Motion and Design - STC

STANDARDS ALIGNMENT KEY

♦ - Unit is aligned as is.

♦V - Unit is aligned with the intentional use of vocabulary from the Washington Science Standards

♦R - Unit is aligned with the intentional use of the STC Children's Book

♦r - Unit is aligned with the intentional use of the readings within the unit.

♦E - Unit is aligned with the intentional use of the lesson extensions

▲ - Unit needs identified changes or additions to be aligned

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Addressed Throughout the Unit							
Inquiry	4-5	INQA	Scientific investigations involve asking and answering *questions* and comparing the answers with *evidence* from the real world.	Identify the *questions* being asked in an investigation. Gather scientific evidence that helps to answer a *question.*	Addressed throughout the unit.	♦	
Inquiry	4-5	INQB	Scientists plan and conduct different kinds of investigations, depending on the *questions* they are trying to answer. Types of investigations include systematic *observations* and descriptions, *field studies*, *models*, and *open-ended explorations* as well as *experiments*.	Given a research *question*, plan an appropriate investigation, which may include systematic *observations, field studies, models, open-ended explorations*, or *controlled experiments*. Work collaboratively with other students to carry out an investigation, selecting appropriate tools and demonstrating safe and careful use of equipment.	Addressed throughout the unit.	♦	This unit is strong on *systematic observation, models, open-ended explorations*, or *controlled experiments*. Students work throughout the unit in collaborative groups.
Inquiry	4-5	INQC	An *experiment* involves a *comparison*. For an *experiment* to be valid and fair, all of the things that can possibly change the outcome of the *experiment* should be kept the same, if possible.	Conduct or critique an *experiment*, noting when the *experiment* might not be fair because some of the things that might change the outcome are not kept the same.	Addressed throughout the unit.	♦	Students consistently use the standard vehicle throughout the unit as a means of ensuring that the data collected is *valid* and *fair.*
Inquiry	4-5	INQD	Investigations involve systematic collection and recording of relevant *observations* and data.	Gather, record, and organize data using appropriate units, tables, graphs, or maps.	Addressed throughout the unit.	♦	
Inquiry	4-5	INQE	Repeated *trials* are necessary for *reliability*.	*Explain that* additional *trials* are needed to ensure that the results are repeatable.	Addressed throughout the unit.	♦	The use of the term repeated *trials* should be used to reinforce *reliability* when students repeat tests three times.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Inquiry	4-5	INQF	A scientific *model* is a simplified representation of an object, event, *system*, or process created to understand some aspect of the *natural world*. When learning from a *model*, it is important to realize that the *model* is not exactly the same as the thing being modeled.	Create a simple *model* to represent an event, *system*, or process. Use the model to learn something about the event, system, or process. Explain how the model is similar to and different from the thing being modeled.	Addressed throughout the unit.	♦ ♦V	Teachers should ask students to explain how the standard vehicle (model) is similar to but not exactly the same as a real world vehicle (natural world).
Inquiry	4-5	INQG	Scientific explanations emphasize *evidence*, have logically consistent arguments, and use known scientific *principles, models*, and theories.	*Generate* a conclusion from a scientific investigation and show how the conclusion is supported by *evidence* and other scientific *principles*.	Addressed throughout the unit.	♦	Throughout the unit, students generate conclusions based on data *(evidence)* gathered through investigations.
Inquiry	4-5	INQH	Scientists communicate the results of their investigations verbally and in writing. They review and ask *questions* about the results of other scientists' work.	Display the findings of an investigation, using tables, graphs, or other visual means to represent the data accurately and meaningfully. Communicate to peers the purpose, procedure, results, and conclusions of an investigation. Respond non-defensively to comments and questions about their investigation. Discuss differences in findings and conclusions reported by other students.	Addressed throughout the unit.	♦V	To meet **all** of the Performance Expectations of this standard, teachers will need to emphasize that scientists respond non-defensively to comments and questions about their investigation.
Inquiry	4-5	INQI	Scientists report the results of their investigations honestly, even when those results show their predictions were wrong, or when they cannot *explain* the results.	*Explain* why records of *observations* must never be changed, even when the *observations* do not match expectations.	Addressed throughout the unit.	♦V	To meet this standard, teachers must intentionally emphasize that honesty is an important trait scientists must possess even when they predict a different outcome or when the data does not support their prediction.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Inquiry	2-3	INQA	Scientific investigations are *designed* to gain knowledge about the *natural world*.	Explain how observations can lead to new knowledge and new *questions* about the *natural world*.	Addressed throughout the unit.	♦	The teacher should intentionally take advantage of the multiple opportunities for sharing that all of the scientific investigations students are conducting enhance their understanding of *force* and *motion.*
Inquiry	2-3	INQB	A scientific investigation may include making and following a plan to accurately observe and *describe* objects, events, and *organisms*; make and record measurements: and *predict* outcomes.	Work with other students to make and follow a plan to carry out a scientific investigation. Actions may include accurately observing and describing objects, events, and *organisms*; measuring and recording data; and predicting outcomes.	Addressed throughout the unit.	♦	This unit is strong on systematic observations with open-ended explorations where students observe and describe objects and events as well as measure and record data after predicting outcomes.
