

**Math Out of the Box Correlation
to
South Carolina Academic Standards
for
Mathematics – 2007**

**Grade Four
Developing Algebraic Thinking: Signs and Symbols**

Increasingly complex repeating and growing patterns are explored leading to writing general rules. Variables are introduced as letters or symbols representing unknowns. Functional relationships are investigated. Change over time data is collected. Data displays include tally tables, line plots, bar graphs, and line graphs. The mean is introduced and used to analyze data along with range, mode, and median. A change-over-time journal is kept.

This correlation was developed by the Math Out of the Box Staff.

Send email to mootb@clemson.edu with questions and comments.



Correlation Information

The purpose of this document is to provide a correlation of Math Out of the Box lessons to the South Carolina Academic Standards for Mathematics, 2007. These correlations are intended to aid classroom teachers with lesson planning, schools with vertical planning, and districts with curriculum planning.

The correlation document is arranged in the following order:

Process Standards

Process standards that are used in the lessons of the subconcept to develop conceptual understanding of mathematics are listed in this column. It is recommended that one process standard be selected for formative assessment in each subconcept.

Content Standards

The content standards listed in this column are those that are addressed in one or more of the phases of the learning cycle in the listed lessons. Standards are connected by subconcept because conceptual knowledge is built in sets of lessons in the Math Out of the Box curriculum. These subconcepts are connected to a big idea of mathematics. The first lesson of a subconcept is an embedded pre-assessment, connecting to prior learning. The final lesson in a subconcept is designed to be formative and summative.

Horizontal Connections

Connections to mathematics standards in other strands are listed here to show the horizontal weave of the Math Out of the Box curriculum. These connections provide opportunities for the development of connections between mathematical concepts, maintenance of skills, and additional practice.

Vertical Connections

Foundation standards show the vertical articulation of the lessons. At times, an investigation is planned in a lesson to specifically build a foundation for the standards in the next grade or grades. These lessons, or parts of lessons, are essential so that concepts are connected from grade to grade.

Cross Curricular Connections

Connections to standards from other subject areas are listed to aid in cross curricular integration and the development of curriculum maps.



Big Idea: Patterns are in the world around us.

Subconcept: Number sequences can be described, analyzed, and extended.

Lessons 1, 2, 3

Focus Question: In what ways can number patterns be described?

Process Standards	Content Standards	Horizontal Connections
<p>Mathematics Standard 4-1 (Process): The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.</p> <p>Indicators</p> <p>4-1.1 Analyze information to solve increasingly more sophisticated problems.</p> <p>4-1.2 Construct arguments that lead to conclusions about general mathematical properties and relationships.</p> <p>4-1.3 Explain and justify answers to problems on the basis of mathematical properties, structures, and relationships on mathematical properties, structures, and relationships.</p> <p>4-1.4 Generate descriptions and mathematical statements about relationships between and among classes of objects.</p> <p>4-1.5 Use correct, complete, and clearly written and oral mathematical language to pose questions, communicate ideas, and extend problem situations.</p> <p>4-1.6 Generalize connections between new mathematical ideas and related concepts and subjects that have been previously considered.</p> <p>4-1.7 Use flexibility in mathematical representations.</p> <p>4-1.8 Recognize the limitations of various forms of mathematical representations.</p>	<p>Mathematics Standard 4-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of numeric and nonnumeric patterns, the representation of simple mathematical relationships, and the application of procedures to find the value of an unknown.</p> <p>Indicators</p> <p>4-3.1 Analyze numeric, nonnumeric, and repeating patterns involving all operations and decimal patterns through hundredths.</p> <p>4-3.2 Generalize a rule for numeric, nonnumeric, and repeating patterns involving all operations.</p> <p>4-3.3 Use a rule to complete a sequence or a table.</p>	<p>Mathematics Standard 4-2 (Numbers and Operations): The student will demonstrate through the mathematical processes an understanding of decimal notation as an extension of the place-value system; the relationships between fractions and decimals; the multiplication of whole numbers; and accurate, efficient, and generalizable methods of dividing whole numbers, adding decimals, and subtracting decimals.</p> <p>Indicators</p> <p>4-2.6 Analyze the magnitude of digits through hundredths on the basis of their place value.</p> <p>4-2.7 Compare decimals through hundredths by using the terms <i>is less than</i>, <i>is greater than</i>, and <i>is equal to</i> and the symbols $<$, $>$, and $=$.</p> <p>4-2.12 Generate strategies to add and subtract decimals through hundredths.</p>

