NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

Product	Activity Title (Preview Link)	Activity Type	Activity Standards	Performance Expectation (Link)	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Engineering, Tech, & Applications of Science
NGSS MS Physical Science	Atomic Composition of Simple Molecules and Extended Structures (Achieving)	Activity - Achieving	MS-PS1-1, SEP2, PS1.A, CCC3	Develop models to describe the atomic composition of simple molecules and extended structures.	SEP2: Developing and Using Models	PS1.A: Structure of Matter	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Atomic Composition of Simple Molecules and Extended Structures (Emerging)	Activity - Emerging	MS-PS1-1, SEP2, PS1.A, CCC3	Develop models to describe the atomic composition of simple molecules and extended structures.	SEP2: Developing and Using Models	PS1.A: Structure of Matter	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Atomic Composition of Simple Molecules and Extended Structures (Mini Assessment)	Mini Assessment	MS-PS1-1, SEP2, PS1.A, CCC3	Develop models to describe the atomic composition of simple molecules and extended structures.	SEP2: Developing and Using Models	PS1.A: Structure of Matter	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Where Did The Potassium Go? Part 1 (Physical Science Assessment)	Assessment	MS-PS1-1, SEP2, PS1.A, CCC3	Develop models to describe the atomic composition of simple molecules and extended structures.	SEP2: Developing and Using Models	PS1.A: Structure of Matter	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Evidence of Chemical Reactions (Achieving)	Activity - Achieving	MS-PS1-2, SEP4, PS1.A, PS1.B, CCC1	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	SEP4: Analyzing and Interpreting Data	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC1: Patterns	N/A
NGSS MS Physical Science	Evidence of Chemical Reactions (Emerging)	Activity - Emerging	MS-PS1-2, SEP4, PS1.A, PS1.B, CCC1	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	SEP4: Analyzing and Interpreting Data	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC1: Patterns	N/A

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NGSS MS Physical Science	Evidence of Chemical Reactions (Mini Assessment)	Mini Assessment	MS-PS1-2, SEP4, PS1.A, PS1.B, CCC1	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	SEP4: Analyzing and Interpreting Data	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC1: Patterns	N/A
NGSS MS Physical Science	Where Did The Potassium Go? Part 2 (Physical Science Assessment)	Assessment	MS-PS1-2, SEP4, PS1.A, PS1.B, CCC1	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	SEP4: Analyzing and Interpreting Data	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC1: Patterns	N/A
NGSS MS Physical Science	Synthetic Materials (Achieving)	Activity - Achieving	MS-PS1-3, SEP8, PS1.A, PS1.B, CCC6	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	SEP8: Obtaining, Evaluating, and Communicating Information	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Synthetic Materials (Emerging)	Activity - Emerging	MS-PS1-3, SEP8, PS1.A, PS1.B, CCC6	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	SEP8: Obtaining, Evaluating, and Communicating Information	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Synthetic Materials (Mini Assessment)	Mini Assessment	MS-PS1-3, SEP8, PS1.A, PS1.B, CCC6	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	SEP8: Obtaining, Evaluating, and Communicating Information	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Food Additives (Physical Science Assessment)	Assessment	MS-PS1-3, SEP8, PS1.A, PS1.B, CCC6	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	SEP8: Obtaining, Evaluating, and Communicating Information	PS1.A: Structure of Matter PS1.B Chemical reactions	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Thermal Energy and Particle Motion (Achieving)	Activity - Achieving	MS-PS1-4, SEP2, PS1.A, PS3.A, CCC2	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.	SEP2: Developing and Using Models	PS1.A: Structure of Matter PS3.A: Definitions of Energy	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Thermal Energy and Particle Motion (Emerging)	Activity - Emerging	MS-PS1-4, SEP2, PS1.A, PS3.A, CCC2	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.	SEP2: Developing and Using Models	PS1.A: Structure of Matter PS3.A: Definitions of Energy	CCC2: Cause and Effect	N/A

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NGSS MS Physical Science	Thermal Energy and Particle Motion (Mini Assessment)	Mini Assessment	MS-PS1-4, SEP2, PS1.A, PS3.A, CCC2	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.	SEP2: Developing and Using Models	PS1.A: Structure of Matter PS3.A: Definitions of Energy	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	The Drinking Bird (Physical Science Assessment)	Assessment	MS-PS1-4, SEP2, PS1.A, PS3.A, CCC2	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.	SEP2: Developing and Using Models	PS1.A: Structure of Matter PS3.A: Definitions of Energy	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Conservation of Mass During Chemical Reactions (Achieving)	Activity - Achieving	MS-PS1-5, SEP2, PS1.B, CCC5	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.	SEP2: Developing and Using Models	PS1.B: Chemical Reactions	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Conservation of Mass During Chemical Reactions (Emerging)	Activity - Emerging	MS-PS1-5, SEP2, PS1.B, CCC5	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.	SEP2: Developing and Using Models	PS1.B: Chemical Reactions	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Conservation of Mass During Chemical Reactions (Mini Assessment)	Mini Assessment	MS-PS1-5, SEP2, PS1.B, CCC5	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.	SEP2: Developing and Using Models	PS1.B: Chemical Reactions	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Where Did The Potassium Go? Part 3 (Physical Science Assessment)	Assessment	MS-PS1-5, SEP2, PS1.B, CCC5	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.	SEP2: Developing and Using Models	PS1.B: Chemical Reactions	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Design a Device to Absorb or Release Thermal Energy (Achieving)	Activity - Achieving	MS-PS1-6, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS1.B, ETS1.B, ETS1.C, CCC5	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	SEP6: Constructing Explanations and Designing Solutions	PS1.B: Chemical Reactions	CCC5: Energy and Matter	ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution
NGSS MS Physical Science	Design a Device to Absorb or Release Thermal Energy (Emerging)	Activity - Emerging	MS-PS1-6, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS1.B, ETS1.B, ETS1.C, CCC5	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	SEP6: Constructing Explanations and Designing Solutions	PS1.B: Chemical Reactions	CCC5: Energy and Matter	ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution

