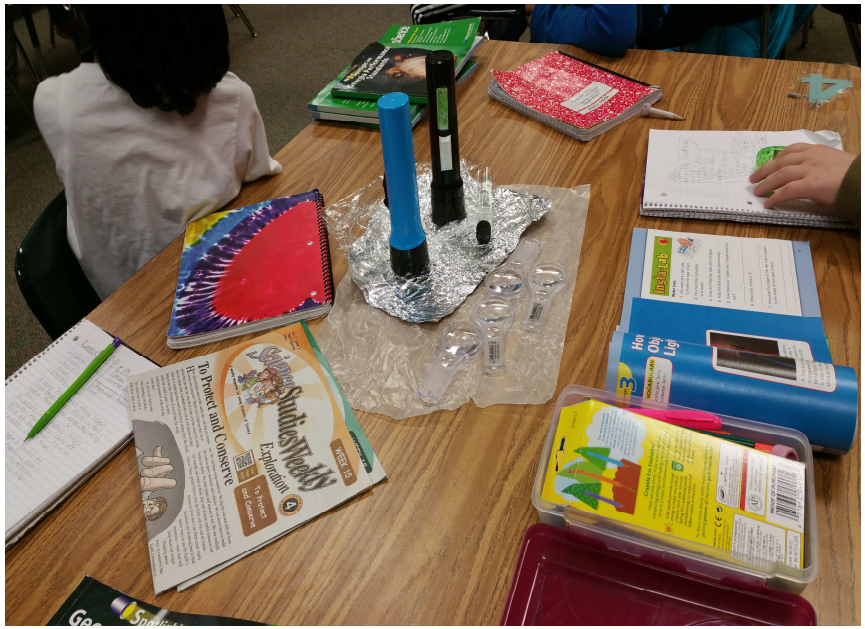
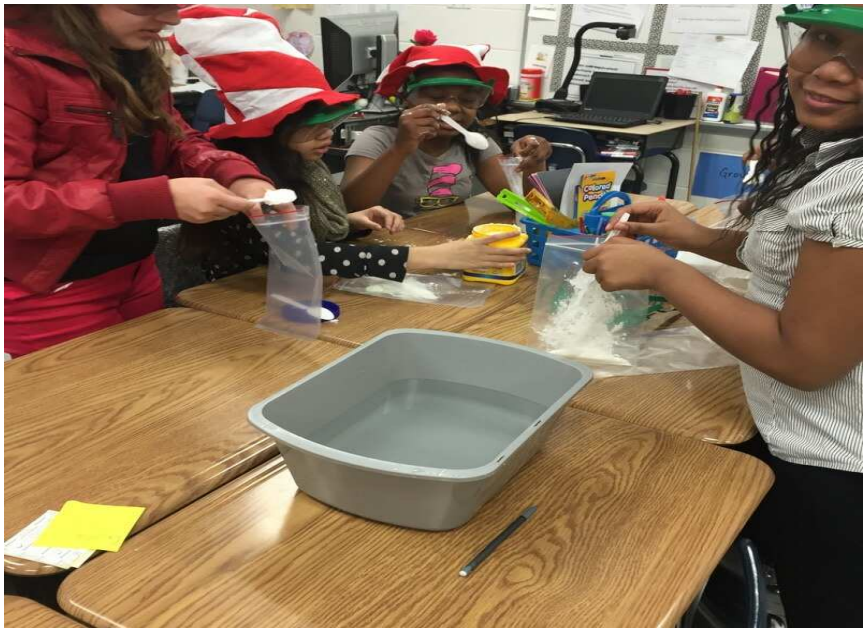
HENRY COUNTY SCHOOLS

ELEMENTARY SCIENCE GRADUATION COMPETENCIES





"The most important characteristic of competency-based education is that it measures learning rather than time. Students progress by demonstrating their competence, which means they prove that they have mastered the knowledge and skills (called competencies) required for a particular course, regardless of how long it takes."

Dr. Robert Mendenhall, President, Western Governor's University

Elementary Science Graduation Competencies

Elementary Science Graduation Competencies are meant to serve as a guide for teachers and leaders as they prepare students to become scientifically literate citizens, critical and creative independent thinkers, and effective communicators and collaborators. In accordance to our Superintendent's 20/20 Vision, we aim to ensure that every Henry County graduate is truly college and career ready for success in the 21st century.

As provided by the research undertaken by the Great Schools Partnership, content area graduation standards are based on state standards and clearly defined learning progressions. They specifically describe the most essential content knowledge that students will need to truly emerge from the educational experience college and career ready. Supporting the Elementary Science Graduation Competencies are relevant performance indicators. Performance indicators are aligned with content-area and cross-curricular state standards, and provide more detailed descriptions of what it means to meet a graduation competency. Scoring criteria for each performance indicator were developed based on best practice and research. The scoring criteria will be used in rubrics for summative assessments across the district to ensure the validity and reliability of scoring for Elementary Science Graduation Competencies for each content area.

The scoring criteria for the Elementary Science Graduation Competencies were collaboratively developed by several dedicated and passionate elementary teachers from across the district.