Notes:

Vertical Connections	Cross Curricular Connections
<p>Grade 5 Standard 5-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of the use of patterns, relations, functions models, structures, and algebraic symbols to represent quantitative relationships and will analyze change in various contexts.</p> <p>Indicators 5-3.1 Represent numeric, algebraic, and geometric patterns in words, symbols, algebraic expressions, and algebraic equations. 5-3.2 Analyze patterns and functions with words, tables, and graphs. 5-3.3 Match tables, graphs, expressions, equations, and verbal descriptions of the same problem situation.</p> <p>Grade 6 Standard 6-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of writing, interpreting, and using mathematical expressions, equations, and inequalities.</p> <p>Indicators 6-3.1 Analyze numeric and algebraic patterns and pattern relationships.</p> <p>Grade 7 Standard 7-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of proportional relationships.</p> <p>Indicators 7-3.1 Analyze geometric patterns and pattern relationships.</p>	<p>Language Arts Standard 4-2 (Reading) The student will read and comprehend a variety of informational texts in print and nonprint formats.</p> <p>Indicators 4-2.2 Analyze informational texts to draw conclusions and make inferences.</p> <p>Standard 4-4 (Writing) The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English.</p> <p>Indicators 4-4.6 Use revision strategies to improve word choice and the organization and development of ideas in written works.</p> <p>Standard 4-5 (Writing) The student will write for a variety of purposes and audiences.</p> <p>Standard 4-6 (Researching) The student will access and use information from a variety of sources.</p> <p>Indicators 4-6.2 Use print sources such as books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs and nonprint media to access information.</p>

Notes:



Big Idea: Patterns are in the world around us.

Subconcept: Growing patterns can be described, analyzed, and extended.

Lessons 4, 5, 6

Focus Question: In what ways can growing patterns be described?

Process Standards	Content Standards	Horizontal Connections
<p>Mathematics Standard 4-1 (Process): The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation. Indicators 4-1.1 Analyze information to solve increasingly more sophisticated problems. 4-1.2 Construct arguments that lead to conclusions about general mathematical properties and relationships. 4-1.3 Explain and justify answers to problems on the basis of mathematical properties, structures, and relationships on mathematical properties, structures, and relationships. 4-1.4 Generate descriptions and mathematical statements about relationships between and among classes of objects. 4-1.5 Use correct, complete, and clearly written and oral mathematical language to pose questions, communicate ideas, and extend problem situations. 4-1.6 Generalize connections between new mathematical ideas and related concepts and subjects that have been previously considered. 4-1.7 Use flexibility in mathematical representations. 4-1.8 Recognize the limitations of various forms of mathematical representations.</p>	<p>Mathematics Standard 4-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of numeric and nonnumeric patterns, the representation of simple mathematical relationships, and the application of procedures to find the value of an unknown. Indicators 4-3.2 Generalize a rule for numeric, nonnumeric, and repeating patterns involving all operations. 4-3.3 Use a rule to complete a sequence or a table. 4-3.4 Translate among, letters, symbols, and words to represent quantities in simple mathematical expressions or equations.</p>	<p>Mathematics Standard 4-5 (Measurement): The student will demonstrate through the mathematical processes an understanding of elapsed time; conversions within the U.S. Customary System; and accurate, efficient, and generalizable methods of determining area. Indicators 4-5.4 Analyze the perimeter of a polygon.</p>

Notes:



Vertical Connections	Cross Curricular Connections
<p>Grade 5 Standard 5-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of the use of patterns, relations, functions models, structures, and algebraic symbols to represent quantitative relationships and will analyze change in various contexts.</p> <p>Indicators 5-3.1 Represent numeric, algebraic, and geometric patterns in words, symbols, algebraic expressions, and algebraic equations. 5-3.2 Analyze patterns and functions with words, tables, and graphs. 5-3.3 Match tables, graphs, expressions, equations, and verbal descriptions of the same problem situation.</p> <p>Grade 6 Standard 6-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of writing, interpreting, and using mathematical expressions, equations, and inequalities.</p> <p>Indicators 6-3.1 Analyze numeric and algebraic patterns and pattern relationships.</p> <p>Grade 7 Standard 7-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of proportional relationships.</p> <p>Indicators 7-3.1 Analyze geometric patterns and pattern relationships.</p>	<p>Language Arts Standard 4-1 (Reading) The student will read and comprehend a variety of literary texts in print and nonprint formats.</p> <p>Indicators 4-1.1 Analyze literary texts to draw conclusions and make inferences.</p> <p>Standard 4-4 (Writing) The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English.</p> <p>Indicators 4-4.6 Use revision strategies to improve word choice and the organization and development of ideas in written works.</p> <p>Standard 4-5 (Writing) The student will write for a variety of purposes and audiences.</p> <p>Standard 4-6 (Researching) The student will access and use information from a variety of sources.</p> <p>Indicators 4-6.2 Use print sources such as books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs and nonprint media to access information.</p>

Notes:

Big Idea: Patterns are in the world around us.

Subconcept: Relationships can be analyzed to determine rules.

Lessons 7, 8, 9, 10

Focus Question: What relationships between function machines and tables can be described?

Process Standards	Content Standards	Horizontal Connections
<p>Mathematics Standard 4-1 (Process): The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation. Indicators 4-1.1 Analyze information to solve increasingly more sophisticated problems. 4-1.2 Construct arguments that lead to conclusions about general mathematical properties and relationships. 4-1.3 Explain and justify answers to problems on the basis of mathematical properties, structures, and relationships on mathematical properties, structures, and relationships. 4-1.4 Generate descriptions and mathematical statements about relationships between and among classes of objects. 4-1.5 Use correct, complete, and clearly written and oral mathematical language to pose questions, communicate ideas, and extend problem situations. 4-1.6 Generalize connections between new mathematical ideas and related concepts and subjects that have been previously considered. 4-1.7 Use flexibility in mathematical representations. 4-1.8 Recognize the limitations of various forms of mathematical representations.</p>	<p>Mathematics Standard 4-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of numeric and nonnumeric patterns, the representation of simple mathematical relationships, and the application of procedures to find the value of an unknown. Indicators 4-3.1 Analyze numeric, nonnumeric, and repeating patterns involving all operations and decimal patterns through hundredths. 4-3.2 Generalize a rule for numeric, nonnumeric, and repeating patterns involving all operations. 4-3.3 Use a rule to complete a sequence or a table. 4-3.4 Translate among, letters, symbols, and words to represent quantities in simple mathematical expressions or equations. 4-3.5 Apply procedures to find the value of an unknown letter or symbol in a whole-number equation.</p>	<p>Mathematics Standard 4-2 (Numbers and Operations): The student will demonstrate through the mathematical processes an understanding of decimal notation as an extension of the place-value system; the relationships between fractions and decimals; the multiplication of whole numbers; and accurate, efficient, and generalizable methods of dividing whole numbers, adding decimals, and subtracting decimals. Indicators 4-2.2 Apply divisibility rules for 2, 5, and 10. 4-2.5 Generate strategies to divide whole numbers by single-digit divisors.</p>

Vertical Connections	Cross Curricular Connections
<p>Grade 5 Standard 5-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of the use of patterns, relations, functions models, structures, and algebraic symbols to represent quantitative relationships and will analyze change in various contexts. Indicators 5-3.1 Represent numeric, algebraic, and geometric patterns in words, symbols, algebraic expressions, and algebraic equations. 5-3.2 Analyze patterns and functions with words, tables, and graphs. 5-3.3 Match tables, graphs, expressions, equations, and verbal descriptions of the same problem situation.</p> <p>Grade 6 Standard 6-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of writing, interpreting, and using mathematical expressions, equations, and inequalities. Indicators 6-3.1 Analyze numeric and algebraic patterns and pattern relationships.</p> <p>Grade 7 Standard 7-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of proportional relationships. Indicators 7-3.1 Analyze geometric patterns and pattern relationships.</p>	<p>Language Arts Standard 4-4 (Writing) The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English. Indicators 4-4.3 Create multiple-paragraph compositions that include a central idea with supporting details and use appropriate transitions between paragraphs. 4-4.6 Use revision strategies to improve word choice and the organization and development of ideas in written works.</p> <p>Standard 4-5 (Writing) The student will write for a variety of purposes and audiences.</p> <p>Standard 4-6 (Researching) The student will access and use information from a variety of sources. Indicators 4-6.2 Use print sources such as books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs and nonprint media to access information.</p>

Notes:

Big Idea: Data can be collected about the world around us.