Inquiry	2-3	INQD	Simple instruments, such as *magnifiers*, *thermometers*, and rulers provide more information than scientists can obtain using only their unaided senses.	Use simple instruments (e.g., metric scales or balances, thermometers, and rulers) to observe and make measurements, and record and display data in a table, bar graph, line plot, or pictograph.	Addressed throughout the unit.	♦	
Inquiry	2-3	INQE	*Models* are useful for understanding *systems* that are too big, too small, or too dangerous to study directly.	Use a simple *model* to study a *system*. *Explain how* the *model* can be used to better understand the system*.*	Addressed throughout the unit.	♦V	The standard vehicle *(model)* should be intentionally referred to as a representation of a *system* (automobile) that would be inappropriate to study directly.
Inquiry	2-3	INQF	Scientists develop explanations, using *observations (evidence)* and what they already know about the world. Explanations should be based on *evidence* from investigations.	Accurately *describe* results, referring to the graph or other data as *evidence*. Draw a conclusion about the *question* that motivated the study using the results of the investigation as *evidence*.	Addressed throughout the unit.	♦	Throughout the unit, students write explanations based on data *(evidence)* gathered through investigations.
Inquiry	2-3	INQG	Scientists make the results of their investigations public, even when the results contradict their expectations.	Communicate honestly about their investigations, describing how *observations* were made, and summarizing results.	Addressed throughout the unit.	♦V	To meet this standard, teachers must intentionally emphasize that honesty is an important trait scientists must possess even when they predict a different outcome or when the data does not support their prediction.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 1							
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPB	People in different cultures all around the world use different materials or *technologies* to solve the same problems.	Give examples of how people around the world use different materials or technologies to solve the same problem. (e.g., in some countries, people use forks for eating, while in other countries they use chopsticks; people in different countries use different materials to build their houses.)	STC Children's Book Lesson 1 Extension #4	♦R ♦E	STC Children's Book: *Bicycles Roll In, Blast Off!* In Lesson 1, Extension #4, students research the invention of the wheel and how different cultures use different technologies to solve the same problem.
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution*.	Use suitable *tools*, techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design*. Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	2-3	APPC	People in all cultures around the world have always had problems and invented tools and techniques (ways of doing something) to solve problems.	Describe a problem that people in different cultures around the world have had to solve and the various ways they have gone about solving that problem.	STC Children's Book Lesson 1 Extension #4	♦R ♦E	STC Children's Book: *Bicycles Roll In, Blast Off!* In Lesson 1, Extension #4, students research the invention of the wheel and how different cultures use different technologies to solve the same problem.
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 2							
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution*.	Use suitable *tools*, techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design*. Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 3							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSC	Systems have *inputs* and *outputs*. Changes in inputs may change the *outputs* of a *system*.	*Describe* what goes into a *system (input)* and what comes out of a *system (output)* (e.g., when making cookies, inputs include sugar, flour, and chocolate chips; *outputs* are finished cookies). Describe the effect on a system if its input is changed (e.g., if sugar is left out, the cookies will not taste very good).	Lessons 3, 4, 7, 10, 12	♦V	This unit contains opportunities for the use of the terms *inputs* and *outputs* but it requires the intentional use by the teacher. For example, in Lesson 7, the more the student *inputs* their energy into winding the rubber band , the further the car will go down a track = *output* (See Final Activity #2.). The same would hold true for the propeller car in which the *input* is student energy winding the rubber band and the *output* is the distance the propeller car travels.
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system*, which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: Cars for One and All; Bicycles Roll In, The Race to Fly
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	4-5	PS1A	The *weight* of an object is a measure of how strongly it is pulled down toward the ground by *gravity*. A spring scale can measure the pulling *force*.	Use a spring scale to measure the *weights* of several objects accurately. *Explain that* the *weight* of an object is a measure of the *force* of *gravity* on the object. Record the measurements in a table.	Lessons 3, 4, 5	▲	In Lessons 3, 4, and 5, the teacher must make use of the information found in the **Background Section** of each lesson and intentionally use the vocabulary words *weight, gravity, and force* as lessons are taught. When discussing these concepts with students, teacher questioning should elicit student understanding.
Physical Science	4-5	PS1B	The relative *speed* of two objects can be determined in two ways: (1) If two objects travel for the same amount of time, the object that has traveled the greatest distance is the fastest. (2) If two objects travel the same distance, the object that takes the least time to travel the distance is the fastest.	Measure the distance that an object travels in a given interval of time and *compare* it with the distance that another object moved in the same interval of time to determine which is fastest.*b Measure the time it takes two objects to travel the same distance and determine which is fastest.	Lessons 3, 4	♦	
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.

