Tier 1

Grade 4 Advanced

A fourth-grade Tier 1 student performing at the **Advanced** Level solves routine tasks and demonstrates consistent academic awareness of the basic and some complex skills, concepts and vocabulary outlined by the Alternate Eligible Content across all four Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice and Proficient Levels, students performing at this level demonstrate these abilities by

- sequencing stages of the life cycles of organisms
- determining the final position of an object given a specific force and direction

Grade 4 Proficient

A fourth-grade Tier 1 student performing at the **Proficient** Level solves simple tasks and demonstrates progressing academic awareness of most of the basic skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least three of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice Level, students performing at this level demonstrate these abilities by

- identifying changes to objects and living things
- recognizing the observation that supports a scientific fact
- selecting the appropriate measuring tools to solve problems
- distinguishing between natural and human made systems
- identifying naturally occurring patterns in nature
- identifying the functions of specific structures of a plants and animals
- distinguishing between living and non-living things
- identifying how seasons affect trees and animals
- matching the impact of pollution with its source

Grade 4 Novice

A fourth-grade Tier 1 student performing at the **Novice** Level demonstrates a growing academic awareness of the basic skills and concepts outlined by the Alternate Eligible Content in at least two of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Emerging Level, students performing at this level demonstrate these abilities by

- selecting the appropriate tool to perform basic measurement tasks
- identifying the basic needs of plant and animals
- identifying the solid and liquid states of matter
- matching objects based physical characteristics
- identify the position of an object relative to another

- distinguishing between pictures of Earth's prominent geological features
- identifying groups of products that can be recycled or reused
- matching the appropriate measuring tool to measure temperature, precipitation and wind direction

Grade 4 Novice

A fourth-grade Tier 1 student performing at the **Emerging** Level demonstrates a growing academic awareness of some of the basic skills and concepts outlined by the Alternate Eligible Content in at least one of the Pennsylvania Science Reporting Categories.

Students performing at this level demonstrate these abilities by

- identifying common technologies by name
- matching animals to their specific habitat
- identifying weather conditions using weather symbols

Grade 8 Advanced

An eighth-grade Tier 1 student performing at the **Advanced** Level solves routine tasks and demonstrates consistent academic awareness of the basic and some complex skills, concepts and vocabulary outlined by the Alternate Eligible Content across all four Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice and Proficient Levels, students performing at this level demonstrate these abilities by

- sequencing recurring patterns found in nature
- identifying the effect of changes to stable systems
- classifying groups of animals based on distinguishing characteristics
- recognizing the energy flow through a food chain
- determining the motion of objects based on the forces acting on it
- recognizing the natural processes that change the Earth's surface

Grade 8 Proficient

An eighth-grade Tier 1 student performing at the **Proficient** Level solves simple tasks and demonstrates progressing academic awareness of most of the basic skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least three of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice Level, students performing at this level demonstrate these abilities by

- selecting measuring tools with the appropriate units to solve tasks
- identifying predator and prey relationships
- matching human activities with their impact on plants and animals
- recognizing recycling as a waste management technique
- identifying the source of a group of products

Grade 8 Novice

An eighth-grade Tier 1 student performing at the **Novice** Level demonstrates a growing academic awareness of the basic skills and concepts outlined by the Alternate Eligible Content in at least two of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Emerging Level, students performing at this level demonstrate these abilities by

- identifying a specified relationship based on observations given
- identifying components of human-made systems by their function
- recognizing the structures of animals that allow them to survive in their environment

Grade 8 Emerging

An eighth-grade Tier 1 student performing at the **Emerging** Level demonstrates a growing academic awareness of some of the basic skills and concepts outlined by the Alternate Eligible Content in at least one of the Pennsylvania Science Reporting Categories.

