SCIENCE PERFORMANCE LEVEL DESCRIPTORS – GRADE 5

ADVANCED

A 5th grade student performing at Advanced effectively, consistently, and appropriately applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student evaluates models and information and revises arguments and explanations by analyzing patterns in data, cause and effect relationships, and system interactions. The student conducts investigations to collect data in order to answer questions and uses criteria and constraints to evaluate solutions to a problem. The student uses mathematical and computational thinking and scientific reasoning to analyze and interpret data in order to evaluate arguments and explanations about cause and effect relationships.

PROFICIENT

A 5th grade student performing at Proficient effectively applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student develops and uses models and information to construct arguments and explanations and to identify and describe patterns in data and system characteristics. The student asks questions that can be investigated and designs solutions to problems that meet given criteria and constraints. The student uses data and mathematical and computational thinking to construct arguments and explanations about cause and effect relationships.

BASIC

A 5th grade student performing at Basic applies, with support, science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student uses models and information to support arguments and explanations, to identify patterns in data, and to describe relationships among parts of systems. The student identifies the data to collect in an investigation in order to answer questions or to describe possible solutions to problems. The student uses data and basic computational thinking to support arguments and explanations about cause and effect relationships.

BELOW BASIC

A 5th grade student performing at Below Basic seldom applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student occasionally identifies models and information to identify patterns in data, and to describe parts of systems. The student infrequently recognizes trends in the data collected during an investigation in order to answer questions or to identify possible solutions to problems. The student occasionally uses data and basic computational thinking to explain the cause and effect relationships.

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Physical Science	**Below Basic** A student who has reached the level of *Below Basic* level is to successfully address some, but not all, of the following:	**Basic** A student who has reached the level of *Basic* is able to successfully address some, but not all, of the following:	**Proficient** A student who has reached the level of *Proficient* is able to successfully address some, but not all, of the following:	**Advanced** A student who has reached the level of *Advanced* is able to successfully address some, but not all, of the following:
Matter and Its Interactions	Recognize a phase change of water as a result of temperature change.	Investigate a phase change of water as a result of temperature change.	Predict and investigate a phase change of water as a result of temperature change.	Use evidence from an investigation to explain a phase change of water as a result of temperature change.
	Identify changes in the state of matter as a result of temperature change.	Describe evidence for changes in the state of matter as a result of temperature change.	Use evidence to predict changes in the state of matter as a result of temperature change.	Analyze and evaluate evidence to predict changes in state of matter as a result of temperature change.
	Identify or recognize that matter is made of particles too small to be seen.	Recognize a model that describes that matter is made of particles too small to be seen.	Use or develop a model to describe that matter is made of particles too small to be seen.	Evaluate models to explain different types of matter made of particles too small to be seen.
	Identify or observe properties of materials.	Investigate properties of materials.	Use measurements to identify materials by their properties.	Analyze measurement data to identify materials based upon their properties.
	Recognize changes in matter such as weight and temperature during changes in substance.	Take measurements of matter such as weight and temperature during changes in substance.	Provide evidence that matter is conserved during changes in substance.	Argue using collected evidence that matter is conserved during changes in substance.
	State whether the mixing of substances produces a new substance.	Investigate whether the mixing of substances produces a new substance.	Investigate and describe whether the mixing of substances produces a new substance.	Investigate and provide evidence for whether the mixing of substances produces a new substance.
Motion Stability: Forces and Interactions	Observe or describe an object's motion.	Investigate an object's motion.	Investigate an object's motion to predict future motion.	Analyze observations and measurements of an object's motion using evidence to predict future motion.