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Physical Science	2-3	PS1D	The relative strength of two *forces* can be compared by observing the difference in how they move a *common* object.	Measure and *compare* the distances moved by an object (e.g., a toy car) when given a small push and when given a big push.	Lessons 3, 6, 7, 11, 12	♦	

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Lesson 4							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSC	Systems have *inputs* and *outputs*. Changes in inputs may change the *outputs* of a *system*.	*Describe* what goes into a *system (input)* and what comes out of a *system (output)* (e.g., when making cookies, inputs include sugar, flour, and chocolate chips; *outputs* are finished cookies). Describe the effect on a system if its input is changed (e.g., if sugar is left out, the cookies will not taste very good).	Lessons 3, 4, 7, 10, 12	♦V	This unit contains opportunities for the use of the terms *inputs* and *outputs* but it requires the intentional use by the teacher. For example, in Lesson 7, the more the student *inputs* their energy into winding the rubber band , the further the car will go down a track = *output* (See Final Activity #2.). The same would hold true for the propeller car in which the *input* is student energy winding the rubber band and the *output* is the distance the propeller car travels.
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system*, which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: Cars for One and All; Bicycles Roll In, The Race to Fly
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	2-3	APPB	Scientific ideas and discoveries can be applied to solving problems.	Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night).	Lessons 4, 5, 8, 10, 12, 14	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	4-5	PS1A	The *weight* of an object is a measure of how strongly it is pulled down toward the ground by *gravity*. A spring scale can measure the pulling *force*.	Use a spring scale to measure the *weights* of several objects accurately. *Explain that* the *weight* of an object is a measure of the *force* of *gravity* on the object. Record the measurements in a table.	Lessons 3, 4, 5	▲	In Lessons 3, 4, and 5, the teacher must make use of the information found in the **Background Section** of each lesson and intentionally use the vocabulary words *weight, gravity, and force* as lessons are taught. When discussing these concepts with students, teacher questioning should elicit student understanding.
Physical Science	4-5	PS1B	The relative *speed* of two objects can be determined in two ways: (1) If two objects travel for the same amount of time, the object that has traveled the greatest distance is the fastest. (2) If two objects travel the same distance, the object that takes the least time to travel the distance is the fastest.	Measure the distance that an object travels in a given interval of time and *compare* it with the distance that another object moved in the same interval of time to determine which is fastest.*b Measure the time it takes two objects to travel the same distance and determine which is fastest.	Lessons 3, 4	♦	
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion*" during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 5							
Systems	4-5	SYSA	Systems contain *subsystems* .	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system* , which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: Cars for One and All; Bicycles Roll In, The Race to Fly
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPA	*Technology* involves changing the *natural world* to meet human needs or wants.	*Describe* ways that people use *technology* to meet their needs and wants (e.g., text messages to communicate with friends; use bicycles or cars for transportation).	Lesson 5 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- *Lunar Rover: Making Tracks on the Moon.* STC Children's Book*: Scientists on the Move, Technology and Design*
Application	4-5	APPC	Problems of moderate complexity can be solved using the *technological design process*. This process begins by defining and researching the problem to be solved.	Define a problem (e.g., a new idea for an inexpensive toy) and list several *criteria* for a successful *solution*. Research the problem to better understand the need and to see how others have solved similar problems.	Lessons 5, 14, 15, 16	♦	Technological Design Process (from Standards Glossary pg. 121): *A sequence of steps used to define and solve a problem. The steps may include a definition of the problem, research about the problem, generation of possible solutions, synthesis or selection of one or more promising solutions, construction and testing of a model or prototype, redesign, and reporting.*

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution* .	Use suitable *tools* , techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design* . Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.
Application	4-5	APPF	*Solutions* to problems must be communicated, if the problem is to be solved.	Communicate the *solution* , results of any tests, and modifications persuasively, using oral, written, and/or pictorial representations of the process and product.	Lessons 5, 14, 15, 16	♦	

