DOINGWHATWORKS

SAMPLE MATERIAL

Research Plan Product Guide and Grading Rubric

MacArthur Ninth Grade School, Texas

Topic: Using Student Achievement Data to Support Instructional Decision Making

Practice: Student Use of Data

Giving students a clearer understanding of how their performance aligns with classroom and school expectations helps them learn how to use their own data. To help students better understand expectations for completed assignments, MacArthur Ninth Grade School developed product guides and rubrics for core subject assignments (e.g., essays, projects, drawings, charts). Each is tailored to the subject and assignment.

Teachers give students the included *Research Plan Product Guide* to clarify expectations for a science fair research plan and project. The instructions include the formatting requirements (e.g., all research plans must be typed in 12 point Times New Roman font), due dates, and process for seeking plan approval from the teacher. Further expectations for the research plan are: a clear statement of the question or problem, a hypothesis, methodology or procedures, and a bibliography.

This product guide also provides guiding questions to help students formulate their research question, steps for finding and documenting

research information, and helpful websites. Parents and students are required to sign the product guide to acknowledge they understand the expectations.

The related *Grading Rubric,* also included here, lists the components for the assignment (title page, question or problem, hypothesis/engineering goals, method or procedures, and bibliography) and the specific requirements for each. For example, the requirements and the points assigned for successful completion of the bibliography are: 5 references are listed (2 points), all references are cited within the research plan (4 points), and citing follows the guidelines for citing references (4 points). Science teachers use this rubric to assess all science fair projects.

Schools can use the product guide and rubric as a model for developing similar guides.

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MacArthur 9th Grade Science Fair 2009

Research Plan Product Guide

Research plans are required for all science fair projects. All research plans must be typed in 12 point Times New Roman font. They will not be accepted if hand written. If you do not have access to a computer, you may write your research plan by hand and set up a time with Mr. McCurry to come after school to type it. Research plans can be turned in printed, via email, on a flash drive, or on a CD or DVD.

All research plans are due to Mr. McCurry in room A207 by November 9, 2009. Ask your teacher how this will be counted as a grade for your biology class.

Product Guide

A. Question or Problem
    a. A high school level question or problem, approved by Mr. McCurry
    b. The question or problem has a predictable outcome
    c. Detailed background information accompanies the question or problem
B. Hypothesis/Engineering Goals
    a. The hypothesis/engineering goals are testable
    b. Both the independent and dependent variables are clearly identified
    c. The hypothesis/engineering goals include only one independent variable
C. Method or Procedures
    a. The method or description for testing the hypothesis or engineering goals are detailed
    b. A control group is identified and used
    c. The method for data collection is identified
    d. Procedures for analyzing data is identified
D. Bibliography
    a. 5 major references
    b. Follow the guidelines for citing references

*If problems or questions involve human subjects, vertebrate specimens, potentially hazardous biological agents or hazardous chemicals, then special guidelines are required and are available upon request.

This product guide must be signed by the student and a parent, and then returned with your research plan.

Your Name _____

By signing below I have reviewed the research plan instructions and guidelines for citing references:

Student Signature _____

Parent Signature _____

If you have any questions, please feel free to contact Mr. McCurry our science fair adult sponsor.
cmccurry@aldine.k12.tx.us
MacArthur 9th room A207
281.985.7400

How to complete Research

I. List Key words associated with your topic, problem or question

II. Use the key words to build some questions that can help you guide your research.

a. Why does _____ happen?
b. How does _____ happen?
c. How does _____ work?
d. How do you detect _____?
e. How do I measure _____?
f. How do we use_____?
g. Who needs _____?
h. Who invented/discovered _____?
i. What causes _____?
j. What is _____ made of?
k. What is the relationship between _____and _____?
l. When does _____ cause _____?
m. When was _____ discovered/invented?
n. Where does _____occur?
o. Where does _____ get used?

*These are only a small sample of possible questions

III. Finding information

a. Read about general information from a dictionary or encyclopedia
b. Use the bibliographies and sources in everything you read to find additional sources
c. Use district subscribed internet resources to find credible information
d. Evaluate your references as you conduct research
    i. Is the source credible?
    ii. Is the source current?
    iii. Is the source biased?
    iv. Is the source free of errors?
    v. Can you cite this reference?
    vi. Is the source easy for others to find or obtain?
e. Speak to an expert
    i. Contact actual people that have experience
    ii. Universities, Industrial Laboratories, Government Agencies are all sources of experts
    iii. Be prepared with questions and be patient
f. When you find information:
    i. Keep a list of the sources as you find information that you might use.
    ii. Record a citation if you think you might use it in your research plan.
g. Helpful websites
    i. Sciencebuddies.org
    ii. Scifair.org
    iii. hunstem.uhd.edu/SEFH/ (Houston Science Fair Website)

MacArthur 9th Science Fair
Research Plan Grading Rubric

Title Page (10 points)

A. A title page is present (2 pts)
B. The title is centered and in larger font (2 pts)
C. The title reflects the topic of the experiment (2 pts)
D. Name is present (2 pts)
E. Date completed is present (2 pts)
F. *Pictures relevant to the topic are present (5 pts bonus)

Question or Problem (20 points)

A. The question that the experiment attempts to answer is described (4 pts)
B. The question is at a high school level and has been approved by Mr. McCurry (4 pts)
C. Background information about the question or problem is described (4 pts)
D. All parts of the question or problem are given background information (4 pts)
E. The background information is detailed (4 pts)

Hypothesis/Engineering Goals (20 points)

A. The hypothesis/engineering goals show a predictable outcome/goal (5 pts)
B. The independent variable is clearly present (5 pts)
C. The dependent variable is clearly present (5 pts)
D. The hypothesis/engineering goal is testable (5 pts)

Method or Procedures (40 points)

A. The steps of the experiment or engineered product are listed (10 points)
B. Each step is detailed (does not leave out necessary information) (5 pts per instance)
C. *Safety and other special steps are taken for experiments involving human subjects, vertebrate animals, possibly hazardous biological agents or hazardous chemicals. (10 points, if necessary)
D. A control group is identified and used for all experiments (3 pts)
E. The method for data collection is identified (2 pts)
F. The method for data collection is described with detail (4 pts)
G. The procedures for analyzing data is identified (2 pts)
H. The procedures for analyzing data is described with detail (4 pts)

Bibliography (10 points)

A. 5 references are listed (2 pts)
B. All references are cited within the research plan (4 pts)
C. Citing follows the guidelines for citing references (4pts)