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	Identify effects of balanced and unbalanced forces on an object's motion.	Investigate effects of balanced or unbalanced forces on an object's motion.	Investigate and describe whether balanced or unbalanced forces change an object's motion.	Investigate evidence of balanced and unbalanced forces on an object's motion.
	Identify electric or magnetic interactions between two objects.	Describe electric or magnetic interactions between two objects.	Explain the electric or magnetic interaction between two objects.	Analyze the electric or magnetic interaction between two objects.
	Identify forces on an object moving on different surfaces.	Investigate forces on an object moving on different surfaces.	Investigate and predict forces on an object moving on different surfaces.	Investigate and analyze forces on an object moving on different surface.
	Recognize the gravitational force exerted by Earth on objects is directed toward the planet's center.	Identify evidence to support the gravitational force exerted by Earth on objects is directed toward the planet's center.	Use evidence to support the gravitational force exerted by Earth on objects is directed toward the planet's center.	Evaluate evidence to support the gravitational force exerted by Earth on objects is directed toward the planet's center.
	Recognize that force or mass affect motion.	Investigate to describe how force or mass affects motion.	Investigate to explain how force or mass affects motion.	Use evidence from an investigation to predict how force or mass affects motion.
Energy	Identify a relationship between speed and energy of an object.	Describe a relationship between speed and energy of an object.	Explain a relationship between speed and energy of an object.	Use evidence to evaluate an explanation for a relationship between speed and energy of an object.
	Recognize energy transformation.	Identify evidence to describe energy transformation.	Use evidence to explain energy transformation.	Analyze and evaluate evidence to predict energy transformation
	Identify a device that converts energy from one form to another.	Describe a device that converts energy from one form to another.	Design, test, or refine a device that converts energy from one form to another.	Evaluate and refine an investigation or design for a device that converts energy from one form to another.
	Identify a simple machine.	Recognize a model of a simple machine.	Use a model to describe simple machines.	Evaluate a model to explain the relationship between simple machines and force.
	Identify that energy in food comes from the sun.	Recognize a model showing energy in food comes from the sun.	Use a model to describe energy in food comes from the sun.	Evaluate a model to explain the relationship between simple machines and force.

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Waves and Their Applications in Technologies for Information Transfer	Identify wave properties.	Identify a model of wave properties.	Describe a model of wave properties.	Use a model to explain wave properties.
	Recognize objects can be seen only when light is reflected or when they produce their own light.	Identify a model showing objects can be seen only when light is reflected or when they produce their own light.	Use a model to show objects can be seen only when light is reflected or when they produce their own light.	Use a model to explain why objects can be seen only when light is reflected or when they produce their own light.

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Life Science	Below Basic A student who has reached the level of *Below Basic* level is to successfully address some, but not all, of the following:	Basic A student who has reached the level of *Basic* is able to successfully address some, but not all, of the following:	Proficient A student who has reached the level of *Proficient* is able to successfully address some, but not all, of the following:	Advanced A student who has reached the level of *Advanced* is able to successfully address some, but not all, of the following:
From Molecules to Organisms: Structure and Processes	Recognize structures for support, survival, growth, behavior, and plant reproduction.	Use evidence to identify structures for support, survival, growth, behavior, and plant reproduction.	Use evidence to explain structures for support, survival, growth, behavior, and plant reproduction.	Analyze evidence to support arguments that plants and animals have structures for support, survival, growth, behavior, and plant reproduction.
	Identify similarities and differences between body systems.	Describe similarities and differences between body systems.	Use evidence to explain similarities and differences between body systems.	Support an argument with evidence to evaluate similarities and differences between body systems.
	Recognize life cycles of plants and animals.	Identify a model that describes life cycles of plants and animals.	Use a model to describe life cycles of plants and animals.	Evaluate a model to explain life cycles of plants and animals.
	Recognize that plants primarily need air and water to grow.	Identify evidence plants primarily need air and water to grow.	Use evidence to support an argument that plants primarily need air and water to grow.	Use evidence and models to support the argument that plants primarily need air and water to grow.
	Recognize animals respond based on information through their senses.	Identify a model of how animals respond based on information through their senses.	Use a model to describe how animals respond based on information through their senses.	Evaluate a model to explain how animals respond based on information through their senses.
Ecosystems: Interactions, Energy, and Dynamics	Identify how matter moves through organisms within an ecosystem.	Recognize a model of how matter moves through organisms within an ecosystem.	Develop a model to describe how matter moves through organisms within an ecosystem.	Evaluate a model to explain how matter moves through organisms within an ecosystem.

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Heredity: Inheritance and Variation of Traits	Identify characteristics inherited from parents or influenced by the environment.	Use evidence to describe characteristics inherited from parents or influenced by the environment.	Support a claim using evidence to explain characteristics inherited from parents or influenced by the environment.	Use evidence to argue that some characteristics are inherited from parents or influenced by the environment.
	Identify variations in a species may increase survival or reproduction.	Recognize evidence of variations in a species may increase survival or reproduction.	Describe evidence of variations in a species may increase survival or reproduction.	Analyze evidence to explain variations in a species may increase survival or reproduction.
	Identify that some organisms have adaptations to survive better in an ecosystem.	Identify evidence to describe that some organisms have adaptations to survive better in an ecosystem.	Use evidence to explain that some organisms have adaptations to survive better in an ecosystem.	Use models and evidence to argue that some organisms have adaptations to survive better in an ecosystem.
	Recognize a solution to a problem with plants and animals caused when the environment changes.	Use evidence to describe a solution to a problem with plants and animals caused when the environment changes.	Use evidence to explain a solution to a problem with plants and animals caused when the environment changes.	Evaluate evidence to construct an explanation for a solution to a problem with plants and animals caused when the environment changes.