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	4-5	APPG	Science and technology have greatly improved food quality and quantity, transportation, health, sanitation, and communication.	Describe specific ways that science and technology have improved the quality of the students' lives.	Lesson 5 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- Lunar Rover: Making Tracks on the Moon. STC Children's Book: *Scientists on the Move, Technology and Design*
Application	4-5	APPH	People of all ages, interests, and abilities engage in a variety of scientific and technological work.	*Describe* several activities or careers that require people to *apply* their knowledge and abilities in *science*, *technology*, engineering, and mathematics.	Lesson 5, 10 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- *Lunar Rover: Making Tracks on the Moon.* Lesson 10 reading selection - *Shirley Muldowney-Drag Racer* STC Children's Book*: Scientists on the Move, Technology and Design*
Application	2-3	APPA	Simple problems can be solved through a *technological design process* that includes: defining the problem,*gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	*Design* a *solution* to a simple problem (e.g., *design* a *tool* for removing an object from a jar when your hand doesn't fit), using a *technological design process* that includes: defining the problem,*a gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	Lessons 5, 14, 15, 16	♦	
Application	2-3	APPB	Scientific ideas and discoveries can be applied to solving problems.	Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night).	Lessons 4, 5, 8, 10, 12, 14	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	4-5	PS1A	The *weight* of an object is a measure of how strongly it is pulled down toward the ground by *gravity*. A spring scale can measure the pulling *force*.	Use a spring scale to measure the *weights* of several objects accurately. *Explain that* the *weight* of an object is a measure of the *force* of *gravity* on the object. Record the measurements in a table.	Lessons 3, 4, 5	▲	In Lessons 3, 4, and 5, the teacher must make use of the information found in the **Background Section** of each lesson and intentionally use the vocabulary words *weight, gravity, and force* as lessons are taught. When discussing these concepts with students, teacher questioning should elicit student understanding.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 6							
Systems	4-5	SYSA	Systems contain *subsystems* .	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system* , which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Physical Science	4-5	PS3A	*Energy* has many forms, such as *heat*, light, sound, *motion*, and electricity.	Identify different forms of *energy* (e.g., *heat*, light, sound, *motion*, electricity) in a given *system*.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).
Physical Science	4-5	PS3B	Energy can be tr*ansferred* from one place to another.	Draw and label diagrams showing several ways that *energy can be transferred* from one place to another (e.g., sound energy passing through *air*, electrical energy through a wire, *heat* energy conducted through a frying pan, light energy through space).	Lessons 6, 7, 8, 9, 11, 12	♦V	Multiple opportunities exist if the teacher is intentional about using the terminology of *energy transfer* and asking students to draw the transfer of energy in the standard vehicle, propeller vehicle or vehicle with a sail.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.
Physical Science	2-3	PS1D	The relative strength of two *forces* can be compared by observing the difference in how they move a *common* object.	Measure and *compare* the distances moved by an object (e.g., a toy car) when given a small push and when given a big push.	Lessons 3, 6, 7, 11, 12	♦	
Physical Science	2-3	PS3A	*Heat*, light, *motion*, electricity, and sound are all forms of energy.	Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*. Explain how light, sound, and motion are all energy.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 7							
Systems	4-5	SYSA	Systems contain *subsystems* .	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSC	Systems have *inputs* and *outputs* . Changes in inputs may change the *outputs* of a *system* .	*Describe* what goes into a *system (input)* and what comes out of a *system (output)* (e.g., when making cookies, inputs include sugar, flour, and chocolate chips; *outputs* are finished cookies). Describe the effect on a system if its input is changed (e.g., if sugar is left out, the cookies will not taste very good).	Lessons 3, 4, 7, 10, 12	♦V	This unit contains opportunities for the use of the terms *inputs* and *outputs* but it requires the intentional use by the teacher. For example, in Lesson 7, the more the student *inputs* their energy into winding the rubber band , the further the car will go down a track = *output* (See Final Activity #2.). The same would hold true for the propeller car in which the *input* is student energy winding the rubber band and the *output* is the distance the propeller car travels.
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system* , which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	4-5	PS3A	*Energy* has many forms, such as *heat*, light, sound, *motion*, and electricity.	Identify different forms of *energy* (e.g., *heat*, light, sound, *motion*, electricity) in a given *system*.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).
Physical Science	4-5	PS3B	Energy can be tr*ansferred* from one place to another.	Draw and label diagrams showing several ways that *energy can be transferred* from one place to another (e.g., sound energy passing through *air*, electrical energy through a wire, *heat* energy conducted through a frying pan, light energy through space).	Lessons 6, 7, 8, 9, 11, 12	♦V	Multiple opportunities exist if the teacher is intentional about using the terminology of *energy transfer* and asking students to draw the transfer of energy in the standard vehicle, propeller vehicle or vehicle with a sail.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	2-3	PS1D	The relative strength of two *forces* can be compared by observing the difference in how they move a *common* object.	Measure and *compare* the distances moved by an object (e.g., a toy car) when given a small push and when given a big push.	Lessons 3, 6, 7, 11, 12	♦	
Physical Science	2-3	PS3A	*Heat*, light, *motion*, electricity, and sound are all forms of energy.	Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*. Explain how light, sound, and motion are all energy.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 8							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system*, which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Applicatio n	2-3	APPB	Scientific ideas and discoveries can be applied to solving problems.	Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night).	Lessons 4, 5, 8, 10, 12, 14	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	4-5	PS3A	*Energy* has many forms, such as *heat*, light, sound, *motion*, and electricity.	Identify different forms of *energy* (e.g., *heat*, light, sound, *motion*, electricity) in a given *system*.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	4-5	PS3B	Energy can be tr*ansferred* from one place to another.	Draw and label diagrams showing several ways that *energy can be transferred* from one place to another (e.g., sound energy passing through *air*, electrical energy through a wire, *heat* energy conducted through a frying pan, light energy through space).	Lessons 6, 7, 8, 9, 11, 12	♦V	Multiple opportunities exist if the teacher is intentional about using the terminology of *energy transfer* and asking students to draw the transfer of energy in the standard vehicle, propeller vehicle or vehicle with a sail.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS3A	*Heat*, light, *motion*, electricity, and sound are all forms of energy.	Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*. Explain how light, sound, and motion are all energy.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 9							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution* .	Use suitable *tools* , techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design* . Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.
