7TH GRADE SCIENCE CURRICULUM MAP

Contents: Nature of Science, Structure and Function, Earth's Dynamic Systems, and Energy, Forces, and Motion

2023-2024

Wa-Nee Community Schools NorthWood Middle School

Scope and Sequence: 7th Grade Science

Nine Weeks	Units	Standards
1 st Nine Weeks	Introduction to Science	See Science and Engineering Process Standards below
	Life Science: Structure and Function	 7.LS.1 Investigate and observe cells in living organisms and collect evidence showing that living things are made of cells. Compare and provide examples of prokaryotic and eukaryotic organisms. Identify the characteristics of living things. 7.LS.2 Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer. 7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells.
2 nd Nine Weeks	Continue Life Science: Structure and Function Earth and Space Science: Earth's Dynamic	 7.LS.3 Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms. 7.LS.4 Research and describe the functions and relationships between various cell types, tissues, and organs in the immune system, circulatory system and digestive system of the human body.
	Systems	 7.ESS.1 Identify and investigate the properties of minerals. Identify and classify a variety of rocks based on physical characteristics from their origin, and explain how they are related using the rock cycle. (i.e. Sedimentary, igneous, and metamorphic rocks) 7.ESS.2 Construct a model or scale drawing (digitally or on paper), based on evidence from rock strata and fossil records, for how the geologic time scale is used to organize Earth's 4.6 billion year-old history. 7.ESS.3 Using simulations or demonstrations, explain continental drift theory and how lithospheric (tectonic) plates have been and still are in constant motion resulting in the creation of landforms on the Earth's surface over time.

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		 7.ESS.4 Construct an explanation, based on evidence found in and around Indiana, for how large scale physical processes, such as Karst topography and glaciation, have shaped the land. 7.ESS.5 Construct a model, diagram, or scale drawing of the interior layers of the Earth. Identify and compare the compositional (chemical) layers to the mechanical (physical) layers of the Earth's interior including magnetic properties.
3 rd Nine Weeks	Continue Earth and Space Science: Earth's Dynamic Systems Physical Science: Energy, Forces, and Motion	 7.ESS.6 Research common synthetic materials (i.e. plastics, composites, polyester, and alloys) to gain an understanding that synthetic materials do come from natural resources and have an impact on society. 7.ESS.7 Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana. Determine which energy resources are the most beneficial and efficient.
		 7.PS.1 Draw, construct models, or use animations to differentiate between atoms, elements, molecules, and compounds. 7.PS.2 Describe the properties of solids, liquids, and gases. Develop models that predict and describe changes in particle motion, density, temperature, and state of a pure substance when thermal energy is added or removed. 7.PS.3 Investigate the Law of Conservation of Mass by measuring and comparing the mass of a substance before and after a change of state. 7.PS.8 Investigate a process in which energy is transferred from one form to another and provide evidence that the total amount of energy does not change during the transfer when the system is closed. (Law of conservation of energy) 7.PS.9 Compare and contrast the three types of heat transfer: radiation, convection, and conduction.
4 th Nine Weeks	Continue Physical Science: Energy, Forces, and Motion	 7.PS.4 Investigate Newton's first law of motion (Law of Inertia) and how different forces (gravity, friction, push and pull) affect the velocity of an object. 7.PS.5 Investigate Newton's second law of motion to show the relationship among force, mass and acceleration. 7.PS.6 Investigate Newton's third law of motion to show the relationship between action and reaction forces. 7.PS.7 Construct a device that uses one or more of Newton's laws of motion. Explain how motion, acceleration, force, and mass are affecting the device.

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Standards Addressed Throughout the	he Year in many labs, activities, and project	cts:
Engineering		
6-8.E.1 Identify the criteria and constrain	nts of a design to ensure a successful solution, ta	king into account relevant scientific principles and potential impacts on
people and the natural environment that	may limit possible solutions.	
6-8.E.2 Evaluate competing design solut	ions using a systematic process to identify how	well they meet the criteria and constraints of the problem.
6-8.E.3 Analyze data from investigations	to determine similarities and differences among	several design solutions to identify the best characteristics of each that can
be combined into a new solution to bette	er meet the criteria for success.	
6-8.E.4 Develop a prototype to generate	data for repeated investigations and modify a p	roposed object, tool, or process such that an optimal design can be achieved.
Science and Engineering Process Standar	rds	
SEPS.1 Posing questions (for science)	and defining problems (for engineering) A pr	actice of science is posing and refining questions that lead to descriptions
and explanations of how the natural an	d designed world(s) work and these questions	s can be scientifically tested. Engineering questions clarify problems to
determine criteria for possible solution	s and identify constraints to solve problems a	bout the designed world.
SEPS.2 Developing and using models	and tools A practice of both science and engin	neering is to use and construct conceptual models that illustrate ideas and
explanations. Models are used to devel	op questions, predictions and explanations; an	halyze and identify flaws in systems; build and revise scientific
explanations and proposed engineered	systems; and communicate ideas. Measureme	nts and observations are used to revise and improve models and designs.
Models include, but are not limited to:	diagrams, drawings, physical replicas, mathem	natical representations, analogies, and other technological models.
Another practice of both science and e	engineering is to identify and correctly use too	ls to construct, obtain, and evaluate questions and problems. Utilize
appropriate tools while identifying their	r limitations. Tools include, but are not limite	d to: pencil and paper, models, ruler, a protractor, a calculator, laboratory
equipment, safety gear, a spreadsheet, e	experiment data collection software, and othe	r technological tools. SEPS.3 Constructing and performing investigations
Scientists and engineers are constructir	ng and performing investigations in the field o	r laboratory, working collaboratively as well as individually. Researching
analogous problems in order to gain in	sight into possible solutions allows them to m	ake conjectures about the form and meaning of the solution. A plan to a
solution pathway is developed prior to	constructing and performing investigations.	Constructing investigations systematically encompasses identified variables
and parameters generating quality data.	. While performing, scientists and engineers m	nonitor and record progress. After performing, they evaluate to make
changes to modify and repeat the invest	stigation if necessary.	
SEPS.4 Analyzing and interpreting data	a Investigations produce data that must be an	alyzed in order to derive meaning. Because data patterns and trends are
not always obvious, scientists and engin	neers use a range of tools to identify the signi	ficant features in the data. They identify sources of error in the
investigations and calculate the degree	of certainty in the results. Advances in science	e and engineering makes analysis of proposed solutions more efficient and
effective. They analyze their results by	continually asking themselves questions; poss	ible questions may be, but are not limited to: "Does this make sense?"
"Could my results be duplicated?" and,	/or "Does the design solve the problem with	the given constraints?"
SEPS.5 Using mathematics and compu-	itational thinking In both science and enginee	ring, mathematics and computation are fundamental tools for
representing physical variables and the	ir relationships. They are used for a range of t	asks such as constructing simulations; solving equations exactly or
approximately; and recognizing, expres	ssing, and applying quantitative relationships.	Mathematical and computational approaches enable scientists and
engineers to predict the behavior of sys	stems and test the validity of such predictions	. Scientists and engineers understand how mathematical ideas
interconnect and build on one another	to produce a coherent whole	

interconnect and build on one another to produce a coherent whole. SEPS.6 Constructing explanations (for science) and designing solutions (for engineering) Scientists and engineers use their results from the investigation in constructing descriptions and explanations, citing the interpretation of data, connecting the investigation to how the natural and designed world(s) work. They 7th Grade Science Curriculum Map

Last Updated: 8/2022

construct or design logical coherent explanations or solutions of phenomena that incorporate their understanding of science and/or engineering or a model that represents it, and are consistent with the available evidence.

SEPS.7 Engaging in argument from evidence Scientists and engineers use reasoning and argument based on evidence to identify the best explanation for a natural phenomenon or the best solution to a design problem. Scientists and engineers use argumentation, the process by which evidence-based conclusions and solutions are reached, to listen to, compare, and evaluate competing ideas and methods based on merits. Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to evaluate claims.

SEPS.8 Obtaining, evaluating, and communicating information Scientists and engineers need to be communicating clearly and articulating the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as, orally, in writing, and through extended discussions. Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs.

Literacy Standards

6-8.LST.1.1: Read and comprehend science and technical texts within a range of complexity appropriate for grades 6-8 independently and proficiently by the end of grade 8.

6-8.LST.1.2: Write routinely over a variety of time frames for a range of discipline specific tasks, purposes, and audiences.

6-8.LST.2.1: Cite specific textual evidence to support analysis of science and technical texts.

6-8.LST.2.2: Determine the central ideas or conclusions of a text; provide an accurate, objective summary of the text.

6-8.LST.2.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

6-8.LST.3.1: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

6-8.LST.3.2: Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

6-8.LST.3.3: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

6-8.LST.4.1: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

6-8.LST.4.2: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

6-8.LST.4.3: Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

6-8.LST.5.1: Write arguments focused on discipline-specific content.

6-8.LST.5.2: Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.

6-8.LST.6.1: Plan and develop; draft; revise using appropriate reference materials; rewrite; try a new approach; and edit to produce and strengthen writing that is clear and coherent, with some guidance and support from peers and adults.

6-8.LST.6.2: Use technology to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Unit: Nature of Science

Lesson 1: The Scien	tific Method		Unit: Nature of Science	
Essential Question(s): What is the scient	ific method and how doe	es it help us?	
Key Terms: hypothe	esis, analyze, conclus	ion, data		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
1.1 What is Science?	SEPS.1 Posing	Understand what	Data in Lab Notebooks	www.sciencespot.net
	questions (for	science is and why we		
	science) and	explore it.	Analyzations, Conclusions,	
	defining problems		Responses, and Reflections in	
	(for engineering)	Develop common	Lab Notebooks	
		scientific terminology.		
1.2 Science KWL	SEPS.1 Posing	Understand what	Data in Lab Notebooks	www.sciencespot.net
	questions (for	science is and why we		
	science) and	explore it.	Analyzations, Conclusions,	
	defining problems		Responses, and Reflections in	
	(for engineering)	Develop common	Lab Notebooks	
		scientific terminology.		
1.3 Scientific	SEPS.1 Posing	Understand what	Data in Lab Notebooks	www.sciencespot.net
Method Chart	questions (for	science is and why we		
	science) and	explore it.	Analyzations, Conclusions,	
	defining problems		Responses, and Reflections in	
	(for engineering)	Develop common	Lab Notebooks	
		scientific terminology.		
Assessment(s):				

Lesson 2:			Unit: Nature of Science	
Essential Question(s): What is the scientific method and how do			es it help us?	
Key Terms: hypoth	esis, analyze, conclusi	on, data		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
2.1 Experiments	SEPS.1 Posing questions (for science) and defining problems (for engineering) SEPS.7 Engaging in argument from evidence	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	www.sciencespot.net OR Science Chat NOS Review Stations
2.2 Controls and Variables	SEPS.1 Posing questions (for science) and defining problems (for engineering)	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	www.sciencespot.net OR Controls and Variables Scavenger Hunt
2.3 Olympics	SEPS.1 Posing questions (for science) and defining problems (for engineering)	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	www.sciencespot.net
2.4 Safety	SEPS.1 Posing questions (for science) and defining problems (for engineering) SEPS.6 Constructing explanations (for science) and	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	www.sciencespot.net

Lesson 2:			Unit: Nature of Science	
Essential Question(s): What is the scientif	ic method and how does	s it help us?	
Key Terms: hypothe	esis, analyze, conclusio	n, data		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration		,		
	designing solutions (for engineering) SEPS.7 Engaging in argument from evidence			
Assessment(s):				

Lesson 3:			Unit: Nature of Science		
Essential Question(s): What is the scienti	fic method and how doe	s it help us?		
Key Terms: hypothe	Key Terms: hypothesis, analyze, conclusion, data				
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
3.1 Metric System	SEPS.2 Developing	Understand what	Data in Lab Notebooks	www.sciencespot.net	
	and using models	science is and why we			
	and tools	explore it.	Analyzations, Conclusions,		
	SEPS.3		Responses, and Reflections in		
	Constructing and	Develop common	Lab Notebooks		
	performing	scientific terminology.			
	investigations				
	SEPS.4 Analyzing				
	and interpreting data				
3.2 Area and Mass	SEPS.5 Using	Understand what	Data in Lab Notebooks	www.sciencespot.net	
Lab	mathematics and	science is and why we			
	computational	explore it.	Analyzations, Conclusions,		
	thinking		Responses, and Reflections in		
	SEPS.6	Develop common	Lab Notebooks		
	Constructing	scientific terminology.			