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NGSS MS Physical Science	Design a Device to Absorb or Release Thermal Energy (Mini Assessment)	Mini Assessment	MS-PS1-6, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS1.B, ETS1.B, ETS1.C, CCC5	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	SEP6: Constructing Explanations and Designing Solutions	PS1.B: Chemical Reactions	CCC5: Energy and Matter	ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution
NGSS MS Physical Science	That's Cool (Physical Science Assessment)	Assessment	MS-PS1-6, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS1.B, ETS1.B, ETS1.C, CCC5	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	SEP6: Constructing Explanations and Designing Solutions	PS1.B: Chemical Reactions	CCC5: Energy and Matter	ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution
NGSS MS Physical Science	Collisions and Newton's Third Law (Achieving)	Activity - Achieving	MS-PS2-1, SEP6, PS2.A, CCC4	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	SEP6: Constructing Explanations and Designing Solutions	PS2.A: Force and Motion	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Collisions and Newton's Third Law (Emerging)	Activity - Emerging	MS-PS2-1, SEP6, PS2.A, CCC4	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	SEP6: Constructing Explanations and Designing Solutions	PS2.A: Force and Motion	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Collisions and Newton's Third Law (Mini Assessment)	Mini Assessment	MS-PS2-1, SEP6, PS2.A, CCC4	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	SEP6: Constructing Explanations and Designing Solutions	PS2.A: Force and Motion	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Football Physics Part 1 (Physical Science Assessment)	Assessment	MS-PS2-1, SEP6, PS2.A, CCC4	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	SEP6: Constructing Explanations and Designing Solutions	PS2.A: Force and Motion	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Effect of Mass and Net Force on Motion (Achieving)	Activity - Achieving	MS-PS2-2, SEP3, PS2.A, CCC7	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.	SEP3: Planning and Carrying Out Investigations	PS2.A: Force and Motion	CCC7: Stability and Change	N/A
NGSS MS Physical Science	Effect of Mass and Net Force on Motion (Emerging)	Activity - Emerging	MS-PS2-2, SEP3, PS2.A, CCC7	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.	SEP3: Planning and Carrying Out Investigations	PS2.A: Force and Motion	CCC7: Stability and Change	N/A
NGSS MS Physical Science	Effect of Mass and Net Force on Motion (Mini Assessment)	Mini Assessment	MS-PS2-2, SEP3, PS2.A, CCC7	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.	SEP3: Planning and Carrying Out Investigations	PS2.A: Force and Motion	CCC7: Stability and Change	N/A

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NGSS MS Physical Science	Football Physics Part 2 (Physical Science Assessment)	Assessment	MS-PS2-2, SEP3, PS2.A, CCC7	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.	SEP3: Planning and Carrying Out Investigations	PS2.A: Force and Motion	CCC7: Stability and Change	N/A
NGSS MS Physical Science	Strength of Electric and Magnetic Forces (Achieving)	Activity - Achieving	MS-PS2-3, SEP1, PS2.B, CCC2	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	SEP1: Asking Questions and Defining Problems	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Strength of Electric and Magnetic Forces (Emerging)	Activity - Emerging	MS-PS2-3, SEP1, PS2.B, CCC2	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	SEP1: Asking Questions and Defining Problems	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Strength of Electric and Magnetic Forces (Mini Assessment)	Mini Assessment	MS-PS2-3, SEP1, PS2.B, CCC2	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	SEP1: Asking Questions and Defining Problems	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Magnetic and Electric Forces Part 1 (Physical Science Assessment)	Assessment	MS-PS2-3, SEP1, PS2.B, CCC2	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	SEP1: Asking Questions and Defining Problems	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Interactions of Gravity and Mass (Achieving)	Activity - Achieving	MS-PS2-4, SEP7, PS2.B, CCC4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	SEP7: Engaging in Argument for Evidence	PS2.B: Types of Interactions	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Interactions of Gravity and Mass (Emerging)	Activity - Emerging	MS-PS2-4, SEP7, PS2.B, CCC4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	SEP7: Engaging in Argument for Evidence	PS2.B: Types of Interactions	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Interactions of Gravity and Mass (Mini Assessment)	Mini Assessment	MS-PS2-4, SEP7, PS2.B, CCC4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	SEP7: Engaging in Argument for Evidence	PS2.B: Types of Interactions	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Interactions in Space Part 1 (Physical Science Assessment)	Assessment	MS-PS2-4, SEP7, PS2.B, CCC4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	SEP7: Engaging in Argument for Evidence	PS2.B: Types of Interactions	CCC4: Systems and System Models	N/A

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NGSS MS Physical Science	Strength of Electric and Magnetic Forces (Achieving)	Activity - Achieving	MS-PS2-5, SEP3, PS2.B, CCC2	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.	SEP3: Planning and Carrying Out Investigations	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Strength of Electric and Magnetic Forces (Emerging)	Activity - Emerging	MS-PS2-5, SEP3, PS2.B, CCC2	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.	SEP3: Planning and Carrying Out Investigations	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Magnetic and Electric Fields (Mini Assessment)	Mini Assessment	MS-PS2-5, SEP3, PS2.B, CCC2	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.	SEP3: Planning and Carrying Out Investigations	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Magnetic and Electric Forces Part 2 (Physical Science Assessment)	Assessment	MS-PS2-5, SEP3, PS2.B, CCC2	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.	SEP3: Planning and Carrying Out Investigations	PS2.B: Types of Interactions	CCC2: Cause and Effect	N/A
NGSS MS Physical Science	Kinetic Energy, Mass, and Speed (Achieving)	Activity - Achieving	MS-PS3-1, SEP4, PS3.A, CCC3	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.	SEP4: Analyzing and Interpreting Data	PS3.A: Definitions of Energy	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Kinetic Energy, Mass, and Speed (Emerging)	Activity - Emerging	MS-PS3-1, SEP4, PS3.A, CCC3	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.	SEP4: Analyzing and Interpreting Data	PS3.A: Definitions of Energy	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Kinetic Energy, Mass, and Speed (Mini Assessment)	Mini Assessment	MS-PS3-1, SEP4, PS3.A, CCC3	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.	SEP4: Analyzing and Interpreting Data	PS3.A: Definitions of Energy	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Energy Skate Park Part 1 (Physical Science Assessment)	Assessment	MS-PS3-1, SEP4, PS3.A, CCC3	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.	SEP4: Analyzing and Interpreting Data	PS3.A: Definitions of Energy	CCC3: Scale, Proportion, and Quantity	N/A

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NGSS MS Physical Science	Stored Potential Energy (Achieving)	Activity - Achieving	MS-PS3-2, SEP2, PS3.A, PS3.C, CCC4	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.	SEP2: Developing and Using Models	PS3.A: Definitions of Energy PS3.C: Relationship Between Energy and Forces	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Stored Potential Energy (Emerging)	Activity - Emerging	MS-PS3-2, SEP2, PS3.A, PS3.C, CCC4	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.	SEP2: Developing and Using Models	PS3.A: Definitions of Energy PS3.C: Relationship Between Energy and Forces	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Stored Potential Energy (Mini Assessment)	Mini Assessment	MS-PS3-2, SEP2, PS3.A, PS3.C, CCC4	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.	SEP2: Developing and Using Models	PS3.A: Definitions of Energy PS3.C: Relationship Between Energy and Forces	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Riding A Roller Coaster (Physical Science Assessment)	Assessment	MS-PS3-2, SEP2, PS3.A, PS3.C, CCC4	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.	SEP2: Developing and Using Models	PS3.A: Definitions of Energy PS3.C: Relationship Between Energy and Forces	CCC4: Systems and System Models	N/A
NGSS MS Physical Science	Devices to Minimize and Maximize Transfer of Thermal Energy (Achieving)	Activity - Achieving	MS-PS3-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS3.A, PS3.B, ETS1.A, ETS1.B, CCC5	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer	SEP6: Constructing Explanations and Designing Solutions	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	ETS1.A: Defining Engineering Problems ETS1.B: Developing Possible Solutions
NGSS MS Physical Science	Devices to Minimize and Maximize Transfer of Thermal Energy (Emerging)	Activity - Emerging	MS-PS3-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS3.A, PS3.B, ETS1.A, ETS1.B, CCC5	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer	SEP6: Constructing Explanations and Designing Solutions	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	ETS1.A: Defining Engineering Problems ETS1.B: Developing Possible Solutions

