WASHINGTON STATE LASER

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

STC/MS

Energy, Machines, & Motion

November 1, 2010

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 02	**Aligned as designed**	Inquiry 2.1 SG pp 14-15	Teacher must be intentional about sharing how the parts used in the investigation create a system.
Lesson 17	**Aligned as designed**	SG pp 171-173 Reading How to Do a Simple Task-in Just 13 Steps	
Lesson 18	**Aligned with modifications (see comments)**	SG pp 181-183 Reading Propellers: Vehicles in Motion	Teacher must be intentional about use of the terms "system" and "subsystem" describing the idea that propellers are a subsystem of a larger vehicle system.
Lesson 20	**Aligned with modifications (see comments)**	SG pp 200-213 Inquiry 20.1	Students are asked to build sections of a roller coaster. When sections are placed together, an opportunity is presented for students to see their section as a subsystem of a larger complete system.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 21	**Aligned with modifications (see comments)**	SG pp 218-219 Inquiry 21.1 & 21.2	Teachers need to emphasize that the car and track are both subsystems that operate together to create a larger system.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 08	**Aligned as designed**	Reading-Klamath Falls A Real Hot Spot	Teacher must be intentional about sharing how the energy in natural hot springs are used for practical manmade purposes.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 14	**Aligned with modifications (see comments)**	Reading-Mechanical Advantage SG p 132; Student Sheet 14.1, TG p 175	Teacher must be intentional about use of the terms system, input and output. The actual mechanical advantage (output) is less that the ideal mechanical advantage (input) because some effort force must overcome friction in the system.
Lesson 15	**Aligned as designed**	Reading- Meaning of Efficiency; Inquiry 15.1 SG p 142	
Lesson 16	**Aligned as designed**	Inquiry 16.1 SG p 151; Student Sheet 16.1A, TG p 195	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQA

Content Standard Scientific inquiry involves asking and answering questions and comparing the answer with what scientists already know about the world.

Performance Expectation • Generate a question that can be answered through scientific investigation. This may involve refining or refocusing a broad and ill-defined question.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 06	**Aligned as designed**	Inquiry 6.1-6.3 SG pp 50-53	Students are asked to work through three similar inquiries. At the end of the third inquiry students with intentional teaching could define a testable question.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 19	**Aligned as designed**	SG pp 192-193 Inquiry 19.1 & 19.2	
Lesson 21	**Aligned as designed**	SG pp 218-219 Inquiry 21.1 & 21.2	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQC

Content Standard Collecting, analyzing, and displaying data are essential aspects of all investigations.

Performance Expectation
- 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 04	**Aligned as designed**	Inquiry 4.1 SG pp 28-29	Students are asked to record data gathered during inquiry. Students are also asked to create a graph to display data and make inferences based on data.
Lesson 05	**Aligned as designed**	Inquiry 5.1 SG pp 38-39; Students Sheet 5.1; Inquiry 5.2 SG pp 40-41	This lesson is a part of a conceptual sequence to develop an understanding of forces.
Lesson 06	**Aligned as designed**	Inquiry 6.1-6.3 pp 50-53; Student Sheet 6.1; Student Sheet 6.2; Student Sheet 6.3	
Lesson 07	**Aligned as designed**	Inquiry 7.1 SG p 65	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQC

Content Standard Collecting, analyzing, and displaying data are essential aspects of all investigations.

Performance Expectation
• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 09	**Aligned as designed**	Inquiry 9.1 SG pp 85-86; Reflection SG p 86	
Lesson 10	**Aligned as designed**	Performance Assessment 10.1	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 1-9.
Lesson 11	**Aligned as designed**	Inquiry 11.1 SG pp 102-103; Inquiry 11.2 SG pp 104-105	
Lesson 12	**Aligned as designed**	Inquiry 12.1 SG pp 112-115	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQC

Content Standard Collecting, analyzing, and displaying data are essential aspects of all investigations.