Lesson 3:			Unit: Nature of Science	
Essential Question	(s): What is the scienti	fic method and how doe	s it help us?	
Key Terms: hypoth	esis, analyze, conclusi	on, data		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	explanations (for science) and designing solutions (for engineering) SEPS.7 Engaging in argument from evidence			
3.3 Volume Lab	SEPS.5 Using mathematics and computational thinking SEPS.6 Constructing explanations (for science) and designing solutions (for engineering) SEPS.7 Engaging in argument from evidence	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	www.sciencespot.net
3.4 Density Lab	SEPS.5 Using mathematics and computational thinking SEPS.6 Constructing explanations (for science) and	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	www.sciencespot.net

Lesson 3:			Unit: Nature of Science		
Essential Question(s): What is the scientific method and how does it help us?					
Key Terms: hypothesis, analyze, conclusion, data					
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
	designing solutions (for engineering) SEPS.7 Engaging in argument from				
3.5 Prediction Candy Lab/Isopod Labs	SEPS. 1 – SEPS. 8 SEPS.8 Obtaining, evaluating, and communicating information	Understand what science is and why we explore it. Develop common scientific terminology.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Rollie Pollies provided by students. Rollie Pollie videos for information gathering.	
Assessment(s): Lab Report for Can Lab Report for Isop End of Unit Assess	dy Lab ood Lab ment: Nature of Scien	ce Quiz in Edmodo			

Unit: Structure and Function

Lesson 1: Pre-Asses	sment: Structure and Fun	ction	Unit: Structure and Functi	on
Essential Question(s): What do we already kr	now about how living things	survive in their environment	nt, and how can we learn
more?				
Key Terms: Cell, con	mpound light microscope	e, scientific illustration		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
1.1	7.LS.1 Investigate and	Students brainstorm	Data in Lab Notebooks	Microscopes
1 period	observe cells in living	what they know and		
	organisms and collect	want to learn about	Analyzations, Conclusions,	Structure and Function Lab
	evidence showing that	cells, body systems,	Responses, and Reflections	Kits
	living things are made of	and how organisms	in Lab Notebooks	
	cells. Compare and	get energy		
	provide examples of			
	prokaryotic and	Create several		
	eukaryotic organisms.	KWL charts on		
	Identify the	various structure		
	characteristics of living	and function topics		
	things.	to determine prior		
		knowledge.		
	7.LS.2 Create a model to			
	show how the cells in	Organisms are		
	multicellular organisms	made of cells.		
	repeatedly divide to	Body systems aid in		
	make more cells for	survival. Organisms		
	growth and repair as a	obtain energy in		
	result of mitosis.	different ways		
	Explain how mitosis is			
	related to cancer.			
	7.LS.3 Explain how cells			
	develop through			
	differentiation into			

Lesson 1: Pre-Assessment: Structure and Function		Unit: Structure and Function		
Essential Question(s): What do we already know about how living the		now about how living thing	s survive in their environme	nt, and how can we learn
more? Kan Tarman Call, company d light minnessene, exigntific illustration				
Key Terms: Cell, co	Standards	Objectives	Assessment (formative)	Resources
Duration	Standards	Objectives	Assessment (ionnative)	Resources
	 specialized tissues and organs in multicellular organisms. 7.LS.4 Research and describe the functions and relationships between various cell types, tissues, and organs in the immune system, circulatory system and digestive system of the human body. 7.LS.5 Compare and contrast the form and function of the 			
	plant and animal cells.			
1.2 1 period	7.LS.1-7.LS.5 (see above)	Use a compound light microscope to observe prepared microscope slides	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Microscopes Structure and Function Lab Kits
1.3 1 period	7.LS.1-7.LS.5 (see above)	Observe unicellular and multicellular organisms and make a claim about how	Data in Lab Notebooks	Microscopes Structure and Function Lab Kits

Investigation & Duration	Standards	Objectives	Assessment (formative)	Resources
		some organisms survive as single cells while others survive with many cells.	Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	
1.4 1/2 period	7.LS.1-7.LS.5 (see above)	Observe structures within plant and animal cells. Make claims about the functions of the observed structures	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Microscopes Structure and Function Lab Kits
Reflection 1/2 period	7.LS.1-7.LS.5 (see above)	Discuss how microscopes help us understand the function of organism structures.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Reflection-page 11

Student Sheets found at: https://ssec.si.edu/sites/default/files/page/SF%20Studentsheets.pdf

Lesson 2: Cells			Unit: Structure and Function	
Essential Question(s): What roles can cells pl	lay in the development and a	survival of organisms?	
Key Terms: Archaea	, Cell Membrane, Cell Th	neory, Cytoplasm, DNA, Eu	karyotic, Nucleus, Organell	e, Prokaryotic, Ribosome,
Species, Unicellular, Wet-Mount Slide, Differentiation, Multicellular, Zy			gote, Embryo, Stem Cell, Ce	ell, Cell Differentiation, Gene
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
2.1	7.LS.1 Investigate and	Draw and describe the	Data in Lab Notebooks	Microscope
1-2 periods	observe cells in living	structures of a		
	organisms and collect	Euglena and suggest how	Analyzations, Conclusions,	Structure and Function Lab
	evidence showing that	they function.	Responses, and Reflections	Kits
	living things are made of cells. Compare and		in Lab Notebooks	
	provide examples of			
	prokaryotic and			
	eukaryotic organisms.			
	Identify the			
	characteristics of living			
	things.			
2.2	7.LS.1 Investigate and	Draw and describe	Data in Lab Notebooks	Microscopes
1 period	observe cells in living	the structures of a		
	organisms and collect	Paramecium, suggest	Analyzations, Conclusions,	Structure and Function Lab
	evidence showing that	how they function,	Responses, and Reflections	Kits
	living things are made of	and compare it to a	in Lab Notebooks	
	cells. Compare and	Euglena.		
	provide examples of			
	prokaryotic and			
	Identify the			
	characteristics of living			
	things			
	tilligs.			

Lesson 2: Cells			Unit: Structure and Function	
Essential Question(s	s): What roles can cells p	lay in the development and	survival of organisms?	
Key Terms: Archaea	, Cell Membrane, Cell Th	neory, Cytoplasm, DNA, Eu	karyotic, Nucleus, Organell	e, Prokaryotic, Ribosome,
Species, Unicellular,	Wet-Mount Slide, Differ	entiation, Multicellular, Zyg	gote, Embryo, Stem Cell, Ce	II, Cell Differentiation, Gene
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
2.3	7.LS.3 Explain how cells	Observe and read	Data in Lab Notebooks	Copies of Student Sheet
2-3 periods	develop through	about the variety		Lesson 2.3
	differentiation into	of cells that make	Analyzations, Conclusions,	
	specialized tissues and	up multicellular	Responses, and Reflections	Microscopes
	organs in multicellular	organisms.	in Lab Notebooks	
	organisms.			Cell Specialization Card Sets
		Determine the function		
	7.LS.4 Research and	of these cells based		Structure and Function Lab
	describe the functions	on their structures and		Kits
	and relationships	provided information.		
	between various cell			
	types, tissues, and			
	organs in the immune			
	system, circulatory			
	system and digestive			
	system of the human			
	body.			
2.4	7.LS.3 Explain how cells	Compare images of	Data in Lab Notebooks	Copies of Student Sheet
1 period	develop through	embryos from		Lesson 2.4
	differentiation into	different animal species to	Analyzations, Conclusions,	
	specialized tissues and	observe cell differentiation.	Responses, and Reflections	Embryonic Development
	organs in multicellular		in Lab Notebooks	Card Sets
	organisms.			
				Structure and Function Lab
	7.LS.4 Research and			Kits
	describe the functions			
	and relationships			
	between various cell			
	types, tissues, and			

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Lesson 2: Cells	Lesson 2: Cells Unit: Structure and Function					
Essential Question(s): What roles can cells pl	lay in the development and	survival of organisms?			
Key Terms: Archaea, Cell Membrane, Cell Theory, Cytoplasm, DNA, Eukaryotic, Nucleus, Organelle, Prokaryotic, Ribosome,						
Species, Unicellular,	Wet-Mount Slide, Differ	rentiation, Multicellular, Zyg	zote, Embryo, Stem Cell, Ce	II, Cell Differentiation, Gene		
Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Duration						
	organs in the immune system, circulatory system and digestive system of the human body.					
Reflection/Quiz 1 period		Use knowledge of cell structure, function, and specialization to design and carry out an investigation and provide evidence to support or rebut an argument. Edit the "Cells" KWL chart	Quiz	Reflection-page 35 Quiz		
Assessment(s): Lesson Quiz	Assessment(s): Lesson Quiz					

Student Sheets found at: https://ssec.si.edu/sites/default/files/page/SF%20Studentsheets.pdf

Lesson 3: Cell Organ	Lesson 3: Cell Organelles Unit: Structure and Function				
Essential Question(s): What structures does a	a cell need in order to surviv	ve?		
Key Terms: Cell Wa	ll, Central Vacuole, Chlor	ophyll, Chloroplast, Endop	lasmic Reticulum, Golgi Bo	dy, Lysosome,	
Mitochondria, Vacu	ole, Cell Membrane, Cyto	oplasm, Mammal, Nucleus,	Ribosome, Active Transpor	rt, Carrier Protein, Channel	
Protein, Diffusion, I	Equilibrium, Osmosis, Pa	assive Transport, Semiperm	eable	D	
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration		Dreve the name of a	Data in Lab Natabaaka	Structure and Europtica Lab	
J.I		outramotic coll and	Data in Lab Notebooks	Vite	
i penou		describe how they	Analyzations Conclusions	Kits	
		function	Responses and Reflections		
			in Lab Notebooks		
3.2		Observe and identify	Data in Lab Notebooks	Student Sheet 3.2	
1 period		certain organelles of			
1		plant cells.	Analyzations, Conclusions,	Microscopes	
			Responses, and Reflections		
		Prepare scientific	in Lab Notebooks	Structure and Function Lab	
		illustrations of		Kits	
		plant cells.			
		Observe the effect			
		of a salt solution on			
		plant cens.			
3.3	7.LS.1 Investigate and	Measure and	Data in Lab Notebooks	Microscopes	
1 period	observe cells in living	compare different			
1	organisms and collect	kinds of animal cells.	Analyzations, Conclusions,	Structure and Function Lab	
	evidence showing that		Responses, and Reflections	Kits	
	living things are made of		in Lab Notebooks		
	cells. Compare and				
	provide examples of				
	prokaryotic and				
	eukaryotic organisms.				
	Identify the				

Lesson 3: Cell Organelles		Unit: Structure and Function		
Essential Question(s): What structures does a	a cell need in order to surviv	re?	
Key Terms: Cell Wa	ll, Central Vacuole, Chlor	ophyll, Chloroplast, Endop	lasmic Reticulum, Golgi Bo	dy, Lysosome,
Mitochondria, Vacu	ole, Cell Membrane, Cyto	plasm, Mammal, Nucleus,	Ribosome, Active Transpor	rt, Carrier Protein, Channel
Protein, Diffusion, I	Equilibrium, Osmosis, Pa	ssive Transport, Semipermo	eable	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	characteristics of living things. 7.LS.2 Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer.			
3.4 1 period	 7.LS.1 Investigate and observe cells in living organisms and collect evidence showing that living things are made of cells. Compare and provide examples of prokaryotic and eukaryotic organisms. Identify the characteristics of living things. 7.LS.2 Create a model to show how the cells in multicellular organisms 	Model the difference between plant and animal cells.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Student Sheet 3.4 a Student Sheet 3.4 b Structure and Function Lab KIts

Lesson 3: Cell Organelles		Unit: Structure and Function		
Essential Question	(s): What structures does a	a cell need in order to surviv	/e?	
Key Terms: Cell Wa	Ill, Central Vacuole, Chlor	ophyll, Chloroplast, Endop	lasmic Reticulum, Golgi Bo	dy, Lysosome,
Mitochondria, Vacu	ole, Cell Membrane, Cyte	pplasm, Mammal, Nucleus,	Ribosome, Active Transpor	rt, Carrier Protein, Channel
Protein, Diffusion,	Equilibrium, Osmosis, Pa	ssive Transport, Semiperm	eable	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer.			
3.5 1 period	 7.LS.2 Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer. 7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells. 	Diagram the differences and similarities among three types of cells.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Structure and Function Lab Kits
3.6 2-3 periods	7.LS.2 Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis.	Summarize the role of each organelle and apply it to a person, place, or object and connect them in a comic story line.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks Cell Comic	Student Sheet 3.6 Student Sheet 3.6 Rubric

Lesson 3: Cell Organelles			Unit: Structure and Function	
Essential Question(s): What structures does a	a cell need in order to surviv	re?	
Key Terms: Cell Wa	ll, Central Vacuole, Chlor	ophyll, Chloroplast, Endop	lasmic Reticulum, Golgi Bo	dy, Lysosome,
Mitochondria, Vacu	ole, Cell Membrane, Cyte	oplasm, Mammal, Nucleus,	Ribosome, Active Transpor	rt, Carrier Protein, Channel
Protein, Diffusion, H	Equilibrium, Osmosis, Pa	ssive Transport, Semiperme	eable	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	Explain how mitosis is related to cancer. 7.LS.5 Compare and contrast the form and function of the organelles found in			
Reflection and Quiz	 plant and animal cells. 7.LS.1 Investigate and observe cells in living organisms and collect evidence showing that living things are made of cells. Compare and provide examples of prokaryotic and eukaryotic organisms. Identify the characteristics of living things. 7.LS.2 Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a 	Use knowledge of organelles to determine if claims made during Lesson 2 are accurate. Edit the "Cells" KWL chart from Lesson 1. Demonstrate knowledge of cell organization.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks Quiz	Quiz Reflection-page 57

Lesson 3: Cell Organelles Unit: Structure and Function				
Essential Question(s): What structures does a cell need in order to survive?				
Key Terms: Cell Wa	ll, Central Vacuole, Chlor	ophyll, Chloroplast, Endopl	lasmic Reticulum, Golgi Bo	dy, Lysosome,
Mitochondria, Vacu	ole, Cell Membrane, Cyto	plasm, Mammal, Nucleus,	Ribosome, Active Transpor	rt, Carrier Protein, Channel
Protein, Diffusion, I	Equilibrium, Osmosis, Pa	ssive Transport, Semipermo	eable	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	Explain how mitosis is			
	related to cancer.			
	7.LS.5 Compare and			
	contrast the form and			
	function of the			
	organelles found in			
	plant and animal cells.			
Assessment(s):				
Cell Comic Strip				
Cell Quiz				
Con Quin				
Student Sheets found	at: https://ssec.si.edu/sites	/default/files/page/SF%20St	udentsheets.pdf	

Lesson 4: Photosynthesis			Unit: Structure and Function		
Essential Question(s): What roles do matter and energy play during photosynthesis?					
Key Terms: Autotrop	ey Terms: Autotroph, Decomposer, Chlorophyll, Energy, Heterotroph, Matter, Omnivore, Photosynthesis, Transpiration,				
Trophic Level, Control, Glucose, Synthesize, Epidermis, Guard Cell, Me			sophyll, Phloem, Stoma, Tra	anspiration, Xylem	
Investigation &	Standards	Standards Objectives Assessment (formative) Resources			
Duration	Duration				
4.1	7.LS.3 Explain how cells	Design and carry out an	Data in Lab Notebooks	Structure and Function Lab	

4.1	7.LO.J Explain now cens	Design and early out an	Data III Lab NOICDOOKS	Structure and Function Lab
2-3 periods	develop through	experiment to gather		Kits
	differentiation into	evidence as to what	Analyzations, Conclusions,	
	specialized tissues and	materials are required for	Responses, and Reflections	Microscopes
	organs in multicellular	photosynthesis to occur.	in Lab Notebooks	
	organisms.			