Physical Science	4-5	PS3A	*Energy* has many forms, such as *heat* , light, sound, *motion* , and electricity.	Identify different forms of *energy* (e.g., *heat* , light, sound, *motion* , electricity) in a given *system* .	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	4-5	PS3B	Energy can be tr*ansferred* from one place to another.	Draw and label diagrams showing several ways that *energy can be transferred* from one place to another (e.g., sound energy passing through *air*, electrical energy through a wire, *heat* energy conducted through a frying pan, light energy through space).	Lessons 6, 7, 8, 9, 11, 12	♦V	Multiple opportunities exist if the teacher is intentional about using the terminology of *energy transfer* and asking students to draw the transfer of energy in the standard vehicle, propeller vehicle or vehicle with a sail.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS3A	*Heat*, light, *motion*, electricity, and sound are all forms of energy.	Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*. Explain how light, sound, and motion are all energy.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 10							
Systems	4-5	SYSA	Systems contain *subsystems* .	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSC	Systems have *inputs* and *outputs* . Changes in inputs may change the *outputs* of a *system* .	*Describe* what goes into a *system (input)* and what comes out of a *system (output)* (e.g., when making cookies, inputs include sugar, flour, and chocolate chips; *outputs* are finished cookies). Describe the effect on a system if its input is changed (e.g., if sugar is left out, the cookies will not taste very good).	Lessons 3, 4, 7, 10, 12	♦V	This unit contains opportunities for the use of the terms *inputs* and *outputs* but it requires the intentional use by the teacher. For example, in Lesson 7, the more the student *inputs* their energy into winding the rubber band , the further the car will go down a track = *output* (See Final Activity #2.). The same would hold true for the propeller car in which the *input* is student energy winding the rubber band and the *output* is the distance the propeller car travels.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: Cars for One and All; Bicycles Roll In, The Race to Fly
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system* .
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	4-5	APPH	People of all ages, interests, and abilities engage in a variety of scientific and technological work.	*Describe* several activities or careers that require people to *apply* their knowledge and abilities in *science*, *technology*, engineering, and mathematics.	Lesson 5, 10 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- *Lunar Rover: Making Tracks on the Moon.* Lesson 10 reading selection - *Shirley Muldowney-Drag Racer.* STC Children's Book*: Scientists on the Move, Technology and Design*
Application	2-3	APPB	Scientific ideas and discoveries can be applied to solving problems.	Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night).	Lessons 4, 5, 8, 10, 12, 14	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physica l	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 11							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Physical Science	4-5	PS3A	*Energy* has many forms, such as *heat*, light, sound, *motion*, and electricity.	Identify different forms of *energy* (e.g., *heat*, light, sound, *motion*, electricity) in a given *system*.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).
Physical Science	4-5	PS3B	Energy can be tr*ansferred* from one place to another.	Draw and label diagrams showing several ways that *energy can be transferred* from one place to another (e.g., sound energy passing through *air*, electrical energy through a wire, *heat* energy conducted through a frying pan, light energy through space).	Lessons 6, 7, 8, 9, 11, 12	♦V	Multiple opportunities exist if the teacher is intentional about using the terminology of *energy transfer* and asking students to draw the transfer of energy in the standard vehicle, propeller vehicle or vehicle with a sail.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.
Physical Science	2-3	PS1D	The relative strength of two *forces* can be compared by observing the difference in how they move a *common* object.	Measure and *compare* the distances moved by an object (e.g., a toy car) when given a small push and when given a big push.	Lessons 3, 6, 7, 11, 12	♦	
Physical Science	2-3	PS3A	*Heat*, light, *motion*, electricity, and sound are all forms of energy.	Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*. Explain how light, sound, and motion are all energy.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 12							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSC	Systems have *inputs* and *outputs*. Changes in inputs may change the *outputs* of a *system*.	*Describe* what goes into a *system (input)* and what comes out of a *system (output)* (e.g., when making cookies, inputs include sugar, flour, and chocolate chips; *outputs* are finished cookies). Describe the effect on a system if its input is changed (e.g., if sugar is left out, the cookies will not taste very good).	Lessons 3, 4, 7, 10, 12	♦V	This unit contains opportunities for the use of the terms *inputs* and *outputs* but it requires the intentional use by the teacher. For example, in Lesson 7, the more the student *inputs* their energy into winding the rubber band , the further the car will go down a track = *output* (See Final Activity #2.). The same would hold true for the propeller car in which the *input* is student energy winding the rubber band and the *output* is the distance the propeller car travels.
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system*, which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution*.	Use suitable *tools*, techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design*. Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.
Application	2-3	APPB	Scientific ideas and discoveries can be applied to solving problems.	Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night).	Lessons 4, 5, 8, 10, 12, 14	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	4-5	PS3A	*Energy* has many forms, such as *heat*, light, sound, *motion*, and electricity.	Identify different forms of *energy* (e.g., *heat*, light, sound, *motion*, electricity) in a given *system*.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Physical Science	4-5	PS3B	Energy can be tr*ansferred* from one place to another.	Draw and label diagrams showing several ways that *energy can be transferred* from one place to another (e.g., sound energy passing through *air*, electrical energy through a wire, *heat* energy conducted through a frying pan, light energy through space).	Lessons 6, 7, 8, 9, 11, 12	♦V	Multiple opportunities exist if the teacher is intentional about using the terminology of *energy transfer* and asking students to draw the transfer of energy in the standard vehicle, propeller vehicle or vehicle with a sail.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.
Physical Science	2-3	PS1C	A greater *force* can make an object move faster and farther.	Give examples to illustrate that a greater *force* can make an object move faster than a lesser *force* (e.g., throwing a ball harder, or hitting it harder with a bat, will make the ball go faster).	Lessons 3, 4, 5, 6, 7, 11, 12	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Greater force makes an object move faster and farther*.
Physical Science	2-3	PS1D	The relative strength of two *forces* can be compared by observing the difference in how they move a *common* object.	Measure and *compare* the distances moved by an object (e.g., a toy car) when given a small push and when given a big push.	Lessons 3, 6, 7, 11, 12	♦	
Physical Science	2-3	PS3A	*Heat*, light, *motion*, electricity, and sound are all forms of energy.	Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*. Explain how light, sound, and motion are all energy.	Lessons 6, 7, 8, 9, 11, 12	♦	This unit is strongly connected to this standard's elements of *motion* and *heat.* The teacher should be intentional about using the terms *energy of motion* and *heat energy* as it relates to *friction* (e.g.: Lesson 8).