Performance Expectation
• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 13	**Aligned as designed**	Inquiry 13.2 SG pp 123-124; Student Sheet 13.2, TG p165	
Lesson 14	**Aligned as designed**	Student Sheet 14.1, TG p 175	
Lesson 15	**Aligned as designed**	Student Sheet 15.1, TG p 183	
Lesson 16	**Aligned as designed**	Inquiry 16.1 SG p 151	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 11-15.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQC

Content Standard Collecting, analyzing, and displaying data are essential aspects of all investigations.

Performance Expectation
• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 18	**Aligned as designed**	SG pp 179-180 Inquiry 18.2; TG p 227 Student Sheet 18.2	
Lesson 19	**Aligned as designed**	SG pp 192-193 Inquiry 19.1 & 19.2	
Lesson 21	**Aligned as designed**	SG pp 218-219 Inquiry 21.1 & 21.2	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 04	**Aligned as designed**	Inquiry 4.1 SG p 28	Teacher must be intentional about use of the terms. Student guide uses term dependent and independent variable. Teachers will need to intentionally bring in terms responding and manipulated variables.
Lesson 06	**Aligned as designed**	Inquiry 6.1-6.3 pp 50-53; Student Sheet 6.1; Student Sheet 6.2; Student Sheet 6.3	Students perform three similar investigations for Inquiry 6.1, 6.2 and 6.3. Teacher must be intentional about sharing each investigation is changing one variable between lessons.
Lesson 07	**Aligned as designed**	Inquiry 7.1 SG pp 64-65	
Lesson 11	**Aligned with modifications (see comments)**	Inquiry 11.2 SG pp 104-105	The lesson contains opportunities for the use of term controlled variable, manipulated variable and responding variable but it requires the intentional use by teachers.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 12	**Aligned with modifications (see comments)**	Inquiry 12.1 SG pp 112-115; Student Sheet 12.1	The lesson contains opportunities for the use of term controlled variable, manipulated variable and responding variable but it requires the intentional use by teachers.
Lesson 13	**Aligned with modifications (see comments)**	Inquiry 13.2 SG p 123; Student Sheet 13.2, TG p165	The lesson contains opportunities for the use of term controlled variable, manipulated variable and responding variable but it requires the intentional use by teachers.
Lesson 16	**Aligned with modifications (see comments)**	Inquiry 16.1 SG p 151	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 11-15.
Lesson 19	**Aligned with modifications (see comments)**	SG pp 192-193 Inquiry 19.1 & 19.2	When students are designing their investigations they should note the controlled, manipulated, and responding variables.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 11	**Aligned with modifications (see comments)**	Inquiry 11.1 SG pp 102-103; Inquiry 11.2 SG pp 104-105	Teacher must be intentional about connecting the sled/cart and inclined plane as a model.
Lesson 12	**Aligned with modifications (see comments)**	Inquiry 12.1 SG pp 112-115	The lesson is an integral part of a learning progression. Teacher must be intentional about use of the term model for the sled/cart and pulley system.
Lesson 13	**Aligned with modifications (see comments)**	Getting Started SG p 121; Inquiry 13.1 SG pp 122-123; Inquiry 13.2 SG pp 123-124	The lesson is an integral part of a learning progression. Teacher must be intentional about use of the term model for the sled/cart and lever system.
Lesson 17	**Aligned with modifications (see comments)**	Inquiry 17.1 SE pp 165-166; Inquiry Master 17.1a; Inquiry Master 17.1b	The Anchor Activity contains multiple opportunities for student involvement. Students may choose to engage in a research project or developing a model through the design process and will cover multiple learning standards with this ongoing lesson.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 18	**Aligned with modifications (see comments)**	SG pp 178-180 Inquiry 18.1 & 18.2	Teacher must be intentional about sharing the fact that the fan car is a model.
Lesson 19	**Aligned with modifications (see comments)**	SG pp 192-193 Inquiry 19.1 & 19.2	Teachers must be intentional about sharing the idea that the mousetrap car is a model of a vehicle.
Lesson 21	**Aligned as designed**	SG pp 218-219 Inquiry 21.1 & 21.2	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQF

Content Standard It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.