Lesson 4: Photosynthesis			Unit: Structure and Function	
Essential Question(s): What roles do matter a	and energy play during pho	tosynthesis?	
Key Terms: Autotro	ph, Decomposer, Chlorop	ohyll, Energy, Heterotroph,	Matter, Omnivore, Photosy	nthesis, Transpiration,
Trophic Level, Cont	rol, Glucose, Synthesize,	Epidermis, Guard Cell, Me	sophyll, Phloem, Stoma, Tra	anspiration, Xylem
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells.			
4.2 1-2 periods	 7.LS.3 Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms. 7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells. 	Observe and identify stomata on a leaf's epidermis.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Structure and Function Lab Kits Microscopes
Reflection and Quiz 1 period	 7.LS.3 Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms. 7.LS.5 Compare and contrast the form and function of the 	Students explore chlorophyll, revisit their previous ideas on photosynthesis, and create a model of photosynthesis.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks Quiz	Reflection-page 84 Quiz

Last Optiated. 07 2022	Last Operated. 0/2022					
Lesson 4: Photosynthesis			Unit: Structure and Functi	on		
Essential Question(s): What roles do matter and energy play during photosynthesis?						
Key Terms: Autotroph, Decomposer, Chlorophyll, Energy, Heterotroph, Matter, Omnivore, Photosynthesis, Transpiration,				nthesis, Transpiration,		
Trophic Level, Control, Glucose, Synthesize, Epidermis, Guard Cell, Mesophyll, Phloem, Stoma, Transpiration, Xylem				anspiration, Xylem		
Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Duration						
	organelles found in					
plant and animal cells.						
Assessment(s):						
End of Lesson Quiz						

Lesson 5: Cellular Respiration	Unit: Structure and Function	
Essential Question(s): Where do cells get the resources they need to a	id in an organism's survival?	
Key Terms: Cellular respiration, Aerobic, Anaerobic, ATP, Fermentation, Photosynthesis, Energy, Hibernation, Metabolic Rate,		
Cell Division, Mitosis		

Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
5.1	7.LS.3 Explain how	Plan and carry out an	Data in Lab Notebooks	
1-2 periods	cells develop through	investigation		Structure and Function Lab Kit
	differentiation into	to determine the form	Analyzations, Conclusions,	
	specialized tissues and	of energy	Responses, and Reflections in	
	organs in multicellular	released during cellular	Lab Notebooks	
	organisms.	respiration.		
	7.LS.5 Compare and			
	contrast the form and			
	function of the			
	organelles found in			
	plant and animal cells.			
5.2	7.LS.3 Explain how	Plan and carry out an	Data in Lab Notebooks	Structure and Function Lab Kit
2 periods	cells develop through	investigation		
	differentiation into	to determine if		
	specialized tissues and	autotrophs		

Lesson 5: Cellular R	Respiration		Unit: Structure and Function	L
Essential Question	(s): Where do cells get th	e resources they need to	aid in an organism's survival?	
Key Terms: Cellular Cell Division, Mitos	respiration, Aerobic, An	naerobic, ATP, Fermenta	tion, Photosynthesis, Energy,	Hibernation, Metabolic Rate,
Investigation & Duration	Standards	Objectives	Assessment (formative)	Resources
	organs in multicellular organisms.	undergo cellular respiration.	Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	
	7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells.			
5.3 1 period	7.LS.3 Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms.	Analyze and interpret data to determine the energy value of different foods.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Structure and Function Lab Kit
	7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells.			
Reflection and Quiz 1 period	7.LS.3 Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms.	Demonstrate an understanding that all living things, including plants and microorganisms, require energy and, therefore, go through a type of	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks Quiz	Quiz
	7.LS.5 Compare and contrast the form and	cellular respiration to accomplish this need.		

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Essential Question	(s): Where do cells get th	e resources they need to	aid in an organism's survival?	
Key Terms: Cellula	r respiration, Aerobic, Ar	naerobic, ATP, Fermenta	tion, Photosynthesis, Energy,	Hibernation, Metabolic Rate,
Cell Division, Mito	sis			
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	function of the organelles found in plant and animal cells.			
Mitosis 2-3 periods	7.LS.2 Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer.	Demonstrate an understanding that cells divide through a process called mitosis.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Mitosis Placemat Lab Article and activity on mitosis and cancer
Assessment(s): End of Lesson Quiz Article: https://india	na.pbslearningmedia.org/r	esource/tdc02.sci.life.cell.ln	o divide/cell-replication-and-can	cerous-cells/#.WRnwPLpFvDs

Lesson 6: Levels of	1 6: Levels of Organization Unit: Structure and Function				
Essential Question(s): How does the organization of an organism's body aid in survival?					
Key Terms: Tissue,	Connective Tissue, Der	mal Tissue, Epithelial Tis	sue, Ground Tissue, Muscle 🕽	l'issue, Nervous Tissue,	
Organ, Organ System	m, Vascular Tissue, Mo	del Organism, Adaptation	, Endothermic, Regenerate, A	antibody, Cell Cycle, Dermis	
Investigation &	Standards	Standards Objectives Assessment (formative) Resources			
Duration					
6.1	7.LS.3 Explain how	Gather evidence that	Data in Lab Notebooks	Structure and Function Lab	
2-3 periods	cells develop through	different tissues play a		Kit	
	differentiation into	pivotal role in the			

Lesson 6: Levels of	Organization		Unit: Structure and Function	
Essential Question(s): How does the organi	zation of an organism's bo	ody aid in survival?	
Key Terms: Tissue,	Connective Tissue, Der	mal Tissue, Epithelial Tis	sue, Ground Tissue, Muscle	Tissue, Nervous Tissue,
Organ, Organ Syste	m, Vascular Tissue, Mo	del Organism, Adaptation	Endothermic, Regenerate, A	Antibody, Cell Cycle, Dermis
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	specialized tissues and	survival of an organism.	Analyzations, Conclusions,	Microscopes
	organs in multicellular		Responses, and Reflections	
	organisms.		in Lab Notebooks	Copies Student Sheets 6.1
	/.LS.4 Research and			
	describe the functions			
	between various coll			
	types tissues and			
	organs in the immune			
	system circulatory			
	system, enclatery			
	system of the human			
	body.			
	5			
	7.LS.5 Compare and			
	contrast the form and			
	function of the			
	organelles found in			
	plant and animal cells.			
6.2	7.LS.3 Explain how	Develop models	Data in Lab Notebooks	Structure and Function Lab
1 period	cells develop through	that display how the		Kit
	differentiation into	bodies of plants and	Analyzations, Conclusions,	
	specialized tissues and	animals are systems of	Responses, and Reflections	
	organs in multicellular	interacting subsystems	in Lab Notebooks	
	organisms.	composed of cells,		
	7 I S 4 Dessenable of -	ussues, organs, and		
	describe the functions	organ systems.		

Lesson 6: Levels of	Organization		Unit: Structure and Function	
Essential Question(s): How does the organi	zation of an organism's bo	ody aid in survival?	
Key Terms: Tissue,	Connective Tissue, Der	mal Tissue, Epithelial Tis	sue, Ground Tissue, Muscle T	lissue, Nervous Tissue,
Organ, Organ System	m, Vascular Tissue, Moo	del Organism, Adaptation	, Endothermic, Regenerate, A	ntibody, Cell Cycle, Dermis
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	and relationships			
	between various cell			
	types, tissues, and			
	organs in the immune			
	system, circulatory			
	system and digestive			
	system of the human			
	body.			
	7.LS.5 Compare and			
	contrast the form and			
	function of the			
	organelles found in			
	plant and animal cells.			
6.3	7.LS.3 Explain how	Research an organ	Data in Lab Notebooks	Structure and Function Lab
2-3 periods	cells develop through	system		Kit
	differentiation into	found in humans using	Analyzations, Conclusions,	
	specialized tissues and	reliable resources, create	Responses, and Reflections	Copies Student Sheets 6.3
	organs in multicellular	a visual aid that	in Lab Notebooks	
	organisms.	encompasses		
		the research, and present		
	7.LS.4 Research and	findings to the class.		
	describe the functions			
	and relationships			
	between various cell			
	types, tissues, and			
	organs in the immune			
	system, circulatory			
	system and digestive			

Lesson 6: Levels of	Organization		Unit: Structure and Function	
Essential Question(s): How does the organi	zation of an organism's bo	ody aid in survival?	
Key Terms: Tissue,	Connective Tissue, Der	mal Tissue, Epithelial Tiss	sue, Ground Tissue, Muscle	Fissue, Nervous Tissue,
Organ, Organ Syste	m, Vascular Tissue, Mo	del Organism, Adaptation	Endothermic, Regenerate, A	ntibody, Cell Cycle, Dermis
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	system of the human			
	body.			
6.4	7 LS 3 Explain how	Use a model of a frog	Data in Lab Notebooks	Structure and Function Lab
2-3 periods	cells develop through	to gather evidence of	Duta in Las Processions	Kit
	differentiation into	the roles that various	Analyzations, Conclusions,	
	specialized tissues and	tissues, organs, and	Responses, and Reflections	Copies Student Sheets 6.4
	organs in multicellular	organ systems play	in Lab Notebooks	-
	organisms.	in the survival of the		
		organism.		
	7.LS.4 Research and			
	describe the functions			
	and relationships			
	between various cell			
	types, tissues, and			
	system circulatory			
	system, circulatory			
	system of the human			
	body.			
	5			
6.5	7.LS.3 Explain how	Gather evidence to	Data in Lab Notebooks	Structure and Function Lab
1 period	cells develop through	determine which bone		Kit
	differentiation into	groups are similar in	Analyzations, Conclusions,	
	specialized tissues and	a variety of animal	Responses, and Reflections	Copies Student Sheets 6.5
	organs in multicellular	species.	in Lab Notebooks	
	organisms.			

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Lesson 6: Levels of	Organization		Unit: Structure and Function	
Essential Question(s): How does the organi	zation of an organism's bo	ody aid in survival?	
Key Terms: Tissue,	Connective Tissue, Der	mal Tissue, Epithelial Tis	sue, Ground Tissue, Muscle 🛛	lissue, Nervous Tissue,
Organ, Organ Syste	m, Vascular Tissue, Moo	del Organism, Adaptation	, Endothermic, Regenerate, A	ntibody, Cell Cycle, Dermis
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	7.LS.4 Research and			
	describe the functions			
	and relationships			
	between various cell			
	types, tissues, and			
	organs in the immune			
	system, circulatory			
	system and digestive			
	system of the human			
	body.			
	7.LS.5 Compare and			
	contrast the form and			
	function of the			
	organelles found in			
	plant and animal cells.			
6.6	7.LS.3 Explain how	Infer evolutionary	Data in Lab Notebooks	Structure and Function Lab
1 period	cells develop through	relationships between		Kit
-	differentiation into	present-day and	Analyzations, Conclusions,	
	specialized tissues and	fossilized organisms	Responses, and Reflections	Copies Student Sheets 6.6
	organs in multicellular	by observing and	in Lab Notebooks	
	organisms.	analyzing a basic		
		set of anatomical		
	7.LS.4 Research and	structures.		
	describe the functions			
	and relationships			
	between various cell			
	types, tissues, and			
	organs in the immune			