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 13							
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system*, which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution*.	Use suitable *tools*, techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design*. Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Application	2-3	APPE	Successful *solutions* to problems often depend on selection of the best tools and materials and on previous experience.	Students can also *evaluate* how well it solved the problem and discuss what they might do differently the next time they have a similar problem.	Lessons 13, 14, 15	♦	In Lesson 13, as students redesign their vehicles to minimize cost, they develop solutions based on the best materials and previous experiences with those materials. Students do not develop a solution based on tools. Note: To meet the full intent of the Performance Expectation, teachers should ask students to discuss what they would do differently the next time they have a similar problem.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Lesson 14							
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPC	Problems of moderate complexity can be solved using the *technological design process*. This process begins by defining and researching the problem to be solved.	Define a problem (e.g., a new idea for an inexpensive toy) and list several *criteria* for a successful *solution*. Research the problem to better understand the need and to see how others have solved similar problems.	Lessons 5, 14, 15, 16	♦	Technological Design Process (from Standards Glossary pg. 121): *A sequence of steps used to define and solve a problem. The steps may include a definition of the problem, research about the problem, generation of possible solutions, synthesis or selection of one or more promising solutions, construction and testing of a model or prototype, redesign, and reporting.*
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution*.	Use suitable *tools*, techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design*. Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.
Application	4-5	APPF	*Solutions* to problems must be communicated, if the problem is to be solved.	Communicate the *solution*, results of any tests, and modifications persuasively, using oral, written, and/or pictorial representations of the process and product.	Lessons 5, 14, 15, 16	♦	
Application	2-3	APPA	Simple problems can be solved through a *technological design process* that includes: defining the problem,*gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	*Design* a *solution* to a simple problem (e.g., *design* a *tool* for removing an object from a jar when your hand doesn't fit), using a *technological design process* that includes: defining the problem,*a gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	Lessons 5, 14, 15, 16	♦	
Application	2-3	APPB	Scientific ideas and discoveries can be applied to solving problems.	Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night).	Lessons 4, 5, 8, 10, 12, 14	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	

