



It CAN Be Done!

NM Content Standards & Benchmarks That Can Be Met Through Inquiry-Based Student Research Projects in Grades 5-8

*An Overview of Science, Language Arts, Mathematics, and
Social Studies Standards & Benchmarks That Can Be Met
Via Inquiry-Based Student Research Projects*

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Inquiry-Based Research Projects Meet and Beat the Standards!

LANGUAGE ARTS

When students select a research topic, their first job is to find out more about it. Related language arts standards & benchmarks are met as students sort out fact from fiction in the information that they read. Young investigators create drawings or narratives to summarize the main ideas and list details to support what they have discovered. Finally, all students also use additional related standards & benchmarks in telling their story and presenting their projects in a logical manner. This provides great opportunities for editing and rewriting. At the middle and high school level, students may explain and defend their findings to other teachers, parents and judges. This provides them with experience in both the listening and oral communication related standards & benchmarks.

Every year, teachers across the United States search for ways to meet National and State Educational Standards and Benchmarks in a variety of content areas.

Those who discover a way to meet many standards across several content areas with a single activity feel like they have found a hidden treasure. That is why inquiry-based student research projects are like pure gold these days!

MATHEMATICS

Mathematics is the language of Science. Student research provides ample opportunities to tie in the Mathematics Standards. One of the hidden bonuses is that many students who are traditionally afraid of math finally see a way and a reason to apply their skills! The collection and analysis of data requires the use of integers, fractions, and decimals, or “Number Sense.” “Data Analysis” and “Probability” are the key to the proof or rejection of a hypothesis. Projects commonly use bar graphs and pie charts to show their results and support their conclusions. Good research projects incorporate a number of mathematics standards & benchmarks.

SOCIAL STUDIES

One of the very first steps in beginning a student research project is a review of other scientists' work. In other words, a search for existing information in current and past literature in its many forms (ex: scientific journals, online articles, scholarly papers, newspaper/magazine articles, etc.). And the rest is, as they say, is history! Students learn about historical time lines and world history in the context of the topic of their research project. Many projects involve patterns of land use and its problems, which includes both geography and geology related standards. Disagreements over the use of protected or threatened lands often lead to the integration of civics and government standards. Junior economists often choose to analyze the cost and efficiency of everything from bubble gum to nail polish. So, who says Social Studies has nothing to do with Science?

SCIENCE

Inquiry-based student research projects help students use all of their acquired skills, develop new skills, and explore their natural talents. It is well known that the science standards & benchmarks are addressed by student research projects, but many other standards in all grades are addressed, as well.

HEALTH

Many student research projects are health or medicine related. Every year there are studies regarding which foods are healthier, whether boys are better than girls at one thing or another, how much bacteria is on everything from doorknobs to toilet seats, the effects of music on comprehension, memory & learning, etc. These studies not only pave the way for future medical research, they address even more state standards!

So, teachers, please take the challenge! Engage your students in inquiry-based research projects and meet LOTS of standards & benchmarks at the same time. You can't go wrong...neither can your students. The ability to conduct inquiry-based research and to then present information orally as well as in writing are skills that last a lifetime.

LANGUAGE ARTS

NM Standards & Benchmarks
Potentially Met Via Inquiry-
Based Student Research
Projects

Strand: Reading and Listening for Comprehension

Content Standard I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed.

5-8 Benchmark I-A: Listen to, read, react to, and interpret information

GRADE	PERFORMANCE STANDARDS
5	1. Listen actively and critically. 3. Read aloud grade-appropriate text with fluency, comprehension, expression, and personal style demonstrating an awareness of volume, pace, audience, & purpose. 4. Follow oral instructions that provide information about a task or assignment.
6	6. Reflect on learning experiences by describing personal learning growth and change in perspective. 7. Interpret how personal circumstances and background shape interaction with text.
7	1. Narrate an account (e.g., news story, historical episode) that creates a coherent organizing structure appropriate to purpose, audience, and context and that orients and engages the reader. 2. Respond to informational materials that are read, heard, or viewed.
8	2. Interact in group activities and/or seminars.

Strand: Reading and Listening for Comprehension

Content Standard I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed.

