

WASHINGTON STATE LASER

Alignment of Washington 6-8
Science Standards by EALR/Domain for

SEPUP

Energy

November 1, 2010

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
 Systems ~ SYSA**

Content Standard

Any system may be thought of as containing subsystems and as being a subsystem of a larger system.

Performance Expectation

- Given a system, identify subsystems and a larger encompassing system

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 58	Aligned with modifications (see comments)	SG pp D-29-32; Student Sheet 58.1; TG pp D-39-44	The teacher needs to be intentional about discussing the standard.

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Systems ~ SYSC**

Content Standard

The output of one system can become the input of another system.

Performance Expectation

- Give an example of how output of matter or energy from a system can become input for another system

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 58	Aligned with modifications (see comments)	SG pp D-29-32; Student Sheet 58.1; TG pp D-39-44	The teacher needs to be intentional about discussing the standard.
Activity 65	Aligned with modifications (see comments)	SG pp D-64-68; SG pp D-67-68 Questions 1-3; TG pp D-93-102	The teacher needs to be intentional about discussing the standard using the terms input and output and the system.

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Systems ~ SYSD**

Content Standard 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.

Performance Expectation • Given a description of a system, analyze and defend whether it is open or closed.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 60	Aligned with modifications (see comments)	SG pp D-36-42; SG p D-42 Question 1; TG pp D-55-60	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.

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Systems ~ SYSE**

Content Standard

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.

Performance Expectation

• 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).

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 61	Aligned with modifications (see comments)	SG pp D-43-46; TG pp D61-66	Teacher must be intentional about use of the terms input and output and the relation to a house as a system.

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQB**

Content Standard

Different kinds of questions suggest different kinds of scientific investigations.

Performance Expectation

- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 54	Aligned as designed	SG pp D8-11; TG pp D9-15	
Activity 63	Aligned with modifications (see comments)	SG pp D-50-53; TG pp D-73-79	The lesson contains many opportunities to discuss how to calculate energy released even though that is a 9-12 standard.
Activity 66	Aligned as designed	SG pp D-69-72; TG pp D-105-111	
Activity 67	Aligned as designed	SG pp D-73-77; SG pp D-76-77 Question 1; TG pp D-113-120	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
Inquiry ~ INQB**

Content Standard

Different kinds of questions suggest different kinds of scientific investigations.

Performance Expectation

- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 68	Aligned as designed	SG pp D-78-80; TG pp D-121-126	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQC**

Content Standard

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.

Performance Expectation

- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 54	Aligned as designed	SG pp D-8-11; TG pp D-9-15	
Activity 56	Aligned with modifications (see comments)	SG pp D-19-22; SG p D-21 Question 1-3; TG pp D-25-29	Teacher must be intentional about use of the terms manipulated and responding variable.
Activity 61	Aligned as designed	SG pp D-43-46; SG p D-46 Questions 1-5; TG pp D-61-66	
Activity 65	Aligned as designed	SG pp D-64-68; SG pp D-67-68 Questions 1- 4; TG pp D-93-102	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQC**

Content Standard

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.

Performance Expectation

- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 66	Aligned as designed	SG pp D-69-72; TG pp D105-111	
Activity 68	Aligned as designed	SG pp D-78-80; SG p D-80 Questions 1, 2; TG pp D-121-126	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQD**

Content Standard

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.

Performance Expectation

• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 54	Aligned with modifications (see comments)	SG pp D-8-11; TG pp D-9-15	Teacher must be intentional about use of the terms manipulated and responding variable.
Activity 59	Aligned as designed	SG pp D-33-35; SG p D-35 Question 5; TG pp D47-52	
Activity 60	Aligned as designed	SG pp D-36-42; SG p D-38 Questions 2; TG pp D-55-60	
Activity 65	Aligned as designed	SG pp D-64-68; SG p D-68 Extension; TG pp D-93-102	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQD**

Content Standard

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.

Performance Expectation

• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 66	Aligned with modifications (see comments)	SG pp D-69-72; TG pp D-105-111	Teacher must be intentional about use of the terms manipulated, controlled and responding variables.

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQE**

Content Standard 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.

Performance Expectation • 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 60	Aligned with modifications (see comments)	SG pp D-36-42; SG p D-38 Question 4; TG pp D-55-60	The teacher needs to be intentional about discussing the standard.
Activity 70	Aligned as designed	SG pp D-86-89; SG p D-88 Question 1; TG pp D-133-139	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Inquiry ~ INQE**

Content Standard 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.

Performance Expectation

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 72	Aligned as designed	SG pp D-96-100; TG pp D-147-152	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Application ~ APPA**

Content Standard People have always used technology to solve problems. Advances in human civilization are linked to advances in technology.

Performance Expectation • Describe how a technology has changed over time in response to societal challenges.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 53	Aligned with modifications (see comments)	SG pp D-4-7; Student Sheet 53.1; TG pp D-1-7	The lesson is an integral part of a learning progression because it is an introduction.
Activity 57	Aligned as designed	SG pp D-23-28; TG pp D-31-36	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Application ~ APPC**

Content Standard 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.

Performance Expectation • 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).

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 53	Aligned with modifications (see comments)	SG pp D-4-7; Student Sheet 53.1; TG pp D-1-7	The lesson is an integral part of a learning progression because it is an introduction.
Activity 64	Aligned as designed	SG pp D-54-63; SG p D-63 Extension 1; TG pp D-83-90	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Application ~ APPE**

Content Standard Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.