Performance Expectation
• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 06	**Aligned as designed**	Reflection A-C SG p 53	
Lesson 07	**Aligned as designed**	Reflection SG p 67 A-D	
Lesson 08	**Aligned as designed**	Student Sheet 8.2	Teachers need to ask students to draw a conclusion regarding the motors ability to lift the sled.
Lesson 10	**Aligned as designed**	Performance Assessment 10.1	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 1-9.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQF

Content Standard It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.

Performance Expectation
• 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.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 14	**Aligned as designed**	Student Sheet 14.1, TG p 175; Reflection p 134	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQG

Content Standard Scientific reports should enable another investigator to repeat the study to check the results.

Performance Expectation • Prepare a written report of an investigation by clearly describing the question being investigated, what was done, and an objective summary of results. The report should provide evidence to accept or reject the hypothesis, explain the relationship between two or more variables, and identify limitations of the investigation.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 22	**Aligned as designed**	SG pp 226-227 Inquiry 22.1	The Anchor Activity contains multiple opportunities for student involvement. Students may choose to engage in a research project or developing a model through the design process and will cover multiple learning standards with this ongoing lesson.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Inquiry ~ INQH

Content Standard	Science advances through openness to new ideas, honesty, and legitimate skepticism. Asking thoughtful questions, querying other scientists' explanations, and evaluating one's own thinking in response to the ideas of others are abilities of scientific inquiry.
Performance Expectation	• Recognize flaws in scientific claims, such as uncontrolled variables, over generalizations from limited data, and experimenter bias. • Listen actively and respectfully to research reports by other students. Critique their presentations respectfully, using logical argument and evidence. • Engage in reflection and self-evaluation.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 19	**Aligned with modifications (see comments)**	SG pp 192-193 Inquiry 19.1 & 19.2	Teacher needs to emphasize that students should report their data accurately. Students tend to be competitive regarding the speed of their vehicle and may skew their data.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 06	**Aligned as designed**	Reading-Rock Climbing Two People, One Powerful Force	The reading contains many opportunities to discuss the technologies necessary for rock climbing
Lesson 11	**Aligned as designed**	Reading-Escape Route in Johnstown	
Lesson 12	**Aligned as designed**	Reading-Uses of Pulleys; Reading-Going Up	
Lesson 13	**Aligned as designed**	Reading-Understanding Levers As Easy As 1 2 3	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 14	**Aligned as designed**	Reading-Secret Wheelbarrow Technology; Reading-More Simple Machines: The Wedge, Screw and Wheel and Axle	
Lesson 15	**Aligned as designed**	Reading-Harnessing the Power of Nature James Watt and the Steam Engine; Reading-Energy Star: A Bright Idea	
Lesson 16	**Aligned with modifications (see comments)**	Inquiry 16.1 SG p 151; Student Sheet 16.1A, TG p195	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 11-16.
Lesson 19	**Aligned as designed**	SG pp 194-197 Reading Rocket Science 101	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 21	**Aligned as designed**	SG pp 220-221 Reading Twists, Turns, and Loops	
Lesson 22	**Aligned as designed**	SG pp 228-230 Reading Unusual Inventions; SG pp 231-233 Reading Building a Better Bicycle Rack the Man Behind Patent Number 3,847,317	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Application ~ APPB

Content Standard Scientists and technological designers (including engineers) have different goals. Scientists answer questions about the natural world; technological designers solve problems that help people reach their goals.

Performance Expectation • Investigate several professions in which an understanding of science and technology is required. Explain why that understanding is necessary for success in each profession.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 17	**Aligned as designed**	SG pp 168-170 Reading Civil Engineering Danelle Bernard's Bridge to the Future	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 07	**Aligned as designed**	Reading-Motors-Getting Smaller Every Day	Teacher must be intentional about sharing with students the technological advancement of motors.
Lesson 15	**Aligned as designed**	Reading-Harnessing the Power of Nature James Watt and the Steam Engine; Reading-Energy Star: A Bright Idea	
Lesson 16	**Aligned as designed**	Reading-Science and Technology SG p 150; Reading Technology-It's Not Just the Computer SG p 152; Reading-Linking a Country to a Continent	
Lesson 18	**Aligned as designed**	SG pp 184-187 Reading Sailing Through the Solar System	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Application ~ APPD

Content Standard The process of technological design begins by defining a problem and identifying criteria for a successful solution, followed by research to better understand the problem and brainstorming to arrive at potential solutions.