5-8 Benchmark I-B: Gather and use information for research and other purposes

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none">1. Understand concept of primary source.2. Research multiple sources to deepen understanding and integrate information and ideas across varied sources and content areas.3. Make connections between print and non-print texts by recognizing similarities and differences using a variety of resources that contribute to informed decisions.
6	<ol style="list-style-type: none">1. Interpret and synthesize information from a variety of sources.2. Use multiple sources of print and non-print information in developing informational materials such as brochures, newsletters, and advertisements.3. Organize information gathered for a research topic into major components based on appropriate criteria.
7	<ol style="list-style-type: none">1. Use a variety of resources to express individual perspectives in response to personal, social, cultural, and historical issues.2. Interpret and synthesize information by responding to information that is read, heard, or viewed.3. Develop informational products and/or presentations that cite multiple print and non-print sources.4. Examine critical relationships between and among elements of a research topic.
8	<ol style="list-style-type: none">1. Use information for specific tasks by analyzing and evaluating information to extend ideas, analyzing and evaluating themes and central ideas in relation to personal and societal issues, creating a research product in both written and presentation form.2. Use images, videos, and visual representations as informational research tools.

Strand: Reading and Listening for Comprehension

Content Standard I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed.

5-8 Benchmark I-C: Apply critical thinking skills to analyze information

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none">1. Evaluate text to determine author’s purpose and opinion.2. Evaluate the usefulness and quality of information and ideas based on purpose, experiences, text.3. Respond to fiction, non-fiction, poetry, and drama using interpretive, critical, and evaluative processes.4. Make informed judgments about bias, propaganda, stereotyping, and media techniques.5. Analyze cause and effect relationships, compare and contrast information, facts, characters, and objects to predict a logical outcome based on the information in the selection.6. Distinguish between fact and opinion.
6	<ol style="list-style-type: none">1. Use critical thinking skills and create criteria to evaluate text and multimedia.2. Recognize the point of view of the author by considering alternative points of view or reasons by remaining fair-minded and open to other interpretations.3. Develop and apply appropriate criteria to evaluate the quality of communication.
7	<ol style="list-style-type: none">1. Use the problem-solving process to refine understanding.2. Refine critical thinking skills and develop criteria that evaluate arguments and judgments.4. Interpret universal themes, values, and conflicts in a selection.
8	<ol style="list-style-type: none">1. Create a research product in both written and presentation form.2. Analyze the inferences and conclusions from fictional and non-fictional contexts, events, characters, settings, and themes.

Strand: Reading and Listening for Comprehension

Content Standard I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed.

5-8 Benchmark I-D: Demonstrate competence in the skills and strategies of the reading process

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none">1. Apply enabling strategies and skills to read.2. Interact with the text by making predictions, formulating questions, supporting answers from textual information, previous experience, and/or other sources, drawing on personal, literary, and cultural understandings, seeking additional information.3. Read a variety of texts (e.g., fiction, nonfiction, newspaper and magazine articles, poetry, drama)
6	<ol style="list-style-type: none">1. Increase fluency, comprehension, and insight through meaningful and comprehensive reading instruction.2. Generate questions to be answered while reading and reflect on what has been learned after reading.3. Use specific strategies to clear up confusing parts of a text (e.g., re-read the text, consult another source, ask for help).4. Follow oral and written directions for a procedure.
7	<ol style="list-style-type: none">1. Respond to various texts and literary selections using interpretive and evaluative reading processes.3. Accurately identify author's purpose and perspective.4. Use knowledge of context and vocabulary to understand informational text.
8	<ol style="list-style-type: none">1. Analyze the purpose of the author or creator and the impact of that purpose by evaluating biases, messages, and underlying assumptions of a variety of texts and media.3. Recognize when information presented in a text is new knowledge and describe how it can be used.4. Use the various parts of a text to locate specific information (index, table of contents, glossary)5. Identify the topic sentence in a reading selection.

Strand: Writing and Speaking for Expression

Content Standard II: Students will communicate effectively through speaking and writing.

5-8 Benchmark II-A: Use speaking as an interpersonal communication tool

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none">1. Read aloud grade-level text with fluency, comprehension, expression, and personal style demonstrating an awareness of volume, pace, audience, and purpose.2. Use language to formulate hypotheses, evaluate information and ideas, present and support arguments, and influence the thinking of others.3. Make presentations to inform or persuade, selecting vocabulary for impact.
6	<ol style="list-style-type: none">2. Clarify, illustrate, and expand upon topics in discussions.
7	<ol style="list-style-type: none">1. Choose precise and engaging language, well suited to the topic and audience.2. Use figurative language and a variety of speech patterns.3. Choose between standard and non-standard English dialects as appropriate for the topic, purpose, and audience.5. Express individual perspective in response to personal, social, cultural, and historical issues.
8	<ol style="list-style-type: none">1. Present similar content for various purposes and to different audiences showing appropriate changes in delivery.2. Create and present arguments that persuade.3. Identify formal and informal speaking contexts that are reflected in slang, jargon, and different language styles.