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EALR	GB	Code	Content Standard	Performance Expectation	Lesson #	AS	Comments/Evidence
Application	2-3	APPE	Successful *solutions* to problems often depend on selection of the best tools and materials and on previous experience.	Students can also *evaluate* how well it solved the problem and discuss what they might do differently the next time they have a similar problem.	Lessons 13, 14, 15	♦	In Lesson 13, as students redesign their vehicles to minimize cost, they develop solutions based on the best materials and previous experiences with those materials. Students do not develop a solution based on tools. Note: To meet the full intent of the Performance Expectation, teachers should ask students to discuss what they would do differently the next time they have a similar problem.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.

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Lesson 15							
Systems	4-5	SYSA	Systems contain *subsystems*.	Identify at least one of the *subsystems* of an object, plant, or animal (e.g., an airplane contains *subsystems* for propulsion, landing, and *control*).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the terms *systems* and *subsystems.* For example: the wheel with the tire can be considered a *subsystem* of the entire vehicle *system.* The propeller mechanism makes up a *subsystem* of the propeller vehicle *system.*
Systems	4-5	SYSB	A *system* can do things that none of its *subsystems* can do by themselves	Specify how a *system* can do things that none of its *subsystems* can do by themselves (e.g., a forest *ecosystem* can sustain itself, while the trees, soil, plant, and animal *populations* cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	The standard vehicle *system* can do things that the wheel, by itself, cannot (e.g. bear a load).
Systems	4-5	SYSD	One defective part can cause a subsystem to malfunction, which in turn will affect the system as a whole.	*Predict* what might happen to a *system* if a part in one or more of its *subsystems* is missing, broken, worn out, mismatched, or misconnected (e.g., a broken toe will affect the skeletal *system*, which can greatly reduce a person's ability to walk).	Lessons 3, 4, 5, 6, 7, 8, 12, 13, 15	♦	The teacher needs to be intentional about discussing the standard vehicle as the *system* which can function when all of the *subsystems* (wheels and axels, winding mechanisms, propeller mechanisms) are working properly. If a *subsystem* is malfunctioning, the *system* in which it resides does not function.
Systems	2-3	SYSA	A *system* is a group of interacting parts that form a whole.	Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 STC Children's Book	♦V ♦R	This unit contains many opportunities to discuss *systems* but the teacher must be intentional about use the term *systems.* For example, the standard vehicle is a *system* such as the wheels, rods, connectors. STC Children's Book: *Cars for One and All; Bicycles Roll In, The Race to Fly*
Systems	2-3	SYSB	A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing.	*Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed). Explain how the parts of a system depend on one another for the system to function.	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	♦V	Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the standard vehicle *system* if a part is missing (e.g. wheel, rod, etc.).

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Systems	2-3	SYSC	A whole object, plant, or animal can do things that none of its parts can do by themselves.	Contrast the *function* of a whole object, plant, or animal with the *function* of one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦	Intentional use of the term *function* is needed when talking about the *function* of a working standard vehicle. A wheel by itself will not *function* the same as it will when it is a part of the complete standard vehicle *system*.
Systems	2-3	SYSD	Some objects need to have their parts connected in a certain way if they are to *function* as a whole.	*Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light).	Lessons 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15	♦V	This unit contains many opportunities to address this standard but the teacher must be intentional about using the term *function.* The propeller assembly and the standard vehicle are examples of *systems* that function when their parts are connected in a specific way.
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPC	Problems of moderate complexity can be solved using the *technological design process*. This process begins by defining and researching the problem to be solved.	Define a problem (e.g., a new idea for an inexpensive toy) and list several *criteria* for a successful *solution*. Research the problem to better understand the need and to see how others have solved similar problems.	Lessons 5, 14, 15, 16	♦	Technological Design Process (from Standards Glossary pg. 121): *A sequence of steps used to define and solve a problem. The steps may include a definition of the problem, research about the problem, generation of possible solutions, synthesis or selection of one or more promising solutions, construction and testing of a model or prototype, redesign, and reporting.*
Application	4-5	APPD	Scientists and engineers often work in teams with other individuals to *generate* different *ideas* for solving a problem.	Work with other students to *generate* possible *solutions* to a problem, and agree on the most promising *solution* based on how well each different idea meets the *criteria* for a successful *solution.*	Lessons 1, 5, 9, 12, 13, 14, 15	♦	

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Application	4-5	APPE	Possible *solutions* should be tested to see if they solve the problem. Building a *model* or prototype is one way to test a possible *solution*.	Use suitable *tools*, techniques, and materials to make a drawing or build a *model* or prototype of the proposed *design*. Test the solution to see how well that solution solves the problem. Modify the design, if necessary.	Lessons 1, 2, 5, 9, 12, 13, 14, 15 Lesson 5 Extension #4; Lesson 13 Extension #5	♦V	Teachers should be intentional about using the term *model* when referring to the standard vehicle.
Application	4-5	APPF	*Solutions* to problems must be communicated, if the problem is to be solved.	Communicate the *solution*, results of any tests, and modifications persuasively, using oral, written, and/or pictorial representations of the process and product.	Lessons 5, 14, 15, 16	♦	
Application	2-3	APPA	Simple problems can be solved through a *technological design process* that includes: defining the problem,*gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	*Design* a *solution* to a simple problem (e.g., *design* a *tool* for removing an object from a jar when your hand doesn't fit), using a *technological design process* that includes: defining the problem,*a gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	Lessons 5, 14, 15, 16	♦	
Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	

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Application	2-3	APPE	Successful *solutions* to problems often depend on selection of the best tools and materials and on previous experience.	Students can also *evaluate* how well it solved the problem and discuss what they might do differently the next time they have a similar problem.	Lessons 13, 14, 15	♦	In Lesson 13, as students redesign their vehicles to minimize cost, they develop solutions based on the best materials and previous experiences with those materials. Students do not develop a solution based on tools. Note: To meet the full intent of the Performance Expectation, teachers should ask students to discuss what they would do differently the next time they have a similar problem.
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.
Physical Science	2-3	PS1B	There is always a *force* involved when something starts moving or changes its *speed* or direction of *motion*.	Identify the *force* that starts something moving or changes its *speed* or direction of *motion* (e.g., when a ball is thrown or when a rock is dropped).	Lessons 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *Force causes changes in speed and direction of motion*.

