

Grade 6 Common Core Pacing Guide
6th Grade Science

Units of Study	Target Standard	“I Can” Statements	Vocabulary	Time Frame
Unit 1: Matter and its Interactions	MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.	-I can illustrate and explain the molecular movement within substances and objects.	atom nucleus proton neutron electron	Trimester 1
	MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	-I can identify chemical and physical changes based off of data interpretations and observations.	malleability ductility combustion density	Trimester 1
	MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	-I can make inferences from research/informational texts that imply how natural resources impact our society.	recycling renewable energy	Trimester 1
	MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	I can develop models that will describe and show molecular movement when energy/heat is added to a substance.	solid liquid gas colloid plasma absolute zero	Trimester 1

	MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	I can develop models that will describe and show how the number of atoms will not change in chemical reactions.	conservation of mass molecules	Trimester 1
	MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	I can create a project that will show chemical reactions by the release or addition of energy/heat.	energy chemical properties	Trimester 1-2
Unit 2- Motion and Stability- Forces and Interactions	MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects	I can design a solution using Newton's Third Law involving the motion of two colliding objects.	gravity inertia	Trimester 2
	MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	I can use scientific evidence to prove an object's motion depends on the sum of the force and the mass of the object.	motion force momentum	Trimester 2
	MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	I can ask questions and interpret data to determine the affects of the strength of electric and magnetic forces.	electricity magnetism	Trimester 2
	MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	I can construct and present arguments using evidence that gravitational interactions are dependent on the attraction and masses of the objects.	gravitational pull	Trimester 2

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	MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	I can conduct investigations and evaluate on the fields that exist between objects exerting forces on each other.	magnetic fields	Trimester 2
Unit 3 Energy	MS-PS3-1 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object	I can construct graphs of data to describe the relationships of kinetic energy to the mass and the speed of an object.	kinetic energy velocity speed mass	Trimester 3
	MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.	I can develop a model to describe how different amounts of potential are stored in an object/system depending on distances.	potential energy stored energy	Trimester 3
	MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	I can construct, design, and test a device using scientific principles that will minimize or maximize heat transfer.	thermal energy	Trimester 3
	MS-PS3-4 Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as	I can use temperature to determine the energy transferred, mass, and average kinetic energy transferred through an investigation.		Trimester 3

	measured by the temperature of the sample.			
	MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	I can construct, use, and present arguments to support the claim that when kinetic energy changes for an object, that energy is transferred to or from that object.	kinetic and potential energy	Trimester 3
Unit 4 MS-ESS3 Earth and Human Activity	MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	I can ask questions and clarify the factors that have caused a rise in global temperatures over the past century.	solar energy recycling natural resources renewable fossil fuels	Trimester 3
Engineering Design	MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	I can support and argue design problems/successes and the potential impacts on people and the environment.	engineering design	Trimester 1,2,3
	MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	I can meet all criteria and constraints of designing solutions and dealing with challenges for environmental and people problems.	evaluate inferences problem	Trimester 1,2,3
	MS-ETS1-3 Analyze data from tests 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 better meet the criteria for success.	I can determine similarities and differences among design solutions and reflect on successes/challenges.	data	Trimester 1,2,3

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	<p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>	<p>I can construct and design projects that will produce data that can be analyzed in graphs/charts.</p>		<p>Trimester 1,2,3</p>
	<p>The Scientific and Engineering Practices</p> <p>Scientists observe something they want to study and use scientific inquiry to plan and conduct their study. They use science process skills as tools to help them gather, organize, analyze, and present their information like an engineer does.</p>	<p>8 Practices</p> <p>1- Asking questions (scientist) defining problems (engineer):</p> <ul style="list-style-type: none"> ● Ask questions about what would happen if a variable is changed. ● Identify testable and non-testable questions. ● Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect. <p>2. Developing and using models:</p> <ul style="list-style-type: none"> ● Build and revise simple models to represent, describe, or predict events and design solution. <p>3. Planning and carrying out investigations:</p> <ul style="list-style-type: none"> ● Design and conduct investigations collaboratively that control variables and provide evidence, in the form of observations and/or data, to support explanations or design solutions. 	<p>Procedure Materials experiment Reasonable-outcomes models solutions data citing conclusion hypothesis</p>	<p>Trimester 1,2,3</p>

		<ul style="list-style-type: none">• Evaluate appropriate methods and/or tools for collecting data <p>4. Analyze and Interpret Data:</p> <ul style="list-style-type: none">• Participate in quantitative approaches to collecting data and conduct multiple trials of qualitative observations, in order to make sense of phenomena, as well as evaluate and refine design solutions. <p>5. Use mathematics and computational thinking:</p> <ul style="list-style-type: none">• Decide if qualitative or quantitative data are best to determine whether a proposed object or tool meets criteria for success.• Create and/or use graphs and/or charts generated from simple algorithms to compare alternative solutions to an engineering problem. <p>6. Constructing explanations (scientist) and designing solutions (engineer)</p> <ul style="list-style-type: none">• Identify and use appropriate evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.• Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. <p>7. Engaging in argument from evidence</p> <ul style="list-style-type: none">• Construct, compare, and refine arguments based on an		
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Trimester 1 Assessments	Trimester 1 Resources
<p>Atoms/Elements pre-assessment in Data Director Atoms/Elements post-test assessment in Data Director Making an atom model-- Identify the subatomic particles within the model BrainPop quizzes- Atoms-Elements- Matter</p>	<p>Brainpop StudyJams Science Hardcourt Textbook Bill Nye- Atoms-Elements</p>
<p>Changes of state- Explanation of the molecular movement within the states of matter and how to successfully transfer between each state (including examples and supporting evidence) Acids and Bases Pre/Post test- Identifying acids and bases using the pH scale. Physical & Chemical Changes- Building a model example of a chemical reaction along with a write-up supporting chemical vs physical changes. BrainPop quizzes- Chemical/Physical Changes- Acids and Bases</p>	<p>Brainpop StudyJams Science Hardcourt Textbook Bill Nye- Property Changes- Chemistry4Kids.com</p>

Trimester 2 Assessments	Trimester 2 Resources
<p>Forces and Interactions- Unit Pre/Post Test Forces, Motion, Momentum. Data stored in Data Director Summative- The Law of Inertia.. Research I. Newton and his Law of Motions. Students need to have 3 resources Potential and Kinetic Energy Pre-Post unit assessment BrainPop Forces and Interactions- Motion- Inertia Summative- Catapult Using a bag of random materials, students have 3</p>	<p>BrainPop Forces and Motion- Building a rollercoaster Bill Nye Forces and Motion- StudyJams Science Hardcourt Textbook</p>

<p>days to make a catapult and launch a marble over a 2ft wall and travel 6ft in the air.</p>	

<h3>Trimester 3 Assessments</h3>	<h3>Trimester 3 Resources</h3>
<p>Pre/Post Test on Energy data stored on Data Director Summative- CO2 car projects. Cars finishing the distance 15ft at a certain speed. Summative- Balloon Rockets. Determining which shape of balloon will travel the furthest distance. Pre/Post Human Impact Assessment within Data Director Summative- Fred the Fish. Interpret the ramifications of pollution by humans and how they affect our Earth's water systems. Summative- Science Fair. Choose a topic that we have learned about this year and create a presentation to lead during our science fair.</p>	<p>StudyJams Brainpop Science Hardcourt Bill Nye- Energy Chemistry4Kids.com</p>