Lesson 6: Levels of	Organization		Unit: Structure and Function	
Essential Question(s): How does the organi	zation of an organism's bo	ody aid in survival?	
Key Terms: Tissue,	Connective Tissue, Der	mal Tissue, Epithelial Tis	sue, Ground Tissue, Muscle	Fissue, Nervous Tissue,
Organ, Organ Syste	m, Vascular Tissue, Mo	del Organism, Adaptation	, Endothermic, Regenerate, A	Antibody, Cell Cycle, Dermis
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	system, circulatory			
	system and digestive			
	system of the human			
	body.			
Reflection and Quiz	7 LS 3 Explain how	Demonstrate knowledge	Data in Lab Notebooks	Reflection—page 132
	cells develop through	of the systems of the	Data in Lab Hotebooks	Reflection page 152
	differentiation into	human body.	Analyzations, Conclusions,	Ouiz
	specialized tissues and	5	Responses, and Reflections	
	organs in multicellular		in Lab Notebooks	
	organisms.			
			Quiz	
	7.LS.4 Research and			
	describe the functions			
	and relationships			
	between various cell			
	types, tissues, and			
	organs in the initiation			
	system and digestive			
	system of the human			
	body.			
	~~~~;			
	7.LS.5 Compare and			
	contrast the form and			
	function of the			
	organelles found in			
	plant and animal cells.			
Assessment(s):				

Lesson 6: Levels of Organization Unit: Structure and Function			1	
Essential Question(	Essential Question(s): How does the organization of an organism's body aid in survival?			
Key Terms: Tissue,	Connective Tissue, Dem	nal Tissue, Epithelial Tis	sue, Ground Tissue, Muscle T	lissue, Nervous Tissue,
Organ, Organ System	m, Vascular Tissue, Moo	lel Organism, Adaptation	, Endothermic, Regenerate, A	ntibody, Cell Cycle, Dermis
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
End of Lesson Quiz				

Lesson 7: The Nervous System			Unit: Structure and Function	on	
Essential Question(	s): How does the brain s	send and receive information	on?		
Key Terms: Stimulu	s, Central Nervous Syste	em, Homeostasis, Neuron,	Neurotransmitter, Sensory N	Neuron, Synapse, Memory,	
Olfatory receptor, R	eflex, Reflex arc				
Investigation & Standards Objectives Assessment (formative) Resour					
Duration					
7.1	7.LS.4 Research and	Analyze the structure and	Data in Lab Notebooks	Structure and Function Lab	
1-2 periods	describe the functions	function of different		Kit	
	and relationships	tissues	Analyzations, Conclusions,		
	between various cell	and cells that work	Responses, and Reflections		
	types, tissues, and	together	in Lab Notebooks		
	organs in the immune	in the nervous system.			
	system, circulatory				
	system and digestive				
	system of the human				
	body.				
7.2	7.LS.4 Research and	Identify the cause-and-	Data in Lab Notebooks	Structure and Function Lab	
1 period	describe the functions	effect relationship		Kit	
-	and relationships	between stimuli and	Analyzations, Conclusions,		
	between various cell	response.	Responses, and Reflections		
	types, tissues, and	_	in Lab Notebooks		
	organs in the immune				

Lesson 7: The Nerv	ous System		Unit: Structure and Function	on
Essential Question(	s): How does the brain s	send and receive information	on?	
Key Terms: Stimulu	s, Central Nervous Syste	em, Homeostasis, Neuron,	Neurotransmitter, Sensory N	Neuron, Synapse, Memory,
Olfatory receptor, R	eflex, Reflex arc			
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	system, circulatory system and digestive system of the human body.			
7.3 2 periods	7.LS.4 Research and describe the functions and relationships between various cell types, tissues, and organs in the immune system, circulatory system and digestive system of the human body.	Explore different senses to determine how the brain gathers and synthesizes information, resulting in an immediate response or behavior.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Structure and Function Lab Kit Student Sheet 7.3
7.4 1 period	7.LS.4 Research and describe the functions and relationships between various cell types, tissues, and organs in the immune system, circulatory system and digestive system of the human body.	Explore some limitations of sensory receptors and how information is gathered and processed by the brain.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Structure and Function Lab Kit
Reflection and Quiz	7.LS.4 Research and describe the functions and relationships between various cell types, tissues, and	Test whether impaired sensory systems react to visual stimuli as quickly as unimpaired sensory systems.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Quiz

Lesson 7: The Nervous System       Unit: Structure and Function			on	
Essential Question(	Essential Question(s): How does the brain send and receive information?			
Key Terms: Stimulu	s, Central Nervous Syste	m, Homeostasis, Neuron,	Neurotransmitter, Sensory N	Neuron, Synapse, Memory,
Olfatory receptor, R	eflex, Reflex arc			
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
	organs in the immune			
	system, circulatory		Quiz	
	system and digestive			
	system of the human			
	body.			
Assessment(s):			•	·
End of Lesson Quiz				

Lesson 8: Assessment: Structure and Function			Unit: Structure and Function	on
Essential Question(s): How are different animals specially adapted to survive in their environment?				
Key Terms: (terms f	rom previous lessons)			
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Written Assessment 1 period	7.LS.1-7.LS.5	Apply knowledge and skills to answer questions in a written assessment about concepts related to structure and function.		Student Sheet 8.WA

Assessment(s):

The written assessment.

Student Sheets found at: https://ssec.si.edu/sites/default/files/page/SF%20Studentsheets.pdf

### Unit: Earth's Dynamic Systems

Lesson 1: Pre-Asses	sment: Earth's Dynamic	: System	Unit: Earth's Dynamic Sys	tem
Essential Question(	s): What do you know al	bout geologic processes?	· · · · · ·	
Key Terms: Crater,	Earthquake, Geyser, Ho	t spring, Volcano, Fossil		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
1.1	7.ESS.3, 7.ESS.4	• Examine real-world	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		observations and images		Kit
		related to geologic	Analyzations, Conclusions,	
		processes and	Responses, and Reflections	
		phenomena.	in Lab Notebooks	
		• Describe what a data set		
		represents and		
		interpret similarities and		
		differences within it		
1.2	7.ESS.1, 7.ESS.3,	• Examine real-world	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period	7.ESS.4	observations and images		Kit
		related to geologic	Analyzations, Conclusions,	
		processes and	Responses, and Reflections	
		phenomena.	in Lab Notebooks	
		• Describe what a data set		
		represents and		
		interpret similarities and		
		differences within it		
Reflection	7.ESS.1, 7.ESS.3,	• Reflect on how geologic	Self-Assessment	Reflection-page 11
1 period	7.ESS.4	processes		
		affect a landscape.	Analyzations, Conclusions,	Quiz
		• Integrate knowledge	Responses, and Reflections	
		gained in	in Lab Notebooks	
		the lesson to explain		
		phenomena		
		of the Burgess Shale		

Lesson 1: Pre-Assess	sment: Earth's Dynamic	System	Unit: Earth's Dynamic Syst	em
Essential Question(s): What do you know about geologic processes?				
Key Terms: Crater, Earthquake, Geyser, Hot spring, Volcano, Fossil				
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Assessment(s): Self-assessment				
Student sheets can be found at: https://sec.si.edu/earths-dynamic-systems				

Lesson 2: When the	Earth Shakes		Unit: Earth's Dynamic Syst	tem
Essential Question(	(s): Why are some structu	ures damaged when Earth	shakes?	
Key Terms: Earthqu	uake, Fault, Intensity, M	agnitude, Model, Risks, Se	eismogram, Destructive, Con	trolled experiment,
Dependent variable	, Independent variable, l	Intensity, Magnitude, Opti	mize, Prototype, Aftershock,	Force
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
2.1	7.ESS.3	• Develop a model of an	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		earthquake.		Kit
	Engineering and	• Describe how a shake	Analyzations, Conclusions,	
	Process Standards	table can	Responses, and Reflections	
		be used to test a model	in Lab Notebooks	
2.2	7.ESS.3	• Design and evaluate a	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		model of an		Kit
	Engineering and	earthquake-resistant	Analyzations, Conclusions,	
	Process Standards	structure	Responses, and Reflections	
			in Lab Notebooks	
2.3	7.ESS.3	• Design, modify, and	Data in Lab Notebooks	Earth's Dynamic Systems Lab
2 periods		evaluate a model		Kit
	Engineering and	of an earthquake-resistant	Analyzations, Conclusions,	
	Process Standards	structure	Responses, and Reflections	
			in Lab Notebooks	

Lesson 2: When the	Earth Shakes		Unit: Earth's Dynamic Syst	tem
Essential Question(	s): Why are some structu	res damaged when Earth	shakes?	
Key Terms: Earthqu	ake, Fault, Intensity, M	agnitude, Model, Risks, Se	eismogram, Destructive, Con	trolled experiment,
Dependent variable,	, Independent variable, I	Intensity, Magnitude, Opti	mize, Prototype, Aftershock,	Force
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Reflection and Quiz	7.ESS.3	<ul> <li>Investigate how soil</li> </ul>	Analyzations, Conclusions,	Student Guide p. 31
		conditions affect the	Responses, and Reflections	
		processes of earthquakes	in Lab Notebooks	Quiz
Assessment(s): End	of Lesson Quiz			
Student sheets can be	found at: https://ssec.si.e	<u>du/earths-dynamic-systems</u>		
T	Earth a sta Data		Units Frankly Damasis Cost	
Lesson 5: Analyzing	Earthquake Data		Unit: Earth's Dynamic Syst	tem
Essential Question(	s): How can we collect d	lata about earthquakes?		
Key Terms: Earthqu	ake Surface wave, Mode	el S-wave, P-wave, Aftersho	ock, Seismograph, Tsunami,	Epicenter, Seismic station,
Focus, Seismogram	, Focus, Seismometer, M	lagnitude, Mitigate, Asthe	nosphere, Intensity, Plate, Co	ore, Lithosphere, Plate
tectonics, Crust, For	rce, Mantle, Rocks, Seisi	mic wave		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 3.1	7.ESS.3, 7.ESS.4,	• Use a spring to model,	Data in Lab Notebooks	Earth's Dynamic Systems Lab

Duration				
Investigation 3.1	7.ESS.3, 7.ESS.4,	• Use a spring to model,	Data in Lab Notebooks	Earth's Dynamic Systems Lab
2 periods	7.PS.8	observe, record, and		Kit
		identify different types of	Analyzations, Conclusions,	
		earthquake waves.	Responses, and Reflections	
		• Relate earthquake waves	in Lab Notebooks	
		to the transfer of energy.		
		• Use a spring to model		
		possible damaging effects		
		of earthquake waves.		
Investigation 3.2	7.ESS.3, 7.ESS.4,	• Record data from	Data in Lab Notebooks	Earth's Dynamic Systems Lab
2 periods	7.PS.8	simulated earthquakes		Kit
		using a model	Analyzations, Conclusions,	
		seismograph.	Responses, and Reflections	
			in Lab Notebooks	

Lesson 3: Analyzing	Earthquake Data		Unit: Earth's Dynamic Syst	tem
Essential Question(	s): How can we collect o	lata about earthquakes?	· · · · · ·	
Key Terms: Earthqu	ake Surface wave, Mod	el S-wave, P-wave, Aftersho	ock, Seismograph, Tsunami,	Epicenter, Seismic station,
Focus, Seismogram	, Focus, Seismometer, N	lagnitude, Mitigate, Asther	nosphere, Intensity, Plate, Co	ore, Lithosphere, Plate
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration	Standards	Objectives	Assessment (Ionnative)	Resources
		• Investigate how common variables affect data recorded by a model seismograph.		
Investigation 3.3 1 period	7.ESS.3, 7.ESS.4, 7.PS.8	<ul> <li>Identify, analyze, and interpret earthquake wave patterns using seismogram data.</li> <li>Apply mathematical concepts to answer scientific quest</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Investigation 3.4 1 period	7.ESS.3, 7.ESS.4, 7.PS.8	<ul> <li>Locate the epicenter of an earthquake using data from three seismic stations.</li> <li>Apply mathematical concepts to answer scientific questions.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Reflection and Quiz 1 period	7.ESS.3, 7.ESS.4, 7.PS.8	<ul> <li>Demonstrate understanding of the properties of earthquakes and how earthquake data is collected, analyzed, and interpreted.</li> <li>Describe how to reduce the effects of future earthquakes</li> </ul>	Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Student Guide – page 63 Quiz

Last Updated: 8/2022

Lesson 3: Analyzing Earthquake Data	Unit: Earth's Dynamic System

Essential Question(s): How can we collect data about earthquakes?

Key Terms: Earthquake Surface wave, Model S-wave, P-wave, Aftershock, Seismograph, Tsunami, Epicenter, Seismic station, Focus, Seismogram, Focus, Seismometer, Magnitude, Mitigate, Asthenosphere, Intensity, Plate, Core, Lithosphere, Plate tectonics, Crust, Force, Mantle, Rocks, Seismic wave

Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Extending Your	7.ESS.5	• "Why Earthquakes Are	Analyzations, Conclusions,	Student Guides
Knowledge Reading		Hard to Predict"	Responses, and Reflections	
Selections		Read about the	in Lab Notebooks	
		factors that prevent		
		scientists from predicting		
		earthquakes.		
		<ul> <li>"Using Waves to</li> </ul>		
		Explore Earth's Interior"		
		Read about how scientists		
		use data from earthquake		
		waves as evidence to make		
		claims about the structure		
		of Earth's interior		
Assessment(s): End	of Lesson Quiz			
	· · · · · · · ·	. /		

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Lesson 4: Investigat	ing Plate Movement		Unit: Earth's Dynamic Syst	em
Essential Question(	s): How do changes in t	he lithosphere affect Earth'	's surface?	
Key Terms: Crust, F	ault, Latitude, Longitud	e, Oceanic ridge, Plate tec	tonics, Ring of Fire, Contine	ntal crust, Lithosphere,
Mantle, Oceanic crust, Convergent plate boundary, Divergent plate boundary, Landform, Plate boundary, Rift valley				
Subduction, Transfo	orm plate boundary, Elas	sticity, Fault, Friction, Stres	ss, Fracture, Tectonic plate,	Lava, Oceanic ridge, Oceanic
trench, Tectonic pla	te, Tsunami, Brittle, De	formation, Elasticity, Fract	ture, Strain, Stress	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 4.1	7.ESS.3, 7.ESS.4	• Plot the locations,	Data in Lab Notebooks	Earth's Dynamic Systems Lab
Investigation 4.1 1 period	7.ESS.3, 7.ESS.4	• Plot the locations, depths, and	Data in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Investigation 4.1 1 period	7.ESS.3, 7.ESS.4	• Plot the locations, depths, and magnitudes of	Data in Lab Notebooks	Earth's Dynamic Systems Lab Kit

Graham Cracker

Lab

7.ESS. 3, 7.ESS.5

Last Updated: 8/2022				
Lesson 4: Investiga	ting Plate Movement		Unit: Earth's Dynamic Sys	tem
<b>Essential Question</b>	(s): How do changes in t	he lithosphere affect Earth	's surface?	
Key Terms: Crust,	Fault, Latitude, Longitud	de, Oceanic ridge, Plate tec	ctonics, Ring of Fire, Contine	ental crust, Lithosphere,
