

To facilitate lesson plan development, the Center for Educational and Training Technology (C.E.T.T.) at Mississippi State University has created a quick lesson planning resource by including MDE's Performance Level Descriptors (PLD's) in the 2010 Mississippi Science Framework. <http://cett.msstate.edu>

FIFTH GRADE

CONTENT STRANDS:

Inquiry
Physical Science

Life Science
Earth and Space Science

COMPETENCIES AND OBJECTIVES:

INQUIRY

1. Develop and demonstrate an understanding of scientific inquiry using process skills. **Blueprint: 8 OBJ/7 ITEMS**

Advanced – 1a. Design a fair scientific investigation including analyzing the data, forming conclusions, manipulating variables and using experimental controls.

Proficient – 1a. Form a hypothesis and predict outcomes, based upon a fair investigation that includes manipulating variables and using experimental controls.

Basic – 1a. Identify the components of a fair investigation (hypothesis, prediction or outcome, manipulating variables, or experimental control).

- a. Form a hypothesis, predict outcomes, and conduct a fair investigation that includes manipulating variables and using experimental controls. (DOK 3)

Proficient – 1b. Distinguish between observations and inferences.

- b. Distinguish between observations and inferences. (DOK 2)

Proficient – 1c. Use precise measurement (e.g. "to the nearest millimeter") in conjunction with simple tools and technology to perform tests and collect data.

Basic – 1c. Identify a simple tool and its associated unit of measurement used to collect data.

- c. Use precise measurement in conjunction with simple tools and technology to perform tests and collect data. (DOK 1)
 - Tools (English rulers [to the nearest one-sixteenth of an inch], metric rulers [to the nearest millimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges, barometers, hygrometers)
 - Types of data (height, mass, volume, temperature, length, time, distance, volume, perimeter, area)

Advanced – 1d. Justify a conclusion based upon data

Proficient – 1d. Organize and interpret data tables and graphs to construct explanations and draw conclusions.

Basic – 1d. Recognize data patterns

- d. Organize and interpret data in tables and graphs to construct explanations and draw conclusions. (DOK 2)

Proficient – 1e. Use drawings, tables, graphs, and written and oral language to describe objects and explain ideas and actions.

- e. Use drawings, tables, graphs, and written and oral language to describe objects and explain ideas and actions. (DOK 2)

Proficient – 1f. Make and compare different proposals when designing a solution or product.

Basic – 1f. Identify an appropriate design for the solution for a problem.

- f. Make and compare different proposals when designing a solution or product. (DOK 2)

Advanced – 1g. Justify that data are significant .

Proficient – 1g. Evaluate whether data results are significant or insignificant.

- g. Evaluate results of different data (whether trivial or significant). (DOK 2)

Proficient – 1h. Infer and describe alternate explanations and predictions.

- h. Infer and describe alternate explanations and predictions. (DOK 3)

PHYSICAL SCIENCE

2. Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world.

Blueprint: 7 OBJ/14 ITEMS

Advanced – 2a. Predict how an object will act and interact based on its properties.

Proficient – 2a. Determine how the properties of an object affect how it acts and interacts.

- a. Determine how the properties of an object affect how it acts and interacts. (DOK 2)

Proficient – 2b. Differentiate between elements, compounds, and mixtures and between chemical and physical changes.

Basic – 2b. Identify elements, compounds, mixtures, chemical changes or physical changes.

- b. Differentiate between elements, compounds, and mixtures and between chemical and physical changes (e.g., gas evolves, color, and/or temperature changes). (DOK 2)

Advanced – 2c. Predict the motion of an object based on position, direction of motion, and speed.

Proficient – 2c. Investigate the motion of an object in terms of its position, direction of motion, and speed.

- c. Investigate the motion of an object in terms of its position, direction of motion, and speed. (DOK 2)
- The relative positions and movements of objects using points of reference (distance vs. time of moving objects)
 - Force required to move an object using appropriate devices (e.g., spring scale)
 - Variables that affect speed (e.g., ramp height/length/surface, mass of object)
 - Effects of an unbalanced force on an object's motion in terms of speed and direction

Proficient – 2d. Categorize examples of potential energy as gravitational, elastic, chemical.

- d. Categorize examples of potential energy as gravitational (e.g., boulder on a hill, child on a slide), elastic (e.g., compressed spring, slingshot, rubber band), or chemical (e.g., unlit match, food). (DOK 2)

Proficient – 2e. Differentiate between the properties of light as reflection, refraction, and absorption.

Basic – 2e. Recognize the effect of prisms, lenses, mirrors, and eyeglasses on the characteristics of light.

- e. Differentiate between the properties of light as reflection, refraction, and absorption. (DOK 1)
- Image reflected by a plane mirror and a curved-surfaced mirror
 - Light passing through air or water
 - Optical tools such as prisms, lenses, mirrors, and eyeglasses

Proficient – 2f. Describe physical properties of matter including mixtures and solutions.

Basic – 2f. Define mass, density, boiling point, freezing point and other physical properties of matter.

- f. Describe physical properties of matter (e.g., mass, density, boiling point, freezing point) including mixtures and solutions. (DOK 1)
- Filtration, sifting, magnetism, evaporation, and flotation
 - Mass, density, boiling point, and freezing point of matter
 - Effects of temperature changes on the solubility of substances

Advanced – 2g. Evaluate a marketable application of conductors and/or insulators.

Proficient – 2g. Categorize materials as conductors or insulators and discuss their real life applications.

- g. Categorize materials as conductors or insulators and discuss their real life applications (e.g., building construction, clothing, animal covering). (DOK 2)

LIFE SCIENCE

3. Predict characteristics, structures, life cycles, environments, evolution, and diversity of organisms. **Blueprint: 5 OBJ/10 ITEMS**

Advanced – 3a. Predict how structural or behavioral adaptations of an organism will allow that organisms to continue living in a changing environment.