Students performing at this level demonstrate these abilities by

- matching different environments with their characteristics
- matching familiar technologies with their uses

Grade 11 Advanced

An eleventh-grade Tier 1 student performing at the **Advanced** Level solves routine tasks and demonstrates consistent academic awareness of the basic as well as some complex skills, concepts and vocabulary outlined by the Alternate Eligible Content across all four Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice and Proficient Levels, students performing at this level demonstrate these abilities by

- recognizing experimental designs that answer specific questions
- making simple predictions and drawing conclusions based on basic graphs, tables, charts, and models
- determining the outcome of common situations by applying knowledge of the forces involved
- determining the relative speed, distance, or elapsed time based on two or more observations
- recognizing the interactions between the living and non-living parts of an ecosystem

Grade 11 Proficient

An eleventh-grade Tier 1 student performing at the **Proficient** Level solves simple tasks and demonstrates progressing academic awareness of most of the basic skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least three of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice Level, students performing at this level demonstrate these abilities by

- identifying causes and predicting results of changes in stable systems
- using observations to draw conclusions about recurring patterns
- identifying the impact that using resources has on their environment

Grade 11 Novice

An eleventh-grade Tier 1 student performing at the **Novice** Level demonstrates a growing academic awareness of the basic skills and concepts outlined by the Alternate Eligible Content in at least two of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Emerging Level, students performing at this level demonstrate these abilities by

- recognizing the similarities and differences in earth's climates
- recognizing the results of specific natural disasters on the environment
- using one data point or characteristic to predict weather events
- comparing the function of structures of different animals

Grade 4 Advanced

A fourth-grade Tier 2 student performing at the **Advanced** Level solves multi-step problems and demonstrates advanced academic awareness of most of the basic and complex skills, concepts, and vocabulary outlined by the Alternate Eligible Content in all four Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice and Proficient Levels, students performing at this level demonstrate these abilities by

- identifying patterns seen in nature
- identifying how seasons affect trees and animals using specific scientific vocabulary
- comparing objects by shape, size, volume and weight to solve problems
- identifying the position of one object to another within a common context
- identifying the plant or animal source of food and clothing

Grade 4 Proficient

A fourth-grade Tier 2 student performing at the **Proficient** Level solves multi-step problems and demonstrates a fundamental academic awareness of most of the basic as well as some complex skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least three of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice Level, students performing at this level demonstrate these abilities by

- identifying common technologies and the old technologies they replace
- selecting the appropriate tools for making observations
- distinguishing whether a system is natural or human made
- identifying how specific structures of plants and animals function together to provide basic needs
- sequencing individual stages of life cycles of different organisms
- matching the source of pollution with its impact on the environment
- recognizing the relationship between push and pull forces and the direction an object moves
- identifying the sources of recyclable products

Grade 4 Novice

A fourth-grade Tier 2 student performing at the **Novice** Level solves routine as well as simple multi-step problems and demonstrates a developing understanding of some of the basic skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least two Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Emerging Level, students performing at this level demonstrate these abilities by

- selecting the appropriate measuring tools to gather specific information and solve

problems
- identifying the basic needs of plants and animals,
- identifying Earth's prominent features when displayed on a map
- identifying products that can be recycled or reused
- identifying changes to object and living things
- recognizing the observations that support a scientific fact
- identifying objects changing states of matter
- predicting weather conditions based on weather symbols or pictures

Grade 4 Emerging

A fourth-grade Tier 2 student performing at the **Emerging** Level solves routine problems and demonstrates a progressing academic awareness of some of the basic skills and concepts outlined by the Alternate Eligible Content in at least one of the Pennsylvania Science Reporting Categories.

Students performing at this level demonstrate these abilities by

- identifying specific technologies given a specific situation or need
- identifying the position of an object relative to another
- identifying the plants and animals that live in different environments
- matching objects based on physical characteristics in order to solve a problem
- predicting weather conditions based on weather symbols or pictures

Grade 8 Advanced

An eighth-grade Tier 2 student performing at the **Advanced** Level solves multi-step problems and demonstrates advanced academic awareness of most of the basic and complex skills, concepts and vocabulary outlined by the Alternate Eligible Content in all four Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice and Proficient Levels, students performing at this level demonstrate these abilities by