Odessa Brooks, Luella Elementary
Maria Caputa, Tussahaw Elementary
Dr. Cynthia Carver, Ola Elementary
Mary Beth Darnell, Walnut Creek Elementary
Elyse Davis, Red Oak Elementary
Patrick Deabenderfer, Rock Spring Elementary
Jenelle Dunn, Woodland Elementary
Shirley English, Wesley Lakes Elementary
Jennifer Foster, Rocky Creek Elementary
Vicki Glaze, Unity Grove Elementary
Sophia Guiterrez, New Hope Elementary
Jessica Hardin, New Hope Elementary
Bridgett Head, Pate's Creek Elementary
Amber Heidle, Unity Grove Elementary
Donna A. Johnson, Austin Road Elementary
Louise Kemp-Dorsey, Red Oak Elementary
LeAnn Konken, Timber Ridge Elementary
Kelsey Lanham, Flippen Elementary
Brooke Little, Luella Elementary
Shelia McKee, Flippen Elementary
Debbie Moore, Pleasant Grove Elementary
Jessica Nazario, Pleasant Grove Elementary
Heather Pouliot, Tussahaw Elementary
Debbie Ripple, East Lake Elementary
Edlyn Rivera, Oakland Elementary
John Schettling, Woodland Elementary
Debbie Sechrist, Wesley Lakes Elementary
Kesha Shiflet, Dutchtown Elementary
Susan Stewart, Stockbridge Elementary
Rebecca Truax, Fairview Elementary
Cong Wang, Dutchtown Elementary
LaVera Ward, Fairview Elementary
Laticia White, Oakland Elementary
Minerva Williams, Stockbridge Elementary

ELEMENTARY GRADUATION STANDARDS- CURRICULUM MAP

Grade Level	Graduation Standard									
	ELE1	ELE2	ELE3	ELE4	ELE5	ELE6	ELE7	ELE8	ELE9	ELE10
Kindergarten	✓		✓	✓	✓		✓			✓
First Grade		✓				✓	✓			
Second Grade	✓		✓	✓	✓				✓	✓
Third Grade			✓			✓		✓	✓	
Fourth Grade	✓	✓			✓			✓	✓	
Fifth Grade			✓	✓		✓	✓	✓	✓	✓

ELEMENTARY GRADUATION STANDARDS- Earth Science

Graduation Standard: ELE1

Earth and Space Sciences: Space and Universe

Students will understand and analyze the origins of the solar system and its position in the universe through scientific processes and practices.

Performance Indicators

A. Use observations of the sun, moon, and stars to describe patterns that can be predicted. (SKE1, S2E2, S4E1, S4E2)

B. Make observations at different times of year to relate the amount of daylight to the time of year. (S2E2, S4E2)

C. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. (SKE1, S2E2)

D. Model and explain the concept of Earth's rotation as it relates to day and night and infer why it is usually cooler at night than in the day. (S4E2)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Kindergarten

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Use observations of the sun, moon, and stars to describe patterns that can be predicted. (SKE1, S2E2, S4E1, S4E2)	The student can identify the sun, moon and stars.	The student can identify what happens in the sky during the day time and what happens in the sky at night.	The student can describe changes from day to night, but not as day turns into night (sunset) or night into day (sunrise).	The student can describe changes and patterns from day to night, and as day turns into night (sunset) and night into day (sunrise).
C. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. (SKE1, S2E2)	The student can recognize the sun and the moon.	The student will know that the sun give us heat or light.	I student will know that the sun provides heat and light.	The student can make connections between the sun and shadows at different times throughout the day.

Second Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Use observations of the sun, moon, and stars to describe patterns that can be predicted. (SKE1, S2E2, S4E1, S4E2)	The student can recognize sun, moon and star patterns.	The student can identify sun, moon, and star patterns.	The student can investigate and compare sun, moon, and star patterns.	The student can design/construct a model of the sun, moon, and star patterns.
B. Make observations at different times of year to relate the amount of daylight to the time of year. (S2E2, S4E2)	The student can recall the different times of year.	The student can classify the different times of year.	The student can compare the different times of year.	The student can analyze the relationship between the Earth and the Sun.
C. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. (SKE1, S2E2)	The student can draw and label patterns of daily changes in length and direction of shadows, day and night, and seasonal appearance of some stars in the night sky	The student can recognize data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and seasonal appearance of some stars in the night sky	The student can construct data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and seasonal appearance of some stars in the night sky.	The student can critique data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and seasonal appearance of some stars in the night sky

Fourth Grade

Performance Indicators	Emerging	Progressing	Competent	Exemplary
A. Use observations of the sun, moon, and stars to describe patterns that can be predicted.	The student can recognize that the sun, moon, and stars have predictable patterns.	The student can identify the patterns of the sun, moon, and stars.	The student can predict and describe patterns based on observations of the sun, moon, and stars.	The student can analyze the patterns of the sun, moon, and stars and design a model to demonstrate the patterns.
B. Make observations at different times of year to relate the amount of daylight to the time of year.	The student can recognize that the amount of daylight is different at different times of the year.	The student can compare the amount of daylight at one time of year to that at another time of year.	The student can observe the amount of daylight at different times of the year and relate it to the time of the year.	The student can analyze and critique how daylight and time of year are related. The student will describe the relationship by designing a model or product.
D. Model and explain the concept of Earth's rotation as it relates to day and night and infer why it is usually cooler at night than in the day.	The student can draw and explain the rotation of the Earth as it relates to day and night.	The student can construct and make observations of the Earth's rotation as it relates to day.	The student can model and explain the concept of Earth's rotation as it relates to day and night and infer why it is usually cooler at night than in the day.	The student can prove the causes of the Earth's rotation as it relates to day and night and analyze the effects of seasons on the earth.

