

ACADEMIC EXPECTATION: Scientific Principles and Processes

Students will demonstrate and apply scientific principles and process skills in order to identify, analyze, and address real world problems.

Scientific Principles

CRITERIA	EXEMPLARY 4	PROFICIENT 3	DEVELOPING 2	BEGINNING 1	S	T
Identifies the Concept/ Problem	Identifies the concept/problem accurately, completely, and insightfully.	Identifies the concept/problem accurately and appropriately.	Demonstrates limited ability to identify concept/problem.	Demonstrates some elements of the concept/problem, but may be inaccurate or incomplete.		
Describes Concept/ Problem	Clearly describes and communicates the essential elements of the concept/problem with insight.	Clearly describes and communicates the essential elements of the concept/problem.	Describes and communicates some of the elements of the concept/problem.	Demonstrates some ability to describe the concept/problem, but may be inaccurate or incomplete.		
Analysis of Concept/ Problem	Uses accurate terminology to make advanced connections between prior knowledge and newly acquired information.	Uses accurate terminology to make connections between prior knowledge and newly acquired information.	Makes some connections between prior knowledge and newly acquired information from class.	Demonstrates evidence of significant misconceptions, inaccurate terminology, or improper connections.		
Application of Concept/ Problem	Effectively relates to concept/problem and makes valid and realistic conclusions with insightful connections.	Gives some evidence of understanding which relates to the concept/problem, validity issues, and/or the conclusion.	Gives some evidence of understanding which relates to the concept/problem, validity issues, and/or the conclusion with some misconceptions.	Gives limited evidence that relates to the concept/problem, lacks validity issues, and/or draws an insufficient conclusion.		

Teacher Comments: _____

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Scientific Process Skills

CRITERIA	EXEMPLARY 4	PROFICIENT 3	DEVELOPING 2	BEGINNING 1	S	T
Observing	Distinguishes from many observations those that are relevant to the problem at hand.	Identifies differences and similarities amongst objects or materials.	Succeeds in identifying obvious differences and similarities to objects and materials.	Identifies characteristics unrelated to objects and materials.		
Questioning	Asks a variety of questions that include investigable and non-investigable questions. Suggests “how” answers to questions of various kinds that can be found.	Asks a variety of questions that include investigable and non-investigable questions. Shows effective participation in discussing questions that can be answered.	Asks a variety of questions that include investigable and non-investigable questions.	Asks questions that are not investigable or non-investigable		
Predicting and/or Hypothesizing	Uses patterns and information or observations from evidence to make justified predictions. Gives explanations that suggest how an observed effect or situation is brought about and could be checked.	Makes use of evidence from experience in making a reasonable prediction with attempts at justification. Shows awareness that there may be more than one explanation that fits the evidence.	Makes some use of evidence from experience and preconceived ideas in making a prediction. Attempts to explain things in terms of a relevant idea from preconceived ideas.	Makes a prediction based on experience or preconceived ideas.		
Planning and Investigating	Demonstrates ability to completely design a controlled experiment. Correctly identifies independent and dependent variables and creates a control group.	Succeeds in planning a fair test: Correctly identifies independent and dependent variables and creates a control group.	Identifies the variable that has to be changed (independent variable) and the things that should be kept the same (constant), but missed some critical steps for a fair test.	Starts with a useful general experimental approach even if details are lacking or need further thought.		
Interpreting	Draws valid conclusions that summarize and are consistent with all the evidence that has been collected. Recognizes that conclusions are tentative and may have to be changed in light of new evidence.	Draws valid conclusions that identify patterns or trends in their observations and measurements.	Notices associations between changes in one variable and another, but has difficulty analyzing the results correctly.	Discusses what they find in relation with their initial question, but has difficulty making associations.		

Teacher Comments _____