WASHINGTON STATE LASER

Alignment of Washington 6-8 Science Standards by Lesson Number for

SEPUP

Energy

November 1, 2010

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 53

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
APPA	People have always used technology to solve problems. Advances in human civilization are linked to advances in technology.	• Describe how a technology has changed over time in response to societal challenges.	SG pp D-4-7; Student Sheet 53.1; TG pp D-1-7	**Aligned with modifications (see comments)**	The lesson is an integral part of a learning progression because it is an introduction.
APPC	Science and technology are interdependent. Science drives technology by demanding better instruments and suggesting ideas for new designs. Technology drives science by providing instruments and research methods.	• Give examples to illustrate how scientists have helped solve technological problems (e.g., how the science of biology has helped sustain fisheries) and how engineers have aided science (e.g., designing telescopes to discover distant planets).	SG pp D-4-7; Student Sheet 53.1; TG pp D-1-7	**Aligned with modifications (see comments)**	The lesson is an integral part of a learning progression because it is an introduction.
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-4-7; TG pp D-1-7; Student Sheet 53.1	**Aligned with modifications (see comments)**	The lesson is an integral part of a learning progression because it introduces different forms of energy.

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 54

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQB	Different kinds of questions suggest different kinds of scientific investigations.	• Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked. • Propose a hypothesis, give a reason for the hypothesis, and explain how the planned investigation will test the hypothesis. • Work collaboratively with other students to carry out the investigations.	SG pp D8-11; TG pp D9-15	**Aligned as designed**	
INQC	Collecting, analyzing, and displaying data are essential aspects of all investigations.	• Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. • Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words. • Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.	SG pp D-8-11; TG pp D-9-15	**Aligned as designed**	
INQD	For an experiment to be valid, all (controlled) variables must be kept the same whenever possible, except for the manipulated (independent) variable being tested and the responding (dependent) variable being measured and recorded. If a variable cannot be controlled, it must be reported and accounted for.	• Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables. Determine which variables should be kept the same (controlled), which (independent) variable should be systematically manipulated, and which responding (dependent) variable is to be measured and recorded. Report any variables not controlled and explain how they might affect results.	SG pp D-8-11; TG pp D-9-15	**Aligned with modifications (see comments)**	Teacher must be intentional about use of the terms manipulated and responding variable.

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SEPUP Energy ~ Activity 54

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-8-11; SG p D-10 Questions 1-4; TG pp D-9-15	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 55

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS1B	Friction is a force that that can help objects start moving, stop moving, slow down or can change the direction of the object's motion.	• Demonstrate and explain the frictional force acting on an object with the use of a physical model.	SG pp D-12-18; Student Sheet 55.1; SG p D-17 Question 3; TG pp D17-21	**Aligned as designed**	
PS1C	Unbalanced forces will cause changes in the speed or direction of an object's motion. The motion of an object will stay the same when forces are balanced.	• Determine whether forces on an object are balanced or unbalanced and justify with observational evidence. • Given a description of forces on an object, predict the object's motion.	SG pp D-12-18; Student Sheet 55.1; SG p D-18 Question 4; TG pp D-17-21	**Aligned as designed**	
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-12-18; Student Sheet 55.1; SG pp D-17-18 Questions 1-4; TG pp D-17-21	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQC	Collecting, analyzing, and displaying data are essential aspects of all investigations.	• Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. • Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words. • Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.	SG pp D-19-22; SG p D-21 Question 1-3; TG pp D-25-29	**Aligned with modifications (see comments)**	Teacher must be intentional about use of the terms manipulated and responding variable.
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-19-22; SG p D-22 Question 4; TG pp D-25-29	**Aligned as designed**	
PS3C	Heat (thermal energy) consists of random motion and the vibrations of atoms and molecules. The higher the temperature, the greater the atomic or molecular motion. Thermal insulators are materials that resist the flow of heat.	• Explain how various types of insulation slow transfer of heat energy based on the atomic-molecular model of heat (thermal energy).	SG pp D-19-22; TG pp D-25-29	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
APPA	People have always used technology to solve problems. Advances in human civilization are linked to advances in technology.	• Describe how a technology has changed over time in response to societal challenges.	SG pp D-23-28; TG pp D-31-36	**Aligned as designed**	
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-23-28; SG p D-28 Question 1; TG pp D31-36	**Aligned with modifications (see comments)**	The lesson contains many opportunities to discuss Law of Conservation of Energy even though it is a 9-12 Content Standard.

