



Middle School Physical Science Curriculum Map

Unit 1 – Lab Skills

1-1	Lab Equipment
1-2	Safety
1-3	Lab Procedures <ul style="list-style-type: none">• <i>MS-PS1-3</i> Gather and make sense of information to describe that synthetic materials come from natural resources.
1-4	The Scientific Process <ul style="list-style-type: none">• <i>MS-PS1-3</i> Gather and make sense of information to describe that synthetic materials come from natural resources.• <i>MS-PS1-2</i> Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.• <i>MS-PS2-2</i> 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.
1-5	Making Observations <ul style="list-style-type: none">• <i>MS-PS1-3</i> Gather and make sense of information to describe that synthetic materials come from natural resources.• <i>MS-PS1-2</i> Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
1-6	Measuring <ul style="list-style-type: none">• <i>MS-PS1-3</i> Gather and make sense of information to describe that synthetic materials come from natural resources.
1-7	Reporting <ul style="list-style-type: none">• <i>MS-PS1-3</i> Gather and make sense of information to describe that synthetic materials come from natural resources.• <i>MS-PS1-2</i> Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Unit 2 – Structure and Properties of Matter

2-1	<p>Nature of Matter</p> <ul style="list-style-type: none"> • <i>MS-PS1-1</i> Develop models to describe the atomic composition of simple molecules and extended structures.
2-2	<p>Mass</p> <ul style="list-style-type: none"> • <i>MS-PS1-1</i> Develop models to describe the atomic composition of simple molecules and extended structures.
2-3	<p>Density</p> <ul style="list-style-type: none"> • <i>MS-PS1-1</i> Develop models to describe the atomic composition of simple molecules and extended structures. • <i>MS-PS1-4</i> Develop a model that predicts and describes changes in particle motion, temperature and state of pure substances when thermal energy is added or removed.
2-4	<p>Properties and Uses of Substances</p> <ul style="list-style-type: none"> • <i>MS-PS1-3</i> Gather and make sense of information to describe that synthetic materials come from natural resources.
2-5	<p>Changes of State</p> <ul style="list-style-type: none"> • <i>MS-PS1-1</i> Develop models to describe the atomic composition of simple molecules and extended structures. • <i>MS-PS1-4</i> Develop a model that predicts and describes changes in particle motion, temperature and state of pure substances when thermal energy is added or removed.
2-6	<p>Particle Theory of Matter</p> <ul style="list-style-type: none"> • <i>MS-PS1-4</i> Develop a model that predicts and describes changes in particle motion, temperature and state of pure substances when thermal energy is added or removed.
2-7	<p>Using Particle Theory</p> <ul style="list-style-type: none"> • <i>MS-PS1-4</i> Develop a model that predicts and describes changes in particle motion, temperature and state of pure substances when thermal energy is added or removed.
2-8	<p>Mixtures</p> <ul style="list-style-type: none"> • <i>MS-PS1-4</i> Develop a model that predicts and describes changes in particle

	<p>motion, temperature and state of pure substances when thermal energy is added or removed.</p>
2-9	<p>Solubility</p> <ul style="list-style-type: none"> • MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature and state of pure substances when thermal energy is added or removed.
2-10	<p>Separating Techniques</p> <ul style="list-style-type: none"> • MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature and state of pure substances when thermal energy is added or removed.

Unit 3 – Chemical Reactions

3-1	<p>Atoms and Molecules</p> <ul style="list-style-type: none"> • MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures. • 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.
3-2	<p>Elements and The Periodic Table</p> <ul style="list-style-type: none"> • MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.
3-3	<p>Compounds</p> <ul style="list-style-type: none"> • 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. • MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources. • MS-PS1-6 Undertake a design project to construct, test and modify a device that either releases or absorbs thermal energy.
3-4	<p>Chemical and Physical Change</p> <ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources. • 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.
3-5	Properties of Acids and Bases <ul style="list-style-type: none"> • 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. • MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources.
3-6	Indicators <ul style="list-style-type: none"> • 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. • MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources.
3-7	The pH Scale <ul style="list-style-type: none"> • 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.
3-8	Reactions of Acids and Bases <ul style="list-style-type: none"> • 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. • MS-PS1-6 Undertake a design project to construct, test and modify a device that either releases or absorbs thermal energy.

Unit 4 – Forces and Interactions

4-1	Speed and Acceleration <ul style="list-style-type: none"> • MS-PS2-1 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects. • 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
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	of the object.
4-2	<p>Force, Mass and Motion</p> <ul style="list-style-type: none"> • MS-PS2-1 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects. • 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.
4-3	<p>Forces</p> <ul style="list-style-type: none"> • MS-PS2-1 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects. • 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. • 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.
4-4	<p>Balanced and Unbalanced Forces</p> <ul style="list-style-type: none"> • 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. • 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.
4-5	<p>Work and Energy</p> <ul style="list-style-type: none"> • 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. • 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.
4-6	<p>Simple Machines</p> <ul style="list-style-type: none"> • 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.

