

## Grade 5 MISA Content-Specific PLDs

### A student at Level 5 will be able to:

1. Use patterns in data to evaluate and revise models and plan investigations that provide evidence that matter is made of tiny particles and that mixing different types of matter can result in new substances.
2. Ask questions and plan investigations to provide evidence that can be used to construct arguments about cause and effect relationships between forces, including electrical and magnetic forces, and objects' motions.
3. Apply scientific ideas, including the use of evidence, mathematical and computational thinking, and scientific reasoning, to design, test, and refine a device that converts energy from one form to another.
4. Evaluate and revise a model to determine how well observations and measurements (*e.g.*, qualitative measurement data) support the identification of materials based on their properties.
5. Evaluate and revise a model that describes patterns in the life cycles of organisms, and use evidence and scientific reasoning to construct an argument that plants and animals need internal and external structures to live.
6. Evaluate and revise a model that describes the movement of matter among living parts of an ecosystem.
7. Use scientific reasoning to explain how patterns in data provide evidence that plants and animals inherit traits and that there is variation among traits within a group of similar organisms.
8. Describe, using scientific reasoning, how data from fossils provides evidence of the effects of environmental changes on the inherited traits of organisms that lived long ago, and use the data to evaluate an argument that some organisms survive better than others in a particular habitat.
9. Construct a scientific explanation for the irregularities in the patterns of rock layers indicate disruptions due to Earth forces (*e.g.*, a canyon with different rock layers in the walls).
10. Evaluate and revise a model for Earth's systems to explain the effects of weathering or the rate of erosion on Earth materials (*e.g.*, rocks, soils, and sediment).
11. Analyze information to make and evaluate an argument that compares the effectiveness of ways in which communities can use scientific ideas and a scientific understanding of the interactions between components of environmental systems, including the use of fuels, to protect a natural resource and the environment.

**A student at Level 4 will be able to:**

1. Develop and use models and patterns in data to provide evidence that matter is made of tiny particles and that mixing different types of matter can result in new substances.
2. Ask questions and plan investigations to provide evidence about cause and effect relationships between forces, including electrical and magnetic forces, and objects' motions.
3. Use evidence and mathematical and computational thinking to construct an explanation about a device that converts energy from one form to another.
4. Develop and use a model that shows how observations and measurements made during an investigation permit the identification of materials based on their properties.
5. Develop and use a model that describes patterns in the life cycles of organisms, and use evidence to construct an argument that plants and animals need internal and external structures to live.
6. Develop and use a model to describe the movement of matter among living parts of an ecosystem.
7. Describe how patterns in data provide evidence that plants and animals inherit traits and that there is variation among traits within a group of similar organisms.
8. Describe how data from fossils provides evidence of the effects of environmental changes on the inherited traits of organisms that lived long ago, and use the data to construct an argument that some organisms survive better than others in a particular habitat.
9. Use reasoning to connect evidence and support an explanation about a specific pattern of rock layers and fossils (*e.g.*, a rock layer containing shells and fish below a rock layer containing fossils of land animals and plants).
10. Develop and use a model for Earth's systems to collect evidence showing the effects of weathering or the rate of erosion on Earth materials (*e.g.*, rocks, soils, and sediment).
11. Obtain and combine information regarding how individual communities can use scientific ideas and a scientific understanding of the interactions between components of environmental systems, including the use of fuels, to protect a natural resource and the environment.

**A student at Level 3 will be able to:**

1. Use a model and patterns in data to describe matter as made of tiny particles and to describe that mixing different types of matter can result in new substances.
2. Ask questions that can be investigated to provide evidence about the effects of balanced and unbalanced forces, including electrical and magnetic forces, on the motion of an object.
3. Use evidence and basic computational thinking to support an explanation about a device that converts energy from one form to another.
4. Make observations and measurements, given an investigation plan, to identify materials based on their properties.
5. Use a model to describe patterns in the life cycles of organisms, using evidence to support the argument that plants and animals need internal and external structures to live.
6. Use a model to describe the movement of matter among living parts of an ecosystem.
7. Identify patterns in data that provide evidence that plants and animals inherit traits and traits can vary within a group of similar organisms.
8. Identify data from fossils that provides evidence of the effects of environmental changes on the inherited traits of organisms that lived long ago and that supports an argument that some organisms survive better than others in a particular habitat.
9. Identify relevant evidence, including local and regional patterns, to support an explanation concerning the presence of particular fossils (*e.g.*, shells, land plants) in specific rock layers.
10. Use a model to describe ways the hydrosphere, geosphere, atmosphere, and biosphere interact and to explain observations made of the effects of weathering and erosion by water, wind, ice, or vegetation.
11. Identify information relevant to the ways in which communities use scientific ideas and a scientific understanding of the interactions between components of environmental systems, including the use of fuels, to protect a natural resource and the environment.

Note: Content-specific performance level descriptors were not developed for Performance Level 2 for the MISA in Grade 5, as the standard setting simply determined the cut point for a borderline Level 3 student.