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NGSS MS Physical Science	Devices to Minimize and Maximize Transfer of Thermal Energy (Mini Assessment)	Mini Assessment	MS-PS3-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS3.A, PS3.B, ETS1.A, ETS1.B, CCC5	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer	SEP6: Constructing Explanations and Designing Solutions	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	ETS1.A: Defining Engineering Problems ETS1.B: Developing Possible Solutions
NGSS MS Physical Science	Aerogels To The Rescue (Physical Science Assessment)	Assessment	MS-PS3-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP6, PS3.A, PS3.B, ETS1.A, ETS1.B, CCC5	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer	SEP6: Constructing Explanations and Designing Solutions	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	ETS1.A: Defining Engineering Problems ETS1.B: Developing Possible Solutions
NGSS MS Physical Science	Relationship of Energy Transferred (Achieving)	Activity - Achieving	MS-PS3-4, SEP3, PS3.A, PS3.B, CCC3	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.	SEP3: Planning and Carrying Out Investigations	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Relationship of Energy Transferred (Emerging)	Activity - Emerging	MS-PS3-4, SEP3, PS3.A, PS3.B, CCC3	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.	SEP3: Planning and Carrying Out Investigations	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Relationship of Energy Transferred (Mini Assessment)	Mini Assessment	MS-PS3-4, SEP3, PS3.A, PS3.B, CCC3	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.	SEP3: Planning and Carrying Out Investigations	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Heating Liquids (Physical Science Assessment)	Assessment	MS-PS3-4, SEP3, PS3.A, PS3.B, CCC3	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.	SEP3: Planning and Carrying Out Investigations	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Physical Science	Kinetic Energy and Energy Transformations (Achieving)	Activity - Achieving	MS-PS3-5, SEP7, PS3.B, CCC5	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.	SEP7: Engaging in Argument for Evidence	PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	N/A