ELEMENTARY GRADUATION STANDARDS- Earth Science

Graduation Standard: ELE2

Earth and Space Sciences: Hydrology and Meteorology

Students will understand and analyze the role of water in Earth processes, the dynamics and composition of the atmosphere and global processes influencing weather and climate.

Performance Indicators

A. Collect, organize, and graph weather data obtained by using simple weather instruments (wind vane, rain gauge, thermometer) and explain the components of the water cycle. (S1E2, S4E3)

B. Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to severe weather and represent data in tables and graphical displays to describe typical weather conditions expected during a particular season (S4E4).

C. Obtain information to identify where water is found on Earth and that it can be solid or liquid. (S4E3)

D. Obtain and combine information to describe climates in different regions of the world. (S4E4)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

First Grade Scoring Criteria

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Collect, organize, and graph weather data obtained by using simple weather instruments (wind vane, rain gauge, thermometer) and explain the components of the water cycle (S1E1).	The student can use simple weather instruments. I can label the components of the water cycle.	The student can make weather observations, organize the data and graph it. I can show understanding by creating a model of the water cycle.	The student can collect, organize, and graph weather data obtained by using simple weather instruments (wind vane, rain gauge, thermometer). I can explain the components of the water cycle.	The student can design and create weather instruments that can be used to collect weather data. I can analyze how weather patterns relate to the water cycle.

Fourth Grade

Performance Indicators	Emerging	Progressing	Competent	Exemplary
Determine whether or not water can be a solid or liquid based on its location on Earth.	The student can identify the different states of water.	The student can identify states of water based on its location on Earth.	The student can compare/contrast the different states of water based on its location on Earth.	The student can provide an argument to justify the different states of water based on its location.
B. Ask questions to obtain information regarding the purpose of weather forecasting to prepare for and respond to severe weather.	The student can identify severe weather patterns using various resources (weather map, weather report, etc.)	The student can observe and formulate questions based on various sources of severe weather conditions.	The student can determine the purpose of weather forecasting to prepare for and respond to severe weather by evaluating weather maps.	The student can analyze a severe weather forecast and can make connections to determine the indicators that lead to the severe weather.
Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	The student can recognize weather conditions based on a particular season.	The student can construct a graphical display representing weather conditions expected in a particular season.	The student can represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	The student can collect data and provide evidence to design a data table to display weather conditions expected for a particular season and region.
D. Compare and contrast climates in different regions of the world.	The student can describe the climates based on the different regions of the world.	The student can identify and describe patterns of climates in different regions of the world.	The student can compare and contrast information to compare climates in different regions of the world.	The student can apply concepts of climates within different regions to show the effects on the world.

ELEMENTARY GRADUATION STANDARDS- Earth Science

Graduation Standard: ELE3

Earth and Space Sciences: Geology

Students will understand and analyze lithospheric materials, tectonic processes, and the human and environmental impacts of natural and human-induced changes to Earth's surface.

Performance Indicators

A. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. (S2E3)

B. Investigate and analyze the processes responsible for the formation of rocks and soils. (SKE2, S3E1)

C. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. (S5E1)

D. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. (S5E1)

E. Create a model that shows the constructive process of the formation of a volcano in the United States. (S5E1)

F. Research a major earthquake in the United States and create a model that demonstrates the constructive processes involved in its formation and its intensity. (S5E1)

G. Create an argument with evidence to explain the role of humans and other organisms in the impact of erosion on a local ecosystem. (S5E1)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Kindergarten

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
B. Investigate and analyze the processes responsible for the formation of rocks and soils. (SKE2, S3E1)	The student can identify a rock.	The student can describe a rock using one physical attribute eg., big/small.	The student can describe rocks using two or more attributes.	The student can classify rocks according to their physical attributes.

Second Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. (S2E3)	The student can list evidence for how plants and animals can change the environment to meet their needs.	The student can interpret evidence for how plants and animals can change the environment to meet their needs.	The student can construct an argument supported by evidence for how plants and animals can change the environment to meet their needs.	The student can critique an argument supported by evidence for how plants and animals can change the environment to meet their needs.