Strand: Writing and Speaking for Expression

Content Standard II: Students will communicate effectively through speaking and writing.

5-8 Benchmarks II-B: Apply grammatical and language conventions to communicate

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1. Write sentences that use independent and dependent clauses, transitions, and conjunctions to connect ideas. 2. Identify and correctly use verbs that are often misused (e.g., lie/lay, sit/set, rise/raise). 3. Use colons and quotation marks correctly. 4. Spell most commonly used words accurately using a multi-strategy approach to learn new spellings. 5. Edit final product for grammar, language conventions, and format. 6. Create and deliver focused, coherent presentations that convey ideas clearly and relate to the background and interest of the audience using a variety of media. 7. Evaluate the content of oral communication.
6	<ol style="list-style-type: none"> 1. Use simple, compound, complex, and compound-complex sentences. 2. Use effective coordination and subordination of ideas to express complete thoughts. 3. Identify and properly use indefinite pronouns and present perfect, past perfect, and future perfect verb tenses to convey appropriate meaning. 4. Use verbs that agree with compound subjects. 5. Punctuate using commas that link two clauses with a conjunction in compound sentences. 6. Correctly spell frequently misspelled words (e.g., there, their, they're). 7. Demonstrate an awareness of language conventions and usage during oral presentations. 8. Identify and correct errors in everyday speech. 9. Support opinions expressed with detailed evidence and with visual or media displays that use appropriate technologies.
7	<ol style="list-style-type: none"> 1. Place modifiers properly and use the active voice. 4. Punctuate by correctly using hyphens, dashes, brackets, and semicolons. 5. Spell derivatives correctly by applying the spellings of bases and affixes. 6. Use a variety of sentences correctly by punctuating them properly and avoiding fragments and run-ons. 8. Choose language that is precise, engaging, and well suited to the topic and audience in a variety of oral presentations. 9. Use figurative language and varying speech patterns to convey meaning. 10. Analyze the effect on the viewer of images, text, and sound in electronic journalism. 12. Proofread, listen to, and monitor self to correct errors.
8	<ol style="list-style-type: none"> 1. Use correct and varied sentence types and sentence openings. 3. Juxtapose items for emphasis. 4. Use subordination, coordination, apposition, and other devices to indicate the relationship between ideas. 5. Evaluate the use of dialects in standard and non-standard English. 6. Prepare an outline based upon a chosen pattern of organization to include an introduction; transitions, previews, summaries; a logically developed body; and an effective conclusion. 7. Revise writing for word choice, appropriate organization, consistent point of view, and transitions between paragraphs, passages and ideas.

Strand: Speaking and Writing for Expression

Content Standard II: Students will communicate effectively through speaking and writing.

5-8 Benchmarks II-C: Demonstrate competence in the skills and strategies of the writing process

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1. Produce a variety of written products that demonstrate competence. 2. Apply the writing process through, pre-writing, creating a rough draft, revising for clarity of thought and focused communication, editing, and publishing and sharing of final product. 3. Create journals, notes, stories, reports, and letters using appropriate formats and multimedia technologies to communicate to an audience for a specific purpose. 4. Focus revision on creating simple and/or complex sentences for clarity and impact and on developing a lead, characters, or mood.
6	<ol style="list-style-type: none"> 1. Compose a variety of writings that express individual perspectives drawn from personal or related experience by drafting, revising, editing, and proofreading own written work, using direct feedback from peers to revise content, and writing for public and private audiences. 2. Demonstrate competence in writing essays that present problems and solutions (e.g., identifies and defines the problem, describes a solution clearly and convincingly, presents logical and well-supported reasons). 3. Produce writings that incorporate a definite voice of the author appropriate to the writing purpose. 4. Use electronic media to effectively communicate with others.
7	<ol style="list-style-type: none"> 1. Express individual perspectives in written response to personal, social, cultural, and historical issues. 2. Differentiate shades of meaning and multiple meanings of words. 3. Produce research reports and technical writings that communicate information effectively to a specific audience. 4. Compose a variety of writings that develop sentence fluency to communicate ideas and information clearly using a variety of multimedia technologies.
8	<ol style="list-style-type: none"> 2. Demonstrate competence in writing by using specific strategies (e.g., tension, suspense, eliminating extraneous details, inconsistencies). 3. Create written arguments to persuade by establishing context, creating a persona, developing interest, developing a controlling idea that makes a clear and knowledgeable judgment, arranging details, reasons, and examples effectively, and anticipating and addressing reader/listener concerns.

