Strand: Inquiry

Mississippi Department of Education
***2010 Mississippi Science Framework* Vertical Alignment**

Kindergarten	First Grade	Second Grade	Third Grade	Fourth Grade	Fifth Grade	Sixth Grade	Seventh Grade	Eighth Grade
Abilities Necessary to do Scientific Inquiry								
1a. Demonstrate an understanding of a simple investigation by asking questions. (DOK 2)	1a. Demonstrate an understanding of a simple investigation by asking appropriate questions about objects, organisms, and events. (DOK 2)	1a. Formulate questions about objects and organisms and predict outcomes in order to conduct a simple investigation. (DOK 2)	1a. Identify questions and predict outcomes that can be examined through scientific investigations. (DOK 3)	1a. Form hypotheses and predict outcomes of problems to be investigated. (DOK 3)	1a. Form a hypothesis, predict outcomes, and conduct a fair investigation that includes manipulating variables and using experimental controls. (DOK 3)	1a. Design and conduct an investigation that includes predicting outcomes, using experimental controls, and making inferences. (DOK 3)	1a. Design, conduct, and draw conclusions from an investigation that includes using experimental controls. (DOK 3)	1a. Design, conduct, and analyze conclusions from an investigation that includes using experimental controls. (DOK 3)
1b. Compare, sort, and group objects according to size, shape, color, and texture. (DOK 2)	1b. Compare, sort, and group objects according to their attributes. (DOK 2)	1b. Compare, sort, and group objects according to two or more attributes. (DOK 2)	1b. Describe familiar objects and events using the senses to collect qualitative (color, size, shape) information. (DOK 1)	1b. Use the senses and simple tools to gather qualitative information about objects or events (size, shape, color, texture, sound, position, change). (DOK 1)	1b. Distinguish between observations and inferences. (DOK 2)	1b. Distinguish between qualitative and quantitative observations and make inferences based on observations. (DOK 3)	1b. Discriminate among observations, inferences, and predictions. (DOK 1)	1b. Distinguish between qualitative and quantitative observations and make inferences based on observations. (DOK 3)
Tools and Techniques of Scientific Inquiry								
1c. Identify simple tools (**rulers, thermometers, scales,** and **hand lenses**) used to gather information. (DOK 1)	1c. Use simple tools (rulers, scales, hand lenses, thermometers, **microscopes**) to gather information. (DOK 1) • Length, using nonstandard units (paper clips, Unifix cubes, etc.)and standard units (inches, centimeters) • Weight, using a balance scale with and without nonstandard units • Capacity, using nonstandard units	1c. Use simple tools (rulers, thermometers, scales, hand lenses, microscopes, **balances,** and **clocks**) to gather information. (DOK 1) • Length, to the nearest inch, foot, yard, centimeter, and meter • Capacity, to the nearest ounce, cup, pint, quart, gallon, and liter • Weight, to the nearest ounce, pound, gram, and kilogram • Time, to the nearest hour, half-hour, quarter-hour, and five-minute intervals (using digital and analog clocks)	1c. Select and use simple tools (rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, and **calculators**) to gather information. (DOK 1) • Length, to the nearest half of an inch, foot, yard, centimeter, and meter • Capacity and weight/mass, in English and metric systems • Time, to the nearest minute • Temperature, to the nearest degree	1c. Demonstrate the accurate use of simple tools to gather and compare information. (DOK 1) • Tools (English rulers [to the nearest eighth of an inch], metric rulers [to the nearest centimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, **anemometers** and **rain gauges**) • Types of data (height, mass/weight, temperature, length, distance, volume, area perimeter)	1c. 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,** and **hygrometers)** • Types of data (height, mass, volume, temperature, length, time, distance, volume, perimeter, area)	1c. Use simple tools and resources to gather and compare information (using standard, metric, and non-standard units of measurement). (DOK 1) • Tools (English and metric rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, rain gauges, anemometers, barometers, **telescopes, compasses, spring scales**) • Types of data (linear measures, mass, volume, temperature, time, area, perimeter) • Resources (e.g., Internet, electronic encyclopedias, journals, community resources, etc.)	1c. Collect and display data using simple tools and resources to compare information (using standard, metric, and non-standard measurement). (DOK 2) • Tools (English and metric rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, rain gauges, anemometers, barometers, tele-scopes, compasses, spring scales, **pH indicators, stopwatches**) • Types of data (linear measures, mass, volume, temperature, area, perimeter) • Resources (e.g., Internet, electronic encyclopedias, journals, community resources, etc.)	1c. Summarize data to show the cause and effect relationship between qualitative and quantitative observations (using standard, metric, and non-standard units of measurement). (DOK 3) • Tools (English and metric rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, rain gauges, anemo-meters, barometers, telescopes, compasses, spring scales, pH indicators, stopwatches, **graduated cylinders, medicine droppers)** • Types of data (linear measures, mass, volume, temperature, area, perimeter) • Resources (e.g., Internet, electronic encyclopedias, journals, community