Mantle, Oceanic cr	ust, Convergent plate bo	undary, Divergent plate bo	undary, Landform, Plate bou	ındary, Rift valley
Subduction, Transf	orm plate boundary, Ela	sticity, Fault, Friction, Stre	ss, Fracture, Tectonic plate,	Lava, Oceanic ridge, Oceanic
trench, l'ectonic pl	ate, I sunami, Brittle, De	Chicativos	Accompany (formative)	Pagauraga
	Standards	Objectives	Assessment (Ionnative)	Kesources
		use the data to	Analyzations, Conclusions,	
		identify patterns	Responses, and Reflections	
		in the locations of	in Lab Notebooks	
		earthquakes.		
Investigation 4.2	7.ESS. 3, 7.ESS.5	• Recognize that an	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		understanding of the		Kit
		motion of earthquake	Analyzations, Conclusions,	
		waves can help scientists	Responses, and Reflections	
		formulate hypotheses	in Lab Notebooks	
T		about Earth's interior.		
Investigation 4.3	/.ESS. 3, /.ESS.5	• Contrast properties of	Data in Lab Notebooks	Earth's Dynamic Systems Lab
2 periods		the lithosphere and the	Andreas Constant	Kit
		these differing properties	Analyzations, Conclusions,	
		contribute to testonic	in Lab Notabooks	
		movement	III Lab INOLEDOOKS	
Investigation 4.4	7 ESS 3 7 ESS 5	• Use models to simulate	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period	1.1.00. 5, 1.1.00.5	the movement of		Kit
Period		lithospheric plates as they	Analyzations, Conclusions,	
		collide, separate, and slide	Responses, and Reflections	
		past one another.	in Lab Notebooks	
		1		

• Use models to simulate

lithospheric plates as they collide, separate, and slide

the movement of

past one another.

Data in Lab Notebooks

Graham Crackers

Student Sheets in OneNote

Frosting

Wax Paper

Last Opdated. 8/2022					
Lesson 4: Investigat	ing Plate Movement		Unit: Earth's Dynamic Sys	tem	
Essential Question(	s): How do changes in t	he lithosphere affect Earth	's surface?		
Key Terms: Crust, F	Key Terms: Crust, Fault, Latitude, Longitude, Oceanic ridge, Plate tectonics, Ring of Fire, Continental crust, Lithosphere,				
Mantle, Oceanic crust, Convergent plate boundary, Divergent plate boundary, Landform, Plate boundary, Rift valley					
Subduction, Transfe	orm plate boundary, Ela	sticity, Fault, Friction, Stre	ess, Fracture, Tectonic plate,	Lava, Oceanic ridge, Oceanic	
trench, Tectonic pla	te, Tsunami, Brittle, De	formation, Elasticity, Frac	ture, Strain, Stress		
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
			Analyzations, Conclusions,		
			Responses, and Reflections		
			in Lab Notebooks		
Investigation 4.5	7.ESS. 3, 7.ESS.5	• Design an investigation	Data in Lab Notebooks	Earth's Dynamic Systems Lab	
1 period		to explore the effects of		Kit	
		applying a force to a	Analyzations, Conclusions,		
		model of a fault.	Responses, and Reflections		
		• Relate the interaction	in Lad Notebooks		
		boundaries to the			
		boundaries to the			
		earthquakes			
		cartinquakes.			
Reflection and Ouiz	7.ESS. 3. 7.ESS.4.	Review concepts from	Analyzations, Conclusions,	Student Guide – page 104	
	7.ESS.5	this lesson and consider	Responses, and Reflections	Fig. 10	
		how the knowledge can	in Lab Notebooks		
		contribute to earthquake			
		understanding and			
		preparation.			
Assessment(s): End	of Lesson Quiz	• • •	·	·	

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Lesson 5: Cycling Matter and Energy Unit: Earth's Dynamic System				tem
Essential Question(	s): How do heat and pre	essure impact geologic feat	ures?	
Key Terms: Convec	tion, Mantle, Mineral, R	ock cycle, Tectonic plate, I	gneous Rock, Magma, Meta	morphic Rock, Sedimentary
Rock, Sediments, W	eathering, Erosion, Min	eral, Geology		
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 5.1	7.ESS.1, 7.ESS.2, 7.ESS.3, 7.ESS.5	• Carry out investigations using a simulation that models the formation of landforms when lithospheric plates move in different directions over a scale of thousands and millions of years.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Investigation 5.2	7.ESS.1, 7.ESS.4	• Construct an explanation based on evidence from a model of how igneous, sedimentary, and metamorphic rocks are formed.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Investigation 5.3	7.ESS.1, 7.ESS.4	• Observe patterns in rock texture and use those patterns to categorize a set of rock samples.	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Reflection and Quiz	7.ESS.1, 7.ESS.2, 7.ESS.3, 7.ESS.4, 7.ESS.5	<ul> <li>Classify rocks as igneous, metamorphic, or sedimentary based on descriptions of their formation.</li> <li>Construct explanations of how igneous,</li> </ul>	Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Student Guide – page 137 Quiz

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Lesson 5: Cycling M	Lesson 5: Cycling Matter and Energy			tem		
Essential Question(	Essential Question(s): How do heat and pressure impact geologic features?					
Key Terms: Convect	tion, Mantle, Mineral, I	Rock cycle, Tectonic plate, I	gneous Rock, Magma, Meta	amorphic Rock, Sedimentary		
Rock, Sediments, W	eathering, Erosion, Mi	neral, Geology				
Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Duration						
		sedimentary, and				
		metamorphic rocks are				
		formed				
Extending Your	7.ESS.1, 7.ESS.2	• "Rocks Worth Keeping"	Analyzations, Conclusions,	Student Guide – page 142-147		
Knowledge Reading		Learn about the vast rock	Responses, and Reflections			
Selection		collection at the	in Lab Notebooks			
		Smithsonian National				
		Museum of				
		Natural History and how				
		rocks and minerals are				
		different.				
		"GEO Profile:				
		White Cliffs of Dover"				
		Understand				
		how both stability and				
		microscopic change over				
		time				
		have affected one of				
		Britain's most famous				
		geological				
		landmarks.				
Assessment(s): End	of Lesson Quiz					

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Essential Question(s): How are volcanoes formed?         Key Terms: Landform, Magma, Lava, Volcano, Seismometer, Tiltmeter, Volcano inflation, Cinder Cone Volcano, Composite Volcano, Fissure, Hot Spot, Shield Volcano, Vent, Viscosity, Crust, Mantle, Petrology, Tsunami         Investigation & Duration       Standards       Objectives       Assessment (formative)       Resources         Investigation 6.1       7.ESS.3, 7.ESS.4       • Analyze and interpret data on volcanoes and earthquakes and use that analysis to forecast future events.       Data in Lab Notebooks       Earth's Dynamic Systems Lab Kit         Investigation 6.2       7.ESS.2, 7.ESS.3, 7.ESS.4       • Use models to understand how geological events change Earth's surface at varying time and spatial scales.       Data in Lab Notebooks       Earth's Dynamic Systems Lab Kit         Investigation 6.3       7.ESS.2, 7.ESS.3, 7.ESS.4       • Use models to understand how geological events change Earth's surface at varying time and spatial scales.       Data in Lab Notebooks       Earth's Dynamic Systems Lab Kit         Investigation 6.3       7.ESS.2, 7.ESS.3, 7.ESS.4       • Use models to understand how geological events change Earth's surface at varying time and spatial scales.       Data in Lab Notebooks       Earth's Dynamic Systems Lab Kit         Investigation 6.3       7.ESS.5       • Use models to understand how geological events change Earth's surface at varying time and spatial scales.       Data in Lab Notebooks       Earth's Dynamic Systems Lab Kit         Investigation 6.3	Lesson 6: Volcanoes: Building Up			Unit: Earth's Dynamic System	
Key Terms: Landform, Magma, Lava, Volcano, Seismometer, Tiltmeter, Volcano inflation, Cinder Cone Volcano, Composite Volcano, Fissure, Hot Spot, Shield Volcano, Vent, Viscosity, Crust, Mantle, Petrology, TsunamiInvestigation & DurationStandardsObjectivesAssessment (formative)ResourcesInvestigation 6.1 1 period7.ESS.3, 7.ESS.4• Analyze and interpret data on volcanoes and earthquakes and use that analysis to forecast future events.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab Kit	Essential Question(	s): How are volcanoes f	formed?		
Volcano, Fissure, Hot Spot, Shield Volcano, Vent, Viscosity, Crust, Mantle, Petrology, TsunamiResourcesInvestigation & DurationStandardsObjectivesAssessment (formative)ResourcesInvestigation 6.1 1 period7.ESS.3, 7.ESS.4• Analyze and interpret data on volcanoes and earthquakes and use that analysis to forecast future events.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying KitData in Lab NotebooksEarth's Dynamic Systems Lab Kit	Key Terms: Landfor	rm, Magma, Lava, Volca	no, Seismometer, Tiltmete	r, Volcano inflation, Cinder	Cone Volcano, Composite
Investigation & DurationStandardsObjectivesAssessment (formative)ResourcesInvestigation 6.1 1 period7.ESS.3, 7.ESS.4• Analyze and interpret data on volcanoes and earthquakes and use that analysis to forecast future events.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying ime and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying ime and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying ime and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.5, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying Responses, and Reflections, in Lab NotebooksEarth's Dynamic Systems Lab Kit	Volcano, Fissure, H	ot Spot, Shield Volcano,	Vent, Viscosity, Crust, Ma	ntle, Petrology, Tsunami	
DurationInvestigation 6.17.ESS.3, 7.ESS.4• Analyze and interpret data on volcances and earthquakes and use that analysis to forecast future events.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.27.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.5, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying Responses, and Reflections in Lab NotebooksEarth's Dynamic Systems Lab Kit	Investigation &	Standards	Objectives	Assessment (formative)	Resources
Investigation 6.1 1 period7.ESS.3, 7.ESS.4• Analyze and interpret data on volcances and earthquakes and use that analysis to forecast future events.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.5, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab Kit	Duration				
1 perioddata on volcanoes and earthquakes and use that analysis to forecast future events.Analyzations, Conclusions, Responses, and Reflections in Lab NotebooksKitInvestigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.5, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying Responses, and Reflections Responses, and ReflectionsEarth's Dynamic Systems Lab Kit	Investigation 6.1	7.ESS.3, 7.ESS.4	• Analyze and interpret	Data in Lab Notebooks	Earth's Dynamic Systems Lab
Investigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab Kit	1 period		data on volcanoes and		Kit
Investigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab Kit			earthquakes and use	Analyzations, Conclusions,	
Investigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying Responses, and Reflections Responses, and ReflectionsEarth's Dynamic Systems Lab Kit			that analysis to forecast	Kesponses, and Keflections	
Investigation 6.2 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab KitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying Responses, and Reflections Responses, and ReflectionsEarth's Dynamic Systems Lab Kit			future events.	in Lab Notebooks	
1 period7.ESS.5understand how geological events change Earth's surface at varying time and spatial scales.Analyzations, Conclusions, Responses, and Reflections in Lab NotebooksKitInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying time and spatial scales.Data in Lab NotebooksEarth's Dynamic Systems Lab Kit	Investigation 6.2	7.ESS.2, 7.ESS.3,	• Use models to	Data in Lab Notebooks	Earth's Dynamic Systems Lab
geological events change Earth's surface at varying time and spatial scales.Analyzations, Conclusions, Responses, and Reflections in Lab NotebooksInvestigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varyingData in Lab NotebooksEarth's Dynamic Systems Lab Kit	1 period	7.ESS.5	understand how		Kit
Investigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varying the surface at varyingData in Lab NotebooksEarth's Dynamic Systems Lab Kit			geological events change	Analyzations, Conclusions,	
Investigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varyingData in Lab Notebooks how Responses, and ReflectionsEarth's Dynamic Systems Lab Kit			Earth's surface at varying	Responses, and Reflections	
Investigation 6.3 1 period7.ESS.2, 7.ESS.3, 7.ESS.5• Use models to understand how geological events change Earth's surface at varyingData in Lab Notebooks Analyzations, Conclusions, Responses, and ReflectionsEarth's Dynamic Systems Lab Kit			time and spatial scales.	in Lab Notebooks	
1 period7.ESS.5understand how geological events change Earth's surface at varyingAnalyzations, Conclusions, Responses, and ReflectionsKit	Investigation 6.3	7 ESS 2. 7 ESS 3	• Use models to	Data in Lab Notebooks	Earth's Dynamic Systems Lab
geological events change Earth's surface at varying Responses, and Reflections	1 period	7.ESS.5	understand how		Kit
Earth's surface at varying Responses, and Reflections	I		geological events change	Analyzations, Conclusions,	
			Earth's surface at varying	Responses, and Reflections	
time and spatial scales. In Lab Notebooks			time and spatial scales.	in Lab Notebooks	
• Understand how			• Understand how		
scientists use patterns in			scientists use patterns in		
data to predict volcanic			data to predict volcanic		
eruptions.			eruptions.		
• Understand how new			• Understand how new		
technology and			technology and		
engineering can help			engineering can help		
scientists observe patterns			scientists observe patterns		
	T C A	7 500 2 7 500 5	in geologic activity.		
Investigation 6.4 /.ESS.5, /.ESS.5 • Observe patterns in the Data in Lab Notebooks Earth's Dynamic Systems Lab	Investigation 6.4	/.E55.3, /.E55.5	• Observe patterns in the	Data in Lab Notebooks	Earth's Dynamic Systems Lab
snape of volcanoes and Kit	1 period		shape of voicanoes and		NIL

Lesson 6: Volcanoes	Lesson 6: Volcanoes: Building Up			Unit: Earth's Dynamic System	
Essential Question(	s): How are volcanoes f	ormed?	· · · · ·		
Key Terms: Landform, Magma, Lava, Volcano, Seismometer, Tiltmeter, Volcano inflation, Cinder Cone Volcano, Composite					
Volcano, Fissure, Hot Spot, Shield Volcano, Vent, Viscosity, Crust, Mantle, Petrology, Tsunami					
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
		to categorize volcanoes	Analyzations, Conclusions,		
		into groups.	Responses, and Reflections		
			in Lab Notebooks		
Reflection and Quiz	7.ESS.2, 7.ESS.3,	Review new knowledge	Analyzations, Conclusions,	Student Guide – page 166	
	7.ESS.4, 7.ESS.5	about how the shape of a	Responses, and Reflections		
		volcano gives clues about	in Lab Notebooks	Quiz	
		its type.			
		• Consider the influence			
		of fault type and lava			
		characteristics on the			
		shape and type of a			