Subconcept: Categorical data can be analyzed and displayed.

Lessons 11, 12, 13

Focus Question: In what ways can categorical data be represented?

Process Standards	Content Standards	Horizontal Connections
<p>Mathematics Standard 4-1 (Process): The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.</p> <p>Indicators</p> <p>4-1.1 Analyze information to solve increasingly more sophisticated problems.</p> <p>4-1.2 Construct arguments that lead to conclusions about general mathematical properties and relationships.</p> <p>4-1.3 Explain and justify answers to problems on the basis of mathematical properties, structures, and relationships on mathematical properties, structures, and relationships.</p> <p>4-1.4 Generate descriptions and mathematical statements about relationships between and among classes of objects.</p> <p>4-1.5 Use correct, complete, and clearly written and oral mathematical language to pose questions, communicate ideas, and extend problem situations.</p> <p>4-1.6 Generalize connections between new mathematical ideas and related concepts and subjects that have been previously considered.</p> <p>4-1.7 Use flexibility in mathematical representations.</p> <p>4-1.8 Recognize the limitations of various forms of mathematical representations.</p>	<p>Mathematics Standard 4-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the impact of data-collection methods, the appropriate graph for categorical or numerical data, and the analysis of possible outcomes for a simple event.</p> <p>Indicators</p> <p>4-6.1 Compare how data-collection methods impact survey results.</p> <p>4-6.2 Interpret data in tables, line graphs, bar graphs, and double bar graphs whose scale increments are greater than or equal to 1.</p> <p>4-6.3 Organize data in tables, line graphs, and bar graphs whose scale increments are greater than or equal to 1.</p> <p>4-6.4 Distinguish between categorical and numerical data.</p> <p>4-6.5 Match categorical and numerical data to appropriate graphs.</p>	<p>Mathematics Standard 4-3 (Algebra): The student will demonstrate through the mathematical processes an understanding of numeric and nonnumeric patterns, the representation of simple mathematical relationships, and the application of procedures to find the value of an unknown.</p> <p>Indicators</p> <p>4-3.3 Use a rule to complete a sequence or a table.</p>

Notes:



Vertical Connections	Cross Curricular Connections
<p>Grade 5 Standard 5-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of investigation design, the effect of data-collection methods on a data set, the interpretation and application of the measures of central tendency, and the application of basic concepts of probability. Indicators 5-6.1 Design a mathematical investigation to address a question. 5-6.2 Analyze how data-collection methods affect the nature of the data set. 5-6.3 Apply procedures to calculate the measures of central tendency (mean, median, and mode). 5-6.4 Interpret the meaning and application of the measures of central tendency.</p> <p>Grade 6 Standard 6-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the relationships within one population or sample. Indicators 6-6.1 Predict the characteristics of one population based on the analysis of sample data. 6-6.2 Organize data in frequency tables, histograms, or stem-and-leaf plots as appropriate. 6-6.3 Analyze which measure of central tendency (mean, median, or mode) is the most appropriate for a given purpose.</p> <p>Grade 7 Standard 7-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the relationships between two populations or samples. Indicators 7-6.1 Predict the characteristics of two populations based on the analysis of sample data. 7-6.2 Organize data in box plots or circle graphs as appropriate. 7-6.3 Apply procedures to calculate the interquartile range. 7-6.4 Interpret the interquartile range for data.</p>	<p>Language Arts Standard 4-2 (Reading) The student will read and comprehend a variety of informational texts in print and nonprint formats. Indicators 4-2.1 Summarize evidence that supports the central idea of a given informational text. 4-2.2 Analyze informational texts to draw conclusions and make inferences. 4-2.3 Analyze informational texts to locate and identify facts and opinions. 4-2.5 Carry out independent reading for extended periods of time to gain information. 4-2.7 Use graphic features such as illustrations, graphs, charts, maps, diagrams, and graphic organizers as sources of information.</p> <p>Standard 4-4 (Writing) The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English. Indicators 4-4.3 Create multiple-paragraph compositions that include a central idea with supporting details and use appropriate transitions between paragraphs. 4-4.6 Use revision strategies to improve word choice and the organization and development of ideas in written works.</p> <p>Standard 4-5 (Writing) The student will write for a variety of purposes and audiences.</p> <p>Standard 4-6 (Researching) The student will access and use information from a variety of sources. Indicators 4-6.2 Use print sources such as books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs and nonprint media to access information.</p> <p>Science Standard 4-1 (Scientific Inquiry) The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific investigation. Indicators 4-1.6 Construct and interpret diagrams, tables, and graphs made from recorded measurements and observations.</p>



