

IOWA SCIENCE
PERFORMANCE LEVEL DESCRIPTORS
DRAFT FOR PUBLIC COMMENT

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General Performance Level Descriptors

The General Performance Level Descriptors (PLDs) provide descriptions of what students at each performance level *know* and what they *are able to do*. Taken together with Grade- and Content-specific PLDs (shown in draft form in the rest of this document) and threshold scores, they convey the meaning of the ISASP results.

Advanced	Students performing at the Advanced level demonstrate thorough competency over the knowledge, skills, and abilities that meet the requirements for their grade level associated with academic readiness for college in the subject area.
Proficient	Students performing at the Proficient level demonstrate adequate competency over the knowledge, skills, and abilities that meet the requirements for their grade level associated with academic readiness for college in the subject area.
Not-Yet-Proficient	Students performing at the not-yet-proficient level have not yet demonstrated the knowledge and skills to be classified as Proficient. <i>(Note: Grade- and Content-Specific Not-Yet-Proficient descriptors will be created after the Grade- and Content-Specific Proficient descriptors are finalized, and so are not included in the April 2019 draft PLDs that follow in this document.)</i>

Grade 5	Proficient	Advanced
	<p>A student performing at the Proficient performance level for grade 5 science has a broad understanding of science and engineering concepts and practice incorporated in the grades 3, 4, and 5 Iowa Core Standards for Science. The student usually communicates ideas accurately using clear and appropriate examples of foundational concepts, supporting or justifying those ideas with relevant details and evidence. Problem-solving and critical thinking skills are used effectively and connections between concepts/ideas from different areas of science, when present, are reasonable and appropriate.</p> <p>The student at the Proficient performance level will demonstrate an understanding of grade-appropriate concepts related to topics in life science including molecules and organisms, ecosystems, heredity, and biological evolution; topics in physical science including matter, motion and stability, energy, and waves; and topics in earth and space science including Earth’s place in the universe, Earth’s systems, and human activity.</p> <p>The student at the Proficient performance will demonstrate knowledge, skills, and abilities related to the Iowa Core Standards for grade 5 science such as:</p> <ul style="list-style-type: none"> ● Analyzes and interprets data to organize information and make predictions. ● Makes and/or analyzes a claim, citing relevant evidence and utilizing cause and effect relationships, to support a design solution. ● Accurately analyzes and interprets data and observations about patterns they observe. ● Constructs an argument with reasonable evidence to support a claim. ● Analyzes a simple design problem, including identifying criteria for success and considering appropriate constraints. 	<p>A student performing at the Advanced performance level for grade 5 science has a comprehensive understanding of science and engineering concepts and practices incorporated in the grades 3, 4, and 5 Iowa Core Standards for Science. The student consistently communicates ideas related to foundational concepts in a sophisticated and insightful manner, using thorough supporting detail and explicit examples. The student reasons and solves problems by using appropriate strategies in an insightful way. Connections between concepts/ideas from different areas of science, when appropriate, are justified and insightful.</p> <p>The student at the Advanced performance level will demonstrate an in-depth understanding of grade-appropriate concepts related to topics in life science including molecules and organisms, ecosystems, heredity, and biological evolution; topics in physical science including matter, motion and stability, energy, and waves; and topics in earth and space science including Earth’s place in the universe, Earth’s systems, and human activity.</p> <p>The student at the Advanced performance will demonstrate knowledge, skills, and abilities related to the Iowa Core Standards for grade 5 science such as:</p> <ul style="list-style-type: none"> ● Analyzes and interprets data to organize information and make sophisticated and insightful predictions. ● Generates and/or analyzes a claim, citing relevant evidence, and utilizes cause and effect relationships to support a sophisticated design solution. ● Accurately and insightfully analyzes and interprets data and observations about patterns they observe. ● Constructs and analyzes an argument, providing insightful and relevant evidence to support a claim. ● Defines and analyzes simple design problems, including identifying criteria for success and considering appropriate constraints. ● Interprets data to identify patterns used as evidence to construct an insightful explanation. ● Formulates insightful questions to predict insightful outcomes.

Iowa Science Performance Level Descriptors

	<ul style="list-style-type: none">● Interprets data to identify patterns used as evidence to construct a reasonable explanation.● Formulates questions to predict reasonable outcomes.● Accurately develops or uses a model that explains most components and relationships within a system.	<ul style="list-style-type: none">● Accurately develops or uses a model that insightfully explains components and relationships within a system.
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Iowa Science Performance Level Descriptors