		volcano.			
		• Devise a strategy for			
		determining whether a			
		volcano is active.			
		• Revise the concept map			
		on geoscience processes			
		that result in volcano			
		formation based on			
		new knowledge gained.			
Assessment(s): End	of Lesson Quiz				
Student shorts can be found at https://accesi.edu/conthe.durancie.gustome					

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Lesson 7: Volcanoes: Eruption			Unit: Earth's Dynamic System	
Essential Question(	s): How do volcanoes cl	hange Earth's surface?	· · · · ·	
Key Terms: Lava, M	lagma, Submarine, Volc	ano, Viscosity, Convection	, Oceanic Ridge, Volcanolog	<u>y</u>
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 7.1 1 period	7.ESS.3, 7.ESS.4	<ul> <li>Investigate lava flow by making predictions about variables like temperature, frequency, and viscosity.</li> <li>Construct an explanation of how lava flow impacts the creation of new landforms.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Investigation 7.2 1 period	7.ESS.3, 7.ESS.4, 7.ESS.5	<ul> <li>Use previous knowledge to draw conclusions about the properties and effects of underwater volcanoes.</li> <li>Develop and build a model of an eruption from an underwater volcano.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit
Investigation 7.3 1 period (Optional Enrichment Activity Based on time)	7.ESS.2, 7.ESS.3	<ul> <li>Plan and carry out a controlled experiment to investigate patterns of volcanic ash fall.</li> <li>Use mathematics to interpret data from the experiment.</li> <li>Compare results to determine patterns, draw</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit

Lesson 7: Volcanoes: Eruption			Unit: Earth's Dynamic System	
Essential Question(	s): How do volcanoes cl	nange Earth's surface?		
Key Terms: Lava, M	Iagma, Submarine, Volc	ano, Viscosity, Convection	, Oceanic Ridge, Volcanolog	х <b>у</b>
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
		conclusions, and make		
		connections to actual ash		
		fall events.		
Investigation 7.4	7.ESS.3	Analyze VEI data to	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		identify patterns of		Kit
		volcanic activity.	Analyzations, Conclusions,	
		<ul> <li>Ask questions about</li> </ul>	Responses, and Reflections	
		the potential benefits of	in Lab Notebooks	
		understanding the VEI of		
		a particular volcano.		
Reflection and Quiz	7.ESS.2, 7.ESS.3,	• Argue from evidence	Analyzations, Conclusions,	Student Guide – page 200
1 period	7.ESS.4, 7.ESS.5	about the long-term	Responses, and Reflections	
		effects of the eruption of	in Lab Notebooks	
		Krakatau and the nature		
		of Anak Krakatau		
		compared with the		
		original volcanic		
		mountain.		
		• Explain how volcanic		
		eruptions have changed		
		Earth's surface and help		
		predict future eruptions.		
Assessment(s): End	ot Lesson Quiz			

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Lesson 8: Changing Earth's Surface			Unit: Earth's Dynamic System	
Essential Question(	s): How have geoscience	e processes changed Earth ³	's surface?	
Key Terms: Earthqu	akes, Erosion, Lahar, A	brasion, Deposition, Erosio	on, Loess, Sand Dune, Weat	hering, Suspended Load,
Glacial ablation, Gla	cial rebound, Glacier, M	Ioraine, Sinkhole, Crater, F	Fossil	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 8.1	7.ESS.4	• Develop an	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		understanding of lahars		Kit
		and how they relate to	Analyzations, Conclusions,	
		volcanoes.	Responses, and Reflections	
		<ul> <li>Investigate lahars by</li> </ul>	in Lab Notebooks	
		making predictions and		
		creating a model to test		
		predictions.		
Investigation 8.2a	7.ESS.1, 7.ESS.4	• Build a model to	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		simulate wind erosion and		Kit
		draw conclusions about	Analyzations, Conclusions,	
		the effects on Earth.	Responses, and Reflections	
		• Demonstrate an	in Lab Notebooks	
		understanding of		
		weathering, erosion, and		
		deposition.		
		Draw connections		
		between wind erosion and		
		asteroid impacts.		
Investigation 8.2b	7.ESS.1, 7.ESS.4	• Build a stream table to	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		model water erosion and		Kit
		draw conclusions about	Analyzations, Conclusions,	
		the effects on Earth.	Responses, and Reflections	
		• Demonstrate an	in Lab Notebooks	
		understanding of		
		weathering, erosion, and		
		deposition.		

Lesson 8: Changing	Lesson 8: Changing Earth's Surface			Unit: Earth's Dynamic System	
Essential Question(	s): How have geoscience	e processes changed Earth	's surface?		
Key Terms: Earthqu	akes, Erosion, Lahar, A	brasion, Deposition, Erosi	on, Loess, Sand Dune, Weat	hering, Suspended Load,	
Glacial ablation, Gla	acial rebound, Glacier, M	Ioraine, Sinkhole, Crater, F	ossil		
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
		• Use mathematics to			
		interpret data from the			
		investigation.			
Investigation 8.2c	7 ESS 1 7 ESS /	• Build a model to	Data in Lab Notebooks	Earth's Dynamic Systems Lab	
1 period	7.1200.1, 7.1200.7	simulate glacial erosion	Data III Lab Notebooks	Kit	
i penou		and draw conclusions	Analyzations Conclusions		
		about the effects on	Responses, and Reflections		
		Earth.	in Lab Notebooks		
		• Explain possible causes			
		of glacial ablation and			
		retreat.			
Investigation 8.2d	7.ESS.1, 7.ESS.4	• Build a model to	Data in Lab Notebooks	Earth's Dynamic Systems Lab	
1 period		simulate sinkholes and		Kit	
		draw conclusions about	Analyzations, Conclusions,		
		the effects on Earth.	Responses, and Reflections		
		Construct an explanation	in Lab Notebooks		
		for how human activity			
		plays a role in the			
		formation of sinkholes.			
Investigation 8.3	7.ESS.1, 7.ESS.4	• Conduct research to	Data in Lab Notebooks	Earth's Dynamic Systems Lab	
		explain how a geoscience		Kıt	
		process 1s responsible for	Analyzations, Conclusions,		
		torming a real-life	Responses, and Reflections		
		structure on Earth.	in Lab Notebooks		
		• Evaluate the credibility			
		ot online resources using a			
		rubric.			

Lesson 8: Changing Earth's Surface			Unit: Earth's Dynamic Syst	tem	
Essential Question(s): How have geoscience processes changed Earth's surface?					
Key Terms: Earthqu	Key Terms: Earthquakes, Erosion, Lahar, Abrasion, Deposition, Erosion, Loess, Sand Dune, Weathering, Suspended Load,				
Glacial ablation, Gla	icial rebound, Glacier, M	Ioraine, Sinkhole, Crater, F	ossil		
Investigation & Standards Objectives Assessment (formative) Resources					
Duration					
		• Demonstrate knowledge			
		by presenting research to			
		the class in a 5-minute			
		presentation.			
Reflection and Quiz	7.ESS.1, 7.ESS.4	• Predict the timescales	Analyzations, Conclusions,	Student Guide – page 231	
		of geoscience processes.	Responses, and Reflections		
		• Investigate craters to	in Lab Notebooks	Quiz	
		explain how ancient			
		asteroid impacts changed			
		Earth's surface.			
		Draw connections			
		between the Burgess			
		Shale and geoscience			
		processes.			
Assessment(s): End	of Lesson Quiz				

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Lesson 9: Analyzing the Fossil Record			Unit: Earth's Dynamic Syst	tem
Essential Question(s): What do fossils and layers of sediment tell us about Earth's past?				
Key Terms: Strata, I	Excavate, Paleontology,	Law of Superposition, Biod	liversity, Geologic Timescale	e, Mass Extinction
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 9.1	7.ESS.2	Develop a model to	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		demonstrate formation		Kit
		of mold and cast fossils.	Analyzations, Conclusions,	
		• Watch a video	Responses, and Reflections	
		demonstrating the	in Lab Notebooks	
		excavation process of		

Lesson 9: Analyzing	Lesson 9: Analyzing the Fossil Record			Unit: Earth's Dynamic System	
Essential Question(	s): What do fossils and l	ayers of sediment tell us ab	out Earth's past?		
Key Terms: Strata, I	Excavate, Paleontology,	Law of Superposition, Biod	liversity, Geologic Timescale	e, Mass Extinction	
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
		fossils and practice a similar technique with a fossil-bearing mound.			
Investigation 9.2 1 period	7.ESS.2, 7.ESS.5	<ul> <li>Create a model of rock strata with fossils to explain Earth's history.</li> <li>Develop an understanding of radiometric dating and its uses.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit	
Investigation 9.3 1 period	7.ESS.2	<ul> <li>Use a simulation to explore radiometric dating and the related vocabulary.</li> <li>Apply knowledge of radiometric dating to explain the fossil record.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit	
Investigation 9.4 1 period	7.ESS.2	<ul> <li>Describe how life-forms have changed throughout Earth's history.</li> <li>Use evidence and reasoning to explain changes in diversity over time.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Earth's Dynamic Systems Lab Kit	
Investigation 9.5 1 period	7.ESS.2	• Identify extinctions and other patterns using the fossil record	Data in Lab Notebooks	Earth's Dynamic Systems Lab Kit	

Lesson 9: Analyzing the Fossil Record			Unit: Earth's Dynamic System	
Essential Question(	s): What do fossils and l	ayers of sediment tell us ab	out Earth's past?	
Key Terms: Strata, H	Excavate, Paleontology,	Law of Superposition, Biod	liversity, Geologic Timescale	e, Mass Extinction
Investigation & Standards Objectives Assessment (formative) Resources				
Duration				
		• Illustrate changes that	Analyzations, Conclusions,	
		result from a geological	Responses, and Reflections	
		scenario.	in Lab Notebooks	
Reflection and Quiz	7.ESS.2, 7.ESS.5	Draw connections	Analyzations, Conclusions,	Student Guide – page 265
		between the fossil record	Responses, and Reflections	
		and the distribution of	in Lab Notebooks	Quiz
		fossils.		
		• Describe the tools used		
		to date fossils		
Assessment(s): End	of Lesson Quiz			
Student sheets can be	found at: https://ssec.si.e	du/earths-dynamic-systems		

Lesson 10: Distribution of Resources on Earth		Unit: Earth's Dynamic System			
Essential Question(	s): How do geoscience p	process impact the distribut	tion of resources on Earth?		
Key Terms: Natural Resource, Geodynamic Region, Aquifer, Groundwater, Groundwater mining, Recharge, Mineral					
Investigation &	nvestigation & Standards Objectives Assessment (formative) Resou				
Duration					
Investigation 10.1	7.ESS.4, 7.ESS.6	Construct an explanation	Data in Lab Notebooks	Earth's Dynamic Systems Lab	
1 period		for the locations of		Kit	
		copper deposits by	Analyzations, Conclusions,		
		mapping and comparing	Responses, and Reflections		
		data about the locations of	in Lab Notebooks		
		copper deposits with			
		locations of volcano and			
		earthquake activity.			
Investigation 10.2	7.ESS.6, 7.ESS.7	• Build a model of an oil	Data in Lab Notebooks	Earth's Dynamic Systems Lab	
1 period		reserve and then try to		Kit	

Lesson 10: Distribut	ion of Resources on Ear	rth	Unit: Earth's Dynamic System	
Essential Question(	s): How do geoscience p	process impact the distribut	tion of resources on Earth?	
Key Terms: Natural	Resource, Geodynamic	Region, Aquifer, Groundw	ater, Groundwater mining, I	Recharge, Mineral
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
		discover buried oil in a	Analyzations, Conclusions,	
		reserve made by another	Responses, and Reflections	
		group. While exploring for	in Lab Notebooks	
		oil, keep track of drilling		
		costs.		
Investigation 10.3	7.ESS.1, 7.ESS.6	• Conduct research about	Data in Lab Notebooks	Earth's Dynamic Systems Lab
2 periods		a specific mineral to learn		Kit
		how that mineral is	Analyzations, Conclusions,	
		formed, where is it found,	Responses, and Reflections	
		and how we use it.	in Lab Notebooks	
		• Present research findings		
		to the class.		
		• Create a bibliography		
		and assess the sources		
		used (at least five) in		
		research.		
Reflection and Quiz	7.ESS.1, 7.ESS.4,	• Create a summary based	Analyzations, Conclusions,	Student Guide – page 285
	7.ESS.6, 7.ESS.7	on a reading passage.	Responses, and Reflections	
		<ul> <li>Explain how scientists</li> </ul>	in Lab Notebooks	Quiz
		expect to access		
		nonrenewable minerals		
		after humans have used		
		up what is on Earth.		
Assessment(s): End	of Lesson Quiz			

Student sheets can be found at: <u>https://ssec.si.edu/earths-dynamic-systems</u>

Lesson 11: Evidence of a Dynamic Earth			Unit: Earth's Dynamic System	
Essential Question(	s): What evidence sugge	ests that Earth is a dynamic	geological system?	
Key Terms: Geologi	cal Timescale, Glacier,	Strata, Law of Superposition	n, Pangaea, Supercontinent,	Magnetite, Seafloor
Spreading,				
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 11.1	7.ESS.2	Describe geological	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period		influences on fossil		Kit
		distribution.	Analyzations, Conclusions,	
		• Develop a time line of	Responses, and Reflections	
		Earth's past events.	in Lab Notebooks	
Investigation 11.2	7.ESS.1, 7.ESS.2,	• Apply the law of	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period	7.ESS.3	superposition to studying		Kit
1		fossils in rock strata.	Analyzations, Conclusions,	
		• Identify conditions in	Responses, and Reflections	
		which the distribution	in Lab Notebooks	
		of fossils may be irregular.		
Investigation 11.3	7.ESS.1, 7.ESS.2,	• Use knowledge of	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period	7.ESS.3	supercontinents to explain		Kit
		how plate tectonics have	Analyzations, Conclusions,	
		influenced the appearance	Responses, and Reflections	
		of Earth.	in Lab Notebooks	
		• Explain similar fossil		
		and rock data found on		
		different landmasses.		
Investigation 11.4	7.ESS.2, 7.ESS.3,	Draw connections	Data in Lab Notebooks	Earth's Dynamic Systems Lab
1 period	7.ESS.5	among divergent plates,		Kit
		volcanic rock, and	Analyzations, Conclusions,	
		magnetism.	Responses, and Reflections	
		• Use data and graphs to	in Lab Notebooks	
		demonstrate evidence of		
		Earth's magnetic reversals.		

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Lesson 11: Evidence of a D	ynamic Earth	Unit: Earth's Dynamic S	ystem

Essential Question(s): What evidence suggests that Earth is a dynamic geological system? Key Terms: Geological Timescale, Glacier, Strata, Law of Superposition, Pangaea, Supercontinent, Magnetite, Seafloor Spreading,

Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
		• Identify benefits of magnetic data on rock and fossil dating.			
Reflection and Quiz	7.ESS.1, 7.ESS.2,	• Provide support for	Analyzations, Conclusions,	Student Guide – page 312	
	7.ESS.3, 7.ESS.5	using rocks to explain	Responses, and Reflections		
		events in Earth's history.	in Lab Notebooks	Quiz	