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NGSS MS Physical Science	Kinetic Energy and Energy Transformations (Emerging)	Activity - Emerging	MS-PS3-5, SEP7, PS3.B, CCC5	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.	SEP7: Engaging in Argument for Evidence	PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Kinetic Energy and Energy Transformations (Mini Assessment)	Mini Assessment	MS-PS3-5, SEP7, PS3.B, CCC5	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.	SEP7: Engaging in Argument for Evidence	PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Energy Skate Park Part 2 (Physical Science Assessment)	Assessment	MS-PS3-5, SEP7, PS3.B, CCC5	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.	SEP7: Engaging in Argument for Evidence	PS3.B: Conservation of Energy and Energy Transfer	CCC5: Energy and Matter	N/A
NGSS MS Physical Science	Wave Amplitude, Frequency, and Energy (Achieving)	Activity - Achieving	MS-PS4-1, SEP5, PS4.A, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	PS4.A: Wave Properties	CCC1: Patterns	N/A
NGSS MS Physical Science	Wave Amplitude, Frequency, and Energy (Emerging)	Activity - Emerging	MS-PS4-1, SEP5, PS4.A, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	PS4.A: Wave Properties	CCC1: Patterns	N/A
NGSS MS Physical Science	Wave Amplitude, Frequency, and Energy (Mini Assessment)	Mini Assessment	MS-PS4-1, SEP5, PS4.A, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	PS4.A: Wave Properties	CCC1: Patterns	N/A
NGSS MS Physical Science	Guitar Strings (Physical Science Assessment)	Assessment	MS-PS4-1, SEP5, PS4.A, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	PS4.A: Wave Properties	CCC1: Patterns	N/A
NGSS MS Physical Science	Modeling Wave Behavior (Achieving)	Activity - Achieving	MS-PS4-2, SEP2, PS4.A, PS4.B, CCC6	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	SEP2: Developing and Using Models	PS4.A: Wave Properties PS4.B: Electromagnetic Radiation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Modeling Wave Behavior (Emerging)	Activity - Emerging	MS-PS4-2, SEP2, PS4.A, PS4.B, CCC6	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	SEP2: Developing and Using Models	PS4.A: Wave Properties PS4.B: Electromagnetic Radiation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Modeling Wave Behavior (Mini Assessment)	Mini Assessment	MS-PS4-2, SEP2, PS4.A, PS4.B, CCC6	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	SEP2: Developing and Using Models	PS4.A: Wave Properties PS4.B: Electromagnetic Radiation	CCC6: Structure and Function	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Physical Science	Finding Koi Fish (Physical Science Assessment)	Assessment	MS-PS4-2, SEP2, PS4.A, PS4.B, CCC6	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	SEP2: Developing and Using Models	PS4.A: Wave Properties PS4.B: Electromagnetic Radiation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Digitized and Analog Signals (Achieving)	Activity - Achieving	MS-PS4-3, SEP8, PS4.C, CCC6	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.	SEP8: Obtaining, Evaluating, and Communicating Information	PS4.C: Information Technologies and Instrumentation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Digitized and Analog Signals (Emerging)	Activity - Emerging	MS-PS4-3, SEP8, PS4.C, CCC6	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.	SEP8: Obtaining, Evaluating, and Communicating Information	PS4.C: Information Technologies and Instrumentation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Digitized and Analog Signals (Mini Assessment)	Mini Assessment	MS-PS4-3, SEP8, PS4.C, CCC6	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.	SEP8: Obtaining, Evaluating, and Communicating Information	PS4.C: Information Technologies and Instrumentation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	Did You Hear That? (Physical Science Assessment)	Assessment	MS-PS4-3, SEP8, PS4.C, CCC6	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.	SEP8: Obtaining, Evaluating, and Communicating Information	PS4.C: Information Technologies and Instrumentation	CCC6: Structure and Function	N/A
NGSS MS Physical Science	MS Physical Science Course Assessment	Course Assessment	MS-PS	NA	NA	NA	NA	NA
NGSS MS Life Science	Cell Theory (Achieving)	Activity - Achieving	MS-LS1-1, SEP3, LS1.A, CCC3	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells	SEP3: Planning and Carrying Out Investigations	LS1.A: Structure and Function	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Life Science	Cell Theory (Emerging)	Activity - Emerging	MS-LS1-1, SEP3, LS1.A, CCC3	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells	SEP3: Planning and Carrying Out Investigations	LS1.A: Structure and Function	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Life Science	Cell Theory (Mini Assessment)	Mini Assessment	MS-LS1-1, SEP3, LS1.A, CCC3	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells	SEP3: Planning and Carrying Out Investigations	LS1.A: Structure and Function	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Life Science	A Living Rock Part 1 (Life Science Assessment)	Assessment	MS-LS1-1, SEP3, LS1.A, CCC3	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells	SEP3: Planning and Carrying Out Investigations	LS1.A: Structure and Function	CCC3: Scale, Proportion, and Quantity	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Function of a Cell (Achieving)	Activity - Achieving	MS-LS1-2, SEP2, LS1.A, CCC6	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	SEP2: Developing and Using Models	LS1.A: Structure and Function	CCC6: Structure and Function	N/A
NGSS MS Life Science	Function of a Cell (Emerging)	Activity - Emerging	MS-LS1-2, SEP2, LS1.A, CCC6	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	SEP2: Developing and Using Models	LS1.A: Structure and Function	CCC6: Structure and Function	N/A
NGSS MS Life Science	Function of a Cell (Mini Assessment)	Mini Assessment	MS-LS1-2, SEP2, LS1.A, CCC6	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	SEP2: Developing and Using Models	LS1.A: Structure and Function	CCC6: Structure and Function	N/A
NGSS MS Life Science	A Living Rock Part 2 (Life Science Assessment)	Assessment	MS-LS1-2, SEP2, LS1.A, CCC6	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	SEP2: Developing and Using Models	LS1.A: Structure and Function	CCC6: Structure and Function	N/A
NGSS MS Life Science	Cell Organization and Body Systems (Achieving)	Activity - Achieving	MS-LS1-3, SEP7, LS1.A, CCC4	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	SEP7: Engaging in Argument for Evidence	LS1.A: Structure and Function	CCC4: Systems and System Models	N/A
NGSS MS Life Science	Cell Organization and Body Systems (Emerging)	Activity - Emerging	MS-LS1-3, SEP7, LS1.A, CCC4	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	SEP7: Engaging in Argument for Evidence	LS1.A: Structure and Function	CCC4: Systems and System Models	N/A
NGSS MS Life Science	Cell Organization and Body Systems (Mini Assessment)	Mini Assessment	MS-LS1-3, SEP7, LS1.A, CCC4	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	SEP7: Engaging in Argument for Evidence	LS1.A: Structure and Function	CCC4: Systems and System Models	N/A
NGSS MS Life Science	Fight-or-Flight Response Part 1 (Life Science Assessment)	Assessment	MS-LS1-3, SEP7, LS1.A, CCC4	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	SEP7: Engaging in Argument for Evidence	LS1.A: Structure and Function	CCC4: Systems and System Models	N/A
NGSS MS Life Science	Animal Behaviors and Plant Structures (Achieving)	Activity - Achieving	MS-LS1-4, SEP7, LS1.B, CCC2	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	SEP7: Engaging in Argument for Evidence	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Animal Behaviors and Plant Structures (Emerging)	Activity - Emerging	MS-LS1-4, SEP7, LS1.B, CCC2	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	SEP7: Engaging in Argument for Evidence	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Animal Behaviors and Plant Structures (Mini Assessment)	Mini Assessment	MS-LS1-4, SEP7, LS1.B, CCC2	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	SEP7: Engaging in Argument for Evidence	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A
NGSS MS Life Science	The Scarlet Honeycreeper (Life Science Assessment)	Assessment	MS-LS1-4, SEP7, LS1.B, CCC2	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	SEP7: Engaging in Argument for Evidence	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Factors that Influence Growth of Organisms (Achieving)	Activity - Achieving	MS-LS1-5, SEP6, LS1.B, CCC2	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Factors that Influence Growth of Organisms (Emerging)	Activity - Emerging	MS-LS1-5, SEP6, LS1.B, CCC2	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Factors that Influence Growth of Organisms (Mini Assessment)	Mini Assessment	MS-LS1-5, SEP6, LS1.B, CCC2	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Agriculture Part 1 (Life Science Assessment)	Assessment	MS-LS1-5, SEP6, LS1.B, CCC2	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.B: Growth and Development of Organisms	CCC2: Cause and Effect	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Photosynthesis, Cycling of Matter, and Flow of Energy (Achieving)	Activity - Achieving	MS-LS1-6, SEP6, LS1.C, PS3.D, CCC5	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Photosynthesis, Cycling of Matter, and Flow of Energy (Emerging)	Activity - Emerging	MS-LS1-6, SEP6, LS1.C, PS3.D, CCC5	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Photosynthesis, Cycling of Matter, and Flow of Energy (Mini Assessment)	Mini Assessment	MS-LS1-6, SEP6, LS1.C, PS3.D, CCC5	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Impala and Lion Part 1 (Life Science Assessment)	Assessment	MS-LS1-6, SEP6, LS1.C, PS3.D, CCC5	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	SEP6: Constructing Explanations and Designing Solutions	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Food, Cellular Respiration, and Energy (Achieving)	Activity - Achieving	MS-LS1-7, SEP2, LS1.C, PS3.D, CCC5	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	SEP2: Developing and Using Models	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Food, Cellular Respiration, and Energy (Emerging)	Activity - Emerging	MS-LS1-7, SEP2, LS1.C, PS3.D, CCC5	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	SEP2: Developing and Using Models	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Food, Cellular Respiration, and Energy (Mini Assessment)	Mini Assessment	MS-LS1-7, SEP2, LS1.C, PS3.D, CCC5	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	SEP2: Developing and Using Models	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Impala and Lion Part 2 (Life Science Assessment)	Assessment	MS-LS1-7, SEP2, LS1.C, PS3.D, CCC5	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	SEP2: Developing and Using Models	LS1.C: Organization for Matter and Energy Flow in Organisms PS3.D: Energy in Chemical Processes and Everyday Life	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Sensory Receptors and the Brain (Achieving)	Activity - Achieving	MS-LS1-8, SEP8, LS1.D, CCC2	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	SEP8: Obtaining, Evaluating, and Communicating Information	LS1.D: Information Processing	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Sensory Receptors and the Brain (Emerging)	Activity - Emerging	MS-LS1-8, SEP8, LS1.D, CCC2	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	SEP8: Obtaining, Evaluating, and Communicating Information	LS1.D: Information Processing	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Sensory Receptors and the Brain (Mini Assessment)	Mini Assessment	MS-LS1-8, SEP8, LS1.D, CCC2	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	SEP8: Obtaining, Evaluating, and Communicating Information	LS1.D: Information Processing	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Fight-or-Flight Response Part 2 (Life Science Assessment)	Assessment	MS-LS1-8, SEP8, LS1.D, CCC2	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	SEP8: Obtaining, Evaluating, and Communicating Information	LS1.D: Information Processing	CCC2: Cause and Effect	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Populations and Resource Availability (Achieving)	Activity - Achieving	MS-LS2-1, SEP4, LS2.A, CCC2	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	SEP4: Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Populations and Resource Availability (Emerging)	Activity - Emerging	MS-LS2-1, SEP4, LS2.A, CCC2	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	SEP4: Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Populations and Resource Availability (Mini Assessment)	Mini Assessment	MS-LS2-1, SEP4, LS2.A, CCC2	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	SEP4: Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	CCC2: Cause and Effect	N/A
NGSS MS Life Science	The Future of Orangutans (Life Science Assessment)	Assessment	MS-LS2-1, SEP4, LS2.A, CCC2	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	SEP4: Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Patterns of Animal Interactions (Achieving)	Activity - Achieving	MS-LS2-2, SEP6, LS2.A, CCC1	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	SEP6: Constructing Explanations and Designing Solutions	LS2.A: Interdependent Relationships in Ecosystems	CCC1: Patterns	N/A
NGSS MS Life Science	Patterns of Animal Interactions (Emerging)	Activity - Emerging	MS-LS2-2, SEP6, LS2.A, CCC1	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	SEP6: Constructing Explanations and Designing Solutions	LS2.A: Interdependent Relationships in Ecosystems	CCC1: Patterns	N/A
NGSS MS Life Science	Patterns of Animal Interactions (Mini Assessment)	Mini Assessment	MS-LS2-2, SEP6, LS2.A, CCC1	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	SEP6: Constructing Explanations and Designing Solutions	LS2.A: Interdependent Relationships in Ecosystems	CCC1: Patterns	N/A
NGSS MS Life Science	California's Kelp Forests Part 1 (Life Science Assessment)	Assessment	MS-LS2-2, SEP6, LS2.A, CCC1	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	SEP6: Constructing Explanations and Designing Solutions	LS2.A: Interdependent Relationships in Ecosystems	CCC1: Patterns	N/A
NGSS MS Life Science	Cycling of Matter and Flow of Energy in Ecosystems (Achieving)	Activity - Achieving	MS-LS2-3, SEP2, LS2.B, CCC5	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	SEP2: Developing and Using Models	LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Cycling of Matter and Flow of Energy in Ecosystems (Emerging)	Activity - Emerging	MS-LS2-3, SEP2, LS2.B, CCC5	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	SEP2: Developing and Using Models	LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	CCC5: Energy and Matter	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Cycling of Matter and Flow of Energy in Ecosystems (Mini Assessment)	Mini Assessment	MS-LS2-3, SEP2, LS2.B, CCC5	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	SEP2: Developing and Using Models	LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Impala and Lion Part 3 (Life Science Assessment)	Assessment	MS-LS2-3, SEP2, LS2.B, CCC5	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	SEP2: Developing and Using Models	LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	CCC5: Energy and Matter	N/A
NGSS MS Life Science	Abiotic Factors, Biotic Factors, and Populations (Achieving)	Activity - Achieving	MS-LS2-4, SEP7, LS2.C, CCC7	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience	CCC7: Stability and Change	N/A
NGSS MS Life Science	Abiotic Factors, Biotic Factors, and Populations (Emerging)	Activity - Emerging	MS-LS2-4, SEP7, LS2.C, CCC7	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience	CCC7: Stability and Change	N/A
NGSS MS Life Science	Abiotic Factors, Biotic Factors, and Populations (Mini Assessment)	Mini Assessment	MS-LS2-4, SEP7, LS2.C, CCC7	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience	CCC7: Stability and Change	N/A
NGSS MS Life Science	California's Kelp Forests Part 2 (Life Science Assessment)	Assessment	MS-LS2-4, SEP7, LS2.C, CCC7	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience	CCC7: Stability and Change	N/A
NGSS MS Life Science	Biodiversity and Ecosystem Services (Achieving)	Activity - Achieving	MS-LS2-5, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP7, LS2.C, LS4.D, ETS1.B, CCC7	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans	CCC7: Stability and Change	ETS1.B: Developing Possible Solutions
NGSS MS Life Science	Biodiversity and Ecosystem Services (Emerging)	Activity - Emerging	MS-LS2-5, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP7, LS2.C, LS4.D, ETS1.B, CCC7	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans	CCC7: Stability and Change	ETS1.B: Developing Possible Solutions

