Unit 3 via the Elements of NGSS Dimensions - Unit 1: https://drive.google.com/file/d/1mxp2vUZPVCqnX0bg8MlDxpawhuRJwYrf/view?usp=drive_link Unit 3: https://drive.google.com/file/d/1G30zYHEjjhRRmLIwttv3Ao9vvfr7KrlQ/view?usp=drive_link See "ASSESSMENT SYSTEM OVERVIEW" materials - Unit 1: https://docs.google.com/document/d/1yn2RKbH6VCUkFBRBqVLSsYFhxlo92AlwrPn0htCqyJw/edit?usp=drive_link Unit 3:https://docs.google.com/document/d/13MfaHhDqr8ckSNQARtQOFCiZs_pprV6ktQXhH-T6gBM/edit?usp=drive_link	Meets Standard	There is clear evidence in this instructional material where students design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.	**See Physics Unit 1 Elements of NGSS Dimensions:** https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link **See Physics Unit 3 Elements of NGSS Dimensions**: https://drive.google.com/file/d/1Z3NbdaCtka0Y7UNmvOk2kVEXAQf_hdx_/view?usp=drive_link In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768 **See Physics Unit 3 Assessment System Overview:** https://docs.google.com/document/d/1QUE4iL3A_hzPD-1p-JVdZQnkXyaziG6embCTW76vwfw/edit?tab=t.0#bookmark=id.ywtr94azmd69 In Unit 3, students design, evaluate, and refine a crumple zone for a vehicle to minimize the force on a vehicle during a collision. Lesson 10 - Design Solutions Lesson 11 - Assessment	Meets Standard	There is clear evidence in this instructional material where students evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	**See Physics Unit 1 Elements of NGSS Dimensions**: https://drive.google.com/file/d/15DvWri8XWLbA-y3dfG_TvskBZBX7YlYY/view?usp=drive_link	**See Physics Unit 1 Assessment System Overview:** https://docs.google.com/document/d/1G5hbZrwSO50JxdjKzDgSE_XDbgxkUwdLCulo4Oq7W8Q/edit?tab=t.0#bookmark=id.l6i86u69w768	Meets Standard	There is clear evidence in this instructional material that students use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.