

Assessment of Experiments and Science Projects Using a Generic Rubric

Teacher Information:

There is a great deal of time involved in assessing and grading such things as science experiments and projects. However, the end result is that you have a better picture of what students truly know, understand, and are able to do. A complete assessment of experiments and/or science projects is something that needs to be carried out no more than once a year or once in a benchmark year. Please remember that students should still be conducting scientific investigations in between these assessments to enhance their understanding and use of the scientific method, and the process skills. **NOTE:** There are no student sheets to this assessment because of its design.

Assessment Options: Because of the time factor, when grading experiments and science projects teachers should consider breaking the assessment into sections. This will allow for multiple local grades to be given and also allow the teacher to spread the evaluation of student work over a broader expanse of time. Suggestions for splits:

- Section #1 - Background Research and Stated Hypothesis
- Section #2 - Identified Variables and Experimental Procedure
- Section #3 - Chart of Collected Data and Graph of Results
- Section #4 - Student Observations, Conclusions, Inferences, Recommendations, and Teacher Observations

Other Advantages to Consider: A generic scoring rubric of this type gives you the option of allowing students to pick their experiment, or opens the door for teachers of different science courses to assess students in their particular field. This evaluation measures the methodology and the processes, which should be the same for all science fields.

Other Options: This generic rubric can easily be expanded to measure other science skills as well, such use of scientific equipment, model formulation, proper safety procedures, etc.

NOTE: This is only an example of what a science experiment rubric could resemble. Please adapt it to fit your particular needs.

Performance Assessment Scoring Rubric for Experiments Using the Scientific Method:

Research:

- Conclusive (Answer contains an exceptional amount of prior knowledge): 3 pts. exceeds
- Partially conclusive (Answer contains a reasonable amount of prior knowledge): 2 pts. meets
- Inconclusive (Answer indicates lack of prior knowledge): 1 pt. does not meet

Hypothesis:

- Correctly stated with both variables identified: 3 pts. exceeds/meets
- No hypothesis: 1 pt. does not meet

Variables:

- All variables are stated correctly: 3 pts. exceed
- All variables are stated correctly, but not all controlled variables are listed: 2 pts. meet
- One of the three types of variables is missing or incorrectly stated: 1 pt. does not meet

Procedure:

- Easily followed containing all procedural steps in their correct order. Metric units are used where necessary: 3 pts. exceeds
- Written, but some steps are vague or unclear. Metric units are used: 2 pts. meets
- Procedure missing two or more critical steps; metric units not used: 1 pt. does not meet

Chart of Data:

- Complete and correctly labeled: 3 pts. exceeds
- Complete, but lacking a clearly explanatory title and/or labeling: 2 pts. meets
- Incomplete, lacking any of the following: a title, dependent or independent variable, or collected data: 1 pt. does not meet

Graph of Results:

- Complete and correctly labeled: 3 pts. exceeds
- Complete, but lacking a clearly explanatory title and/or labeling: 2 pts. meets
- Incomplete; lacking any of the following: a title, dependent or independent variable, or collected data: 1 pt. does not meet

Observations:

- Very descriptive using a variety new vocabulary terms: 3 pts. exceeds
- Partially conclusive using some new vocabulary terms: 2 pts. meets
- Inconclusive demonstrating limited vocabulary terms: 1 pt. does not meet

Conclusions, Inferences, and Recommendations:

- Tells whether hypothesis was proven correct or incorrect by providing sufficient information for all of the following - conclusion (a statement of the results), inferences (assumptions that can be drawn from the conclusion) and recommendations for the design of a new experiment: 3 pts. exceeds
- Provides sufficient information for any two of the following - conclusion, inferences, recommendations: 2 pts. meets
- Provides insufficient information for two or all of the following - conclusion, inferences, recommendations: 1 pt. does not meet

Teacher Observation:

- Student performed experiment honestly, accurately, and independently: 3 pts. exceeds
- Student performed experiment honestly and accurately, but needed teacher assistance: 2 pts. meets
- Student did not perform the experiment honestly and/or accurately: 1 pt. does not meet

Overall Rating:

- Exceeds = 25 - 27 pts.
- Meets = 18 - 24 pts.
- Does Not Meet = Below 18 pts.