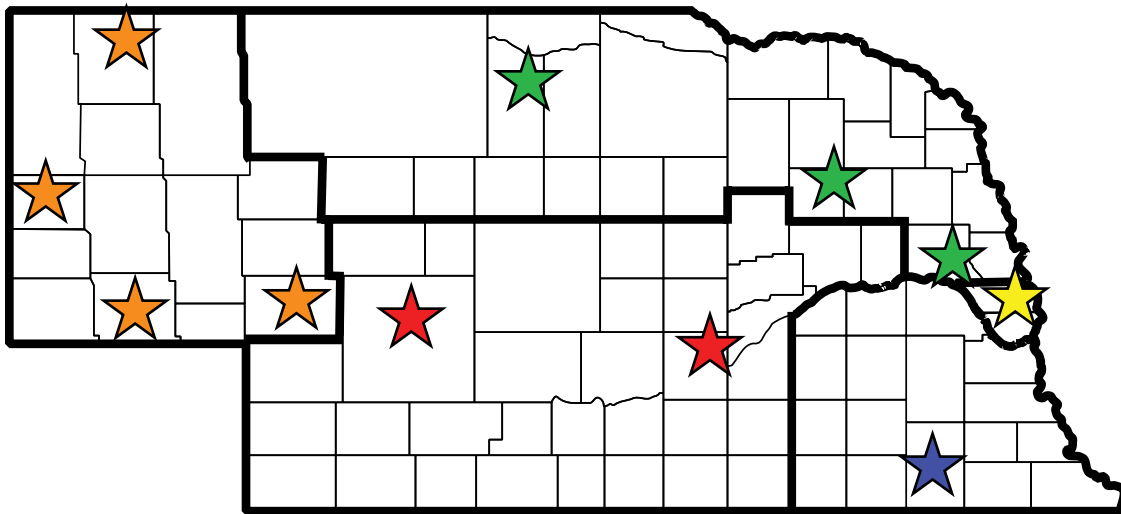




Nebraska Coalition  
*for Lifesaving Cures*  
RESEARCH TODAY *for* HEALTHIER TOMORROWS.

## A Teacher's Handbook for the 2009 Regional Health/Science Meets



**Grand Island - March 19**  
**North Platte with NJAS - March 26**

Contact: Lana Lofgreen, CN-AHEC  
(308) 385-6677    [lana@cn-ahec.org](mailto: lana@cn-ahec.org)



**Ainsworth - February 18**  
**Fremont - March 26**  
**Norfolk - March 16**

Contact: Gretchen Forsell, NNAHEC  
(402) 644-7256    [gforsell@nnaheec.org](mailto: gforsell@nnaheec.org)



**Chadron - March 6**  
**Ogallala - March 13**  
**Scottsbluff - February 20**  
**Sidney - March 20**

Contact: Mr. Conrad, NP-AHEC  
(308) 635-6712    [conrad@np-ahec.org](mailto: conrad@np-ahec.org)



**Beatrice - March 26**

Contact: Connie Schmidt, SE-AHEC  
(402) 228-9093    [cschmidt@se-ahec.org](mailto: cschmidt@se-ahec.org)



**Omaha - April 25**

Contact: Lisa Jewell, UNMC Youth Learning Center  
(402) 559-6357    [ljewell@unmc.edu](mailto: ljewell@unmc.edu)

Dear 8th Grade Science Teacher:

Would your students like the opportunity to attend UNMC's 17th annual State Science Meet for 8th graders in June 2009?

To qualify for the State Meet, Nebraska 8th grade students need to participate in a Regional Health/Science Meet. The 2009 regional meets will be held in Ainsworth, Beatrice, Chadron, Fremont, Grand Island, Norfolk, North Platte, Ogallala, Omaha, Scottsbluff, and Sidney.

For the regional meets, students are required to complete a science project, write a short description or abstract of their project, maintain a project logbook, and develop a poster board display presentation of their project. Judges will evaluate and rank science projects at each regional meet. From the regional meets, 100 students will be invited to attend the UNMC State Science Meet, June 11-13, 2009 in Omaha.

The State Science Meet provides students with the opportunity to participate in a variety of hands-on science activities. Students who attend the State Science Meet experience a host of activities to get them excited about science and introduce them to careers in health care. Lodging and meals are provided by UNMC.