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Biodiversity and Ecosystem Services (Mini Assessment)	Mini Assessment	MS-LS2-5, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP7, LS2.C, LS4.D, ETS1.B, CCC7	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans	CCC7: Stability and Change	ETS1.B: Developing Possible Solutions
NGSS MS Life Science	California's Kelp Forests Part 3 (Life Science Assessment)	Assessment	MS-LS2-5, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, SEP7, LS2.C, LS4.D, ETS1.B, CCC7	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	SEP7: Engaging in Argument for Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans	CCC7: Stability and Change	ETS1.B: Developing Possible Solutions
NGSS MS Life Science	Gene Mutations (Achieving)	Activity - Achieving	MS-LS3-1, SEP2, LS3.A, LS3.B, CCC6	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	SEP2: Developing and Using Models	LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC6: Structure and Function	N/A
NGSS MS Life Science	Gene Mutations (Emerging)	Activity - Emerging	MS-LS3-1, SEP2, LS3.A, LS3.B, CCC6	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	SEP2: Developing and Using Models	LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC6: Structure and Function	N/A
NGSS MS Life Science	Gene Mutations (Mini Assessment)	Mini Assessment	MS-LS3-1, SEP2, LS3.A, LS3.B, CCC6	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	SEP2: Developing and Using Models	LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC6: Structure and Function	N/A
NGSS MS Life Science	Malaria and Sickle Cell Disease Part 1 (Life Science Assessment)	Assessment	MS-LS3-1, SEP2, LS3.A, LS3.B, CCC6	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	SEP2: Developing and Using Models	LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC6: Structure and Function	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Life Science	Asexual and Sexual Reproduction (Achieving)	Activity - Achieving	MS-LS3-2, SEP2, LS1.B, LS3.A, LS3.B, CCC2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	SEP2: Developing and Using Models	LS1.B: Growth and Development of Organisms LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Asexual and Sexual Reproduction (Emerging)	Activity - Emerging	MS-LS3-2, SEP2, LS1.B, LS3.A, LS3.B, CCC2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	SEP2: Developing and Using Models	LS1.B: Growth and Development of Organisms LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Asexual and Sexual Reproduction (Mini Assessment)	Mini Assessment	MS-LS3-2, SEP2, LS1.B, LS3.A, LS3.B, CCC2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	SEP2: Developing and Using Models	LS1.B: Growth and Development of Organisms LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Forms of Reproduction (Life Science Assessment)	Assessment	MS-LS3-2, SEP2, LS1.B, LS3.A, LS3.B, CCC2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	SEP2: Developing and Using Models	LS1.B: Growth and Development of Organisms LS3.A: Inheritance of Traits LS3.B: Variation of Traits	CCC2: Cause and Effect	N/A
NGSS MS Life Science	The Fossil Record (Achieving)	Activity - Achieving	MS-LS4-1, SEP4, LS4.A, CCC1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A