Strand: Literature and Media

Content Standard III: Students will use literature and media to develop an understanding of people, societies, and the self.

5-8 Benchmarks III-A: Use language, literature, and media to understand various social and cultural perspectives

GRADE	PERFORMANCE STANDARDS
8	2. Use literature and media to reflect on learning experiences.

MATHEMATICS

Grades 5-8

NM Standards & Benchmarks
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Projects

Strand: NUMBER AND OPERATIONS

Standard: Students will understand numerical concepts and mathematical operations.

5-8 Benchmark N.1: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

GRADE	PERFORMANCE STANDARDS
5	4) Interpret percents as part of a hundred (i.e., find decimal and percent equivalents for common fractions, explain how they represent the same value, and compute a given percent of a whole number).
6	3) Use appropriate representations of positive rational numbers in the context of real-life applications.
7	3) Use properties of the real-number system to explain reasoning and to formulate and solve real-world problems.

Strand: NUMBER AND OPERATIONS

Standard: Students will understand numerical concepts and mathematical operations.

5-8 Benchmark N.2: Understand the meaning of operations and how they relate to one another.

GRADE	PERFORMANCE STANDARDS
5	5) Use arithmetic operations and inverse relationships to represent and solve real-world problems.
6	3) Demonstrate the relationship and equivalency among ratios and percents. 5) Explain and perform: <ol style="list-style-type: none"> whole number division and express remainders as decimals or appropriately in the context of the problem addition, subtraction, multiplication, and division with decimals addition and subtraction with integers addition, subtraction, and multiplication with fractions and mixed numerals

7	3) Calculate given percentages of quantities and use them to solve problems (e.g., discounts of sales, interest earned, tips, markups, commission, profit, simple interest).
8	1) Use real number properties (e.g., commutative, associative, distributive) to perform various computational procedures. 2) Perform arithmetic operations and their inverses (e.g., addition/subtraction, multiplication/division, square roots of perfect squares, cube roots of perfect cubes) on real numbers.

Strand: **NUMBER AND OPERATIONS**

Standard: Students will understand numerical concepts and mathematical operations.

5-8 Benchmark N.3: Compute fluently and make reasonable estimates.

GRADE	PERFORMANCE STANDARDS
5	4) Explain how the estimation strategy impacts the result. 7) Recognize and explain the differences between exact and approximate values.
6	2) Use estimates to check reasonableness of results and make predictions in situations involving rational numbers. 6) Interpret and use ratios in different contexts. 7) Compute and perform multiplication and division of fractions and decimals and apply these procedures to solving problems.
7	1) Use estimation to check reasonableness of results, and use this information to make predictions in situations involving rational numbers, π , and simple algebraic equations.
8	1) Formulate algebraic expressions that include real numbers to describe and solve real-world problems. 6) Select and use appropriate forms of rational numbers to solve real-world problems including those involving proportional relationships.

Strand: ALGEBRA

Standard: Students will understand algebraic concepts and applications.

5-8 Benchmark A.1: Understand patterns, relations, and functions.

GRADE	PERFORMANCE STANDARDS
5	2) Describe, represent, and analyze patterns and relationships. 3) Identify, describe, and continue patterns presented in a variety of formats (e.g., numeric, visual, oral, written, kinesthetic, pictorial). 4) Generate a pattern using a written description.
6	3) Explain and use symbols to represent unknown quantities and variable relationships. 4) Explain and use the relationships among ratios, proportions, and percents. 5) Make generalizations based on observed patterns and relationships.
7	1) Identify and continue patterns presented in a variety of formats. 2) Represent a variety of relationships using tables, graphs, verbal rules, and possible symbolic notation, and recognize the same general pattern presented in different representations.
8	1) Move between numerical, tabular, and graphical representations of linear relationships. 2) Use variables to generalize patterns and information presented in tables, charts, and graphs: <ol style="list-style-type: none"> a) graph linear functions noting that the vertical change per unit of horizontal change (the slope of the graph) is always the same b) plot the values of quantities whose ratios are always the same, fit a line to the plot, and understand that the slope of the line equals the quantities

Strand: ALGEBRA

Standard: Students will understand algebraic concepts and applications.

5-8 Benchmark A.2: Represent and analyze mathematical situations and structures using algebraic symbols.