Third Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
ELE 3. B Investigate and analyze the processes responsible for the formation of rocks and soils (S3E1).	The student can investigate the processes responsible for the formation of rocks and soils.	The student can identify the processes responsible for the formation of rocks and soils.	The student can analyze the processes responsible for the formation of rocks and soils.	The student can make connections between the processes responsible for the formation of rocks and soils.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
C. Student makes observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	The student can identify the effects of weathering or erosion.	The student can describe the cause/effect relationship of weathering and erosion.	The student can make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	The student can analyze different real world landforms to formulate an explanation of weathering and rate of erosion by water, ice, wind, or vegetation.
D. Student obtains and combines information about ways individual communities use science ideas to protect the Earth's resources and environments.	The student can list ways individual communities use science ideas to protect the Earth's resources.	The student can explain how communities use science ideas to protect the Earth's resources and environments.	The student can obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environments.	The student can critique existing human interventions in a specific community and how effective it is at protecting the Earth's resources and environments.

E. Student creates a model that shows the constructive process of the formation of a volcano in the United States.	The student can identify volcanoes as a constructive process.	The student can draw a model of a volcano to show the constructive processes involved in its formation.	The student can create a model that shows the constructive process of the formation of a volcano in the United States.	The student can create and analyze a model that shows the constructive process of the formation of a volcano in the United States and compares it to a real world volcano.
F. Research a major earthquake in the United States and create a model that demonstrates the constructive processes involved in its formation and its intensity.	The student can identify major earthquakes as a constructive process.	The student can draw a model of an earthquake to show the constructive processes involved in it formation.	The student can research a major earthquake in the United States and create a model that demonstrates the constructive processes involved in its formation and its intensity.	The student can create and analyze a model that shows the constructive process of the formation of an earthquake in the United States and compares it to a real world earthquake.

ELEMENTARY GRADUATION STANDARDS- Physical Science

Graduation Standard: ELE4

Physical Sciences: Structure/Properties of Matter and Interactions

Students will understand and analyze atoms, matter, reactions, and interactions through scientific processes and practices.

Performance Indicators

A. Make observations to construct an evidence-based account on how an object made of a small set of pieces can be disassembled and made into a new object (S5P1).

B. Develop a model to describe that matter is made of particles too small to be seen (S5P1).

C. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved (S5P2).

D. Plan and conduct investigations, make observations and measurements to identify materials based on their observable properties (SKP1, S2P1, and S5P2).

E. Conduct an investigation to determine whether the mixing of two or more substances results in new substances (S5P2).

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Kindergarten

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
D. Plan and conduct investigations, make observations and measurements to identify materials based on their observable properties (SKP1, S2P1, and S5P2).	The student can identify two types of materials i.e, paper/clay	The student can classify objects by more than one attribute.	The student can compare and sort materials based on their composition. I can classify common objects according to their physical attributes.	The student can plan and conduct investigations, to identify materials based on their observable physical properties.

Second Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
D. Plan and conduct investigations, make observations and measurements to identify materials based on their observable properties (SKP1, S2P1, and S5P2).	The student can recall and state the states of matter and their properties.	The student can make observations about the states of matter and their properties	The student can plan and conduct investigations, make observations and measurements to identify materials based on their observable properties.	When given a set of observations and measurements, the student can prove which state of matter is being discussed.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Make observations to construct an evidence-based account on how an object made of a small set of pieces can be disassembled and made into a new object.	The student can identify that and object can be broken down into a small set of pieces (tangrams).	The student can disassemble an object into its small parts and reassemble it again.	The student can make observations to construct an evidence-based account on how an object made of a small set of pieces can be disassembled and made into a new object.	The student can explain how this same concept relates to other content areas.
B. Student develops a model to describe that matter is made of particles too small to be seen.	The student can identify particles in matter that are too small to be seen.	The student can compare the particles of matter to cells of an organism.	The student can develop a model to describe that matter is made of particles too small to be seen.	The student can present their model with detailed explanation on how this concept applies to all matter.
C. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling or mixing substances, the total weight of matter is conserved.	The student can define the law of conservation.	The student can explain the cause and effect of heating, cooling or mixing of a substance.	The student can measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling or mixing substances, the total weight of matter is conserved.	The student can analyze the data obtained from investigating the law of conservation.

D. Plan and conduct investigations, make observations and measurements to identify materials based on their observable properties.	The student can describe the major properties of an object.	The student can classify an object based on its observable properties.	The student can plan and conduct investigations, make observations, and measurements to identify materials based on their observable properties.	The student can apply concept to real world situations.
E. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Student can define chemical change.	Student is able to identify evidence of a chemical reaction.	Student can conduct and investigation to determine whether the mixing of two or more substances results in new substances.	Student will analyze and interpret data from the investigation to determine if a chemical reaction has occurred.

ELEMENTARY GRADUATION STANDARDS- Physical Science

Graduation Standard: ELE5

Physical Sciences: Forces, Motions, and Interactions

Students will understand and analyze forces, mass, motion, and interactions through scientific processes and practices.

Performance Indicators

A. Plan and conduct an investigation to compare the effects of direction on the different strengths of pushes and pulls (SKP2, S2P3).

B. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion (S2P2, S2P3).

C. Support an argument that the gravitational force exerted by Earth on objects is directed down (SKP3, S4P3).

D. Develop and design a scientific investigation to demonstrate the relationship between the application of a force and the resulting change in position and motion on an object (S2P3, S4P3).