Alignment of Washington 6-8 Science Standards with SEPUP Energy ~ Activity 58

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
SYSA	Any system may be thought of as containing subsystems and as being a subsystem of a larger system.	• Given a system, identify subsystems and a larger encompassing system	SG pp D-29-32; Student Sheet 58.1; TG pp D-39-44	**Aligned with modifications (see comments)**	The teacher needs to be intentional about discussing the standard.
SYSC	The output of one system can become the input of another system.	• Give an example of how output of matter or energy from a system can become input for another system	SG pp D-29-32; Student Sheet 58.1; TG pp D-39-44	**Aligned with modifications (see comments)**	The teacher needs to be intentional about discussing the standard.
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-29-32; Student Sheet 58.1; SG pp D-30-32 Questions 1, 2; TG pp D-39-44	**Aligned as designed**	

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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-29-32; Student Sheet 58.1; SG pp D-30-32 Questions 1 , 2; TG pp D-39-44	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with SEPUP Energy ~ Activity 59

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQD	For an experiment to be valid, all (controlled) variables must be kept the same whenever possible, except for the manipulated (independent) variable being tested and the responding (dependent) variable being measured and recorded. If a variable cannot be controlled, it must be reported and accounted for.	• Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables. Determine which variables should be kept the same (controlled), which (independent) variable should be systematically manipulated, and which responding (dependent) variable is to be measured and recorded. Report any variables not controlled and explain how they might affect results.	SG pp D-33-35; SG p D-35 Question 5; TG pp D47-52	**Aligned as designed**	
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-33-35; SG p D-35 Questions 2-4; TG pp D-47-52	**Aligned as designed**	
PS3C	Heat (thermal energy) consists of random motion and the vibrations of atoms and molecules. The higher the temperature, the greater the atomic or molecular motion. Thermal insulators are materials that resist the flow of heat.	• Explain how various types of insulation slow transfer of heat energy based on the atomic-molecular model of heat (thermal energy).	SG pp D-33-35; TG pp D-47-52	**Aligned with modifications (see comments)**	The teacher needs to be intentional about discussing the standard using the "Conduction in a gas" illustration on SG p D-33.

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
SYSD	In an open system, matter flows into and out of the system. In a closed system, energy may flow into or out of the system, but matter stays within the system.	• Given a description of a system, analyze and defend whether it is open or closed.	SG pp D-36-42; SG p D-42 Question 1; TG pp D-55-60	**Aligned with modifications (see comments)**	The teacher needs to be intentional about discussing the standard. Teacher must be intentional about use of the terms input, output, open system and closed system.
INQD	For an experiment to be valid, all (controlled) variables must be kept the same whenever possible, except for the manipulated (independent) variable being tested and the responding (dependent) variable being measured and recorded. If a variable cannot be controlled, it must be reported and accounted for.	• Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables. Determine which variables should be kept the same (controlled), which (independent) variable should be systematically manipulated, and which responding (dependent) variable is to be measured and recorded. Report any variables not controlled and explain how they might affect results.	SG pp D-36-42; SG p D-38 Questions 2; TG pp D-55-60	**Aligned as designed**	
INQE	Models are used to represent objects, events, systems, and processes. Models can be used to test hypotheses and better understand phenomena, but they have limitations.	• Create a model or simulation to represent the behavior of objects, events, systems, or processes. Use the model to explore the relationship between two variables and point out how the model or simulation is similar to or different from the actual phenomenon.	SG pp D-36-42; SG p D-38 Question 4; TG pp D-55-60	**Aligned with modifications (see comments)**	The teacher needs to be intentional about discussing the standard.

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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-36-42; SG p D-42 Questions 1-3; TG pp D-55-60	**Aligned as designed**	
PS3C	Heat (thermal energy) consists of random motion and the vibrations of atoms and molecules. The higher the temperature, the greater the atomic or molecular motion. Thermal insulators are materials that resist the flow of heat.	• Explain how various types of insulation slow transfer of heat energy based on the atomic-molecular model of heat (thermal energy).	SG pp D-36-42; SG p D-38 Questions 2-4; SG p D-42 Questions 1-3; TG pp D55-60	**Aligned as designed**	

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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
SYSE	If the input of matter or energy is the same as the output, then the amount of matter or energy in the system won't change; but if the input is more or less than the output, then the amount of matter or energy in the system will change.	• Measure the flow of matter into and out of an open system and predict how the system is likely to change (e.g., a bottle of water with a hole in the bottom, an ecosystem, an electric circuit).	SG pp D-43-46; TG pp D61-66	**Aligned with modifications (see comments)**	Teacher must be intentional about use of the terms input and output and the relation to a house as a system.
INQC	Collecting, analyzing, and displaying data are essential aspects of all investigations.	• Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. • Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words. • Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.	SG pp D-43-46; SG p D-46 Questions 1-5; TG pp D-61-66	**Aligned as designed**	
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-43-46; TG pp D-61-66	**Aligned with modifications (see comments)**	Teachers need to emphasize that thermal energy is transferred.