There is a \$5 registration fee for each student to participate in the regional meets. For information about fee waivers, contact the regional representative for the site you plan to attend. (Contact information is provided on page 1 of this booklet.)

Our objective is to involve students in detailed projects of a scientific nature and to inspire their career aspirations especially in the areas of health science.

This booklet is designed to provide the information you will need to assist your students' participation in the regional meet in your area.

We would like to thank the Nebraska Area Health Education Centers (AHECs) and the Coalition for Lifesaving Cures for making this opportunity available to teachers and 8th grade students across Nebraska.

We hope to see you and your students at one of the regional meets.

UNMC State Science Meet Committee Members

## Table of Contents

Rational for Science Research	4
Meeting State Standards	5
Types of Science Research Projects	6
Categories of Projects	6
Getting Started	7
UNMC Health/Science Meet Guidelines	8
Time line	9
Resources	11

### **Acknowledgments**

*The Northern Nebraska Area Health Education Center (NNAHEC) developed the concept for this booklet. This book is the result of discussions with teachers in the NNAHEC region who needed assistance in providing a science meet opportunity to their students.*

*Special thanks goes to Lee A. Brogie for writing this booklet and Judy Williams for helping review it.*

**Lee A. Brogie** Mrs.. Brogie teaches science at Wayne Middle School in Wayne, Nebraska. Every year, her 7th and 8th grade students conduct individual science research projects and participate in science fairs at the school, regional, and state levels. Mrs. Brogie has received the Presidential Award for Excellence in Science and Mathematics Teaching, was selected as a NASA honors teacher, and was a recipient of the Woodrow Wilson fellowship for Environmental Science. Mrs. Brogie may be contacted via e-mail: [lebrogil@wayneschools.org](mailto:lebrogil@wayneschools.org)

**Judy Williams** Mrs.. Williams taught science for 33 years in the Central City Public Schools. Mrs. Williams currently serves as the director of Nebraska Junior Academy of Sciences. Several of Mrs. Williams' publications have won "Excellence in Teaching Awards" from the Nebraska State Department of Education.

*This brochure is funded in part by the Rural Health Education Network and Federal funding through the Nebraska AHEC Program Office, Health Resources & Services Administration, Bureau of Health Professions Federal Grant #U76HP00592.*

## Rationale for Science Research

Science, as defined by Miriam-Webster, is *the state of knowing: knowledge as distinguished from ignorance or misunderstanding*. In essence, science is learning. As a teacher there is no greater joy than helping students to experience the wonder of learning as they design, implement, and complete their very own science research project. Creating a science research component for your curriculum provides an opportunity to extend science beyond the classroom as students take an in-depth look at a topic that is of interest to them personally.

Students working as science researchers experience the excitement, pleasure, frustration, and collaboration connected with scientific research. In addition, students must integrate reading, writing, mathematics, science, and technology in order to maximize their learning. Exhibiting projects at Regional Health/Science Meets provides students with an opportunity to share what they have learned with others, gives them recognition for their scientific endeavors, and encourages them to take a serious interest in science as a career.

## Meeting State Standards

Depending upon the nature of the project, the following Core Curriculum Standards from Nebraska LEARNS can be met:

### Reading/Writing

Standard	<i>By the end of the 8th grade, students will:</i>
8.1.2	identify, locate, and use multiple resources to access information on an assigned or self-selected topic.
8.2.1	write using standard English (conventions) for sentence structure, usage, punctuation, capitalization, and spelling.
8.2.4	demonstrate the use of multiple forms to write for different audiences and purposes.
8.2.5	demonstrate the ability to use self-generated questions, note taking, summarizing and outlining while learning.
8.3.2	use multiple presentation styles for specific audiences and purposes.

## Mathematics

<b>Standard</b>	<i>By the end of the 8th grade, students will:</i>
8.3.1	select measurement tools and measure quantities for temperature, time, distance, volume, and mass in standard and metric units at the designated level of precision.
8.3.2	convert units within measurement systems using standard and metric, given conversion factors.
8.5.1	collect, construct, and interpret data displays and compute mean, median, and mode.
8.5.2	read and interpret tables, charts, and graphs to make comparisons and predictions.
8.5.3	conduct experiments or simulations to demonstrate theoretical probability and relative frequency.
8.5.4	identify statistical methods and probability for making decisions.
8.6.3	describe and represent relations, using tables, graphs, and rules.