Performance Expectation
- Define a problem that can be solved by technological design and identify criteria for success.
- Research how others solved similar problems.
- Brainstorm different solutions.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 16	**Aligned as designed**	Inquiry 16.1, SG p 151; Student Sheet 16.1A, TG p 195	
Lesson 17	**Aligned with modifications (see comments)**	Inquiry 17.1 SE pp 165-166; Inquiry Master 17.1a; Inquiry Master 17.1b	The Anchor Activity contains multiple opportunities for student involvement. Students may choose to engage in a research project or developing a model through the design process and will cover multiple learning standards with this ongoing lesson.
Lesson 22	**Aligned as designed**	SG pp 231-233 Reading Building a Better Bicycle Rack the Man Behind Patent Number 3,847,317	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 17	**Aligned as designed**	Inquiry 17.1 SE pp 165-166; Inquiry Master 17.1a; Inquiry Master 17.1b	The Anchor Activity contains multiple opportunities for student involvement. Students may choose to engage in a research project or developing a model through the design process and will cover multiple learning standards with this ongoing lesson.
Lesson 22	**Aligned with modifications (see comments)**	SG pp 231-233 Reading Building a Better Bicycle Rack the Man Behind Patent Number 3,847,317	Teachers need to emphasize the idea that Bob Burruss acted as both a scientist and an engineer in his invention.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 16	**Aligned with modifications (see comments)**	Inquiry 16.1 SG p 151; Student Sheet 16.1A, TG p 195	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 11-15. Teacher must be intentional about the term solution as part of the design process.
Lesson 17	**Aligned with modifications (see comments)**	Inquiry 17.1 SE pp 165-166; Inquiry Master 17.1a; Inquiry Master 17.1b	The Anchor Activity contains multiple opportunities for student involvement. Students may choose to engage in a research project or developing a model through the design process and will cover multiple learning standards with this ongoing lesson.
Lesson 22	**Aligned as designed**	SG pp 231-233 Reading Building a Better Bicycle Rack the Man Behind Patent Number 3,847,317	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Application ~ APPH

Content Standard People in all cultures have made and continue to make contributions to society through science and technology.

Performance Expectation • Describe scientific or technological contributions to society by people in various cultures.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 01	**Aligned as designed**	SG pp 9-11 Reading Galileo ad Experimental Science	
Lesson 05	**Aligned as designed**	Reading: Bungee Jumping: The Forces Are With You; Reading Hooke and Newton	Includes focus on how the Bunlap People on Pentecost Island use forces as part of their cultural traditions. Additionally, the contributions of Robert Hooke and Sir Isaac Newton are outlined.
Lesson 08	**Aligned as designed**	Reading-Klamath Falls A Real Hot Spot	
Lesson 19	**Aligned as designed**	SG pp 198-199 Reading Medieval Warfare in Modern Times	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Physical Science ~ PS1A

Content Standard Average speed is defined as the distance traveled in a given period of time.

Performance Expectation
• Measure the distance an object travels in a given interval of time and calculate the object's average speed, using S = d/t. (e.g., a battery-powered toy car travels 20 meters in 5 seconds, so its average speed is 4 meters per second).
• Illustrate the motion of an object using a graph, or infer the motion of an object from a graph of the object's position vs. time or speed vs. time.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 01	**Aligned as designed**	SG pp 5-7 Inquiry 1.4 & Inquiry 1.6 & Inquiry 1.8	The lesson is an integral part of a learning progression. This lesson is a part of a conceptual sequence.
Lesson 09	**Aligned as designed**	Inquiry 9.1 SG pp 85-86	This lesson is a part of a learning progression towards understanding of speed.
Lesson 18	**Aligned as designed**	SG p 175 Getting Started; SG p 177 Reading Measuring Motion; SG pp 179-180 Inquiry 18.2	
Lesson 19	**Aligned as designed**	SG pp 192-193 Inquiry 19.1 & 19.2	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Physical Science ~ PS1A

Content Standard Average speed is defined as the distance traveled in a given period of time.

