

Authentic Inquiry Lab Scoring Rubric

© 2005 ISU Physics Teacher Education Program

CRITICAL INQUIRY CHARACTERISTICS:

Primarily Cookbook Lab Approach (0-1 point)	Mixed lab (2-3 points)	Primarily Inquiry Lab Approach (4-5 points)	Score
consistently driven with step-by-step instructions requiring minimum intellectual engagement of the students thereby promoting robotic, rule-conforming behaviors.	Approach inconsistent	consistently driven by questions requiring ongoing intellectual engagement using higher-order thinking skills making for independent thought and action; includes a minimum of necessary instructions.	
focuses students' activities on verifying information previously communicated in class thereby moving from abstract toward concrete; merely relies on the use of formulas to verify certain phenomena.	Approach inconsistent	focuses students' attention on collecting and interpreting data to discover new concepts, principles, or empirical relationships thereby moving from concrete toward abstract.	
presumes students will learn the nature of scientific inquiry by "experience" or implicitly; students execute imposed experimental designs that tell students which variables to hold constant, which to vary, which are independent, and which are dependent.	Approach inconsistent	requires students to create their own controlled experimental designs; require students to independently identify, distinguish, and control pertinent independent and dependent variables; promote student understanding of the skills and nature of scientific inquiry.	
employs procedures that are inconsistent with the nature of scientific endeavor; shows the work of science to be an unrealistic linear process.	Approach inconsistent	employs procedures that are much more consistent with authentic scientific practice; shows the work of science to be recursive and self-correcting.	
INQUIRY CHARACTERISTICS SUBTOTAL:			

IMPORTANT EXECUTION CHARACTERISTICS:

Characteristic	Unacceptable or Poor (0-1 point)	Fair (2 points)	Good (3 points)	Score
Professionalism	Amateurish; some material of substance, but lots of extraneous commentary; clear that writer does not understand the problem and/or scientific procedures.	Pre-professional; material mostly of substance, but includes some extraneous commentary; some writer confusion about problem and/or scientific procedures.	Professional; includes only material of substantive value; clear evidence that writer understands problem and/or scientific procedures.	
Logical Organization	Logic weak, perhaps flawed; provides little to no opportunity for students to collect meaningful data; attempts to have students draw conclusions from the limited data; somewhat disorganized presentation of information.	Fairly good use of logic; provides good opportunity for data collection, but expects student to draw conclusions on the basis of limited data; orderly presentation of information and arguments.	Guidelines provided are all well reasoned, "win the day" and make sense; provides for appropriate collection of data; requires students to draw conclusions flow from evidence; order of presentation suggests use of a topical outline	

Concept Development	Weak effort to develop conceptual understanding of the subject matter; focuses strongly on development of relationship; no effort to have student state or explain any concept that might have been developed.	Significant effort to develop conceptual understanding, but observations are insufficient to allow for student to use inductive reasoning; call for students to explain concept developed, but no requirement for student to explain reasoning.	Strong effort to develop conceptual understanding of the subject matter through the use of observation and inductive reasoning; strong call for student to describe concept developed and reasoning behind it.	
Pre-lab	Pre-lab does not relate significantly to the knowledge, skills, and concepts of the main body of the inquiry lab guidelines; does not contain a cautionary note that pre-lab must be turned in at the beginning of the lab period; contains no name for name, etc.	Pre-lab cannot be detached from the main body of the inquiry lab guidelines; main body of lab guidelines refers to required pre-lab information that is not readily available after pre-lab is turned in.	Inquiry lab guidelines contain both a pre-lab activities as well as lab guidelines; the pre-lab develops those concepts, ideas, and skills required to completed main body of lab; detachable pre-lab document; no reliance in lab guidelines upon material due in pre-lab.	
Clarity	Student performance objective not clearly stated; tolerably well written; a fair number of minor grammatical errors; a few major errors; confusing to reader; no evidence of regular review and revision; key points are made, but not often elaborated.	Student performance objective clearly stated and reasonably well written; a few minor grammatical errors; easy and interesting reading; evidence of regular revision and proof reading; key points are made, but not always elaborated.	Student performance objective clearly stated; well written; no grammatical errors; easy and interesting reading; clear evidence of regular revision & proofing; key ideas are fully elaborated and illustrate what is meant; examples are provided as appropriate.	
Objectives	Contains no, inadequate number, or poorly worded objectives; no clear alignment of tasks and assessments with objectives.	Has well formulated objectives and tasks, but alignment between the two is not made obvious.	Includes clear, well-written objectives; each objective has a clearly associated task and assessment.	
Feasibility	Lab is essentially undoable and is of little worth; tasks required cannot be reasonably accomplished, or not accomplished at all.	Lab is mostly doable, but one or two sections have required activities that are unreasonably difficult or impossible to perform.	Lab is eminently doable; writer shows clear evidence of having thought the entire process through step by stop.	
Spelling and Punctuation	A modest number of spelling and punctuation errors.	No spelling errors, and only a few punctuation errors.	Insignificant number of punctuation errors; no spelling errors.	
Format and Appearance	Fails to meet two or three guidelines of appropriate font, font size, line spacing, and border areas; fair print quality; fails to make efficient use of space; requires too much use of paper; wasteful.	Fails to meet one the guidelines for appropriate font, font size, line spacing, and border areas; good print quality; makes fairly good use of space; needs to be economized.	Uses appropriate font, font size, line spacing, and border areas; good layout; good print quality; makes good use of space; uses print and paper resources sparingly; lab can be printed economically.	
INQUIRY CHARACTERISTICS SUBTOTAL:				
EXECUTION CHARACTERISTICS SUBTOTAL:				
Reviewer's Comments:	TOTAL POINTS:			