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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-47-49; SG p D-49 Questions 2, 5; TG pp D-67-71	**Aligned with modifications (see comments)**	The lesson contains opportunities to discuss how to quantify energy but standard appears in 9-12.

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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQB	Different kinds of questions suggest different kinds of scientific investigations.	• Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked. • Propose a hypothesis, give a reason for the hypothesis, and explain how the planned investigation will test the hypothesis. • Work collaboratively with other students to carry out the investigations.	SG pp D-50-53; TG pp D-73-79	**Aligned with modifications (see comments)**	The lesson contains many opportunities to discuss how to calculate energy released even though that is a 9-12 standard.
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-50-53; SG p D-52 Question 2; TG pp D-73-79	**Aligned as designed**	
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-50-53; SG p D-52 Question 2; TG pp D-73-79	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
APPC	Science and technology are interdependent. Science drives technology by demanding better instruments and suggesting ideas for new designs. Technology drives science by providing instruments and research methods.	• Give examples to illustrate how scientists have helped solve technological problems (e.g., how the science of biology has helped sustain fisheries) and how engineers have aided science (e.g., designing telescopes to discover distant planets).	SG pp D-54-63; SG p D-63 Extension 1; TG pp D-83-90	**Aligned as designed**	
APPG	The benefits of science and technology are not available to all the people in the world.	• Contrast the benefits of science and technology enjoyed by people in industrialized and developing nations.	SG pp D-54-63; SG p D-63 Extension 2; TG pp D-83-90	**Aligned as designed**	
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-54-63; SG p D-62 Questions 3 & 4; TG pp D-83-90	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 65

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
SYSC	The output of one system can become the input of another system.	• Give an example of how output of matter or energy from a system can become input for another system	SG pp D-64-68; SG pp D-67-68 Questions 1-3; TG pp D-93-102	**Aligned with modifications (see comments)**	The teacher needs to be intentional about discussing the standard using the terms input and output and the system.
INQC	Collecting, analyzing, and displaying data are essential aspects of all investigations.	• Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. • Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words. • Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.	SG pp D-64-68; SG pp D-67-68 Questions 1- 4; TG pp D-93-102	**Aligned as designed**	
INQD	For an experiment to be valid, all (controlled) variables must be kept the same whenever possible, except for the manipulated (independent) variable being tested and the responding (dependent) variable being measured and recorded. If a variable cannot be controlled, it must be reported and accounted for.	• Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables. Determine which variables should be kept the same (controlled), which (independent) variable should be systematically manipulated, and which responding (dependent) variable is to be measured and recorded. Report any variables not controlled and explain how they might affect results.	SG pp D-64-68; SG p D-68 Extension; TG pp D-93-102	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-64-68; SG p D-68 Question 5; TG pp D-93-102	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 66

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQB	Different kinds of questions suggest different kinds of scientific investigations.	• Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked. • Propose a hypothesis, give a reason for the hypothesis, and explain how the planned investigation will test the hypothesis. • Work collaboratively with other students to carry out the investigations.	SG pp D-69-72; TG pp D-105-111	**Aligned as designed**	
INQC	Collecting, analyzing, and displaying data are essential aspects of all investigations.	• Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. • Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words. • Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.	SG pp D-69-72; TG pp D105-111	**Aligned as designed**	
INQD	For an experiment to be valid, all (controlled) variables must be kept the same whenever possible, except for the manipulated (independent) variable being tested and the responding (dependent) variable being measured and recorded. If a variable cannot be controlled, it must be reported and accounted for.	• Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables. Determine which variables should be kept the same (controlled), which (independent) variable should be systematically manipulated, and which responding (dependent) variable is to be measured and recorded. Report any variables not controlled and explain how they might affect results.	SG pp D-69-72; TG pp D-105-111	**Aligned with modifications (see comments)**	Teacher must be intentional about use of the terms manipulated, controlled and responding variables.