GRADE	PERFORMANCE STANDARDS
6	<ol style="list-style-type: none">1) Solve problems involving proportional relationships.4) Demonstrate that a variable can represent a single quantity that changes.5) Demonstrate how changes in one variable affect other variables.
7	<ol style="list-style-type: none">2) Use variables and appropriate operations to write an expression, an equation, or an inequality that represents a verbal description.6) Use letters as variables in mathematical expressions to describe how one quantity changes when a related quantity changes.
8	<ol style="list-style-type: none">4) Demonstrate understanding of the relationships between ratios, proportions, and percents and solve for a missing term in a proportion.6) Formulate and solve problems involving simple linear relationships, find percents of a given number, variable situations, and unknown quantities.7) Use symbols, variables, expressions, inequalities, equations, and simple systems of equations to represent problem situations that involve variables or unknown quantities.

Strand: **ALGEBRA**

Standard: Students will understand algebraic concepts and applications.

5-8 Benchmark A.3: Use mathematical models to represent and understand quantitative relationships.

GRADE	PERFORMANCE STANDARDS
5	2) Understand and use mathematical models such as: <ol style="list-style-type: none"> a) the number line to model the relationship between rational numbers and rational number operations b) pictorial representation of addition and subtraction of rational numbers with regrouping c) manipulatives or pictures to model computational procedures d) graphs, tables, and charts to describe data e) diagrams or pictures to model problem situations 3) Demonstrate how a situation can be represented in more than one way.
6	1) Develop and use mathematical models to represent and justify mathematical relationships found in a variety of situations. 2) Create, explain, and use mathematical models such as: <ol style="list-style-type: none"> a) Venn diagrams to show the relationships between the characteristics of two or more sets b) equations and inequalities to model numerical relationships c) three-dimensional geometric models d) graphs, tables, and charts to interpret and analyze data
7	1) Create scale models and use them for dimensional drawings. 3) Select and use an appropriate model for a particular situation.
8	1) Generate different representations to model a specific numerical relationship given one representation of data (e.g., a table, a graph, an equation, a verbal description).

Strand: **ALGEBRA**

Standard: Students will understand algebraic concepts and applications.

5-8 Benchmark A.4: Analyze changes in various contexts.

GRADE	PERFORMANCE STANDARDS
5	1) Recognize and create patterns of change from everyday life using numerical or pictorial representations. 2) Generalize patterns of change and recognize the same general patterns presented in different representations.
6	1) Represent and explain changes using one-step equations with one variable. 4) Use tables and symbols to represent and describe proportional and other relationships involving conversions, sequences, and perimeter.
8	1) Use graphs, tables, and algebraic representations to make predictions and solve problems that involve change. 2) Estimate, find, and justify solutions to problems that involve change using tables, graphs, and algebraic expressions. 3) Use appropriate problem-solving strategies (e.g., drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table or graph, working a simpler problem, writing an algebraic expression or working backward) to solve problems that involve change. 5) Analyze problems that involve change by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing, and observing patterns. 6) Generalize a pattern of change using algebra and show the relationship among the equation, graph, and table of values. 7) Recognize the same general pattern of change presented in different representations.

Strand: MEASUREMENT

Standard: Students will understand measurement systems and applications.

5-8 Benchmark M.1: Understand measurable attributes of objects and the units, systems, and processes of measurement.

GRADE	PERFORMANCE STANDARDS
5	1) Understand properties (e.g., length, area, weight, volume) and select the appropriate type of unit for measuring each using both U.S. customary and metric systems. 2) Select and use appropriate units and tools to measure according to the degree of accuracy required in a particular problemsolving situation.
7	2) Select and use the appropriate size and type of unit for a given measurement situation. 5) Use measures expressed as rates and measures expressed as products to solve problems, check the units of the solutions, and analyze the reasonableness of the answer.

Strand: MEASUREMENT

Standard: Students will understand measurement systems and applications.

5-8 Benchmark M.2: Apply appropriate techniques, tools, and formulas to determine measurements.

GRADE	PERFORMANCE STANDARDS
6	1) Apply various measurement techniques and tools, units of measure, and degrees of accuracy to find accurate rational number representations for length, liquid, weight, perimeter, temperature, and time. 4) Select and justify the selection of measurement tools, units of measure, and degrees of accuracy appropriate to the given situation.
8	2) Use estimation to solve problems.

