### Abilities Necessary to do Scientific Inquiry

<table>
<thead>
<tr>
<th>Kindergarten</th>
<th>First Grade</th>
<th>Second Grade</th>
<th>Third Grade</th>
<th>Fourth Grade</th>
<th>Fifth Grade</th>
<th>Sixth Grade</th>
<th>Seventh Grade</th>
<th>Eighth Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Demonstrate an understanding of a simple investigation by asking questions. (DOK 2)</td>
<td>1a. Demonstrate an understanding of a simple investigation by asking appropriate questions about objects, organisms, and events. (DOK 2)</td>
<td>1a. Formulate questions about objects and predict outcomes in order to conduct a simple investigation. (DOK 2)</td>
<td>1a. Identify questions and predict outcomes that can be examined through scientific investigations. (DOK 3)</td>
<td>1a. Form hypotheses and predict outcomes of problems to be investigated. (DOK 3)</td>
<td>1a. Design and conduct an investigation that includes predicting outcomes, using experimental controls, and making inferences. (DOK 3)</td>
<td>1a. Design, conduct, and draw conclusions from an investigation that includes using experimental controls. (DOK 3)</td>
<td>1a. Design, conduct, and analyze conclusions from an investigation that includes using experimental controls. (DOK 3)</td>
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</tbody>
</table>

**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, thermometers, scales, hand lenses, microscopes) to gather information. (DOK 1) | 1c. Use simple tools (rulers, thermometers, scales, hand lenses, microscopes) to gather information. (DOK 1) | 1c. Identify simple tools (rulers, thermometers, scales, hand lenses, microscopes) to gather information. (DOK 1) | 1c. Demonstrate the accurate use of simple tools in conjunction with simple tools and technology to perform tests and collect data. (DOK 1) | 1c. Use simple tools and resources to gather and compare information (using standard, metric, and non-standard units of measurement). (DOK 1) | 1c. Collect and display data using simple tools and resources to compare information (using standard, metric, and non-standard units of measurement). (DOK 3) | 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) |
| | Length, using standard units (paper clips, Unifix cubes, etc.) | Length, to the nearest inch, foot, yard, centimeter, and meter | Length, to the nearest quarter, half-hour, and five-minute intervals (using digital and analog clocks) | Tools (English rulers [to the nearest eighth of an inch], metric rulers [to the nearest centimeter]) | Tools (English rules and metric rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, rain gauges, anemometers, barometers, telescopes, compasses, spring scales) | Tools (English and metric rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, rain gauges, anemometers, barometers, telescopes, compasses, spring scales, pH indicators, stopwatches) | Tools (English and metric rulers, thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, rain gauges, anemometers, barometers, telescopes, compasses, spring scales, pH indicators, stopwatches, graduated cylinders, medicine droppers) | 1c. Identify simple tools (rulers, thermometers, scales, and hand lenses) used to gather information. (DOK 1) | 1c. Use simple tools (rulers, thermometers, scales, hand lenses, microscopes) to gather information. (DOK 1) | 1c. Use simple tools (rulers, thermometers, scales, hand lenses, microscopes) to gather information. (DOK 1) | 1c. Identify simple tools (rulers, thermometers, scales, hand lenses, microscopes) to gather information. (DOK 1) | 1c. Demonstrate the accurate use of simple tools in conjunction with simple tools and technology to perform tests and collect data. (DOK 1) | 1c. Use simple tools and resources to gather and compare information (using standard, metric, and non-standard units of measurement). (DOK 1) | 1c. Collect and display data using simple tools and resources to compare information (using standard, metric, and non-standard units of measurement). (DOK 3) | 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) |

| 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. 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 and compare information about objects or events (size, shape, color, texture, sound, position, change). (DOK 1) | 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) | 1b. Distinguish between qualitative and quantitative observations and make inferences based on observations. (DOK 3) |

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

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)

1g. Infer and describe alternate explanations and predictions. (DOK 3)

1h. Infer and describe alternate 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)

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 through 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. 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)