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Kindergarten

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Plan and conduct an investigation to compare the effects of direction on the different strengths of pushes and pulls (SKP2, S2P3).	The student can recognize that some things can move with help.	The student can sort some objects according to their motion.	The student can describe and sort objects into categories according to their motion, and investigate motion using push, pull, and roll.	The student can plan an investigation to compare the effects of direction, on the different strengths of pushes and pulls.
C. Support an argument that the gravitational force exerted by Earth on objects is directed down (SKP3, S4P3).	The student can explain the difference between up and down	The student can recognize and can explain why some things in the sky return to earth.	The student can explain that there is a force called gravity that pulls things down.	The student can demonstrate and support an argument that the gravitational force exerted by Earth on objects is directed down.

Second Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Plan and conduct an investigation to compare the effects of direction on the different strengths of pushes and pulls (SKP2, S2P3).	The student can define the difference between a push and a pull.	The student can classify and graph data of the effects of direction on pushes and pulls.	The student can plan and conduct an investigation to compare the effects of direction on the different strengths of pushes and pulls.	The student can analyze effects of direction on the different strengths of pushes and pulls.
B. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to	The student can make measurements of an object's motion.	The student can make observations of an object's motion.	The student can make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to	The student can analyze observations and/or measurements of an object's motion to provide evidence that a pattern can be used to

predict future motion (S2P2, S2P3).			predict future motion.	predict future motion.
D. Develop and design a scientific investigation to demonstrate the relationship between the application of a force and the resulting change in position and motion on an object (S2P3, S4P3).	The student can illustrate and label the relationship between the application of a force and resulting change in position and motion on an object.	The student can estimate and graph the relationship between the application of a force and resulting change in position and motion on an object.	The student can develop and design a scientific investigation to demonstrate the relationship between the application of a force and resulting change in position and motion on an object.	The student can critique a scientific investigation to demonstrate the relationship between the application of a force and resulting change in position and motion on an object.

Fourth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
C. Support an argument that the gravitational force exerted by Earth by objects is directed down	The student can recognize that the gravitational force on Earth is directed down.	The student can predict that the gravitational force exerted by Earth on an object is directed down.	The student can support an argument that the gravitational force exerted by Earth on objects is directed down	The student can design a demonstration to support their argument that the gravitational force exerted by Earth on objects is directed down.
D. Develop and design a scientific investigation to demonstrate the relationship between the application of a force and the resulting change in position and motion on an object.	The student can draw a representation of the relationship between the application of a force and the resulting change in position and motion on an object.	The student can identify the cause/effect of the force applied to an object	The student can develop and design a scientific investigation to demonstrate the relationship between the application of a force and the resulting change in position and motion on an object.	The student can conduct an investigation and evaluate the experimental design of the application of a force on an object resulting in change of position and motion.

ELEMENTARY GRADUATION STANDARDS- Physical Science

Graduation Standard: ELE6

Physical Sciences: Energy, Waves, Electricity, Magnetism, and Interactions

Students will understand and analyze energy and the characteristics of waves as demonstrated through the integration of scientific practices.

Performance Indicators

A. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate (S1P1).

B. Plan and conduct an investigation to determine the effect of placing objects made of different materials in the path of a light beam (S1P1, S1P4).

C. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents (S3P1).

D. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other (S1P1, S3P2, and S5P3).

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

First Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate (S1P1).	The student can recognize that vibrating materials can make sounds and that sounds can make materials vibrate.	The student can make observations on how vibrating materials make sounds and how sounds make materials vibrate.	The student can plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	The student can design an instrument that demonstrates how vibrations make sound and how they can be used to change pitch and volume.
B. Plan and conduct an investigation to determine the effect of placing objects made of different materials in the path of a light beam (S1P1).	The student can recognize that light will pass through certain objects and not pass through other objects.	The student can prove that light passes through certain objects while it does not pass through others.	The student can predict and test which items light will pass through and not pass through.	The student can plan and conduct an investigation to determine the effect of placing objects made of different materials in the path of a light beam.
D. Ask questions to determine cause and effect relationships of magnetic interactions between two objects not in contact with each other (S1P1).	The student can use objects to determine which objects are magnetic and non-magnetic.	The student can classify and distinguish between objects that are magnetic and non-magnetic.	The student can ask questions to determine cause and effect relationships between magnetic interactions between two objects not in contact with each other.	The student can provide evidence of the cause and effect relationships between magnetic interactions between two objects not in contact with each other.

Third Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
C. Make observations to provide evidence that energy can be transferred from place to place by heat (S3P1).	The student can make observations that energy can be transferred from place to place by heat but unable to provide evidence.	The student can summarize evidence derived from observations that energy can be transferred from place to place by heat.	The student can explain that the evidence derived from observations that energy can be transferred from place to place by heat.	The student can prove that the evidence derived from observations shows that energy can be transferred from place to place by heat.
D. Ask questions to determine cause and effect relationships of magnetic interactions between two objects not in contact with each other (S3P2).	The student can identify magnetic interactions between two objects not in contact with each other.	The student can summarize the magnetic interactions between two objects not in contact with each other.	The student can formulate questions to determine cause and effect relationships of magnetic interactions between two objects not in contact with each other.	The student can critique answers to the questions formulated to determine cause and effect relationships of magnetic interactions between two objects not in contact with each other.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
D. Ask questions to determine causes and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	The student can define vocabulary related to magnets or electricity	The student can compare and contrast electricity and magnetism.	The student can ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	The student can research and explain how electricity and magnetism is used together in real world situations.