- identifying ways to protect the environment by reducing waste
- identifying differences and similarities in the physical properties of substances
- identifying the renewable or nonrenewable sources of commonly used products
- recognizing the natural processes that change the Earth's surface
- identifying the phase changes of water associated with the components of the water cycle
- predicting weather events based on cloud type and wind direction
- comparing the motion of objects based on the forces acting on it
- distinguishing between different types of energy sources
- sequencing naturally occurring patterns

Grade 8 Proficient

An eighth-grade Tier 2 student performing at the **Proficient** Level solves multi-step problems and demonstrates a fundamental academic awareness of most of the basic as well as some complex skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least three of the Pennsylvania Science Reporting Categories. In addition to the skills

demonstrated by students performing at the Novice Level, students performing at this level demonstrate these abilities by

- identifying the impact of a specific change to a system
- describing relationships between objects or events based on observations
- selecting measuring tools with the appropriate units to solve tasks
- classifying animals and plants based on shared characteristics
- sequencing the energy flow through a food chain
- identifying relationships within a food web
- identifying the impact of human activities on plants and animals

Grade 8 Novice

An eighth-grade Tier 2 student performing at the **Novice** Level solves routine as well as simple multi-step problems and demonstrates a developing understanding of some of the basic skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least two Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Emerging Level, students performing at this level demonstrate these abilities by

- identifying components of naturally occurring systems
- identifying the components of a human-made system by function

Grade 8 Emerging

An eighth-grade Tier 2 student performing at the **Emerging** Level solves routine problems and demonstrates a progressing academic awareness of some of the basic skills and concepts outlined by the Alternate Eligible Content in at least one of the Pennsylvania Science Reporting Categories.

Students performing at this level demonstrate these abilities by

- recognizing familiar technologies and their uses
- identifying the structure and functions of plants and animals that allow them to survive in their environment and
- matching basic habitats with their defining characteristics

Grade 11 Advanced

An eleventh-grade Tier 2 student performing at the **Advanced** Level solves multi-step problems and demonstrates advanced academic awareness of most of the basic and complex skills, concepts, and vocabulary outlined by the Alternate Eligible Content in all four Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice and Proficient Levels, students performing at this level demonstrate these abilities by

- understanding that a model can be used to represent abstract concepts
- recognizing outcomes of experiments and what the experiment was designed to measure
- using a chart, graph, pictures or model to make predictions or draw conclusions

- identifying representations of biological concepts such as symbiosis, mutualism, competition, and predation
- interpreting tables and graphs to determine the relative speed, distance, and time of objects
- recognizing the processes that change the earth's surface over time such as sedimentation, erosion, and weathering
- predicting the outcomes of common situations using an understanding of forces

Grade 11 Proficient

An eleventh-grade Tier 2 student performing at the **Proficient** Level solves multi-step problems and demonstrates a fundamental academic awareness of most of the basic as well as some complex skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least three of the Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Novice Level, students performing at this level demonstrate these abilities by

- completing a pattern or sequence
- identifying factors which result in specific changes in outcome
- making short-term predictions
- selecting the variable that causes a specific change in a system
- discriminating between methods, instruments, and scales for making scientific observations
- identifying the impact of resource use on the environment
- analyzing data to predict weather events

Grade 11 Novice

An eleventh-grade Tier 2 student performing at the **Novice** Level solves routine as well as simple multi-step problems and demonstrates a developing understanding of some of the basic skills, concepts and vocabulary outlined by the Alternate Eligible Content in at least two Pennsylvania Science Reporting Categories.

In addition to the skills demonstrated by students performing at the Emerging Level, students performing at this level demonstrate these abilities by

- linking human activity to its impact on the environment
- comparing and contrasting earth's climates including the characteristics of the animals and plants that inhabit each
- recognizing the results of natural disasters on environments

Grade 11 Emerging

An eleventh-grade Tier 2 student performing at the **Emerging** Level solves routine problems and demonstrates a progressing academic awareness of some of the basic skills and concepts outlined by the Alternate Eligible Content in at least one of the Pennsylvania Science Reporting Categories.

Students performing at this level demonstrate these abilities by

- recognizing familiar technologies and their uses
- identifying the structure and functions of different plants and animals