

Course Syllabus

Science, Science Grade 4

Morgan County Curriculum 4.1 Elementary., Final
Morgan County School District

Physical Science: Motion & Forces (25%)

■ 1.2.1 (DOK 3) ASSESSED

The learner will be able to students will interpret or represent data related to an object's straight-line motion in order to make inferences and predictions of changes in position and/or time. An object's motion can be described by measuring its change in position over time such as rolling different objects (e.g., spheres, toy cars) down a ramp. Collecting and representing data related to an object's motion provides the opportunity to make comparisons and draw conclusions.

■ 1.2.2 (DOK 3) ASSESSED

The learner will be able to students will infer causes and effects of pushes and pulls (forces) on objects based on representations or interpretations of straight-line movement/motion in charts, graphs, and qualitative comparisons. The position and motion of objects can be changed by pushing or pulling. The amount of change is related to the force (defined as the strength of the push or pull) and the mass of the object(s) used. The force with which a ball is hit illustrates this principle. Cause and effect relationships, along with predicted consequences related to the strength of pushes and pulls (force) on an object's position and motion should be explored and qualitatively compared.

■ 1.2.3 (DOK 3) ASSESSED

The learner will be able to explain that sound is a result of vibrations, a type of motion; and describe pitch (high, low) as a difference in sounds that are produced and relate that to the rate of vibration. Vibration is a type of motion that can be observed, described, measured and compared. Sound is produced by vibrating objects. The pitch of the sound can be varied by changing the rate of vibration. The relationship between rates of vibration and produced sounds can be described and graphed.

Earth & Space: Earth & Universe (25%)

■ 2.3.1 (DOK 2) ASSESSED

The learner will be able to classify earth materials by the ways that they are used; and explain how their properties make them useful for different purposes. Earth materials provide many of the resources humans use. The varied materials have different physical properties that can be used to describe, separate, sort and classify them. Inferences about the unique properties of the earth materials yield ideas about their usefulness. For example, some are useful as building materials (e.g., stone, clay, marble), some as sources of fuel (e.g., petroleum, natural gas), or some for growing the plants we use as food.

■ 2.3.2 (DOK 3) ASSESSED

The learner will be able to describe and explain consequences of changes to the surface of the Earth, including some common fast changes like landslides, volcanic eruptions and earthquakes, and some common slow changes like erosion and weathering. The surface of the Earth changes. Some changes are due to slow processes such as erosion or weathering. Some changes are due to rapid processes such as landslides, volcanic eruptions and earthquakes. Analyzing the changes to identify cause and effect relationships helps to define and understand the consequences.

■ 2.3.3 (DOK 3) ASSESSED

The learner will be able to make generalizations and/or predictions about weather changes from day to day and over seasons based on weather data. Weather changes from day to day and over seasons. Weather can be described by observations and measurable quantities such as temperature, wind direction, wind speed and precipitation. Data can be displayed and used to make predictions.

■ 2.3.4 (DOK 3) ASSESSED

The learner will be able to identify patterns, recognize relationships and draw conclusions about the Earth-Sun system by interpreting a variety of representations/models like diagrams, sundials, distance of sun above horizon of the sun's apparent movement in the sky. Changes in movement of objects

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in the sky have patterns that can be observed, described and modeled. The Sun appears to move across the sky in the same way every day, but the Sun's apparent path changes slowly over seasons. Data collected can be used to identify patterns, recognize relationships and draw conclusions about the Earth and Sun system.

■ 2.3.5 Supporting

The learner will be able to understand that the moon moves across the sky on a daily basis much like the Sun. The observable shape of the moon can be described as it changes from day to day in a cycle that lasts about a month.

Biological Science (30%)

■ 3.4.1 (DOK 3) ASSESSED

The learner will be able to compare the different structures and functions of plants and animals that contribute to the growth, survival and reproduction of the organisms; and make inferences about the relationship between structure and function in organisms. Each plant or animal has structures that serve different functions in growth, survival and reproduction. For example, humans have distinct body structures for walking, holding, seeing and talking. Evidence about the relationship between structure and function should be used to make inferences and draw conclusions.

■ 3.4.2 Supporting

The learner will be able to understand that things in the environment are classified as living, nonliving and once living. Living things differ from nonliving things. Organisms are classified into groups by using various characteristics like body coverings, body structures.

■ 3.4.3 (DOK 3) ASSESSED

The learner will be able to compare a variety of life cycles of plants and animals in order to classify and make inferences about an organism. Plants and animals have life cycles that include the beginning of life, growth and development, reproduction and death. The details of a life cycle are different for different organisms. Models of organisms' life cycles should be

used to classify and make inferences about an organism.