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 66

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-69-72; SG p D-72 Questions 1-4; TG pp D-105-111	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with SEPUP Energy ~ Activity 67

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQB	Different kinds of questions suggest different kinds of scientific investigations.	• Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked. • Propose a hypothesis, give a reason for the hypothesis, and explain how the planned investigation will test the hypothesis. • Work collaboratively with other students to carry out the investigations.	SG pp D-73-77; SG pp D-76-77 Question 1; TG pp D-113-120	**Aligned as designed**	The unit/lesson contains many opportunities to discuss how to calculate efficiency but that is a 9-12 standard.
APPE	Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.	• Collaborate with other students to generate creative solutions to a problem, and apply methods for making tradeoffs to choose the best solution.	SG pp D-73-77; SG p D-77 Question 4-5; TG pp D-113-120	**Aligned as designed**	The unit/lesson contains many opportunities to also discuss how to calculate efficiency which is a 9-12 standard.
PS3A	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	• List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy). • Describe ways in which energy is transformed from one form to another and transferred from one place to another (e.g., chemical to electrical energy in a battery, electrical to light energy in a bulb).	SG pp D-73-77; TG pp D-113-120	**Aligned with modifications (see comments)**	Teacher must be intentional about sharing the energy transfers and transformations. The unit/lesson contains many opportunities to discuss how to calculate efficiency but that is a 9-12 standard.

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-73-77; TG pp D-113-120	**Aligned with modifications (see comments)**	The unit/lesson contains many opportunities to discuss how to calculate efficiency but that is a 9-12 standard.

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 68

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQB	Different kinds of questions suggest different kinds of scientific investigations.	• Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked. • Propose a hypothesis, give a reason for the hypothesis, and explain how the planned investigation will test the hypothesis. • Work collaboratively with other students to carry out the investigations.	SG pp D-78-80; TG pp D-121-126	**Aligned as designed**	
INQC	Collecting, analyzing, and displaying data are essential aspects of all investigations.	• Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. • Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words. • Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.	SG pp D-78-80; SG p D-80 Questions 1, 2; TG pp D-121-126	**Aligned as designed**	
APPE	Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.	• Collaborate with other students to generate creative solutions to a problem, and apply methods for making tradeoffs to choose the best solution.	SG pp D-78-80; SG p D-80 Questions 1-3; TG pp D-121-126	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
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Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3E	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	• Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	SG pp D-78-80; TG pp D-121-126	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 69

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-81-85; TG pp D-127-132	**Aligned with modifications (see comments)**	The lesson contains many opportunities to discuss how to calculate efficiency but that is a 9-12 standard.

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 70

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQE	Models are used to represent objects, events, systems, and processes. Models can be used to test hypotheses and better understand phenomena, but they have limitations.	• Create a model or simulation to represent the behavior of objects, events, systems, or processes. Use the model to explore the relationship between two variables and point out how the model or simulation is similar to or different from the actual phenomenon.	SG pp D-86-89; SG p D-88 Question 1; TG pp D-133-139	**Aligned as designed**	
APPF	Solutions must be tested to determine whether or not they will solve the problem. Results are used to modify the design, and the best solution must be communicated persuasively.	• Test the best solution by building a model or other representation and using it with the intended audience. Redesign as necessary. • Present the recommended design using models or drawings and an engaging presentation.	SG pp D-86-89; SG pp D-88-89 Questions 1-4; TG pp D-133-139	**Aligned as designed**	
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-86-89; SG p D-88 Questions 1-2; TG pp D-133-139	**Aligned as designed**	

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SEPUP Energy ~ Activity 71

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
APPE	Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.	• Collaborate with other students to generate creative solutions to a problem, and apply methods for making tradeoffs to choose the best solution.	SG pp D-90-95; SG p D-95 Question 1-2; SG p D-95 Extension; TG pp D-141-145	**Aligned as designed**	
PS3B	Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.	• Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of energy from warmer objects to cooler ones until the objects reach the same temperature.	SG pp D-90-95; SG p D-95 Question 1; TG pp D-141-145	**Aligned as designed**	

Alignment of Washington 6-8 Science Standards with
SEPUP Energy ~ Activity 72

Standard	Content Standard	Performance Expectation	Evidence of Alignment	Alignment	Alignment Comments
INQF	It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.	• Generate a scientific conclusion from an investigation using inferential logic, and clearly distinguish between results (e.g., evidence) and conclusions (e.g., explanation). • Describe the differences between an objective summary of the findings and an inference made from the findings.	SG pp D-96-100; TG pp D-147-152	**Aligned as designed**	
APPE	Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.	• Collaborate with other students to generate creative solutions to a problem, and apply methods for making tradeoffs to choose the best solution.	SG pp D-96-100; SG p D-99 Questions 1-4; TG pp D-147-152	**Aligned as designed**	