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NGSS MS Life Science	The Fossil Record (Emerging)	Activity - Emerging	MS-LS4-1, SEP4, LS4.A, CCC1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	The Fossil Record (Mini Assessment)	Mini Assessment	MS-LS4-1, SEP4, LS4.A, CCC1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Whale Evolution Part 1 (Life Science Assessment)	Assessment	MS-LS4-1, SEP4, LS4.A, CCC1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Past and Present Organisms (Achieving)	Activity - Achieving	MS-LS4-2, SEP6, LS4.A, CCC1	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	SEP6: Constructing Explanations and Designing Solutions	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Past and Present Organisms (Emerging)	Activity - Emerging	MS-LS4-2, SEP6, LS4.A, CCC1	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	SEP6: Constructing Explanations and Designing Solutions	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Past and Present Organisms (Mini Assessment)	Mini Assessment	MS-LS4-2, SEP6, LS4.A, CCC1	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	SEP6: Constructing Explanations and Designing Solutions	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Whale Evolution Part 2 (Life Science Assessment)	Assessment	MS-LS4-2, SEP6, LS4.A, CCC1	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	SEP6: Constructing Explanations and Designing Solutions	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A

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NGSS MS Life Science	Embryological Development (Achieving)	Activity - Achieving	MS-LS4-3, SEP4, LS4.A, CCC1	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Embryological Development (Emerging)	Activity - Emerging	MS-LS4-3, SEP4, LS4.A, CCC1	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Embryological Development (Mini Assessment)	Mini Assessment	MS-LS4-3, SEP4, LS4.A, CCC1	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Embryological Development (Life Science Assessment)	Assessment	MS-LS4-3, SEP4, LS4.A, CCC1	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	SEP4: Analyzing and Interpreting Data	LS4.A: Evidence of Common Ancestry and Diversity	CCC1: Patterns	N/A
NGSS MS Life Science	Genetic Variation and Natural Selection (Achieving)	Activity - Achieving	MS-LS4-4, SEP6, LS4.B, CCC2	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	SEP6: Constructing Explanations and Designing Solutions	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Genetic Variation and Natural Selection (Emerging)	Activity - Emerging	MS-LS4-4, SEP6, LS4.B, CCC2	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	SEP6: Constructing Explanations and Designing Solutions	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Genetic Variation and Natural Selection (Mini Assessment)	Mini Assessment	MS-LS4-4, SEP6, LS4.B, CCC2	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	SEP6: Constructing Explanations and Designing Solutions	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A

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NGSS MS Life Science	Get a Grip Part 1 (Life Science Assessment)	Assessment	MS-LS4-4, SEP6, LS4.B, CCC2	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	SEP6: Constructing Explanations and Designing Solutions	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Human Influence on Artificial Selection (Achieving)	Activity - Achieving	MS-LS4-5, SEP8, LS4.B, CCC2	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	SEP8: Obtaining, Evaluating, and Communicating Information	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Human Influence on Artificial Selection (Emerging)	Activity - Emerging	MS-LS4-5, SEP8, LS4.B, CCC2	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	SEP8: Obtaining, Evaluating, and Communicating Information	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Human Influence on Artificial Selection (Mini Assessment)	Mini Assessment	MS-LS4-5, SEP8, LS4.B, CCC2	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	SEP8: Obtaining, Evaluating, and Communicating Information	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Agriculture Part 2 (Life Science Assessment)	Assessment	MS-LS4-5, SEP8, LS4.B, CCC2	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	SEP8: Obtaining, Evaluating, and Communicating Information	LS4.B: Natural Selection	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Natural Selection and Traits Over Time (Achieving)	Activity - Achieving	MS-LS4-6, SEP5, LS4.C, CCC2	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	SEP5: Using Mathematics and Computational Thinking	LS4.C: Adaptation	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Natural Selection and Traits Over Time (Emerging)	Activity - Emerging	MS-LS4-6, SEP5, LS4.C, CCC2	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	SEP5: Using Mathematics and Computational Thinking	LS4.C: Adaptation	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Natural Selection and Traits Over Time (Mini Assessment)	Mini Assessment	MS-LS4-6, SEP5, LS4.C, CCC2	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	SEP5: Using Mathematics and Computational Thinking	LS4.C: Adaptation	CCC2: Cause and Effect	N/A
NGSS MS Life Science	Get a Grip Part 2 (Life Science Assessment)	Assessment	MS-LS4-6, SEP5, LS4.C, CCC2	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	SEP5: Using Mathematics and Computational Thinking	LS4.C: Adaptation	CCC2: Cause and Effect	N/A

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NGSS MS Life Science	MS Life Science Science Course Assessment	Course Assessment	MS-LS	NA	NA	NA	NA	NA
NGSS MS Earth Space Science	Patterns in the Earth-Sun-Moon System (Achieving)	Activity - Achieving	MS-ESS1-1, SEP2, ESS1.A, ESS1.B, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	ESS1.A: The Universe and Its Stars ESS1.B: Earth and The Solar System	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Patterns in the Earth-Sun-Moon System (Emerging)	Activity - Emerging	MS-ESS1-1, SEP2, ESS1.A, ESS1.B, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	ESS1.A: The Universe and Its Stars ESS1.B: Earth and The Solar System	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Patterns in the Earth-Sun-Moon System (Mini Assessment)	Mini Assessment	MS-ESS1-1, SEP2, ESS1.A, ESS1.B, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	ESS1.A: The Universe and Its Stars ESS1.B: Earth and The Solar System	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Making Models of the Earth-Sun-Moon System (Earth Space Assessment)	Assessment	MS-ESS1-1, SEP2, ESS1.A, ESS1.B, CCC1	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.	SEP5: Using Mathematics and Computational Thinking	ESS1.A: The Universe and Its Stars ESS1.B: Earth and The Solar System	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Gravity's Role in the Universe (Achieving)	Activity - Achieving	MS-ESS1-2, SEP2, ESS1.A, ESS1.B, CCC4	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	SEP2: Developing and Using Models	ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Gravity's Role in the Universe (Emerging)	Activity - Emerging	MS-ESS1-2, SEP2, ESS1.A, ESS1.B, CCC4	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	SEP2: Developing and Using Models	ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Gravity's Role in the Universe (Mini Assessment)	Mini Assessment	MS-ESS1-2, SEP2, ESS1.A, ESS1.B, CCC4	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	SEP2: Developing and Using Models	ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System	CCC4: Systems and System Models	N/A