Strand: DATA ANALYSIS AND PROBABILITY

Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

5-8 Benchmark D.1: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1) Construct, read, analyze, and interpret tables, charts, graphs, and data plots. 2) Construct, interpret, and analyze data from graphical representations and draw simple conclusions using bar graphs, line graphs, circle graphs, frequency tables, and Venn diagrams. 3) Display, analyze, compare, and interpret different data sets, including data sets of different sizes. 4) Organize and display single-variable data in appropriate graphs and representations. 5) Organize, read, and display numerical (quantitative) and non-numerical (qualitative) data in a clear, organized, and accurate manner including correct titles, labels, and intervals or categories including: <ol style="list-style-type: none"> a) frequency tables b) stem and leaf plots c) bar, line, and circle graphs d) Venn diagrams e) pictorial displays f) charts and tables 6) Formulate questions and identify data to be collected to correctly answer a question.
6	<ol style="list-style-type: none"> 1) Use statistical representations to analyze data. 5) Solve problems by collecting, organizing, displaying and interpreting data. 6) Compare different samples of a population with the entire population and determine the appropriateness of using a sample. 7) Conduct and explain sampling techniques such as observations, surveys, and random sampling for gathering data. 10) Explain advantages and disadvantages of using various display formats for a specific data set. 11) Formulate and solve problems by collecting, organizing, displaying, and interpreting data.

7	<ol style="list-style-type: none">1) Describe how data representations influences interpretation.2) Select and use appropriate representation for presenting collected data and justify the selection.3) Use measures of central tendency and spread to describe a set of data.7) Use various scales and formats to display the same data set.8) Identify and explain the misleading representations of data.9) Collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set.11) Identify and explain the effects of scale and/or interval changes on graphs of whole number data sets.12) Use and explain sampling techniques (e.g., observations, surveys, and random sampling) for gathering data.13) Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, and selecting, collecting, and displaying appropriate data to address the problem.
8	<ol style="list-style-type: none">2) Generate, organize, and interpret real numbers in a variety of situations.3) Organize, analyze, and display appropriate quantitative and qualitative data to address specific questions including:<ol style="list-style-type: none">a) frequency distributionsb. plotsb) histogramsd. bar, line, and pie graphsc) diagram and pictorial displaysf. charts and tables4) Select the appropriate measure of central tendency to describe a set of data for a particular problem situation.6) Develop an appropriate strategy using a variety of data from surveys, samplings, estimations, and inferences to address a specific problem.

Strand: DATA ANALYSIS AND PROBABILITY

Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

5-8 Benchmark D.2: Select and use appropriate statistical methods to analyze data.

GRADE	PERFORMANCE STANDARDS
5	1) Organize and display single-variable data in appropriate graphs and representations and determine which types of graphs are appropriate for various data sets. 2) Use fractions and percentages to compare data sets of different sizes.
6	1) Choose an appropriate graphical format to organize and represent data. 2) Describe the effects of missing or incorrect data. 3) Compute and analyze statistical measurements for data sets: <ul style="list-style-type: none"> a) understand how additional data added to data sets may affect the computations of central tendency b) understand how the inclusion or exclusion of outliers affects measures of central tendency c) know why a specific measure of central tendency provides the most useful information in a given context 4) Use data samples of a population and describe the characteristics and limitations of the sample. 5) Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population. 6) Explain how the way a question is asked in a survey might influence the results obtained. 7) Identify data that represent sampling errors and explain why the sample and the display might be biased. 8) Identify claims based on statistical data and, in sample cases, evaluate the validity and usefulness of the claims.
7	2) Know various ways to display data sets (e.g., stem and leaf plot, box and whisker plot, scatter plots) and use these forms to display a single set of data or to compare two sets of data. 3) Use the analysis of data to make convincing arguments. 4) Use appropriate technology to gather and display data sets and identify the relationships that exist among variables within the data set. 5) Use data samples of a population and describe the characteristics and limitations of the sample.

	<ol style="list-style-type: none">6) Identify data that represent sampling errors and explain why the sample and the display might be biased.7) Identify claims based on statistical data and evaluate the validity of the claims.
8	<ol style="list-style-type: none">2) Generate, organize, and interpret real number and other data in a variety of situations.3) Analyze data to make decisions and to develop convincing arguments from data displayed in a variety of formats including:<ol style="list-style-type: none">a) plotsb) distributionsc) graphsd) scatter plotse) diagramsf) pictorial displaysg) charts and tablesh) Venn diagrams4) Interpret and analyze data from graphical representations and draw simple conclusions (e.g., line of best fit).5) Evaluate and defend the reasonableness of conclusions drawn from data analysis.6) Use appropriate central tendency and spread as a means for effective decision-making in analyzing data and outliers.7) Identify simple graphic misrepresentations and distortions of sets of data (e.g., unequal interval sizes, omission of parts of axis range, scaling).8) Use appropriate technology to display data as lists, tables, matrices, graphs, and plots and to analyze the relationships of variables in the data displayed.