Proficient – 3a. Compare and contrast the diversity of organisms due to adaptations to show how organisms have evolved as a result of environmental changes.

Basic – 3a. Identify the adaptation that allows an organism to live in their particular environment.

- a. Compare and contrast the diversity of organisms due to adaptations to show how organisms have evolved as a result of environmental changes. (DOK 2)
- Diversity based on kingdoms, phyla, and classes (e.g., internal/external structure, body temperature, size, shape)
 - Adaptations that increase an organism's chances to survive and reproduce in a particular habitat (e.g., cacti needles/leaves, fur/scales)
 - Evidence of fossils as indicators of how life and environmental conditions have changed

Proficient – 3b. Research and classify the organization of living things.

Basic – 3b. Identify the components (e.g., cells, organs, organ systems) within an organized, living system.

- b. Research and classify the organization of living things. (DOK 2)
- Differences between plant and animal cells
 - Function of the major parts of body systems (nervous, circulatory, respiratory, digestive, skeletal, muscular) and the ways they support one another
 - Examples of organisms as single-celled or multi-celled

Proficient – 3c. Research and cite evidence of the work of scientists as it contributed to the discovery and prevention of disease.

- c. Research and cite evidence of the work of scientists (e.g., Pasteur, Fleming, Salk) as it contributed to the discovery and prevention of disease. (DOK 3)

Proficient – 3d. Distinguish between asexual and sexual reproduction.

Basic – 3d. Identify reproduction as asexual or sexual.

- d. Distinguish between asexual and sexual reproduction. (DOK 1)
- Asexual reproduction processes in plants and fungi (e.g., vegetative propagation in stems, roots, and leaves of plants, budding in yeasts, fruiting bodies in fungi)
 - Asexual cell division (mushroom spores produced/dispersed)
 - Sexual reproduction (e.g., eggs, seeds, fruit)

Advanced – 3e. Predict how possible changes in the food web or environment will affect the flow of energy.

Proficient – 3e. Give examples of how consumers and producers are related in food chains and food webs.

Basic – 3e. Identify the levels of organization in a food chain or food web (e.g., producers, consumers, herbivores, carnivores, omnivores).

- e. Give examples of how consumers and producers (carnivores, herbivores, omnivores, and decomposers) are related in food chains and food webs. (DOK 1)

EARTH AND SPACE SCIENCE

4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky. **Blueprint: 7 OBJ/14 ITEMS**

Proficient – 4a. Categorize Earth's materials.

Basic – 4a. Identify Earth's materials.

- a. Categorize Earth's materials. (DOK 1)
 - Rocks, minerals, soils, water, and atmospheric gases
 - Layers of the atmosphere, hydrosphere, and lithosphere

Advanced – 4b. Explain how constructive processes combine with destructive processes to create certain land features.

Proficient – 4b. Explain how surface features caused by constructive processes differ from destructive processes.

Basic – 4b. Identify surface features formed from constructive or destructive processes.

- b. Explain how surface features caused by constructive processes (e.g., depositions, volcanic eruptions, earthquakes) differ from destructive processes (e.g., erosion, weathering, impact of organisms). (DOK 2)

Advanced – 4c. Predict weather based on the season and collected data.

Proficient – 4c. Summarize how weather changes.

Basic – 4c. Identify tools used for collecting weather data.

- c. Summarize how weather changes. (DOK 2)
 - Weather changes from day to day and over the seasons
 - Tools by which weather is observed, recorded, and predicted

Advanced – 4d. Critique ways to conserve natural resources.

Proficient – 4d. Describe changes caused by humans on the environment and natural resources and cite evidence from research of ways to conserve natural resources in the United States, including Mississippi.

- d. Describe changes caused by humans on the environment and natural resources and cite evidence from research of ways to conserve natural resources in the United States, including (but not limited to) Mississippi. Examples of Mississippi efforts include the following: (DOK 2)
- Associated Physics of America, a private company located in Greenwood Mississippi, develops ways to convert a variety of agricultural products into efficient, environment-friendly and cost-effective energy sources.
 - The Natural Resource Enterprises (NRE) Program of the Department of Wildlife and Fisheries and the Cooperative Extension Service at MSU educate landowners in the Southeast about sustainable natural resource enterprises and compatible habitat management practices.
 - The Engineer Research and Development Center of the Vicksburg District of the U.S. Army Corps of Engineers provides quality engineering and other professional products and services to develop and manage the Nation's water resources, reduce flood damage, and protect the environment.

Advanced – 4e. Compare the movement patterns of the moon around the Earth to the movement pattern of the Earth around the sun over a specific time period.

Proficient – 4e. Predict the movement patterns of the sun, moon, and Earth over a specified time period.

Basic – 4e. Identify the location of the sun, moon, or Earth at a specific time period.

- e. Predict the movement patterns of the sun, moon, and Earth over a specified time period. (DOK 1)

Proficient – 4f. Compare and contrast the physical characteristics of the planets.

Basic – 4f. Identify physical characteristics (e.g. mass, surface gravity, moons) of a planet.

- f. Compare and contrast the physical characteristics of the planets (e.g., mass, surface gravity, distance from the sun, surface characteristics, moons). (DOK 2)

Proficient – 4g. Conclude that the supply of many Earth resources is limited and critique a plan to extend the use of Earth's resources.

- g. Conclude that the supply of many Earth resources (e.g., fuels, metals, fresh water, farmland) is limited and critique a plan to extend the use of Earth's resources (e.g., recycling, reuse, renewal). (DOK 3)