Grade 8	Proficient	Advanced
	<p>A student performing at the Proficient performance level for grade 8 science has a broad understanding of the three dimensions of the science and engineering concepts and practices incorporated in the grades 6, 7, and 8 Iowa Core Standards for Science. The student usually communicates ideas accurately using clear and appropriate examples, supporting or justifying those ideas with relevant details and evidence. Problem-solving and critical thinking skills are used effectively. Connections between concepts/ideas from different areas of science, when present, are reasonable and appropriate.</p> <p>The student at the Proficient performance level will demonstrate an understanding of grade-appropriate concepts related to topics in life science including molecules and organisms, ecosystems, heredity, and biological evolution; topics in physical science including matter, motion and stability, energy, and waves; and topics in earth and space science including Earth’s place in the universe, Earth’s systems, and human activity.</p> <p>The student at the Proficient performance level will demonstrate knowledge, skills, and abilities related to the Iowa Core Standards for grade 8 science, such as:</p> <ul style="list-style-type: none"> ● Develops models that represent most of the relationships within systems. ● Effectively uses, analyzes, and evaluates models, data, evidence and claims. ● Revises a model to reduce limitations, including correcting errors. ● Identifies a pattern within graphical displays to indicate relationships that exist within a system. ● Describes systems in terms of their components, roles, and interactions. 	<p>A student performing at the Advanced performance level for grade 8 science has a comprehensive understanding of the three dimensions of the science and engineering concepts and practices incorporated in the grades 6, 7, and 8 Iowa Core Standards for Science Iowa Core Standards for Science. The student consistently communicates ideas in a sophisticated and complex manner, using thorough supporting detail and explicit examples. The student reasons and solves problems by using appropriate strategies in an insightful way. Connections between concepts/ideas from different areas of science, when appropriate, are justified and insightful.</p> <p>The student at the Advanced performance level will demonstrate an in-depth understanding of grade-appropriate concepts related to topics in life science including molecules and organisms, ecosystems, heredity, and biological evolution; topics in physical science including matter, motion and stability, energy, and waves; and topics in earth and space science including Earth’s place in the universe, Earth’s systems, and human activity.</p> <p>The student at the Advanced performance level will demonstrate knowledge, skills, and abilities related to the Iowa Core Standards for grade 8 science such as:</p> <ul style="list-style-type: none"> ● Develops detailed models that clearly represent the relationships within systems. ● Consistently uses, analyzes, and evaluates models, data, evidence and claims in insightful ways. ● Makes appropriate predictions using patterns within graphical displays. ● Constructs and presents arguments supported with relevant evidence and reasoning in a sophisticated manner. ● Critiques the arguments and reasoning of others. ● Plan a detailed investigation, identifying the appropriate variables and controls.

Iowa Science Performance Level Descriptors

	<ul style="list-style-type: none">● Constructs, uses, and presents arguments supported with relevant evidence.● Plans an investigation, identifying the variables and controls.● Defines the problem and designs a solution that meets the criteria and constraints.● Identifies the relationship and interaction between structure and function.	<ul style="list-style-type: none">● Evaluates competing solution designs that meet the criteria and constraints.● Explains in detail the relationships and interactions between structure and function.● Understands and applies knowledge and appropriate terminology in a relevant way.
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Iowa Science Performance Level Descriptors

Grade 10	Proficient	Advanced
	<p>A student performing at the Proficient performance level for grade 10 science has an adequate understanding of the three dimensions of the science and engineering concepts and practices incorporated in the Iowa Core Standards for Science appropriate for grades 9 and 10.</p> <p>The student at the Proficient performance level will demonstrate an understanding of grade-appropriate concepts related to topics in life science including molecules and organisms, ecosystems, heredity, and biological evolution; topics in physical science including matter, motion and stability, energy, and waves; and topics in earth and space science including Earth’s place in the universe, Earth’s systems, and human activity.</p> <p>The student at the Proficient performance level will demonstrate knowledge, skills, and abilities related to the Iowa Core Standards for grade 10 science such as:</p> <ul style="list-style-type: none"> • Uses models to predict the relationships between systems or between components of systems. • Constructs and revises an explanation based on valid and reliable evidence obtained from a variety of sources. • Plans and conducts an investigation to produce data to serve as the bases for evidence. • Applies scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects. • Refines a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations. • Uses mathematical representations of phenomena to support claims and describe explanations. • Analyzes data using tools, technologies, and/or models in order to make valid and reliable scientific claims. • Evaluates questions that challenge the premise or an argument, the interpretation of a data set, or the suitability of a design. 	<p>A student performing at the Advanced performance level for grade 10 science has a comprehensive understanding of the three dimensions of the science and engineering concepts and practices incorporated in the Iowa Core Standards for Science appropriate for grades 9 and 10. The student consistently communicates ideas in a sophisticated and insightful manner, using thorough supporting detail and explicit examples. The student reasons and solves problems by using appropriate strategies in an insightful way. Connections between concepts/ideas from different areas of science, when appropriate, are justified and insightful.</p> <p>The student at the Advanced performance level will demonstrate an in-depth understanding of grade-appropriate concepts related to topics in life science including molecules and organisms, ecosystems, heredity, and biological evolution; topics in physical science including matter, motion and stability, energy, and waves; and topics in earth and space science including Earth’s place in the universe, Earth’s systems, and human activity.</p> <p>The student at the Advanced performance level will demonstrate knowledge, skills, and abilities related to the Iowa Core Standards for grade 10 science such as:</p> <ul style="list-style-type: none"> • Formulates a hypothesis and conducts an experiment to test this hypothesis. • Accurately uses models to predict the relationships between systems or between components of systems. • Effectively constructs and revises an explanation based on valid and reliable evidence obtained from a variety of sources. • Plans and conducts an investigation to produce data to serve as the bases for evidence. • Applies and contrasts scientific principles and evidence to provide an insightful explanation of phenomena and solve design problems, taking into account possible unanticipated effects. • Refines a solution to a complex real-world problem, based on insightful scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Iowa Science Performance Level Descriptors

	<ul style="list-style-type: none">• Evaluates the claims, evidence, and reasoning behind currently accepted explanations and solutions to determine the merits of an argument.	<ul style="list-style-type: none">• Synthesizes mathematical representations of phenomena to support claims and describe explanations.• Accurately interprets data using tools, technologies, and/or models in order to make valid and reliable scientific claims.• Insightfully evaluates questions that challenge the premise or an argument, the interpretation of a data set, or the suitability of a design.• Critiques and appraises the claims, evidence, and reasoning behind currently accepted explanations and solutions to determine the merits of an argument.
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