Big Idea: Data can be collected about the world around us.
Subconcept: Numerical data can be analyzed and displayed.
Lessons 14, 15, 16

Focus Question: In what ways can numerical data be represented?

Process Standards	Content Standards	Horizontal Connections
<p>Mathematics Standard 4-1 (Process): The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.</p> <p>Indicators</p> <p>4-1.1 Analyze information to solve increasingly more sophisticated problems.</p> <p>4-1.2 Construct arguments that lead to conclusions about general mathematical properties and relationships.</p> <p>4-1.3 Explain and justify answers to problems on the basis of mathematical properties, structures, and relationships on mathematical properties, structures, and relationships.</p> <p>4-1.4 Generate descriptions and mathematical statements about relationships between and among classes of objects.</p> <p>4-1.5 Use correct, complete, and clearly written and oral mathematical language to pose questions, communicate ideas, and extend problem situations.</p> <p>4-1.6 Generalize connections between new mathematical ideas and related concepts and subjects that have been previously considered.</p> <p>4-1.7 Use flexibility in mathematical representations.</p> <p>4-1.8 Recognize the limitations of various forms of mathematical representations.</p>	<p>Mathematics Standard 4-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the impact of data-collection methods, the appropriate graph for categorical or numerical data, and the analysis of possible outcomes for a simple event.</p> <p>Indicators</p> <p>4-6.2 Interpret data in tables, line graphs, bar graphs, and double bar graphs whose scale increments are greater than or equal to 1.</p> <p>4-6.3 Organize data in tables, line graphs, and bar graphs whose scale increments are greater than or equal to 1.</p> <p>4-6.4 Distinguish between categorical and numerical data.</p> <p>4-6.5 Match categorical and numerical data to appropriate graphs.</p>	<p>Mathematics Standard 4-5 (Measurement): The student will demonstrate through the mathematical processes an understanding of elapsed time; conversions within the U.S. Customary System; and accurate, efficient, and generalizable methods of determining area.</p> <p>Indicators</p> <p>4-5.1 Use appropriate tools to measure objects to the nearest unit: measuring length in quarter inches, centimeters, and millimeters; measuring liquid volume in cups, quarts, and liters; and measuring weight and mass in pounds, milligrams, and kilograms.</p> <p>4-5.9 Exemplify situations in which highly accurate measurements are required.</p>

Notes:

Vertical Connections	Cross Curricular Connections
<p>Grade 5 Standard 5-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of investigation design, the effect of data-collection methods on a data set, the interpretation and application of the measures of central tendency, and the application of basic concepts of probability. Indicators 5-6.1 Design a mathematical investigation to address a question. 5-6.2 Analyze how data-collection methods affect the nature of the data set.</p> <p>Grade 6 Standard 6-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the relationships within one population or sample. Indicators 6-6.1 Predict the characteristics of one population based on the analysis of sample data. 6-6.2 Organize data in frequency tables, histograms, or stem-and-leaf plots as appropriate. 6-6.3 Analyze which measure of central tendency (mean, median, or mode) is the most appropriate for a given purpose.</p> <p>Grade 7 Standard 7-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the relationships between two populations or samples. Indicators 7-6.1 Predict the characteristics of two populations based on the analysis of sample data. 7-6.2 Organize data in box plots or circle graphs as appropriate. 7-6.3 Apply procedures to calculate the interquartile range. 7-6.4 Interpret the interquartile range for data.</p>	<p>Language Arts Standard 4-2 (Reading) The student will read and comprehend a variety of informational texts in print and nonprint formats. Indicators 4-2.1 Summarize evidence that supports the central idea of a given informational text. 4-2.2 Analyze informational texts to draw conclusions and make inferences. 4-2.3 Analyze informational texts to locate and identify facts and opinions. 4-2.5 Carry out independent reading for extended periods of time to gain information. 4-2.7 Use graphic features such as illustrations, graphs, charts, maps, diagrams, and graphic organizers as sources of information.</p> <p>Standard 4-4 (Writing) The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English. Indicators 4-4.3 Create multiple-paragraph compositions that include a central idea with supporting details and use appropriate transitions between paragraphs. 4-4.6 Use revision strategies to improve word choice and the organization and development of ideas in written works.</p> <p>Standard 4-5 (Writing) The student will write for a variety of purposes and audiences.</p> <p>Standard 4-6 (Researching) The student will access and use information from a variety of sources. Indicators 4-6.2 Use print sources such as books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs and nonprint media to access information.</p> <p>Science Standard 4-1 (Scientific Inquiry): The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific investigation. Indicators 4-1.1 Classify observations as either quantitative or qualitative.</p>



	<p>4-1.2 Use appropriate instruments and tools (including a compass, an anemometer, mirrors, and a prism) safely and accurately when conducting simple investigations.</p> <p>4-1.3 Summarize the characteristics of a simple scientific investigation that represent a fair test (including a question that identifies the problem, a prediction that indicates a possible outcome, a process that tests one manipulated variable at a time, and results that are communicated and explained).</p> <p>4-1.4 Distinguish among observations, predictions, and inferences.</p> <p>4-1.6 Construct and interpret diagrams, tables, and graphs made from recorded measurements and observations.</p> <p>4-1.7 Use appropriate safety procedures when conducting investigations.</p>
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Notes:

Big Idea: Data can be collected about the world around us.

Subconcept: A story can be told about the data.

Lessons 17, 18, 19, 20

Focus Question: How does the data-collection method impact the results?

Process Standards	Content Standards	Horizontal Connections
<p>Mathematics Standard 4-1 (Process): The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.</p> <p>Indicators</p> <p>4-1.1 Analyze information to solve increasingly more sophisticated problems.</p> <p>4-1.2 Construct arguments that lead to conclusions about general mathematical properties and relationships.</p> <p>4-1.3 Explain and justify answers to problems on the basis of mathematical properties, structures, and relationships on mathematical properties, structures, and relationships.</p> <p>4-1.4 Generate descriptions and mathematical statements about relationships between and among classes of objects.</p> <p>4-1.5 Use correct, complete, and clearly written and oral mathematical language to pose questions, communicate ideas, and extend problem situations.</p> <p>4-1.6 Generalize connections between new mathematical ideas and related concepts and subjects that have been previously considered.</p> <p>4-1.7 Use flexibility in mathematical representations.</p> <p>4-1.8 Recognize the limitations of various forms of mathematical representations.</p>	<p>Mathematics Standard 4-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the impact of data-collection methods, the appropriate graph for categorical or numerical data, and the analysis of possible outcomes for a simple event.</p> <p>Indicators</p> <p>4-6.1 Compare how data-collection methods impact survey results.</p> <p>4-6.2 Interpret data in tables, line graphs, bar graphs, and double bar graphs whose scale increments are greater than or equal to 1.</p> <p>4-6.3 Organize data in tables, line graphs, and bar graphs whose scale increments are greater than or equal to 1.</p> <p>4-6.4 Distinguish between categorical and numerical data.</p> <p>4-6.5 Match categorical and numerical data to appropriate graphs.</p>	<p>Mathematics Standard 4-5 (Measurement): The student will demonstrate through the mathematical processes an understanding of elapsed time; conversions within the U.S. Customary System; and accurate, efficient, and generalizable methods of determining area.</p> <p>Indicators</p> <p>4-5.1 Use appropriate tools to measure objects to the nearest unit: measuring length in quarter inches, centimeters, and millimeters; measuring liquid volume in cups, quarts, and liters; and measuring weight and mass in pounds, milligrams, and kilograms.</p> <p>4-5.7 Use Celsius and Fahrenheit thermometers to determine temperature changes during time intervals.</p> <p>4-5.9 Exemplify situations in which highly accurate measurements are required.</p>