ELEMENTARY GRADUATION STANDARDS- Life Science

Graduation Standard: ELE7

Life Science: Structure, Function, and Information Processing

Students will apply scientific and engineering practices to understand and analyze molecular, structural, and chemical biology as they relate to biological systems and each level of organization from cells to organ systems.

Performance Indicators

A. Create an evidence-based argument to determine whether learned behaviors or inherited traits have a greater influence on who we are. (S5L2.a)

B. Use tools to examine different types of cells and determine the similarities and differences among them. (S5L3.a)

C. Construct an argument that genes contain the information that is the basis for our traits and are passed from one generation to the next. (S5L2.a-b)

D. Develop a classification model that can be used to distinguish a plant cell from an animal cell. (S5L3.b)

E. Construct an argument that the cell membrane, nucleus, and cytoplasm are needed to maintain a healthy internal environment (homeostasis) for all cells and why plant cells also need a cell wall. (S5L3.b)

F. Describe and illustrate the similarities and differences that exist among single-celled and multi-celled organisms. (S5L3.c)

G. Design and conduct an experiment to determine the basic needs of a plant and roles of specific plant structures in helping the plant get those basic needs. (S1L1.b and c)

H. Create a model to show similarities and differences in the needs of plants and animals. (S1L1.a and b.)

I. Create an artifact that displays parent and offspring organisms and describe the similarities and differences among them. Provide an explanation for the similarities and differences described. http://www.dnaftb.org (SKL2)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Kindergarten

Performance Indicators	Emerging	Progressing	Competent	Exemplary
I. Create an artifact that displays parent and offspring organisms and describe the similarities and differences among them. Provide an explanation for the similarities and differences described. http://www.dnaftrecognizeb.org (SKL2)	The student can explain the difference between living and non-living organisms.	The student can identify animals as living organisms and group animals according to how they are similar or different.	The student can describe and illustrate two or more similarities and differences between a parent and baby (human or animal)	The student can create an artifact that displays parent and offspring organisms and describe the similarities and differences between them. I can provide an explanation for the similarities and differences described.

First Grade

Performance Indicators	Emerging	Progressing	Competent	Exemplary
ELE7.G Design and conduct an experiment to determine the basic needs of a plant and roles of specific plant structures in helping the plant get those basic needs. (S1L1.b and c)	The student can draw and label the parts of a plant. I can tell the basic needs of a plant.	The student can make observations about how plants grow I can make observations of the roles of specific plant structures.	The student can design and conduct an experiment to determine the basic needs of a plant. I can design and conduct an experiment to explain the roles of specific plant structures in helping the plant get those basic needs.	The student can analyze different scenarios with seeds to determine the basic needs of a plant. I can create a model of a plant to show the basic parts.
ELE.7 H Create a model to show similarities and differences in the needs of plants and animals. (S1L1.a and b.)	The student can recognize the basic needs of plants and animals.	The student can distinguish between the needs of plants and animals.	The student can compare and contrast the needs of plants and animals.	The student can create a model to show similarities and differences in the needs of plants and animals.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
B. Use tools to examine different types of cells and determine the similarities and differences among them.	The student can draw the different types of cells.	The student can compare the different types of cells	The student can use tools to examine different types of cells and determine the similarities and differences among them.	The student can apply the differences to real world examples.
C. Construct an argument that genes contain the information that is the basis for our traits and are passed from one generation to the next.	The student can define what genes are.	The student can identify patterns found in traits that are passed from generations to the next.	The student can construct an argument that genes contain the information that is the basis for our traits and are passed from one generation to the next.	The student can critique a constructed argument of others.
D. Develop a classification model that can be used to distinguish a plant cell from an animal cell.	The student can draw and label the plant and animal cell.	The student can compare the different types of cells.	The student can develop a classification model that can be used to distinguish a plant cell from an animal cell.	The student can apply the differences to real world examples.
E. Construct an argument that the cell membrane, nucleus, and cytoplasm are needed to maintain a healthy internal environment for all cells and why plant cells also need a cell wall.	The student can identify the parts of an animal and plant cell.	The student can distinguish the function of the different organelles in both plant and animal cell.	The student can construct an argument that the cell membrane, nucleus, and cytoplasm are needed to maintain a healthy internal environment for all cells and why plant cells also need a cell wall.	The student can apply concepts learned to explain the term homeostasis.

F. Describe and illustrate the similarities and differences that exist among single-celled and multi-celled organisms.	The student can name single-celled and multi-celled organisms.	The student can compare and contrast a multi-celled organism to a single-celled organism.	The student can describe and illustrate the similarities and differences that exist among single-celled and multi-celled organisms.	The student can create a model comparing single-celled to multi-celled organisms.