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Lesson 16							
Systems	2-3	SYSE	Similar parts may play different roles in different objects, plants, or animals.	Identify ways that similar parts can play different roles in different *systems* (e.g., birds may use their beaks to crack seeds while other birds use their beaks to catch fish).	Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	When students are designing vehicles, they use many similar parts to perform different functions in the *system* (e.g. a rod can be a part of the base of the car or support a sail).
Application	4-5	APPC	Problems of moderate complexity can be solved using the *technological design process*. This process begins by defining and researching the problem to be solved.	Define a problem (e.g., a new idea for an inexpensive toy) and list several *criteria* for a successful *solution*. Research the problem to better understand the need and to see how others have solved similar problems.	Lessons 5, 14, 15, 16	♦	Technological Design Process (from Standards Glossary pg. 121): *A sequence of steps used to define and solve a problem. The steps may include a definition of the problem, research about the problem, generation of possible solutions, synthesis or selection of one or more promising solutions, construction and testing of a model or prototype, redesign, and reporting.*
Application	4-5	APPF	*Solutions* to problems must be communicated, if the problem is to be solved.	Communicate the *solution*, results of any tests, and modifications persuasively, using oral, written, and/or pictorial representations of the process and product.	Lessons 5, 14, 15, 16	♦	
Application	2-3	APPA	Simple problems can be solved through a *technological design process* that includes: defining the problem,*gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	*Design* a *solution* to a simple problem (e.g., *design* a *tool* for removing an object from a jar when your hand doesn't fit), using a *technological design process* that includes: defining the problem,*a gathering information, exploring ideas, making a plan, testing possible *solutions* to see which is best, and communicating the results.	Lessons 5, 14, 15, 16	♦	

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Application	2-3	APPD	Tools help scientists see more, measure more accurately, and do things that they could not otherwise accomplish.	Select appropriate *tools* and materials to meet a goal or solve a specific problem (e.g., build the tallest tower with wooden blocks, or longest bridge span) and *explain* the reason for those choices.	Lessons 1, 4, 5, 7, 8, 10, 12, 13, 14, 15, 16	♦	
Physical Science	2-3	PS1A	*Motion* can be described as a change in position over a period of time.	Give an example to illustrate *motion* as a change in position over a period of time (e.g., if a student stands near the door and then moves to his/her seat, the student is "in *motion"* during that time).	Lessons 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	♦	Multiple opportunities exist if the teacher is intentional about reinforcing the concept represented by this standard - *motion* is a *change in position over time*.

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STC Children's Book							
Application	4-5	APPA	*Technology* involves changing the *natural world* to meet human needs or wants.	*Describe* ways that people use *technology* to meet their needs and wants (e.g., text messages to communicate with friends; use bicycles or cars for transportation).	Lesson 5 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- *Lunar Rover: Making Tracks on the Moon.* STC Children's Book*: Scientists on the Move, Technology and Design*
Application	4-5	APPB	People in different cultures all around the world use different materials or *technologies* to solve the same problems.	Give examples of how people around the world use different materials or technologies to solve the same problem. (e.g., in some countries, people use forks for eating, while in other countries they use chopsticks; people in different countries use different materials to build their houses.)	STC Children's Book Lesson 1 Extension #4	♦R ♦E	STC Children's Book: *Bicycles Roll In, Blast Off!* In Lesson 1, Extension #4, students research the invention of the wheel and how different cultures use different technologies to solve the same problem.
Application	4-5	APPG	Science and technology have greatly improved food quality and quantity, transportation, health, sanitation, and communication.	Describe specific ways that science and technology have improved the quality of the students' lives.	Lesson 5 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- *Lunar Rover: Making Tracks on the Moon* . STC Children's Book: *Scientists on the Move, Technology and Design*

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Application	4-5	APPH	People of all ages, interests, and abilities engage in a variety of scientific and technological work.	*Describe* several activities or careers that require people to *apply* their knowledge and abilities in *science*, *technology*, engineering, and mathematics.	Lesson 5, 10 Reading Selection STC Children's Book	♦r ♦R	Lesson 5 reading selection- Lunar Rover: Making Tracks on the Moon. Lesson 10 reading selection - Shirley Muldowney-Drag Racer. STC Children's Book: *Scientists on the Move, Technology and Design*
Application	2-3	APPC	People in all cultures around the world have always had problems and invented tools and techniques (ways of doing something) to solve problems.	Describe a problem that people in different cultures around the world have had to solve and the various ways they have gone about solving that problem.	STC Children's Book Lesson 1 Extension #4	♦R ♦E	STC Children's Book: *Bicycles Roll In, Blast Off!* In Lesson 1, Extension #4, students research the invention of the wheel and how different cultures use different technologies to solve the same problem.