Performance Expectation
• Measure the distance an object travels in a given interval of time and calculate the object's average speed, using S = d/t. (e.g., a battery-powered toy car travels 20 meters in 5 seconds, so its average speed is 4 meters per second).
• Illustrate the motion of an object using a graph, or infer the motion of an object from a graph of the object's position vs. time or speed vs. time.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 21	**Aligned as designed**	SG pp 218-219 Inquiry 21.1 & 21.2; SG pp 222-225 Reading Isaac Newton Goes Skiing	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 01	**Aligned with modifications (see comments)**	SG pp 5-6 Inquiry 1.3 & Inquiry 1.5	The lesson is an integral part of a learning progression. This lesson is a part of a conceptual sequence.
Lesson 06	**Aligned as designed**	Inquiry 6.1 SG pp 50-51, Inquiry 6.2 SG pp 51-52, Inquiry 6.3 SG pp 52-53, Reading: Nature Puts On the Brakes SG pp 54-58	
Lesson 11	**Aligned as designed**	Getting Started SG p 101; Inquiry 11.1; Inquiry 11.2 SG pp 102-105; Reflection SG p 105	
Lesson 16	**Aligned as designed**	Inquiry 16.1 SG pp 151, Student Sheet 16.1A, TG p 195	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 11-15.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 18	**Aligned with modifications (see comments)**	SG pp 178-180 Inquiry 18.1 & Inquiry 18.2; SG pp 184-187 Reading Sailing Through the Solar System	Teachers need to ask students to explain what force (friction) slows the vehicle. Teachers need to ask students to explain what forces are acting on the vehicle along different sections of the track.
Lesson 19	**Aligned with modifications (see comments)**	SG pp 192-193 Inquiry 19.1 & 19.2	Teachers need to ask students to explain the forces (friction) present that slow the vehicle.
Lesson 21	**Aligned as designed**	SG pp 218-219 Inquiry 21.1 & 21.2; SG pp 222-225 Reading Isaac Newton Goes Skiing	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 01	**Aligned with modifications (see comments)**	SG pp 4-8 Inquiry 1.1 & Inquiry 1.2 & Inquiry 1.6 & Inquiry 1.7 & Inquiry 1.8	The lesson is an integral part of a learning progression. This lesson is a part of a conceptual sequence.
Lesson 05	**Aligned as designed**	Getting Started SG p37; Inquiry 5.1 SG pp 38-39; Student Sheet 5.1; Reading-The Difference Between Mass and Weight; Inquiry 5.2 SG pp 40-41	The lesson is an integral part of a learning progression towards understanding of forces.
Lesson 06	**Aligned as designed**	Getting Started SG p 49; Inquiry 6.1, Inquiry 6.2, Inquiry 6.3 SG pp 50-53; Readings-Nature Puts on the Brakes & Rock Climbing	
Lesson 07	**Aligned as designed**	Inquiry 7.1 SG pp 64-67	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 09	**Aligned as designed**	Inquiry 9.1 SG pp 85-86	Teacher must be intentional about sharing when the load at rest the forces are balanced, when the load is being lifted the forces are no longer balanced.
Lesson 10	**Aligned as designed**	Performance Assessment Student Sheet 10.1, TG pp 122-126; Inquiry Master 10.5 Multiple Choice Short Response, TG pp 119-120	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 1-9.
Lesson 12	**Aligned with modifications (see comments)**	Inquiry 12.1 SG pp 112-115	Teacher must be intentional about sharing when sled is at rest in the system the forces are balanced, when the sled is lifting the forces are unbalanced.
Lesson 16	**Aligned with modifications (see comments)**	Inquiry 16.1 SG p 151; Student Sheet 16.1A, TG p 195	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 11-15.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 18	**Aligned as designed**	SG pp 178-180 Inquiry 18.1 & 18.2	
Lesson 19	**Aligned as designed**	SG pp 192-193 Inquiry 19.1 & Inquiry 19.2	
Lesson 21	**Aligned as designed**	SG pp 218-219 Inquiry 21.1 & 21.2; SG pp 222-225 Reading Isaac Newton Goes Skiing	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Physical Science ~ PS1D

Content Standard The same unbalanced force will change the motion of an object with more mass more slowly than an object with less mass.