Performance Expectation • Collaborate with other students to generate creative solutions to a problem, and apply methods for making tradeoffs to choose the best solution.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 67	Aligned as designed	SG pp D-73-77; SG p D-77 Question 4-5; TG pp D-113-120	The unit/lesson contains many opportunities to also discuss how to calculate efficiency which is a 9-12 standard.
Activity 68	Aligned as designed	SG pp D-78-80; SG p D-80 Questions 1-3; TG pp D-121-126	
Activity 71	Aligned as designed	SG pp D-90-95; SG p D-95 Question 1-2; SG p D-95 Extension; TG pp D-141-145	
Activity 72	Aligned as designed	SG pp D-96-100; SG p D-99 Questions 1-4; TG pp D-147-152	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Application ~ APPF**

Content Standard 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.

Performance Expectation

- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 70	Aligned as designed	SG pp D-86-89; SG pp D-88-89 Questions 1-4; TG pp D-133-139	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Application ~ APPG**

Content Standard

The benefits of science and technology are not available to all the people in the world.

Performance Expectation

- Contrast the benefits of science and technology enjoyed by people in industrialized and developing nations.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 64	Aligned as designed	SG pp D-54-63; SG p D-63 Extension 2; TG pp D-83-90	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS1B**

Content Standard 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.

Performance Expectation • Demonstrate and explain the frictional force acting on an object with the use of a physical model.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 55	Aligned as designed	SG pp D-12-18; Student Sheet 55.1; SG p D-17 Question 3; TG pp D17-21	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS1C**

Content Standard 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.

- Performance Expectation**
- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 55	Aligned as designed	SG pp D-12-18; Student Sheet 55.1; SG p D-18 Question 4; TG pp D-17-21	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS3A**

Content Standard 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.

- Performance Expectation**
- 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).

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 53	Aligned with modifications (see comments)	SG pp D-4-7; TG pp D-1-7; Student Sheet 53.1	The lesson is an integral part of a learning progression because it introduces different forms of energy.
Activity 54	Aligned as designed	SG pp D-8-11; SG p D-10 Questions 1-4; TG pp D-9-15	
Activity 55	Aligned as designed	SG pp D-12-18; Student Sheet 55.1; SG pp D-17-18 Questions 1-4; TG pp D-17-21	
Activity 56	Aligned as designed	SG pp D-19-22; SG p D-22 Question 4; TG pp D-25-29	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS3A**

Content Standard 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.

- Performance Expectation**
- 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).

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 58	Aligned as designed	SG pp D-29-32; Student Sheet 58.1; SG pp D-30-32 Questions 1, 2; TG pp D-39-44	
Activity 62	Aligned with modifications (see comments)	SG pp D-47-49; SG p D-49 Questions 2, 5; TG pp D-67-71	The lesson contains opportunities to discuss how to quantify energy but standard appears in 9-12.
Activity 63	Aligned as designed	SG pp D-50-53; SG p D-52 Question 2; TG pp D-73-79	
Activity 67	Aligned with modifications (see comments)	SG pp D-73-77; TG pp D-113-120	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
SEPUP Energy
Physical Science ~ PS3B**

Content Standard

Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.

Performance Expectation

• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 59	Aligned as designed	SG pp D-33-35; SG p D-35 Questions 2-4; TG pp D-47-52	
Activity 60	Aligned as designed	SG pp D-36-42; SG p D-42 Questions 1-3; TG pp D-55-60	
Activity 61	Aligned with modifications (see comments)	SG pp D-43-46; TG pp D-61-66	Teachers need to emphasize that thermal energy is transferred.
Activity 63	Aligned as designed	SG pp D-50-53; SG p D-52 Question 2; TG pp D-73-79	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS3B**

Content Standard

Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.

Performance Expectation

• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 69	Aligned with modifications (see comments)	SG pp D-81-85; TG pp D-127-132	The lesson contains many opportunities to discuss how to calculate efficiency but that is a 9-12 standard.
Activity 70	Aligned as designed	SG pp D-86-89; SG p D-88 Questions 1-2; TG pp D-133-139	
Activity 71	Aligned as designed	SG pp D-90-95; SG p D-95 Question 1; TG pp D-141-145	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS3C**

Content Standard

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.

Performance Expectation

• Explain how various types of insulation slow transfer of heat energy based on the atomic-molecular model of heat (thermal energy).

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 56	Aligned as designed	SG pp D-19-22; TG pp D-25-29	
Activity 59	Aligned with modifications (see comments)	SG pp D-33-35; TG pp D-47-52	The teacher needs to be intentional about discussing the standard using the "Conduction in a gas" illustration on SG p D-33.
Activity 60	Aligned as designed	SG pp D-36-42; SG p D-38 Questions 2-4; SG p D-42 Questions 1-3; TG pp D55-60	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS3E**

Content Standard 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.

Performance Expectation • 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 57	Aligned with modifications (see comments)	SG pp D-23-28; SG p D-28 Question 1; TG pp D31-36	The lesson contains many opportunities to discuss Law of Conservation of Energy even though it is a 9-12 Content Standard.
Activity 58	Aligned as designed	SG pp D-29-32; Student Sheet 58.1; SG pp D-30-32 Questions 1 , 2; TG pp D-39-44	
Activity 64	Aligned as designed	SG pp D-54-63; SG p D-62 Questions 3 & 4; TG pp D-83-90	
Activity 65	Aligned as designed	SG pp D-64-68; SG p D-68 Question 5; TG pp D-93-102	

**Alignment of Washington 6-8 Science Standards with
SEPUP Energy
Physical Science ~ PS3E**

Content Standard 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.

Performance Expectation • 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Activity 66	Aligned as designed	SG pp D-69-72; SG p D-72 Questions 1-4; TG pp D-105-111	
Activity 67	Aligned with modifications (see comments)	SG pp D-73-77; TG pp D-113-120	The unit/lesson contains many opportunities to discuss how to calculate efficiency but that is a 9-12 standard.
Activity 68	Aligned as designed	SG pp D-78-80; TG pp D-121-126	