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NGSS MS Earth Space Science	Interactions in Space Part 2 (Earth Space Science Assessment)	Assessment	MS-ESS1-2, SEP2, ESS1.A, ESS1.B, CCC4	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	SEP2: Developing and Using Models	ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Objects in the Solar System (Achieving)	Activity - Achieving	MS-ESS1-3, SEP4, ESS1.B, CCC3	Analyze and interpret data to determine scale properties of objects in the solar system.	SEP4: Analyzing and Interpreting Data	ESS1.B: Earth and The Solar System	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Objects in the Solar System (Emerging)	Activity - Emerging	MS-ESS1-3, SEP4, ESS1.B, CCC3	Analyze and interpret data to determine scale properties of objects in the solar system.	SEP4: Analyzing and Interpreting Data	ESS1.B: Earth and The Solar System	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Objects in the Solar System (Mini Assessment)	Mini Assessment	MS-ESS1-3, SEP4, ESS1.B, CCC3	Analyze and interpret data to determine scale properties of objects in the solar system.	SEP4: Analyzing and Interpreting Data	ESS1.B: Earth and The Solar System	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Exploring Space (Earth Space Science Assessment)	Assessment	MS-ESS1-3, SEP4, ESS1.B, CCC3	Analyze and interpret data to determine scale properties of objects in the solar system.	SEP4: Analyzing and Interpreting Data	ESS1.B: Earth and The Solar System	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Geologic Time (Achieving)	Activity - Achieving	MS-ESS1-4, SEP6, ESS1.C, CCC3	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.	SEP6: Constructing Explanations and Designing Solutions	ESS1.C: The History of Planet Earth	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Geologic Time (Emerging)	Activity - Emerging	MS-ESS1-4, SEP6, ESS1.C, CCC3	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.	SEP6: Constructing Explanations and Designing Solutions	ESS1.C: The History of Planet Earth	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Geologic Time (Mini Assessment)	Mini Assessment	MS-ESS1-4, SEP6, ESS1.C, CCC3	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.	SEP6: Constructing Explanations and Designing Solutions	ESS1.C: The History of Planet Earth	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Whale Evolution Part 3 (Earth Space Science Assessment)	Assessment	MS-ESS1-4, SEP6, ESS1.C, CCC3	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.	SEP6: Constructing Explanations and Designing Solutions	ESS1.C: The History of Planet Earth	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Cycling of Earth's Materials (Achieving)	Activity - Achieving	MS-ESS2-1, SEP2, ESS2.A, CCC7	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	SEP2: Developing and Using Models	ESS2.A: Earth Materials and Systems	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Cycling of Earth's Materials (Emerging)	Activity - Emerging	MS-ESS2-1, SEP2, ESS2.A, CCC7	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	SEP2: Developing and Using Models	ESS2.A: Earth Materials and Systems	CCC4: Systems and System Models	N/A

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NGSS MS Earth Space Science	Cycling of Earth's Materials (Mini Assessment)	Mini Assessment	MS-ESS2-1, SEP2, ESS2.A, CCC7	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	SEP2: Developing and Using Models	ESS2.A: Earth Materials and Systems	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Devil's Tower Rock Formations (Earth Space Science Assessment)	Assessment	MS-ESS2-1, SEP2, ESS2.A, CCC7	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	SEP2: Developing and Using Models	ESS2.A: Earth Materials and Systems	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Geoscience Processes (Achieving)	Activity - Achieving	MS-ESS2-2, SEP6, ESS2.A, ESS2.C, CCC3	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	SEP6: Constructing Explanations and Designing Solutions	ESS2.A: Earth Materials and Systems ESS2.C: The Roles of Water in Earth's Surface Processes	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Geoscience Processes (Emerging)	Activity - Emerging	MS-ESS2-2, SEP6, ESS2.A, ESS2.C, CCC3	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	SEP6: Constructing Explanations and Designing Solutions	ESS2.A: Earth Materials and Systems ESS2.C: The Roles of Water in Earth's Surface Processes	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Geoscience Processes (Mini Assessment)	Mini Assessment	MS-ESS2-2, SEP6, ESS2.A, ESS2.C, CCC3	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	SEP6: Constructing Explanations and Designing Solutions	ESS2.A: Earth Materials and Systems ESS2.C: The Roles of Water in Earth's Surface Processes	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Where on Earth? Part 1 (Earth Space Science Assessment)	Assessment	MS-ESS2-2, SEP6, ESS2.A, ESS2.C, CCC3	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	SEP6: Constructing Explanations and Designing Solutions	ESS2.A: Earth Materials and Systems ESS2.C: The Roles of Water in Earth's Surface Processes	CCC3: Scale, Proportion, and Quantity	N/A
NGSS MS Earth Space Science	Evidence of Plate Motions (Achieving)	Activity - Achieving	MS-ESS2-3, SEP4, ESS1.C, ESS2.B, CCC1	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	SEP4: Analyzing and Interpreting Data	ESS1.C: The History of Planet Earth ESS2.B: Plate Tectonics and Large-Scale System Interactions	CCC1: Patterns	N/A

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NGSS MS Earth Space Science	Evidence of Plate Motions (Emerging)	Activity - Emerging	MS-ESS2-3, SEP4, ESS1.C, ESS2.B, CCC1	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	SEP4: Analyzing and Interpreting Data	ESS1.C: The History of Planet Earth ESS2.B: Plate Tectonics and Large-Scale System Interactions	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Evidence of Plate Motions (Mini Assessment)	Mini Assessment	MS-ESS2-3, SEP4, ESS1.C, ESS2.B, CCC1	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	SEP4: Analyzing and Interpreting Data	ESS1.C: The History of Planet Earth ESS2.B: Plate Tectonics and Large-Scale System Interactions	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Evidence of Tectonic Plate Motion (Earth Space Science Assessment)	Assessment	MS-ESS2-3, SEP4, ESS1.C, ESS2.B, CCC1	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	SEP4: Analyzing and Interpreting Data	ESS1.C: The History of Planet Earth ESS2.B: Plate Tectonics and Large-Scale System Interactions	CCC1: Patterns	N/A
NGSS MS Earth Space Science	The Water Cycle (Achieving)	Activity - Achieving	MS-ESS2-4, SEP2, ESS2.C, CCC5	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes	CCC5: Energy and Matter	N/A
NGSS MS Earth Space Science	The Water Cycle (Emerging)	Activity - Emerging	MS-ESS2-4, SEP2, ESS2.C, CCC5	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes	CCC5: Energy and Matter	N/A
NGSS MS Earth Space Science	The Water Cycle (Mini Assessment)	Mini Assessment	MS-ESS2-4, SEP2, ESS2.C, CCC5	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes	CCC5: Energy and Matter	N/A
NGSS MS Earth Space Science	Where Did the Water Go? (Earth Space Science Assessment)	Assessment	MS-ESS2-4, SEP2, ESS2.C, CCC5	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes	CCC5: Energy and Matter	N/A