Performance Expectation • Given two different masses that receive the same unbalanced force, predict which will move more quickly.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 06	**Aligned as designed**	Inquiry 6.2 SG pp 51-52	
Lesson 07	**Aligned as designed**	Inquiry 7.1 SG pp 64-67	
Lesson 08	**Aligned as designed**	Inquiry 8.1 SG p 76; Inquiry 2 SG pp 77-78	Teacher must be intentional about sharing how forces change between different masses. The masses include the block from Lesson 6, two washers, and sled with 7 washers. From this information students will calculate work done on the various masses.
Lesson 10	**Aligned as designed**	Performance Assessment 10.1; Inquiry Master 10.5	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 1-9.

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
Physical Science ~ PS1D

Content Standard The same unbalanced force will change the motion of an object with more mass more slowly than an object with less mass.

Performance Expectation • Given two different masses that receive the same unbalanced force, predict which will move more quickly.

Lesson Number	Alignment	Evidence of Alignment	AlignmentComments
Lesson 21	**Aligned as designed**	SG pp 222-225 Reading Isaac Newton Goes Skiing	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 01	**Aligned with modifications (see comments)**	SG pp 4-8 Inquiry 1.1 & Inquiry 1.2 & Inquiry 1.3 & Inquiry 1.4 & Inquiry 1.5 & Inquiry 1.6 & Inquiry 1.7 & Inquiry 1.8	The lesson is an integral part of a learning progression. This lesson is a part of a conceptual sequence.
Lesson 02	**Aligned as designed**	Inquiry 2.1, SG pp 14 -15	The lesson is an integral part of a learning progression.
Lesson 03	**Aligned as designed**	Inquiry 3 SG pp 21-23	Teachers must be intentional about sharing the occurrences of energy transformations. Examples may include chemical energy in charged batteries is transformed into electrical energy that is then transformed into kinetic energy to run a motor, or electrical energy is transformed into chemical energy when uncharged batteries are placed into the charger.
Lesson 04	**Aligned as designed**	Inquiry 4.1 SG Reading-Electric Cars: Back to the Future; Reading-Putting Wind to Work SG pp 30-35	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 09	**Aligned as designed**	Reading-The Power of Nature	
Lesson 10	**Aligned as designed**	Performance Assessment 10.1; Inquiry Master 10.5	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 1-9.
Lesson 20	**Aligned with modifications (see comments)**	SG p 200 Introduction	The lesson is an integral part of a learning progression.
Lesson 21	**Aligned as designed**	SG pp 216-217 Reading Potential and Kinetic Energy; SG pp 218-219 Inquiry 21.1 & 21.2; SG pp 220-221 Reading Twists, Turns. and Loops; SG pp 222-225 Reading Isaac Newton Goes Skiing	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 02	**Aligned as designed**	Inquiry 2.1 SG pp 14-15 Reflection A; Reading: Wet-Cell and Dry-Cell Batteries SG pp 18-19	• The lesson contains many opportunities to discuss electrical energy needed to light the battery constructed by the students.
Lesson 03	**Aligned as designed**	Inquiry 3 SG pp 22-23; Reading-Different Batteries for Different Needs SG pp 24-25	Teacher must be intentional about sharing where energy transformations occur. Teachers may want to have students draw light and motor system and label transformations.
Lesson 04	**Aligned as designed**	Inquiry 4 Reading Electric Cars: Back to the Future; Reading Putting the Wind to Work SG pp 30-35	
Lesson 09	**Aligned as designed**	Reading-Work, Energy and Power	

Alignment of Washington 6-8 Science Standards with
STC/MS Energy, Machines, & Motion
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
Lesson 10	**Aligned as designed**	Performance Assessment 10.1; Inquiry Master 10.5	The lesson is an integral part of a learning progression. Students are asked to demonstrate conceptual understanding of standards in Lessons 1-9.
Lesson 10	**Aligned as designed**	Reading-Cars Energy to Burn	