ACHIEVEMENT LEVEL DESCRIPTORS
Washington Comprehensive Assessment of Science
Grade 8

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Science Assessment Team
Office of Superintendent of Public Instruction
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Grade 8 Level 2

An 8th grade student performing at **Level 2** applies, with support, science and engineering practices and crosscutting concepts to explain phenomena and design solutions to problems in the natural and the designed world. The student uses models, information, and patterns in data to describe relationships among parts of systems and to make predictions about how systems change over time. The student describes the data to collect in an investigation in order to identify the relationship between two variables. The student identifies a solution to a problem that meets given criteria for success. The student uses data and basic mathematical thinking to support arguments and explanations about cause and effect relationships among parts of systems.

A student performing at Level 2 can do things like:

1. Use a model and patterns in data to show that the number of particles does not change during chemical reactions and that particle motion changes when thermal energy is added to or removed from a system. (Derived from PS1)
2. Describe how evidence from a given investigation supports the argument that change in an object's motion depends on mass and force. (Derived from PS2)
3. Use information and graphical displays of data to describe qualitative relationships between speed, mass, and kinetic energy, and use evidence and basic mathematical thinking to support a given argument about energy transfers and changes in kinetic energy. (Derived from PS3)
4. Use a model to describe the relationship between amplitude and wave energy and to identify that properties of a material determine whether a wave is reflected, absorbed, or transmitted. (Derived from PS4)
5. Use evidence from an investigation and a model to support the argument that organisms are made of cells that can form tissues, organs, and systems of organs that function to keep organisms alive. (Derived from LS1)
6. Use a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (Derived from LS2)
7. Use models to identify differences between sexual or asexual reproduction and to identify which type of reproduction results in increased genetic variation. (Derived from LS3)
8. Identify patterns in fossil data that provide evidence for changes in populations over time and that support the explanation that some organisms survive better than other organisms because of differences in traits. (Derived from LS4)
9. Use models of the Earth-sun-moon system to identify the patterns of movement that cause lunar phases, eclipses, and seasons. (Derived from ESS1)
10. Identify data that provide evidence that moving air masses affect weather conditions, and use a model to describe that unequal heating and the rotation of Earth cause regional climates. (Derived from ESS2)
11. Ask questions and identify evidence to support arguments about one factor that has caused the rise in global temperatures over the past century. (Derived from ESS3)
12. Define criteria for a successful solution to a problem that takes into account potential impacts on people and the environment. (Derived from ETS1)

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Grade 8 Level 3

An 8th grade student performing at **Level 3** effectively applies science and engineering practices and crosscutting concepts to explain phenomena and design solutions to problems in the natural and the designed world. The student develops models and uses information and patterns in data to describe relationships among parts of systems and to identify scientific principles that can be used to make predictions about how systems change over time. The student asks questions and plans investigations to determine the relationship between two variables. The student identifies criteria and constraints and uses patterns in data to evaluate solutions to problems. The student uses data and mathematical and computational thinking to construct arguments and explanations about how parts of a system depend on each other.

In addition to the skills and knowledge demonstrated at Level 2, a student performing at Level 3 can do things like:

1. Develop and use models and interpret patterns in data to show that mass is conserved during chemical reactions and to predict changes in particle motion when thermal energy is added to or removed from a system. (Derived from PS1)
2. Use data from an investigation to construct an argument about how change in motion depends on mass and force. (Derived from PS2)
3. Use information to construct graphical displays of data that describe quantitative relationships between speed, mass, and kinetic energy, and use evidence and mathematical and computational thinking to construct an argument about energy transfers and changes in kinetic energy. (Derived from PS3)
4. Develop and use a model to describe the quantitative relationship between amplitude and wave energy and use properties of a material to predict whether a wave will be reflected, absorbed, or transmitted by a material. (Derived from PS4)
5. Use evidence from an investigation to develop a model and support the argument that organisms are made of cells that can form tissues, organs, and systems of organs that interact to keep organisms alive. (Derived from LS1)
6. Develop and use a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (Derived from LS2)
7. Develop and use models to describe sexual or asexual reproduction and to describe that only sexual reproduction results in increased genetic variation. (Derived from LS3)
8. Describe how patterns in fossil data provide evidence for changes in populations over time, and use the data to construct an explanation that some organisms survive better than other organisms because of differences in traits. (Derived from LS4)
9. Develop and use models of the Earth-sun-moon system to describe the patterns of movement that cause lunar phases, eclipses, and seasons. (Derived from ESS1)
10. Describe how data provide evidence that moving air masses affect weather conditions, and develop and use a model that describes how uneven heating and the rotation of Earth cause regional climates. (Derived from ESS2)
11. Ask questions that can provide evidence that supports arguments about multiple factors that have caused the rise in global temperatures over the past century. (Derived from ESS3)
12. Define criteria for success and constraints on a solution to a problem that takes into account potential impacts on people and the environment. (Derived from ETS1)

Grade 8 Level 4

An 8th grade student performing at **Level 4** effectively, consistently, and appropriately applies science and engineering practices and crosscutting concepts to explain phenomena and design solutions to problems in the natural and the designed world. The student evaluates how well models, information, and patterns in data describe relationships among parts of systems, and uses scientific principles and reasoning to make predictions about how systems change over time. The student plans and evaluates investigations designed to determine the relationship between two variables. The student uses patterns in data to determine which solution to a problem best meets the criteria for success. The student uses data, mathematical and computational thinking, and scientific reasoning to construct and evaluate arguments and explanations about how parts of a system depend on each other.

In addition to the skills and knowledge demonstrated at Level 3, a student performing at Level 4 can do things like:

1. Analyze and interpret patterns in data in order to evaluate and revise a model that describes how mass is conserved during chemical reactions and to explain predicted changes in particle motion when thermal energy is added to or removed from a system. (Derived from PS1)
2. Plan an investigation to produce evidence that can be used to evaluate an argument about how change in motion depends on mass and force. (Derived from PS2)
3. Use information to construct graphical displays of data and evaluate how well the data describe quantitative relationships between speed, mass, and kinetic energy, and use evidence, mathematical and computational thinking, and scientific reasoning to construct an argument about energy transfers and changes in kinetic energy. (Derived from PS3)
4. Evaluate and revise a model that describes the quantitative relationship between amplitude and wave energy, and use scientific reasoning to predict whether a wave will be reflected, absorbed, or transmitted by a material based on the properties of the material. (Derived from PS4)
5. Use evidence from an investigation to revise a model and evaluate the argument that organisms are made of cells that can form tissues, organs, and systems of organs that interact to keep organisms alive. (Derived from LS1)
6. Evaluate and revise a model that describes the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (Derived from LS2)
7. Evaluate and revise models of sexual and asexual reproduction, and explain, using scientific reasoning, how only sexual reproduction results in increased genetic variation. (Derived from LS3)
8. Describe, using scientific reasoning, how patterns in fossil data provide evidence for changes in populations over time, and use the data to evaluate the explanation that some organisms survive better than other organisms because of differences in traits. (Derived from LS4)
9. Evaluate and revise models of the Earth-sun-moon system and explain, using scientific reasoning, the patterns of movement that cause lunar phases, eclipses, and seasons. (Derived from ESS1)
10. Describe, with scientific reasoning, how data provide evidence that moving air masses affect weather conditions, and evaluate and revise a model that describes how uneven heating and the rotation of Earth cause regional climates. (Derived from ESS2)
11. Ask questions and use evidence to construct arguments about how multiple factors have caused the rise in global temperatures over the past century. (Derived from ESS3)
12. Use criteria and constraints to evaluate a solution to a problem that takes into account scientific principles and potential impacts on people and the environment. (Derived from ETS1)