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								resources, etc.)
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Analyze Information and Draw Conclusions								
1d. Recognize that people have always had questions about their world and identify science as one way of answering questions and explaining the natural world. (DOK 1)	1d. Match a simple problem to a technological solution related to the problem (e.g., dull pencil – sharpener, bright light – sunglasses, hot room – fan, cold head – hat, heavy baby – stroller). (DOK 1)	1d. Collect and display technological products (e.g., zipper, coat, hook, ceiling fan pull chain, can opener, bridge, apple peeler, wheel barrow, nut cracker, etc.) to determine their function. (DOK 1)	1d. Draw conclusions and communicate the results of an investigation. (DOK 2)	1d. Use simple sketches, diagrams, tables, charts, and writing to draw conclusions and communicate data results. (DOK 2)	1d. Organize and interpret data in tables and graphs to construct explanations and draw conclusions. (DOK 2)	1d. Analyze data collected from a scientific investigation to construct explanations and draw conclusions. (DOK 3)	1d. Organize data in tables and graphs and analyze data to construct explanations and draw conclusions. (DOK 3)	1d. Analyze evidence that is used to form explanations and draw conclusions. (DOK 3)
				1g. Draw conclusions about important steps (e.g., making observations, asking questions, trying to solve a problem, etc.) that led to inventions and discoveries. (DOK 3)	1g. Evaluate results of different data (whether trivial or significant). (DOK 2)	1g. Infer explanations for why scientists might draw different conclusions from a given set of data. (DOK 2)	1g. Develop a logical argument to explain why scientists often review and ask questions about the results of other scientists' work. (DOK 3)	1g. Justify a scientist's need to revise conclusions after encountering new experimental evidence that does not match existing explanations. (DOK 3)
					1h. Infer and describe alternate explanations and predictions. (DOK 3)	1h. Recognize and analyze alternative explanations and predictions. (DOK 2)	1h. Make relationships between evidence and explanations. (DOK 2)	1h. Analyze different ideas and recognize the skepticism of others as part of the scientific process in considering alternative conclusions. (DOK 3)
Communicate Scientific Procedures and Explanations								
1e. Describe ideas using drawings and oral expression. (DOK 2)	1e. Use diagrams, written, and oral expression to describe ideas or data. (DOK 2)	1e. Create line graphs, bar graphs, and pictographs, to communicate data. (DOK 2)	1e. Communicate data by creating diagrams, charts, tables, and graphs. (DOK 2)	1e. Interpret and describe patterns of data using drawings, diagrams, charts, tables, graphs, and maps. (DOK 2)	1e. Use drawings, tables, graphs, and written and oral language to describe objects and explain ideas and actions. (DOK 2)	1e. Communicate scientific procedures and conclusions using diagrams, charts, tables, graphs, maps, written explanations, and/or scientific models. (DOK 2)	1e. Communicate results of scientific procedures and explanations through a variety of written and graphic methods. (DOK 2)	1e. Develop a logical argument defending conclusions of an experimental method. (DOK 3)
Understandings About Scientific Inquiry								
1f. Recognize that when a science investigation is done the way it was done before, very similar results are expected. (DOK 1)	1f. Predict the results of an investigation if it is repeated. (DOK 2)	1f. Infer that science investigations generally work the same way in different places. (DOK 2)	1f. Ask questions and seek answers to explain why different results sometimes occur in repeated investigations. (DOK 2)	1f. Explain why scientists and engineers often work in teams with different individuals doing different things that contribute to the results. (DOK 2)	1f. Make and compare different proposals when designing a solution or product. (DOK 2)	1f. Evaluate the results or solutions to problems by considering how well a product or design met the challenge to solve a problem. (DOK 3)	1f. Explain how science and technology are reciprocal. (DOK 1)	1f. Develop a logical argument to explain why perfectly designed solutions do not exist. (DOK 3)