ELEMENTARY GRADUATION STANDARDS- Life Science

Graduation Standard: ELE8

Life Science: Matter and Energy in Organisms and Ecosystems

Students will apply scientific and engineering practices to understand and analyze the characteristics, functions, and behavioral interactions within an ecosystem.

Performance Indicators

A. Develop a map of Georgia that illustrates the types of ecological communities present and the organisms that live in them. Identify trends that you notice while constructing the map. (S3L1.a)

B. Observe an ecosystem in your community and create a model that identifies a sample of the producers, consumers, and decomposers and that shows how these organisms are dependent on each other. Construct a sample food web and food chain from the ecosystem you observe. (S4L1.a.b)

C. Create an argument with evidence to explain what will happen to other populations of organisms if plants or animals from an ecosystem are scarce or too abundant. (S4L1.d)

D. Research and construct an argument that either rejects or accepts the claim that all microorganisms in an ecosystem are harmful. (S5L4)

E. Plan and conduct a scientific investigation to determine the effect of soil microorganisms on the growth of plants. (S5L4.a)

F. Analyze data from the CDC for a specific harmful microorganism (may be assigned) and construct an argument for the effects of the microorganism on the human population (S5L4.b)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Third Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Develop a map of Georgia that illustrates the types of ecological communities present and the organisms that live in them. Identify trends that you notice while constructing the map (S3L1a).	The student can label a map of Georgia that illustrates the types of ecological communities present and the organisms that live in them.	The student can develop a map of Georgia that only illustrates the types of ecological communities present.	The student can develop a map of Georgia that illustrates the types of ecological communities present and the organisms that live in them. Identify trends that you notice while constructing the map.	The student can critique the trends noticed while constructing the map of Georgia.

Fourth Grade

Performance Indicators	Emerging	Progressing	Competent	Exemplary
B. Observe an ecosystem in your community and create a model that identifies a sample of the producers, consumers, and decomposers and that shows how these organisms are dependent on each other.	The student can identify samples of the producers, consumers and decomposers in your community.	The student can create a model that identifies a sample of the producers, consumers and decomposers in your community.	The student can create a model that identifies a sample of the producers, consumers, and decomposers and that shows how these organisms are dependent on each other in your community.	The student can create a model that identifies a sample of the producers, consumers, and decomposers that analyzes how these organisms are dependent on each other in your community, predicting the effects of external factors on the ecosystem.
Construct a sample food web and food chain from the ecosystem you observe.	The student can identify a food web and food chain from the ecosystem they observe.	The student can classify a food web and food chain from the ecosystem they observe.	The student can construct a sample food web and food chain from an ecosystem in their community.	The student can construct and analyze a food web and food chain, predicting the effects of external factors on the food chain and food web.
C. Create an argument with evidence to explain what will happen to other populations of organisms if plants or animals from an ecosystem are scarce or too abundant.	The student can state that problems exist when plants or animals from an ecosystem are scarce or too abundant.	The student can distinguish the difference between populations within an ecosystem that are scarce or too abundant, and that affect other organisms.	Providing sufficient evidence, the student can construct an explanation of what will happen to other populations of organisms if plants or animals from an ecosystem are scarce or too abundant.	Providing sufficient evidence, the student can analyze the effects of scarcity and overabundance on populations of organisms within an ecosystem and provide possible solutions to these problems.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
D. Research and construct an argument that either refutes or accepts the claim that all microorganisms in an ecosystem are harmful.	The student can identify the harmful or beneficial microorganisms.	The student can identify both harmful and helpful microorganisms.	The student can research and construct an argument that either refutes or accepts the claim that all microorganisms in an ecosystem are harmful.	The student can analyze data from the CDC for specific harmful microorganism and construct an argument for the effects of the microorganism on the human population.

ELEMENTARY GRADUATION STANDARDS- Life Science

Graduation Standard: ELE9

Life Science: Growth, Development, and Reproduction of Organisms, Natural Selection, and Adaptations

Students will apply scientific and engineering practices to understand and analyze the relationship between genetics, adaptation, and biodiversity.

Performance Indicators

A. Research the different traits found in fruit flies and create a model to show how the trait(s) you choose are passed from parent to offspring. Relate the inheritance of the traits to the ability of the flies to survive in their natural habitat (S5L2.b.)
http://www.dnaftb.org/10/index.html

B. Generate an argument with evidence to explain whether behaviors are the result of genetics, environment or both. (S5L2.a)

C. Describe and illustrate how DNA contributes to the similarities and differences of life and the development of adaptations in organisms. (S5L2.b.)

D. Construct a model to demonstrate that in a particular habitat (may be in the state of GA) some organisms (plant or animal) can better survive than others and describe why some organisms cannot survive in certain habitats at all. (S3L1.b and c; S4L2.a)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Second Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Determine the sequence of the life cycle of common animals in your area: a mammal such as a cat or dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.	The student can draw and label the sequence of the life cycle of common animals in your area: a mammal such as a cat or dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.	The student can classify the sequence of the life cycle of common animals in your area: a mammal such as a cat or dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.	The student can differentiate between the sequences of the life cycles of two common animals in your area: a mammal such as a cat or dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.	The student can make connections between the sequences of the life cycles of two common animals in your area: a mammal such as a cat or dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.