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Earth and Space Science	**Below Basic** A student who has reached the level of *Below Basic* level is to successfully address some, but not all, of the following:	**Basic** A student who has reached the level of *Basic* is able to successfully address some, but not all, of the following:	**Proficient** A student who has reached the level of *Proficient* is able to successfully address some, but not all, of the following:	**Advanced** A student who has reached the level of *Advanced* is able to successfully address some, but not all, of the following:
Earth's Place in the Universe	Recognize relationships between amount of daylight and time of year.	Observe and describe relationships between amount of daylight and time of year.	Use evidence to support explanations of the relationships between daylight and time of year	Analyze evidence to support a claim explaining the relationships between daylight and time of year.
	Recognize change in landscape over time.	Identify evidence for causes for change in landscape over time.	Use a model to describe evidence for changes in landscape over time,	Use a model and evidence to explain changes in landscape over time.
	Identify differences in brightness among stars in the sky and the Sun.	Identify evidence for differences in brightness among stars in the sky and the Sun.	Use evidence to describe the difference in brightness of the Sun compared to other stars is due to distance,	Argue using evidence from a model that the difference in brightness of the Sun compared to other stars is due to distance.
	Recognize daily patterns of shadows and seasonal changes in the night sky.	Describe observable daily patterns of shadows and seasonal changes in the night sky.	Graph data to reveal observable daily patterns of shadows and seasonal changes in the sky.	Graph data to explain observable daily patterns of shadows and seasonal changes in the sky.
Earth's Systems	Recognize how natural processes shape Earth's surfaces.	Investigate how natural processes shape Earth's surface.	Investigate and provide evidence for how natural processes shape Earth's surface.	Use evidence from an investigation to evaluate how natural processes shape Earth's surface.
	Describe the ways in which the four Earth spheres interact.	Identify a model to describe the ways in which the four Earth spheres interact.	Develop a model to describe the ways in which the four Earth spheres interact.	Develop models to describe multiple ways in which the four Earth spheres interact.
	Identify patterns in Earth's features.	Identify patterns found in data to describe Earth's features.	Use models to describe patterns in data of Earth's features.	Use models to analyze data to explain patterns of Earth's features.
	Identify reservoirs of water on Earth.	Observe and describe reservoirs of water on Earth,	Describe and graph differences in water distribution on Earth.	Explain and graph differences in water distribution on Earth.

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	Recognize typical weather conditions.	Identify a model to represent data of typical weather conditions.	Use a model to describe typical weather conditions.	Use a model to explain typical weather conditions and predict future conditions.
	Identify climates in different regions.	Describe evidence of climates in different regions.	Evaluate evidence of climates in different regions.	Evaluate evidence to describe and predict climates in different regions.
Earth and Human Activity	Recognize solutions to reduce the impacts of natural Earth processes on humans.	Describe solutions to reduce the impacts of natural Earth processes on humans.	Generate and compare solutions to reduce the impacts of natural Earth processes on humans.	Evaluate solutions to reduce the impacts of natural Earth processes on humans.
	Identify a solution that reduces the impacts of weather-related hazards.	Recognize a claim to a solution that reduces the impacts of weather-related hazards.	Create a claim to a solution that reduces the impacts of weather-related hazards.	Analyze a claim to a solution that reduces the impacts of weather-related hazards.
	Identify a way to protect the environment.	Describe evidence for a way to protect the environment.	Combine information about ways to protect the environment.	Combine information about and argue for ways to protect the environment.

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Engineering and Technology Science	**Below Basic** A student who has reached the level of *Below Basic* level is to successfully address some, but not all, of the following:	**Basic** A student who has reached the level of *Basic* is able to successfully address some, but not all, of the following:	**Proficient** A student who has reached the level of *Proficient* is able to successfully address some, but not all, of the following:	**Advanced** A student who has reached the level of *Advanced* is able to successfully address some, but not all, of the following:
Engineering Design	Identify design constraints and criteria.	Describe the design constraints and criteria.	Define a simple design problem, including constraints and criteria.	Explain a simple design problem, including constraints and criteria.
	Recognize a possible solution to an engineering problem.	Describe a possible solution to an engineering problem.	Generate and compare multiple possible solutions to an engineering design problem.	Use several sources to generate and compare multiple possible solutions to an engineering problem.
	Recognize ways to improve a model or prototype.	Carry out tests to improve a model or prototype.	Carry out tests to improve a model or prototype by controlling variables.	Carry out tests and analyze data to improve a model or prototype by controlling variables and identifying failures.