Strand: DATA ANALYSIS AND PROBABILITY

Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

5-8 Benchmark D.3: Develop and evaluate inferences and predictions that are based on data.

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1) Make and justify valid inferences, predictions, and arguments based on statistical analysis. 2) Compare a given prediction with the results of an investigation. 5) Evaluate the reasonableness of inferences that are based on data in the context of the original solution. 6) Identify the method used to make an inference and/or a prediction on a given data set and solve similar problems. 7) Determine the accuracy of a prediction or an inference based on the accuracy of the data in a given data set.
6	<ol style="list-style-type: none"> 1) Identify claims based on statistical data and evaluate the validity of the claim 2) Conduct observations, surveys, experiments and/or simulations, record the results in charts, tables, or graphs, and use the results to draw conclusions and make predictions. 4) Compare expected results with actual results in a simple experiment.
7	<ol style="list-style-type: none"> 1) Formulate and justify mathematical conjectures based on data and a general description of the mathematical question or problem posed. 2) Analyze data to make accurate inferences, predictions, and to develop convincing arguments from data displayed in a variety of forms.
8	<ol style="list-style-type: none"> 2) Describe how reader bias, measurement errors, and display distortion can affect the interpretation of data, predictions, and inferences based on data. 3) Conduct simple experiments and/or simulations, record results in charts, tables, or graphs, and use the results to draw conclusions and make predictions. 4) Compare expected results with experimental results and information used in predictions and inferences.

Strand: DATA ANALYSIS AND PROBABILITY

Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

5-8 Benchmark D.4: Understand and apply basic concepts of probability.

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1) Determine probabilities through experiments and/or simulations and compare the results with mathematical expressions. 2) Make predictions from the results of student-generated experiments of single events. 3) Identify simple experiments where the probabilities of all outcomes are equal. 6) Use probability to generalize from a simple pattern or set of examples and justify why the generalization is reasonable.
6	<ol style="list-style-type: none"> 1) List all possible outcomes for a compound event composed of two independent events and recognize whether an outcome is certain, impossible, likely, or unlikely. 2) Determine and compare experimental (empirical) and mathematical (theoretical) probabilities (e.g., flipping two color counters). 3) Determine theoretical and experimental probabilities and use them to make predictions about events. 4) Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome. 5) Use data to estimate the probability of future events (e.g., batting averages). 6) Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, $1 - P$ is the probability of the event not occurring. 7) Describe the difference between independent and dependent events and identify situations involving independent or dependent events.
7	<ol style="list-style-type: none"> 1) Determine the probability of a compound event composed of two independent events. 5) Use probability to generate convincing arguments, draw conclusions, and make decisions in a variety of situations. 6) Make predictions based on theoretical probabilities of compound events.

8	<ol style="list-style-type: none">1) Calculate the odds of a desired outcome in a simple experiment.2) Design and use an appropriate simulation to estimate the probability of a real-world event (e.g., disk toss, cube toss).3) Explain the relationship between probability and odds and calculate the odds of a desired outcome in a simple experiment.4) Use theoretical or experimental probability to make predictions about real-world events.5) Use probability to generate convincing arguments, draw conclusions, and make decisions in a variety of situations.6) Understand that the probability of two unrelated events occurring is the sum of the two individual possibilities and that the probability of one event following another, in independent trials, is the product of the two probabilities.
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SOCIAL STUDIES

NM Standards & Benchmarks
Potentially Met Via Inquiry-
Based Student Research
Projects

Strand: History

Content Standard I : Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs, and turning points in New Mexico, United States, and world history in order to understand the complexity of the human experience.

5-8 Benchmark I-D—Skills: Research historical events and people from a variety of perspectives.

Grade	Performance Standards
5	<ol style="list-style-type: none"> 1. Differentiate between, locate, and use primary and secondary sources (e.g., computer software, interviews, biographies, oral histories, print, visual material, artifacts) to acquire information. 2. Use resources for historical information (e.g., libraries, museums, historical societies, courthouse, world wide web, family records, elders). 3. Gather, organize, and interpret information using a variety of media and technology. 4. Show the relationship between social contexts and events. 5. Use effective communication skills and strategies to share research findings.
6	<ol style="list-style-type: none"> 1. Organize information by sequencing, categorizing, identifying cause-and-effect relationships, comparing and contrasting, finding the main idea, summarizing, making generalizations and predictions, drawing inferences and conclusions. 2. Identify different points of view about an issue or topic. 3. Use a decision-making process to identify a situation that requires a solution; gather information, identify options, predict consequences, and take action to implement that solution.
7	<ol style="list-style-type: none"> 1. Analyze and evaluate information by developing and applying criteria for selecting appropriate information and use it to answer critical questions. 2. Demonstrate the ability to examine history from the perspectives of the participants. 3. Use the problem-solving process to identify a problem; gather information, list and consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution using technology to present findings.
8	<ol style="list-style-type: none"> 1. Understand and apply the problem-solving skills for historical research, to include: <ul style="list-style-type: none"> • use of primary and secondary sources • sequencing • posing questions to be answered by historical inquiry • collecting, interpreting, and applying information • gathering and validating materials that present a variety of perspectives.