■ 3.4.4 (DOK 2) ASSESSED

The learner will be able to identify some characteristics of organisms that are inherited from the parents and others that are learned from interactions with the environment. Observations of plants and animals yield the conclusion that organisms closely resemble their parents at some time in their life cycle. Some characteristics (e.g., the color of flowers, the number of appendages) are passed to offspring. Other characteristics are learned from interactions with the environment, such as the ability to ride a bicycle, and these cannot be passed on to the next generation. Data related to inherited versus learned characteristics can be used to draw conclusions about various groups of organisms.

■ 3.5.1 (DOK 3) ASSESSED

The learner will be able to use representations of fossils to: draw conclusions about the nature of the organisms and the basic environments that existed at the time; make inferences about the relationships to organisms that are alive today. Fossils found in Earth materials provide evidence about organisms that lived long ago and the nature of the environment at that time. Representations of fossils provide the basis for describing and drawing conclusions about the organisms and basic environments represented by them.

Unifying concepts (20%)

■ 4.6.1 (DOK 2) ASSESSED

The learner will be able to students will analyze patterns and make generalizations about the basic relationships of plants and animals in an ecosystem (food chain). Plants make their own food. All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants. Basic relationships and connections between organisms in food chains, including the flow of energy, can be used

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to discover patterns within ecosystems.

■ 4.6.2 (DOK 3) ASSESSED

The learner will be able to students will: analyze data/evidence of the Sun providing light and heat to earth; use data/evidence to substantiate the conclusion that the Sun's light and heat are necessary to sustaining life on Earth. Simple observations, experiments and data collection begin to reveal that the Sun provides the light and heat necessary to maintain the temperature of Earth. Evidence collected and analyzed should be used to substantiate the conclusion that the sun's light and heat are necessary to sustain life on Earth.

■ 4.6.3 (DOK 3) ASSESSED

The learner will be able to evaluate a variety of models/representations of electrical circuits (open, closed, series and/or parallel) to: make predictions related to changes in the system; compare the properties of conducting and non-conducting materials. Electricity in circuits can produce light, heat and sound. Electrical circuits require a complete conducting path through which an electrical current can pass. Analysis of a variety of circuit models creates an opportunity to make predictions about circuits, as well as to demonstrate an understanding of the concepts of open and closed circuits and basic conducting and non-conducting materials.

■ 4.6.4 (DOK 3) ASSESSED

The learner will be able to analyze models/representations of light in order to generalize about the behavior of light.
represent the path of light as it interacts with a variety of surfaces (reflecting, refracting, absorbing).
Light can be observed as traveling in a straight line until it strikes an object. Light can be reflected by a shiny object (e.g., mirror, spoon), refracted by a lens (e.g., magnifying glass, eyeglasses) or absorbed by an object (e.g., dark surface). Questions posed about the behavior and interaction of light with a variety of surfaces, can be explored through investigations using simple equipment.

■ 4.6.5 (DOK 2) ASSESSED

The learner will be able to identify ways that heat can be produced (e.g. burning, rubbing) and properties of materials that conduct heat better than others; describe the movement of heat between objects. Heat can be produced in many ways such as burning or rubbing. Heat moves from a warmer object to a cooler one by contact (conduction) or at a distance. Some materials absorb and conduct heat better than others. Simple investigations can illustrate that metal objects conduct heat better than wooden objects.

■ 4.7.1 (DOK 3) ASSESSED

The learner will be able to students will make predictions and/or inferences based on patterns of evidence related to the survival and reproductive success of organisms in particular environments. The world has many different environments. Distinct environments support the lives of different types of organisms. When the environment changes some plants and animals survive and reproduce and others die or move to new locations. Examples of environmental changes resulting in either increase or decrease in numbers of a particular organism should be explored in order to discover patterns and resulting cause and effect relationships between organisms and their environments (e.g., structures and behaviors that make an organism suited to a particular environment). Connections and conclusions should be made based on the data.

■ 4.7.2 (DOK 3) ASSESSED

The learner will be able to describe human interactions in the environment where they live; classify the interactions as beneficial or harmful to the environment using data/evidence to support conclusions.
All organisms, including humans, cause changes in the environment where they live. Some of these changes are detrimental to the organism or to other organisms; other changes are beneficial (e.g., dams benefit some aquatic organisms but are detrimental to others). By evaluating the consequences of change using cause and effect relationships, solutions to real life situations/dilemmas can be proposed. t

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