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NGSS MS Earth Space Science	Changes in Weather (Achieving)	Activity - Achieving	MS-ESS2-5, SEP3, ESS2.C, ESS2.D, CCC2	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	SEP3: Planning and Carrying Out Investigations	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Changes in Weather (Emerging)	Activity - Emerging	MS-ESS2-5, SEP3, ESS2.C, ESS2.D, CCC2	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	SEP3: Planning and Carrying Out Investigations	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Changes in Weather (Mini Assessment)	Mini Assessment	MS-ESS2-5, SEP3, ESS2.C, ESS2.D, CCC2	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	SEP3: Planning and Carrying Out Investigations	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	It's Windy Out There (Earth Space Science Assessment)	Assessment	MS-ESS2-5, SEP3, ESS2.C, ESS2.D, CCC2	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	SEP3: Planning and Carrying Out Investigations	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Factors That Affect Climate (Achieving)	Activity - Achieving	MS-ESS2-6, SEP2, ESS2.C, ESS2.D, CCC4	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.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Factors That Affect Climate (Emerging)	Activity - Emerging	MS-ESS2-6, SEP2, ESS2.C, ESS2.D, CCC4	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.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC4: Systems and System Models	N/A

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NGSS MS Earth Space Science	Factors That Affect Climate (Mini Assessment)	Mini Assessment	MS-ESS2-6, SEP2, ESS2.C, ESS2.D, CCC4	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.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Rotation and Circulation (Earth Space Science Assesment)	Assessment	MS-ESS2-6, SEP2, ESS2.C, ESS2.D, CCC4	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.	SEP2: Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	CCC4: Systems and System Models	N/A
NGSS MS Earth Space Science	Consumption of Natural Resources (Achieving)	Activity - Achieving	MS-ESS3-1, SEP6, ESS3.A, CCC2	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 geoscience processes.	SEP6: Constructing Explanations and Designing Solutions	ESS3.A: Natural Resources	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Consumption of Natural Resources (Emerging)	Activity - Emerging	MS-ESS3-1, SEP6, ESS3.A, CCC2	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 geoscience processes.	SEP6: Constructing Explanations and Designing Solutions	ESS3.A: Natural Resources	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Consumption of Natural Resources (Mini Assessment)	Mini Assessment	MS-ESS3-1, SEP6, ESS3.A, CCC2	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 geoscience processes.	SEP6: Constructing Explanations and Designing Solutions	ESS3.A: Natural Resources	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Where on Earth? Part 2 (Earth Space Science Assessment)	Assessment	MS-ESS3-1, SEP6, ESS3.A, CCC2	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 geoscience processes.	SEP6: Constructing Explanations and Designing Solutions	ESS3.A: Natural Resources	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Effects of Natural Hazards (Achieving)	Activity - Achieving	MS-ESS3-2, SEP4, ESS3.B, CCC1	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	SEP4: Analyzing and Interpreting Data	ESS3.B: Natural Hazards	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Effects of Natural Hazards (Emerging)	Activity - Emerging	MS-ESS3-2, SEP4, ESS3.B, CCC1	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	SEP4: Analyzing and Interpreting Data	ESS3.B: Natural Hazards	CCC1: Patterns	N/A

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NGSS MS Earth Space Science	Effects of Natural Hazards (Mini Assessment)	Mini Assessment	MS-ESS3-2, SEP4, ESS3.B, CCC1	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	SEP4: Analyzing and Interpreting Data	ESS3.B: Natural Hazards	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Forecasting Atlantic Hurricanes (Earth Space Science Assessment)	Assessment	MS-ESS3-2, SEP4, ESS3.B, CCC1	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	SEP4: Analyzing and Interpreting Data	ESS3.B: Natural Hazards	CCC1: Patterns	N/A
NGSS MS Earth Space Science	Minimizing Human Impact on the Environment (Achieving)	Activity - Achieving	MS-ESS3-3, SEP6, ESS3.C, CCC2	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	SEP6: Constructing Explanations and Designing Solutions	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Minimizing Human Impact on the Environment (Emerging)	Activity - Emerging	MS-ESS3-3, SEP6, ESS3.C, CCC2	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	SEP6: Constructing Explanations and Designing Solutions	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Minimizing Human Impact on the Environment (Mini Assessment)	Mini Assessment	MS-ESS3-3, SEP6, ESS3.C, CCC2	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	SEP6: Constructing Explanations and Designing Solutions	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Impacts on Earth Systems Part 1 (Earth Space Science Assessment)	Assessment	MS-ESS3-3, SEP6, ESS3.C, CCC2	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	SEP6: Constructing Explanations and Designing Solutions	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Human Populations and Earth's Resources (Achieving)	Activity - Achieving	MS-ESS3-4, SEP7, ESS3.C, CCC2	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	SEP7: Engaging in Argument for Evidence	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Human Populations and Earth's Resources (Emerging)	Activity - Emerging	MS-ESS3-4, SEP7, ESS3.C, CCC2	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	SEP7: Engaging in Argument for Evidence	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Human Populations and Earth's Resources (Mini Assessment)	Mini Assessment	MS-ESS3-4, SEP7, ESS3.C, CCC2	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	SEP7: Engaging in Argument for Evidence	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A

NGSS MIDDLE - PENDA ACTIVITIES DIRECTORY

NGSS MS Earth Space Science	Impacts on Earth Systems Part 2 (Earth Space Science Assessment)	Assessment	MS-ESS3-4, SEP7, ESS3.C, CCC2	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	SEP7: Engaging in Argument for Evidence	ESS3.C: Human Impacts on Earth Systems	CCC2: Cause and Effect	N/A
NGSS MS Earth Space Science	Cause of Global Climate Change (Achieving)	Activity - Achieving	MS-ESS3-5, SEP1, ESS3.D, CCC7	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	SEP1: Asking Questions and Defining Problems	ESS3.D: Global Climate Change	CCC7: Stability and Change	N/A
NGSS MS Earth Space Science	Cause of Global Climate Change (Emerging)	Activity - Emerging	MS-ESS3-5, SEP1, ESS3.D, CCC7	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	SEP1: Asking Questions and Defining Problems	ESS3.D: Global Climate Change	CCC7: Stability and Change	N/A
NGSS MS Earth Space Science	Cause of Global Climate Change (Mini Assessment)	Mini Assessment	MS-ESS3-5, SEP1, ESS3.D, CCC7	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	SEP1: Asking Questions and Defining Problems	ESS3.D: Global Climate Change	CCC7: Stability and Change	N/A
NGSS MS Earth Space Science	Impacts on Earth Systems Part 3 (Earth Space Science Assessment)	Assessment	MS-ESS3-5, SEP1, ESS3.D, CCC7	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	SEP1: Asking Questions and Defining Problems	ESS3.D: Global Climate Change	CCC7: Stability and Change	N/A
NGSS MS Earth Space	MS Earth Space Science Course Assessment	Course Assessment	MS-ESS	NA	NA	NA	NA	NA
NGSS MS High Stakes Assessment	MS Science High Stakes Assessment	High Stakes Assessment	MS-	NA	NA	NA	NA	NA