		• Develop a time line for			
		Earth's future based on			
		knowledge of past events.			
Assessment(s): End of Lesson Quiz					
Student sheets can be	found at: https://ssec.si.e	du/earths-dynamic-systems			

Lesson 12: Assessment: Earth's Dynamic Systems			Unit: Earth's Dynamic Syst	em	
Essential Question(	Essential Question(s): How can we use knowledge of Earth's dynamic systems to understand the past and prepare for the future?				
Key Terms:					
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
Performance	7.ESS.1 – 7.ESS.7	• Examine real-world		Performance Assessment Sheet	
Assessment		observations and images		and Rubrics	
and Reflection		related to geoscience			
5-8 periods		processes and			
-		phenomena.			
		• Describe what a data set			
		represents and interpret			
		similarities and differences			
		within it.			

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Lesson 12: Assessment: Earth's Dynamic Systems		Unit: Earth's Dynamic System			
Essential Question(	s): How can we use kno	wledge of Earth's dynamic	systems to understand the p	ast and prepare for the future?	
Key Terms:					
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
Written Assessment	7.ESS.1 – 7.ESS.7	• Examine real-world		Copies of Written Assessment	
1 period		observations and images		and Answer Keys	
		related to geoscience			
		processes and			
		phenomena.			
		• Describe what a data set			
		represents and interpret			
		similarities and differences			
		within it.			
Assessment(s): Unit	Written Assessment and I	Performance Assessment			
Student sheets can be found at: https://ssec.si.edu/earths-dynamic-systems					

## Unit: Energy, Forces, and Motion

Pre-Lesson: The Structure of Matter			Unit: Energy, Forces, and M	Aotion
Essential Question(	Essential Question(s): What is the structure of matter and how can it change?			
Key Terms: Atoms,	Key Terms: Atoms, Elements, Molecules, and Compounds, States of Matter, Solid, Liquid, Gas, Motion, Density, Temperature,			
Thermal Energy		_	_	
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation Pre.1 1-2 days	7.PS.1	<ul> <li>Phet simulation to create atom models and molecule models.</li> <li>Explain that atoms are the building blocks of matter.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Online Phet simulations

Finalize activities and resources for Pre-Lesson: Elements, Molecules, States of Matter, etc.

Pre-Lesson: The Structure of Matter			Unit: Energy, Forces, and Motion	
Essential Question(	s): What is the structure	of matter and how can it c	hange?	
Key Terms: Atoms,	Elements, Molecules, ar	nd Compounds, States of M	latter, Solid, Liquid, Gas, Mo	otion, Density, Temperature,
Thermal Energy				1
Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
		• Use diagrams to explain the positions and charges of protons, neutrons, and electrons within an atom.		
Investigation Pre.2 1-2 days	7.PS.1	<ul> <li>Explain that every element is composed of a specific type of atom.</li> <li>Explain that a molecule is made of two or more atoms (same or different types of atoms - Example - H2O and H2 are both molecules.)</li> <li>A compound is two or more elements. (Ex - H2O or CO2)</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Resources to construct models
Investigation Pre.3	7.PS.2	<ul> <li>List the properties of solids, liquids and gases. Find examples of each state of matter.</li> <li>Explain that adding heat (thermal energy) to a substance increases the speed of the atoms, which eventually alters the substances state of</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Dry Ice

Pre-Lesson: The Structure of Matter		Unit: Energy, Forces, and Motion				
Essential Question(s	Essential Question(s): What is the structure of matter and how can it change?					
Key Terms: Atoms,	Key Terms: Atoms, Elements, Molecules, and Compounds, States of Matter, Solid, Liquid, Gas, Motion, Density, Temperature,					
Thermal Energy	Thermal Energy					
Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Duration						
		<ul> <li>matter (solid -&gt; liquid -&gt; gas).</li> <li>Explain that removing heat (thermal energy) from a substance decreases the speed of the atoms, which eventually alters the substances state of matter (gas -&gt; liquid - &gt; solid).</li> <li>May even discuss evaporation, condensation, sublimation, freezing and melting. Provide real-world examples of each.</li> </ul>				
Assessment(s): End	of Lesson Quiz					

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Essential Question(s): What do you know about energy, forces, and motion?         Key Terms: Force, Energy, Mass, Speed       Standards       Objectives       Assessment (formative)       Resources         Investigation & Duration       11-1.6       7.PS.3, 7.PS.8       • Plan and carry out investigations to answer questions about forces, energy changes, and motion.       Data in Lab Notebooks       Energy, Forces, and Motion Lab Kit         2-3 days total       SEPS Standards 1-8       • Plan and carry out investigations to answer questions about forces, energy changes, and motion.       Analyzations, Conclusions, Responses, and Reflections in to investigate the forces acting on a system.       Student Sheet 1.2         2-3 days total       • Objective and motion.       • Ask testable questions to uncerstand speed and motion.       • Model the energy changes taking place in a moving system.       • Construct and analyze graphs to understand speed and motion.       • Model the energy changes taking place in a moving system.       • Determine criteria for a design project and then use the criteria to test and improve designs.       • Determine criteria to test and improve designs.       • Determine criteria to test and improve designs.	Lesson: 1 Pre-Assessment: Let's Get Moving		Unit: Energy, Forces, and Motion				
Key Terms: Force, Energy, Mass, Speed           Investigation & Duration         Standards         Objectives         Assessment (formative)         Resources           Investigation 1.1-1.6         7.PS.3, 7.PS.8         • Plan and carry out investigations to answer questions about forces, Stations)         Data in Lab Notebooks         Energy, Forces, and Motion           2-3 days total         SEPS Standards 1-8         energy changes, and motion.         Analyzations, Conclusions, energy changes, and motion.         Responses, and Reflections in Lab Notebooks         Student Sheet 1.2           2-3 days total         - Ask testable questions to investigate the forces acting on a system.         Copies of Student Self- Assessment         Assessment           • Model the energy changes taking place in a moving system.         • Model the energy changes taking place in a moving system.         • Model the energy changes taking place in a moving system.         • Determine criteria for a design project and then use the criteria to test and improve designs.         • Determine criteria to test and improve         • Hould the criteria to test and improve         • Hould the criteria to test and improve	Essential Question(s): What do you know about energy, forces, and motion?						
Investigation & DurationStandardsObjectivesAssessment (formative)ResourcesInvestigation 1.1-1.67.PS.3, 7.PS.8• Plan and carry out investigations to answer questions about forces, energy changes, and motion.Data in Lab NotebooksEnergy, Forces, and Motion Lab Kit2-3 days totalSEPS Standards 1-8questions about forces, energy changes, and motion.Responses, and Reflections in Lab NotebooksStudent Sheet 1.22-3 days total- Ask testable questions to investigate the forces acting on a system. • Construct and analyze graphs to understand speed and motion Ask tenergy changes taking place in a moving system Ask tenergy changes taking pla	Key Terms: Force, E	Energy, Mass, Speed					
DurationImage: constraint of the second	Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Investigation 1.1-1.67.PS.3, 7.PS.8• Plan and carry out investigations to answer questions about forces, energy changes, and motion.Data in Lab NotebooksEnergy, Forces, and Motion Lab Kit2-3 days totalSEPS Standards 1-8energy changes, and motion.Analyzations, Conclusions, Responses, and Reflections in Lab NotebooksStudent Sheet 1.22-3 days total• Ask testable questions to investigate the forces acting on a system. • Construct and analyze graphs to understand speed and motion.• Model the energy changes taking place in a moving system.• Model the energy changes taking place in a moving system.• Model the energy changes taking place in a moving system.• Determine criteria for a design project and then use the criteria to test and improve designs.• Hon we have criteria to test and improve designs.• Hon we have <b< td=""><td>Duration</td><td></td><td></td><td></td><td></td></b<>	Duration						
(Pre-Assessment Stations)SEPS Standards 1-8investigations to answer questions about forces, energy changes, and motion.Analyzations, Conclusions, Responses, and Reflections in Lab NotebooksStudent Sheet 1.22-3 days total- Ask testable questions to investigate the forces acting on a system Copies of Student Self- AssessmentCopies of Student Self- Assessment0- Model the energy changes taking place in a moving system Optermine criteria for a design project and then use the criteria to test and improve designs Determine criteria to test and improve designs De	Investigation 1.1-1.6	7.PS.3, 7.PS.8	Plan and carry out	Data in Lab Notebooks	Energy, Forces, and Motion		
(Pre-Assessment Stations)SEPS Standards 1-8questions about forces, energy changes, and motion.Analyzations, Conclusions, Responses, and Reflections in Lab NotebooksStudent Sheet 1.22-3 days total• Ask testable questions to investigate the forces acting on a system. • Construct and analyze graphs to understand speed and motion.• Model the energy changes taking place in a moving system.Student Self- Assessment• Determine criteria for a design project and then use the criteria to test and improve desiens.• Determine criteria to test and improve designs.• Determine criteria to test and improve test and improve test and improve test and improve test and improve test and improve test			investigations to answer		Lab Kit		
Stations) 2-3 days totalenergy changes, and motion.Responses, and Reflections in Lab NotebooksStudent Sheet 1.22-3 days total• Ask testable questions to investigate the forces acting on a system. • Construct and analyze graphs to understand speed and motion. • Model the energy changes taking place in a moving system. • Determine criteria for a design project and then use the criteria to test and improve designs.Responses, and Reflections in Lab NotebooksStudent Sheet 1.2Copies of Student Self- AssessmentCopies of Student Self- Assessment	(Pre-Assessment	SEPS Standards 1-8	questions about forces,	Analyzations, Conclusions,			
2-3 days total       motion.       Lab Notebooks       Copies of Student Self-Assessment         • Ask testable questions to investigate the forces acting on a system.       • Construct and analyze graphs to understand speed and motion.       • Model the energy changes taking place in a moving system.       • Determine criteria for a design project and then use the criteria to test and improve designs.       • Or the criteria to test and improve designs.	Stations)		energy changes, and	Responses, and Reflections in	Student Sheet 1.2		
<ul> <li>Ask testable questions to investigate the forces acting on a system.</li> <li>Construct and analyze graphs to understand speed and motion.</li> <li>Model the energy changes taking place in a moving system.</li> <li>Determine criteria for a design project and then use the criteria to test and improve designs.</li> </ul>	2-3 days total		motion.	Lab Notebooks			
to investigate the forces acting on a system. • Construct and analyze graphs to understand speed and motion. • Model the energy changes taking place in a moving system. • Determine criteria for a design project and then use the criteria to test and improve designs.			• Ask testable questions		Copies of Student Self-		
acting on a system.         • Construct and analyze         graphs to understand         speed and motion.         • Model the energy         changes taking place in a         moving system.         • Determine criteria for         a design project and         then use the criteria to         test and improve         designs.			to investigate the forces		Assessment		
<ul> <li>Construct and analyze graphs to understand speed and motion.</li> <li>Model the energy changes taking place in a moving system.</li> <li>Determine criteria for a design project and then use the criteria to test and improve designs.</li> </ul>			acting on a system.				
graphs to understand         speed and motion.         • Model the energy         changes taking place in a         moving system.         • Determine criteria for         a design project and         then use the criteria to         test and improve         designs.			• Construct and analyze				
<ul> <li>speed and motion.</li> <li>Model the energy changes taking place in a moving system.</li> <li>Determine criteria for a design project and then use the criteria to test and improve designs.</li> </ul>			graphs to understand				
<ul> <li>Model the energy changes taking place in a moving system.</li> <li>Determine criteria for a design project and then use the criteria to test and improve designs.</li> </ul>			speed and motion.				
<ul> <li>changes taking place in a moving system.</li> <li>Determine criteria for a design project and then use the criteria to test and improve designs.</li> </ul>			• Model the energy				
<ul> <li>moving system.</li> <li>Determine criteria for <ul> <li>a design project and</li> <li>then use the criteria to</li> <li>test and improve</li> <li>designs.</li> </ul> </li> </ul>			changes taking place in a				
Determine criteria for a design project and then use the criteria to test and improve designs.			moving system.				
a design project and then use the criteria to test and improve designs.			• Determine criteria for				
then use the criteria to test and improve designs.			a design project and				
test and improve designs.			then use the criteria to				
designs.			test and improve				
			designs.				
Assessment(s):	Assessment(s):						
Self-Assessment	Self-Assessment						

Quiz

Student sheets can be found here: <u>https://ssec.si.edu/sites/default/files/page/EFM%20BLMs_1607.pdf</u>

Last Updated: 8/2022

Lesson 2: Force, Velocity, and Acceleration	Unit: Energy, Forces, and Motion

Essential Question(s): Why do objects speed up, slow down, or change direction?

Key Terms: Force, Mass, Predict, Speed, Acceleration, Average Speed, Velocity, Balanced Forces, Net Force, Gravity, Newton, Weight, Law

Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