Notes:



Vertical Connections	Cross Curricular Connections
<p>Grade 5 Standard 5-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of investigation design, the effect of data-collection methods on a data set, the interpretation and application of the measures of central tendency, and the application of basic concepts of probability.</p> <p>Indicators</p> <p>5-6.1 Design a mathematical investigation to address a question.</p> <p>5-6.2 Analyze how data-collection methods affect the nature of the data set.</p> <p>5-6.3 Apply procedures to calculate the measures of central tendency (mean, median, and mode).</p> <p>5-6.4 Interpret the meaning and application of the measures of central tendency.</p> <p>Grade 6 Standard 6-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the relationships within one population or sample.</p> <p>Indicators</p> <p>6-6.1 Predict the characteristics of one population based on the analysis of sample data.</p> <p>6-6.2 Organize data in frequency tables, histograms, or stem-and-leaf plots as appropriate.</p> <p>6-6.3 Analyze which measure of central tendency (mean, median, or mode) is the most appropriate for a given purpose.</p> <p>Grade 7 Standard 7-6 (Data Analysis and Probability): The student will demonstrate through the mathematical processes an understanding of the relationships between two populations or samples.</p> <p>Indicators</p> <p>7-6.1 Predict the characteristics of two populations based on the analysis of sample data.</p> <p>7-6.2 Organize data in box plots or circle graphs as appropriate.</p> <p>7-6.3 Apply procedures to calculate the interquartile range.</p> <p>7-6.4 Interpret the interquartile range for data.</p>	<p>Language Arts Standard 4-2 (Reading) The student will read and comprehend a variety of informational texts in print and nonprint formats.</p> <p>Indicators</p> <p>4-2.1 Summarize evidence that supports the central idea of a given informational text.</p> <p>4-2.2 Analyze informational texts to draw conclusions and make inferences.</p> <p>4-2.3 Analyze informational texts to locate and identify facts and opinions.</p> <p>4-2.4 Create responses to informational texts through a variety of methods such as drawings, written works, and oral presentations.</p> <p>4-2.5 Carry out independent reading for extended periods of time to gain information.</p> <p>4-2.7 Use graphic features such as illustrations, graphs, charts, maps, diagrams, and graphic organizers as sources of information.</p> <p>4-2.8 Use functional text features (including tables of contents, glossaries, indexes, and appendices).</p> <p>Standard 4-6 (Researching) The student will access and use information from a variety of sources.</p> <p>Indicators</p> <p>4-6.1 Clarify and refine a research topic.</p> <p>4-6.2 Use print sources such as books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs and nonprint media to access information.</p> <p>4-6.3 Organize information by classifying or sequencing.</p> <p>4-6.4 Paraphrase research information accurately and meaningfully.</p> <p>4-6.5 Create a list of sources that contains information (including the author and title of a publication) necessary to properly credit and document the work of others.</p> <p>4-6.6 Use the Internet with the aid of a teacher.</p> <p>4-6.7 Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.</p> <p>4-6.8 Select appropriate graphics, in print or electronic form, to support written works and oral and visual presentations.</p> <p>Science Standard 4-1 (Scientific Inquiry): The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific</p>



	<p>investigation.</p> <p>Indicators</p> <p>4-1.1 Classify observations as either quantitative or qualitative.</p> <p>4-1.2 Use appropriate instruments and tools (including a compass, an anemometer, mirrors, and a prism) safely and accurately when conducting simple investigations.</p> <p>4-1.3 Summarize the characteristics of a simple scientific investigation that represent a fair test (including a question that identifies the problem, a prediction that indicates a possible outcome, a process that tests one manipulated variable at a time, and results that are communicated and explained).</p> <p>4-1.4 Distinguish among observations, predictions, and inferences.</p> <p>4-1.5 Recognize the correct placement of variables on a line graph.</p> <p>4-1.6 Construct and interpret diagrams, tables, and graphs made from recorded measurements and observations.</p> <p>4-1.7 Use appropriate safety procedures when conducting investigations.</p>
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