SCIENCE

NM Standards & Benchmarks
Potentially Met Via Inquiry-
Based Student Research
Projects

Strand I: Scientific Thinking and Practice

Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

5-8 Benchmark I: Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1) Plan and conduct investigations, including formulating testable questions, making systematic observations, developing logical conclusions, and communicating findings. 2) Use appropriate technologies (e.g., calculators, computers, balances, spring scales, microscopes) to perform scientific tests and to collect and display data. 3) Use graphic representations (e.g., charts, graphs, tables, labeled diagrams) to present data and produce explanations for investigations. 4) Describe how credible scientific investigations use reproducible elements including single variables, controls, and appropriate sample sizes to produce valid scientific results. 5) Communicate the steps and results of a scientific investigation.
6	<ol style="list-style-type: none"> 1) Construct appropriate graphs from data and develop qualitative and quantitative statements about the relationships between variables being investigated. 2) Examine the reasonableness of data supporting a proposed scientific explanation. 3) Justify predictions and conclusions based on data.
7	<ol style="list-style-type: none"> 1) Use a variety of print and web resources to collect information, inform investigations, and answer a scientific question or hypothesis. 2) Use models to explain the relationships between variables being investigated.
8	<ol style="list-style-type: none"> 1) Evaluate the accuracy and reproducibility of data and observations. 2) Use a variety of technologies to gather, analyze and interpret scientific data. 3) Know how to recognize and explain anomalous data.

Strand I: Scientific Thinking and Practice

Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

5-8 Benchmark II: Understand the processes of scientific investigation and how scientific inquiry results in scientific knowledge.

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1) Understand that different kinds of investigations are used to answer different kinds of questions (e.g., observations, data collection, controlled experiments). 2) Understand that scientific conclusions are subject to peer and public review.
6	<ol style="list-style-type: none"> 1) Understand that scientific knowledge is continually reviewed, critiqued, and revised as new data become available. 2) Understand that scientific investigations use common processes that include the collection of relevant data and observations, accurate measurements, the identification and control of variables, and logical reasoning to formulate hypotheses and explanations. 3) Understand that not all investigations result in defensible scientific explanations.
7	<ol style="list-style-type: none"> 1) Describe how bias can affect scientific investigation and conclusions. 2) Critique procedures used to investigate a hypothesis. 3) Analyze and evaluate scientific explanations.
8	<ol style="list-style-type: none"> 1) Examine alternative explanations for observations. 2) Describe ways in which science differs from other ways of knowing and from other bodies of knowledge (e.g. experimentation, logical arguments, skepticism). 3) Know that scientific knowledge is built on questions posed as testable hypotheses, which are tested until the results are accepted by peers.

Strand I: Scientific Thinking and Practice

Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

5-8 Benchmark III: Use mathematical ideas, tools, and techniques to understand scientific knowledge.

GRADE	PERFORMANCE STANDARDS
5	<ol style="list-style-type: none"> 1) Use appropriate units to make precise and varied measurements. 2) Use mathematical skills to analyze data. 3) Make predictions based on analyses of data, observations, and explanations. 4) Understand the attributes to be measured in a scientific investigation and describe the units, systems, and processes for making the measurement.
6	<ol style="list-style-type: none"> 1) Evaluate the usefulness and relevance of data to an investigation. 2) Use probabilities, patterns, and relationships to explain data and observations.
7	<ol style="list-style-type: none"> 1) Understand that the number of data (sample size) influences the reliability of a prediction. 2) Use mathematical expressions to represent data and observations collected in scientific investigations. 3) Select and use an appropriate model to examine a phenomenon.
8	<ol style="list-style-type: none"> 1) Use mathematical expressions and techniques to explain data and observations and to communicate findings (e.g. formulas and equations, significant figures, graphing, sampling, estimation, mean). 2) Create models to describe phenomena.