4-7	Electrical Charge <ul style="list-style-type: none"> • MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. • 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.
4-8	Electrical Current <ul style="list-style-type: none"> • MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. • 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.
4-9	Electrical Circuits <ul style="list-style-type: none"> • MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. • 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.
4-10	Resistance and Power <ul style="list-style-type: none"> • MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. • 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.
4-11	Electricity and Magnetism <ul style="list-style-type: none"> • MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. • 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.

Unit 5 – Energy

5-1	The Nature of Energy
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	<ul style="list-style-type: none"> • 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. • 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.
5-2	Measuring Energy <ul style="list-style-type: none"> • 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. • 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.
5-3	Transforming Energy <ul style="list-style-type: none"> • 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.
5-4	Heat Energy <ul style="list-style-type: none"> • MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
5-5	Heat transfer <ul style="list-style-type: none"> • MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. • 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 measured by the temperature of the sample.
5-6	Heat and Particle Theory <ul style="list-style-type: none"> • MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. • 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 measured by the temperature of the sample.

Unit 6 – Waves and Electromagnetic Radiation

<p>6-1</p>	<p>The Electromagnetic Spectrum</p> <ul style="list-style-type: none"> • MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. • MS-PS4-3 Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
<p>6-2</p>	<p>The Nature of Light</p> <ul style="list-style-type: none"> • MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
<p>6-3</p>	<p>Reflection</p> <ul style="list-style-type: none"> • MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
<p>6-4</p>	<p>Refraction</p> <ul style="list-style-type: none"> • MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
<p>6-5</p>	<p>Color</p> <ul style="list-style-type: none"> • MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
<p>6-6</p>	<p>The Eye</p> <ul style="list-style-type: none"> • MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
<p>6-7</p>	<p>The Nature of Sound</p> <ul style="list-style-type: none"> • MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. • MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

6-8	The Ear <ul style="list-style-type: none"> MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
6-9	Waves for Communication <ul style="list-style-type: none"> MS-PS4-3 Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

Unit 7 – Space Systems

7-1	Earth's Place in the Solar System <ul style="list-style-type: none"> MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
7-2	Earth's Cycles <ul style="list-style-type: none"> MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
7-3	Eclipses <ul style="list-style-type: none"> MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
7-4	The Planets of the Solar System <ul style="list-style-type: none"> MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. MS-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system.
7-5	Stars

	<ul style="list-style-type: none"> • MS-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system.
7-6	Galaxies <ul style="list-style-type: none"> • MS-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system.
7-7	Conditions for Life <ul style="list-style-type: none"> • MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

Unit 8 – History of Earth

8-1	Ancient Earth <ul style="list-style-type: none"> • MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history • MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales • MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
8-2	Earth’s Changing Surface <ul style="list-style-type: none"> • MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
8-3	Plate Tectonics <ul style="list-style-type: none"> • MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
8-4	Volcanoes <ul style="list-style-type: none"> • MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-

	<p>year-old history</p> <ul style="list-style-type: none"> • MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales • MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
8-5	<p>Earthquakes</p> <ul style="list-style-type: none"> • MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history • MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales • MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
8-6	<p>Meteorites</p> <ul style="list-style-type: none"> • MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history • MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales

Unit 9 – Earth’s Systems

9-1	<p>The Structure of the Earth</p> <ul style="list-style-type: none"> • MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history • MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.
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<p>9-2</p>	<p>Chemical and Physical Weathering</p> <ul style="list-style-type: none"> • MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history • MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process. • MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.
<p>9-3</p>	<p>Erosion</p> <ul style="list-style-type: none"> • MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process. • MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.
<p>9-4</p>	<p>Classifying Rocks</p> <ul style="list-style-type: none"> • MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.
<p>9-5</p>	<p>The Rock Cycle</p> <ul style="list-style-type: none"> • MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.
<p>9-6</p>	<p>Nutrient Cycling</p> <ul style="list-style-type: none"> • MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.

Unit 10 – Weather and Climate

<p>10-1</p>	<p>The Atmosphere</p> <ul style="list-style-type: none"> • MS-ESS2-4 Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity. • MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
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<p>10-2</p>	<p>The Water Cycle</p> <ul style="list-style-type: none"> • MS-ESS2-4 Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity. • MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
<p>10-3</p>	<p>Weather Patterns</p> <ul style="list-style-type: none"> • MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. • MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
<p>10-4</p>	<p>Climate and Climate Change</p> <ul style="list-style-type: none"> • MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
<p>10-5</p>	<p>Effects of Climate Change</p> <ul style="list-style-type: none"> • MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. • MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Unit 11 – Human Impact

<p>11-1</p>	<p>Human Activities Affecting the Earth’s Surface</p> <ul style="list-style-type: none"> • MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geosciences processes. • MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. • MS-ESS3-4 Construct an argument supported by evidence for how increases
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	<p>in human population and per-capita consumption of natural resources impact Earth's systems.</p>
11-2	<p>Pollution</p> <ul style="list-style-type: none"> • MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geosciences processes. • MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. • MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
11-3	<p>Acid Rain</p> <ul style="list-style-type: none"> • MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. • MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. • MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
11-4	<p>Resource Extraction</p> <ul style="list-style-type: none"> • MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. • MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
11-5	<p>Quarrying, Mining and Drilling</p> <ul style="list-style-type: none"> • MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. • MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.