

INQUIRY STUDENT SCORING RUBRIC

PRIMARY (GRADES K-2)

Abilities necessary to do scientific inquiry:

	1. Beginning	2. Progressing	3. Proficient	4. Exemplary
A. Asking Questions	Asks questions unrelated to the topic of study	Asks questions but requires extensive teacher guidance	Asks a question that relates to a topic of study with some teacher guidance	Asks a question that relates to a topic of study without teacher guidance
B. Conducting Investigations	Makes observations not directly related to the investigation	Makes observations with teacher support	Makes observations directly related to the investigation using either qualitative or quantitative observations	Makes at least three observations directly related to the investigation using both qualitative (descriptions of observations using five senses) and quantitative observations (information gathered from counts of measurements)
C. Using Tools to Extend the Senses	Unable to correctly select and use tools	Selects appropriate tools with some assistance but may make mistakes in their use	Selects and uses tools appropriately with minimal assistance	Selects and correctly uses appropriate tools independently
D. Develop Reasonable Explanations to Explain Observations	Not developmentally appropriate	Not developmentally appropriate	Not developmentally appropriate	Not developmentally appropriate
E. Sharing Findings with Classmates, Teacher, Family, or Community Members	Describes things in terms of characteristics	Describes things in terms of characteristics; draws pictures that illustrate some features of the thing being described	Describes and compares things in terms of characteristics, relative order, or motion; draws pictures that correctly portray some features of the thing being described	Describes and compares things in terms of characteristics (e.g., number, shape, texture, size, weight, color), relative order (e.g., before/middle/after, top/bottom), and motion (e.g., fast/slow, straight/curved); draws pictures that correctly portray most features of the thing being described

INQUIRY STUDENT SCORING RUBRIC

INTERMEDIATE (GRADES 3-5)

Abilities necessary to do scientific inquiry:

	1. Beginning	2. Progressing	3. Proficient	4. Exemplary
A. Asking Testable Questions that May be Explored through Scientific Investigation	Uses teacher-generated question	Asks testable questions with considerable teacher guidance	Asks testable questions with minimal teacher guidance	Asks testable questions that may be explored scientifically without teacher guidance
B. Planning and Conducting an Investigation	Uses teacher-provided investigation	Plans and conducts an investigation with considerable teacher guidance	Plans and conducts a replicable investigation with few logic errors; may make changes which are not logical to the investigation	Plans and conducts a replicable investigation that has logical steps; may make logical amendments to the investigation
C. Using Simple Equipment and Tools to Gather Data and Extend the Senses	Seldom chooses appropriate tools/equipment and seldom uses them correctly and accurately	Sometimes chooses appropriate tools/equipment and sometimes uses them correctly and accurately	Usually chooses appropriate tools/equipment and usually uses them correctly and accurately	Consistently chooses appropriate tools/equipment and consistently uses them correctly and accurately
D. Using Data to Develop a Reasonable Explanation to Answer the Question Being Investigated	Records of and organization of data is missing and explanation, if present, is illogical	Records of and organization of data is incomplete/inaccurate and explanation may be logical but reflects incomplete/inaccurate data or scientific information	Usually records and organizes data in a logical manner and develops a reasonable explanation based on collected data and/or facts from reliable scientific sources	Consistently records and organizes data in a logical manner and develops a reasonable explanation based on collected data and/or facts from reliable scientific sources
E. Communicating Procedures, Results, and Explanations of an Investigation	Writes inaccurate instructions; does not use sketches; communicates incomplete and inaccurate descriptions of objects and events	Writes incomplete instructions; draws inaccurate sketches; ignores data when describing objects and events	Writes instructions that others can follow in carrying out procedures; makes sketches to aid in explaining procedures or ideas; uses qualitative data to describe and compare objects and events	Writes precise instructions that others can follow in carrying out procedures; makes detailed sketches to aid an explaining procedures or ideas; uses qualitative and quantitative data to describe and compare objects and events

INQUIRY STUDENT SCORING RUBRIC

MIDDLE SCHOOL (GRADES 6-8)

Abilities necessary to do scientific inquiry:

	1. Beginning	2. Progressing	3. Proficient	4. Exemplary
A. Identifying Questions and Formulating Hypotheses that May be Examined through Scientific Investigations	Testing the question is not possible; hypothesis is missing or unclear	Formulates testable questions which lead to a scientific investigation; even though the hypotheses is present it does not directly answer the question	Formulates testable questions and hypotheses that lead to scientific investigation	Formulates testable questions and hypotheses that are specific, based on scientific concepts, and lead to scientific investigation
B. Designing and Conducting a Scientific Investigation	Little attempt is made to control and manipulate variables; design of investigation contains major flaws in sequence and logic; extensive teacher intervention is necessary	Flaws are evident in identifying variables; design of investigation contains minor flaws; some teacher intervention is necessary	Identifies what variable is controlled and what variables are manipulated; design of investigation is sequential and logical; experimental design requires minimal teacher intervention	Identifies what variable is controlled and what variables are manipulated; design of investigation is sequential and logical to the hypothesis; experimental design requires minimal teacher guidance
C. Using Appropriate Tools and Techniques to Collect and Record Data	Collects and records invalid data; uses inappropriate equipment and techniques; data collected contains inaccuracies in measurement which alter the results; required extensive teacher intervention or guidance	Collects and records objective data; incorrectly uses equipment and techniques; requires some teacher intervention	Collects and records complete and objective data; uses appropriate equipment and techniques; requires minimal teacher intervention	Collects and records data which is complete, accurate, and objective; uses appropriate equipment and techniques; requires minimal teacher guidance
D. Using Evidence to Develop Explanations and Describe Relationships between Evidence and Explanation	Students are unable to draw inferences (interpretation of an observation)	Students draw faulty inferences based on patterns or previously held ideas	Students draw inferences based on relationships, perceived patterns, or previously held ideas	Data is analyzed objectively; students draw logical inferences based on observed patterns and relationships; inferences lead to questions for future investigations
E. Communicating Procedures, Results, and Explanations of a Scientific Investigation	Scientific information is unclear; presentation lacks focus and organization; medium hinders communication	Scientific information has some clarity; presentation has some focus and organization; medium permits communication	Scientific information is communicated clearly; presentation is focused and organized; medium facilitates communication	Scientific information is communicated clearly and precisely but may also include inventive/expressive dimensions; presentation is effectively focused and organized (e.g., using tables, models, texts, figures); a variety of media enhance communication

INQUIRY STUDENT SCORING RUBRIC

HIGH SCHOOL (GRADES 9-12)

Abilities necessary to do scientific inquiry:

	1. Beginning	2. Progressing	3. Proficient	4. Exemplary
A. Formulating Questions and a Hypothesis Statement	Is not able to formulate a testable hypothesis that answers the question	Formulates a hypothesis that may not answer the question; supported by opinions and misconceptions	Formulates a coherent testable hypothesis that potentially answers the question; partially supported by prior knowledge	Formulates a coherent testable hypothesis that potentially answers the question; completely supported by prior knowledge
B. Designing and Conducting Scientific Investigations	Designs and conducts a scientific investigation unrelated to the hypothesis; steps are not logical, not sequential, and/or are vague; variables and constants are missing; no repeated trials	Relationship between the hypothesis and the scientific investigation lacks clarity; steps are missing and/or difficult to follow; variables and constants are not properly identified and/or mismanaged and detract from results; trials are insufficient to test hypothesis	Designs and conducts a scientific investigation related directly to the hypothesis; steps contain minor inaccuracies in logic and/or sequence; minor inaccuracies in identifying and managing variables and constants do not significantly affect overall results; evidence of repeated trials	Designs and conducts a scientific investigation related directly to the hypothesis; steps are logical and sequential; variables and constants are identified and managed objectively; repeated trials are sufficient to validate results
C. Using Appropriate Tools and Techniques to Collect and Record Data	Selects inappropriate equipment and techniques; does not employ safety when using lab equipment, ineffective use of technology and mathematical concepts; significant errors or gaps in collected data	Incorrectly uses equipment and techniques; some unsafe practices are evident; ineffective use of technology and mathematical concepts; errors present in collected data	Selects and safely uses lab equipment; generally chooses/uses appropriate technology and mathematical concepts; minor inaccuracies and some subjectivity in data collection; some inconsistencies present in recording data	Selects and safely uses lab equipment; effectively chooses/uses appropriate technology and mathematical concepts; data is collected and recorded in a systematic, accurate, and objective manner
D. Formulating and Revising Scientific Explanations and Models Using Logic and Evidence	Explanations/models are not based on analysis of data or accurate science; data which refutes the hypothesis is discounted; connections are not present between results and hypothesis; no evidence of possible revision and alternative explanations	Explanations/models are based on flawed analysis of data and misconceptions of science; formulates limited revisions	Explanations/models partially reflect evidence from investigation and are based on accurate science; uses results to verify or refute the hypothesis; formulates possible revisions	Explanations/models reflect evidence from investigation and are based on accurate science; uses results to verify or refute hypothesis; formulates possible revisions and alternative explanations

INQUIRY STUDENT SCORING RUBRIC

HIGH SCHOOL (GRADES 9-12)

Abilities necessary to do scientific inquiry:

E. Communicating and Defending a Scientific Argument	Methods and procedures are unclear and inaccurately represented; arguments and responses to critical comments as well as the connections between the investigation and accurate scientific knowledge are missing	Methods and procedures are unclear or represented inaccurately; arguments and responses to critical comments as well as the connections between the investigation and accurate scientific knowledge are flawed	Methods and procedures are generally accurate to allow replication of the investigation and support the opportunity for further investigation; arguments and responses to critical comments contain some flaws in logic but generally demonstrate the connections between the investigation and accurate science	Methods and procedures are clearly and accurately represented to allow replication of investigation and enhance opportunities for further investigation; arguments and responses to critical comments are logical and effectively demonstrate understanding of relationships between the investigation and accurate science
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