B. Relate seasonal changes to observations of how a tree changes throughout a school year.	The student can identify seasonal changes of how a tree changes throughout a school year.	The student can observe seasonal changes of how a tree changes throughout a school year.	The student can critique seasonal changes of how a tree changes throughout a school year.	The student can analyze seasonal changes of how different tree change throughout a school year.
C. Investigate the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.	The student can draw and label the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.	The student can classify the sequence of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.	The student can investigate the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.	The student can analyze the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.

Third Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
D. Construct a model to demonstrate that in a particular habitat (in GA) some organisms (plant or animal) can better survive than others and describe why some organisms cannot survive in certain habitats at all.	The student can recite what will happen to an organism if changes are made to the habitat.	The student can distinguish between various features of animals that allow them to live and thrive in different regions of GA.	The student can construct a model of various features that allow living organisms to thrive within a particular habitat in GA.	The student can synthesize and gather information about factors that have impacted the survival of organisms in a particular habitat.

Fourth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
D. Construct a model to demonstrate that in a particular habitat where certain organisms (plant or animal) can better survive than others and describe why some organisms cannot survive in certain habitats at all.	The student can identify components of a particular habitat.	The student can identify and interpret components of a particular habitat and explain.	The student can identify particular habitats related to GA and explain why some organisms do not thrive in certain habitats.	The student can identify and distinguish particular habitats related to GA and prove why some organisms do not thrive in certain habitats.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
ELE9 **Read texts and use media to determine patterns in learned behaviors and inherited traits from parent to offspring.**	The student can define what inherited traits and learned behaviors are.	The student can identify the learned behaviors and inherited traits in offspring.	The student can read texts and use media to determine patterns in learned behaviors and inherited traits from parent to offspring.	The student can will generate an argument with evidence to explain whether behaviors are the result of genetics, environment or both.

ELEMENTARY GRADUATION STANDARDS- Life Science

Graduation Standard: ELE10

Life Science: Classification and the diversity of organisms

Students will apply scientific and engineering practices to understand and analyze the structural similarities of organisms and how they can be compared scientifically.

Performance Indicators

A. Develop a model and a method for classifying a given group of plants and/or animals (vertebrate and invertebrate) and compare your method to an established method for classifying organisms (i.e. modern taxonomy). Provide an explanation of the rational for your model. (SKL1. b and c; SKL2.a and b; S5L.1.a and b)

Scoring Criteria By Grade Level: NOTE: Only the applicable criteria are listed.

Kindergarten

Performance Indicators	Emerging	Progressing	Competent	Exemplary
A. Develop a model and a method for classifying a given group of plants and/or animals (vertebrate and invertebrate) and compare your method to an established method for classifying organisms (i.e. modern taxonomy). Provide an explanation of the rational for your model. (SKL1. b and c; S5L.1.a and b)	The student can identify the difference between an animal and a plant.	The student can group plants according to one observable feature AND group animals according to one observable feature.	The student can classify by collecting and displaying plants AND animals (vertebrate and invertebrate) according to more than two observable features. The student can make observations and construct a report based on my findings.	The student can develop a model and a method for classifying animals (vertebrate and invertebrate) and plants. The student can construct a report that explains and proves my rational for the method I used in classifying the animals and plants.
SKL2.a and b;	The student can sort different types of animals into groups and I can sort different types of plants into groups.	The student can explain about one similarity or one difference in animals and I can explain about one similarity or one difference in plants.	The student can classify by collecting and displaying plants AND animals (vertebrate and invertebrate) by their similarities and differences. The student can make observations and construct a report based on my findings.	The student can develop a model and a method for demonstrating the similarities and differences between animals (vertebrate and invertebrate) and plants. The student can construct a report that explains and proves my understanding of the similarities and differences found for the animals and plants based on my model.

Second Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Identify fungi (mushroom) as living organisms	The student can recall fungi (mushrooms) as living organisms.	The student can identify fungi (mushrooms) as living organisms.	The student can construct the life cycle of fungi (mushrooms) as living organisms.	The student can create a model of the life cycle of fungi (mushrooms) as living organisms.

Fifth Grade

Performance Indicators	**Emerging**	**Progressing**	**Competent**	**Exemplary**
A. Develop a model and a method for classifying a given group of animals (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibians, reptile, bird and mammal).	The student can group various items.	The student can relate grouping to vertebrates and invertebrates.	The student can develop a model and a method for classifying a given group of animals (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibians, reptile, bird and mammal).	The student can determine the scientific names for a collected group of animals and develop a dichotomous key that can be used to identify the organisms collected.
A. Develop a model and method for classifying a given group of plants (vascular and non-vascular)	The student can recognize if a plant is vascular or nonvascular.	The student can support ideas with details and examples if different plants.	The student can develop a model and method for classifying a given group of plants (vascular and non-vascular)	The student can determine the scientific names for a collected group of leaves or plants and develop a dichotomous key that can be used to identify the organisms collected.