Investigation 2.1 2 periods	7.PS.4, 7.PS.5	<ul> <li>Measure the speed and average speed of an object in motion across a flat surface.</li> <li>Analyze and interpret data from investigations on motion.</li> <li>Describe the motion of an object, and explain how your reference frame affects your description.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Energy, Forces, and Motion Lab Kit
Investigation 2.2 1 period	7.PS.4, 7.PS.5	<ul> <li>Measure the speed and average speed of an object in motion across a flat surface.</li> <li>Investigate how forces affect the motion of an object.</li> <li>Analyze and interpret data from investigations on motion.</li> <li>Employ force diagrams to model forces acting on an object.</li> </ul>	Data in Lab Notebooks Analyzations, Conclusions, Responses, and Reflections in Lab Notebooks	Energy, Forces, and Motion Lab Kit
Investigation 2.3 1 period	7.PS.3, 7.PS.4, 7.PS.5	• Plan and carry out an investigation to explore how mass affects an object's motion.	Data in Lab Notebooks	Energy, Forces, and Motion Lab Kit

Last Updated: 8/2022

Lesson 2: Force Velocity and Acceleration	Unit: Energy Forces and Motion
Lesson 2, 1 orec, verocity, and necercration	Unit. Lifely, 1 orees, and motion

Essential Question(s): Why do objects speed up, slow down, or change direction?

Key Terms: Force, Mass, Predict, Speed, Acceleration, Average Speed, Velocity, Balanced Forces, Net Force, Gravity, Newton, Weight, Law

Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
		• Analyze and interpret	Analyzations, Conclusions,	
		data from investigations	Responses, and Reflections	
		on motion.	in Lab Notebooks	
Investigation 2.4	7.PS.3, 7.PS.4, 7.PS.5	• Students observe	Data in Lab Notebooks	Energy, Forces, and Motion
1 period		evidence for acceleration		Lab Kit
		due to gravity.	Analyzations, Conclusions,	
			Responses, and Reflections	
			in Lab Notebooks	
Investigation 2.5	7.PS.3, 7.PS.4, 7.PS.5	• Describe how mass and	Data in Lab Notebooks	Energy, Forces, and Motion
1 period		weight are related.		Lab Kit
		Construct and analyze	Analyzations, Conclusions,	
		data tables and graphs	Responses, and Reflections	
		describing the relationship	in Lab Notebooks	
		between mass and weight.		
Reflection and Quiz	7.PS.3, 7.PS.4, 7.PS.5	Construct explanations	Analyzations, Conclusions,	Student Guide – page 28
		about object motion using	Responses, and Reflections	
		evidence gathered	in Lab Notebooks	Quiz
		from investigations.		
Assessment(s): End	of Lesson Quiz			

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Last Updated: 8/2022

Lesson 4: Newton's First and Second Laws	Unit: Energy, Forces, and Motion

Essential Question(s): How can we predict if the motion of an object will change or stay the same?

Key Terms: Balanced Forces, Inertia, Net Force, Newton's First Law, Newton's Second Law, Unbalanced Forces, Acceleration, Mass, Speed, Gravity

Investigation &	Standards	Objectives	Assessment (formative)	Resources			
Duration							
Investigation 4.1	7.PS.4, 7.PS.5	• Apply Newton's first law	Data in Lab Notebooks	Energy, Forces, and Motion			
1 period		to		Lab Kit			
		plan an investigation	Analyzations, Conclusions,				
		regarding	Responses, and Reflections				
		the motion of a car.	in Lab Notebooks				
Investigation 4.2	7.PS.4, 7.PS.5	• Apply Newton's second	Data in Lab Notebooks	Energy, Forces, and Motion			
1 period		law to		Lab Kit			
		plan an investigation	Analyzations, Conclusions,				
		regarding	Responses, and Reflections				
		the motion of a car.	in Lab Notebooks				
Reflection and Quiz	7.PS.4, 7.PS.5	Construct explanations	Analyzations, Conclusions,	Student Guide – page 57			
1 period		about the motion	Responses, and Reflections				
		of a car using evidence	in Lab Notebooks	Quiz			
		gathered from					
		investigations					
Assessment(s). End	Assessment(a): End of Lessen Ovin						

Assessment(s): End of Lesson Quiz

Student sheets can be found here: https://ssec.si.edu/sites/default/files/page/EFM%20BLMs 1607.pdf

Lesson 6: Newton's Third Law Unit: Energy, J				Motion		
Essential Question(	Essential Question(s): How would a ball move if you threw it in space?					
Key Terms: Balance	Key Terms: Balanced Forces, Collision, Force Pair, Newton's Second Law, Newton's Third Law, Unbalanced Forces, Friction,					
Gravity, Inertia, Velo	ocity					
Investigation &	Standards         Objectives         Assessment (formative)         Resources					
Duration						
Investigation 6.1	7.PS.4, 7.PS.5, 7.PS.6,	• Build a battery-powered	Data in Lab Notebooks	Energy, Forces, and Motion		
2 periods	7.PS.7	fan car and make		Lab Kit		

Last Updated: 8/2022

Lesson 6: Newton's Third Law	Unit: Energy, Forces, and Motion
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Essential Question(s): How would a ball move if you threw it in space?

Key Terms: Balanced Forces, Collision, Force Pair, Newton's Second Law, Newton's Third Law, Unbalanced Forces, Friction, Gravity, Inertia, Velocity

Investigation &	Standards	Objectives	Assessment (formative)	Resources
Duration				
		predictions about its motion.	Analyzations, Conclusions, Responses, and Reflections	
		• Determine the effects of balanced and unbalanced forces on the motion of the fan car.	in Lab Notebooks	
Investigation 6.2 1 period	7.PS.6, 7.PS.7	• Apply Newton's third law of motion.	Data in Lab Notebooks Analyzations, Conclusions, Responses and Reflections	Energy, Forces, and Motion Lab Kit
			in Lab Notebooks	
Reflection and Quiz	7.PS.4, 7.PS.5, 7.PS.6,	• Explain the differences	Analyzations, Conclusions,	Student Guide – page 90
1 period	7.PS.7	between action-	Responses, and Reflections	
		reaction force pairs and balanced forces	in Lab Notebooks	Quiz
Assessment(s): End	of Lesson Quiz			

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Lesson 8: Transforming Energy Unit: Energy, Forces, and Motion						
Essential Question(	Essential Question(s): How do energy transformation inform the design of a roller coaster?					
Key Terms: Constra	Key Terms: Constraints, Kinetic Energy, Potential Energy, Energy Transformation, System					
Investigation &	Standards	Objectives Assessment (formative) Resources				
Duration						
Investigation 8.1 6-8 periods	7.PS.7, 7.PS.8	• Define and investigate relevant scientific	Data in Lab Notebooks	Energy, Forces, and Motion Lab Kit		

Lesson 8: Transforming Energy			Unit: Energy, Forces, and Motion		
Essential Question(	s): How do energy tra	insformation inform the c	lesign of a roller coaster?		
Key Terms: Constra	ints, Kinetic Energy,	Potential Energy, Energy	Transformation, System		
Investigation &	Standards	Objectives	Assessment (formative)	Resources	
Duration					
		principles inherent to	Analyzations, Conclusions,	Cardboard Tubes, Tape,	
		the design of a marble	Responses, and Reflections in	Marble Run Data Sheet	
		roller coaster.	Lab Notebooks		
Investigation 8.2	7.PS.7	Apply understanding	Data in Lab Notebooks	Energy, Forces, and Motion	
7-9 periods		of energy, forces, and		Lab Kit	
ī		motion to construct a	Analyzations, Conclusions,		
		roller coaster that	Responses, and Reflections in	Cardboard Tubes, Tape,	
		accomplishes a design	Lab Notebooks	Marble Run Data Sheet	
		challenge.			
		• Collect and use data to			
		evaluate competing			
		design solutions.			
		• Use engineering			
		processes to test and			
		refine roller coaster			
		design for optimization.			
Reflection and Quiz	7.PS.7, 7.PS.8	• Use evidence to	Analyzations, Conclusions,	Student Guide – page 133	
1 period		support claims related to	Responses, and Reflections in		
		the design challenge.	Lab Notebooks	Quiz	
		• Use criteria to evaluate			
		the success of roller			
		coaster designs.			
		• Describe changes in			
		killetic and potential			
		moving along a roller			
		coaster track			
Assessment(s): End	of Lesson Quiz	COASICI LIACK.			

Lesson 8: Transforming Energy			Unit: Energy, Forces, and Motion			
Essential Question(s): How do energy transformation inform the design of a roller coaster?						
Key Terms: Constraints, Kinetic Energy, Potential Energy, Energy Transformation, System						
Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Duration						
Student sheets can be found here: https://ssec.si.edu/sites/default/files/page/EFM%20BLMs_1607.pdf						

Lesson 9: Energy Transfer and Heat Transfer			Unit: Energy, Forces, and Motion			
Essential Question(s): How is energy transferred from one form to another?						
Key Terms: Law of Conservation of Energy, Open System, Closed System, Heat Transfer, Radiation, Convection, Conduction						
Investigation &	Standards	Objectives	Assessment (formative)	Resources		
Duration						
Investigation 9.1	7.PS.8	<ul> <li>Define energy as the capacity to do work.</li> <li>Must be able to prove that the total about of energy does not change during the transfer in a closed</li> </ul>				
		<ul> <li>In a closed system, matter and energy do</li> <li>not leave the system</li> </ul>	Finalize activities and resources for Lesson 9, Cons of Energy, Heat transfer			
		<ul> <li>The amount of energy remains constant in the system.</li> <li>In an open system, matter and energy can enter or leave the system. Almost all systems are open.</li> </ul>				

Lesson 9: Energy Tr	ransfer and Heat Transf	er	Unit: Energy, Forces, and Motion						
Essential Question(s): How is energy transferred from one form to another?									
Key Terms: Law of Conservation of Energy, Open System, Closed System, Heat Transfer, Radiation, Convection, Conduction									
Investigation &	Standards	Objectives	Assessment (formative)	Resources					
Duration									
		• Analyze data or							
		investigate how energy							
		is transferred in a							
		closed system versus							
		an open system							
Investigation 9.2	7.PS.9	<ul> <li>Define and provide</li> </ul>							
		examples of radiation,							
		convection, and							
		conduction.							
Assessment(s):									
Lesson 10: Assessment: Energy, Forces, and Motion   Unit: Energy, Forces, and Motion									
Essential Question(	s): How do people use a	Essential Question(s): How do people use an understanding of energy, forces, and motion to make predictions and design tools							
that make the world safe, enjoyable, and accessible?									
that make the world	safe, enjoyable, and acc	cessible?							
Key Terms:	safe, enjoyable, and acc	cessible?		D					
Key Terms: Investigation &	Standards	Cessible? Objectives	Assessment (formative)	Resources					
that make the world         Key Terms:         Investigation &         Duration	Standards	Objectives	Assessment (formative)	Resources					
that make the world         Key Terms:         Investigation &         Duration         Performance         Assessment	Standards 7.PS.1-7.PS.9	Objectives     Using knowledge of	Assessment (formative)	Resources Student Performance					
that make the world         Key Terms:         Investigation &         Duration         Performance         Assessment         2 periods	Standards 7.PS.1-7.PS.9	Objectives     Using knowledge of energy, forces, and motion create a plan for	Assessment (formative)	Resources Student Performance Assessment and Rubrics					
that make the world         Key Terms:         Investigation &         Duration         Performance         Assessment         2 periods	Standards 7.PS.1-7.PS.9	Objectives     Objectives     Using knowledge of     energy, forces, and     motion, create a plan for     transporting produce	Assessment (formative)	Resources Student Performance Assessment and Rubrics					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Periods	Standards 7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the	Assessment (formative)	Resources Student Performance Assessment and Rubrics					
that make the world         Key Terms:         Investigation &         Duration         Performance         Assessment         2 periods	Standards 7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the yehicle	Assessment (formative)	Resources Student Performance Assessment and Rubrics					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Written Assessment	Standards 7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Written Assessment         1 period       Vertice	Standards         7.PS.1-7.PS.9         7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and skills to answer questions	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written         Assessment					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Written Assessment         1 period       Verial Assessment	Standards         7.PS.1-7.PS.9         7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and skills to answer questions in a written assessment	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written         Assessment					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Written Assessment         1 period       Period	safe, enjoyable, and acc         Standards         7.PS.1-7.PS.9         7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and skills to answer questions in a written assessment about concepts related to	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written         Assessment					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Vritten Assessment         1 period       Vritten Assessment	safe, enjoyable, and acc         Standards         7.PS.1-7.PS.9         7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and skills to answer questions in a written assessment about concepts related to energy, forces, and	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written         Assessment					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         2 periods       Written Assessment         1 period       Period	safe, enjoyable, and acc         Standards         7.PS.1-7.PS.9         7.PS.1-7.PS.9	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and skills to answer questions in a written assessment about concepts related to energy, forces, and motion.	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written         Assessment					
that make the world         Key Terms:         Investigation & Duration         Performance       Assessment         Assessment       2 periods         Written Assessment       1 period         Assessment(s): Unit       1 period	Standards         7.PS.1-7.PS.9         7.PS.1-7.PS.9         Written Assessment and I	• Using knowledge of energy, forces, and motion, create a plan for transporting produce without it falling off the vehicle • Apply knowledge and skills to answer questions in a written assessment about concepts related to energy, forces, and motion.	Assessment (formative)	Resources         Student Performance         Assessment and Rubrics         Copies of Student Written         Assessment					