## Science

<b>Standard</b>	<i>By the end of the 8th grade, students will:</i>
8.1.1	develop an understanding of systems, order, and organization.
8.1.2	develop an understanding of evidence, models, and explanation.
8.1.3	develop an understanding of change, constancy, and measurement.
8.2.1	develop the abilities needed to do scientific inquiry.
8.3	Physical Science
8.4	Life Science
8.5	Earth and Space Science
8.6.1	develop an understanding of technological design.
8.8.1	develop an understanding of science as a human endeavor.
8.8.2	develop an understanding of the nature of science.
8.8.3	develop an understanding of the history of science.

## Types of Science Research Projects

### Collection

A collection of various scientifically related objects that demonstrates learning through the process of collecting and categorizing. Scientific names should be used when available.

### Demonstration

A demonstration is an illustration or explanation of a scientific principle that shows how and why something works.

### Experiment

An experiment uses the scientific method to answer a question and test a hypothesis. Students doing experiments should be familiar with and be able to define the following variables:

- Independent variable (or IV)** – variable that is purposely changed (modified, altered, varied, or manipulated) by the experimenter.
- Dependent variable (or DV)** – variable that responds (reacts) and is measured in an experiment.
- Control (control group)** – the part of an experiment that serves as a standard of comparison. A control is used to detect the effects of factors that should be kept constant, but which vary.
- Constants** – the factors kept the same during the experiment.

### Innovation/Invention

The creation of a new or improved device or process used to improve conditions, solve problems, or to fill needs.

### Model

Small object, usually built to scale, that represents some already existing object.

### \*\*Observational Study

Observing and recording observations related to scientific phenomena.

### \*\*Informative Study

Based on your thoughts and the facts and ideas you have collected from a variety of sources, your informative study should demonstrate a thorough, accurate, and coherent explanation of the topic.

## Categories of Projects

- Chemistry, Biochemistry & Physics
- Earth, Space & Environmental Science
- Medicine, Health & Microbiology
- Behavior & Social Science
- Botany & Zoology
- Computer, Math & Engineering

## Getting Started

The following pages will give you ideas on how to incorporate science research projects into your classroom.

### 1. Select a Topic

The first step in preparing a good science research project is to select a topic for your project. Select a topic you are interested in and make sure it is not too easy or too complicated.

### 2. Research your Topic

Learn as much as you can about your topic. Read books from the library, gather existing information from the internet, talk to experts, take a field trip, and write to companies. Look for information from several different sources. Keep a bibliography citing all sources of information.

### 3. Design your Plan

Determine the type of project you will conduct for your science research. Choose one question that will narrow the focus of your science research. Create a time line (see page 8) for conducting your research making sure to identify important dates.

### 4. Conduct your Science Research

Keep detailed notes on everything you do and on observations that you make. Stick to your timetable as closely as possible.

### 5. Examine your Results

Upon completion of your science research, examine and organize your findings. Determine how you can best explain and share with others what you have learned (data table, graphs, pictures, diagrams, etc.).

### 6. Draw Conclusions

Summarize your learning by doing the following: State the purpose of the project; identify major findings including what you learned, whether you accept or reject your hypothesis, and the answer to your question; and make recommendations for future research.

Need ideas for science projects?  
Go to [www.sciencebuddies.org](http://www.sciencebuddies.org)

# UNMC Health/Science Meet Guidelines

## 1. Investigation and Design

To qualify for the UNMC's State Meet in June, projects must be done individually and should reflect your own thoughts, experiences, ideas, and knowledge. Projects involving live subjects cannot cause harm or distress to the subject(s) at any time during the experience.

## 2. Written Materials

**Abstract:** An abstract is a summary of your science research project. It should be 250 words or less and single-spaced. Your abstract should include a statement of purpose (the reason for doing your project), your hypothesis, methods used in conducting your research project, the results, and if the research project has been completed, you also need to add your conclusion.

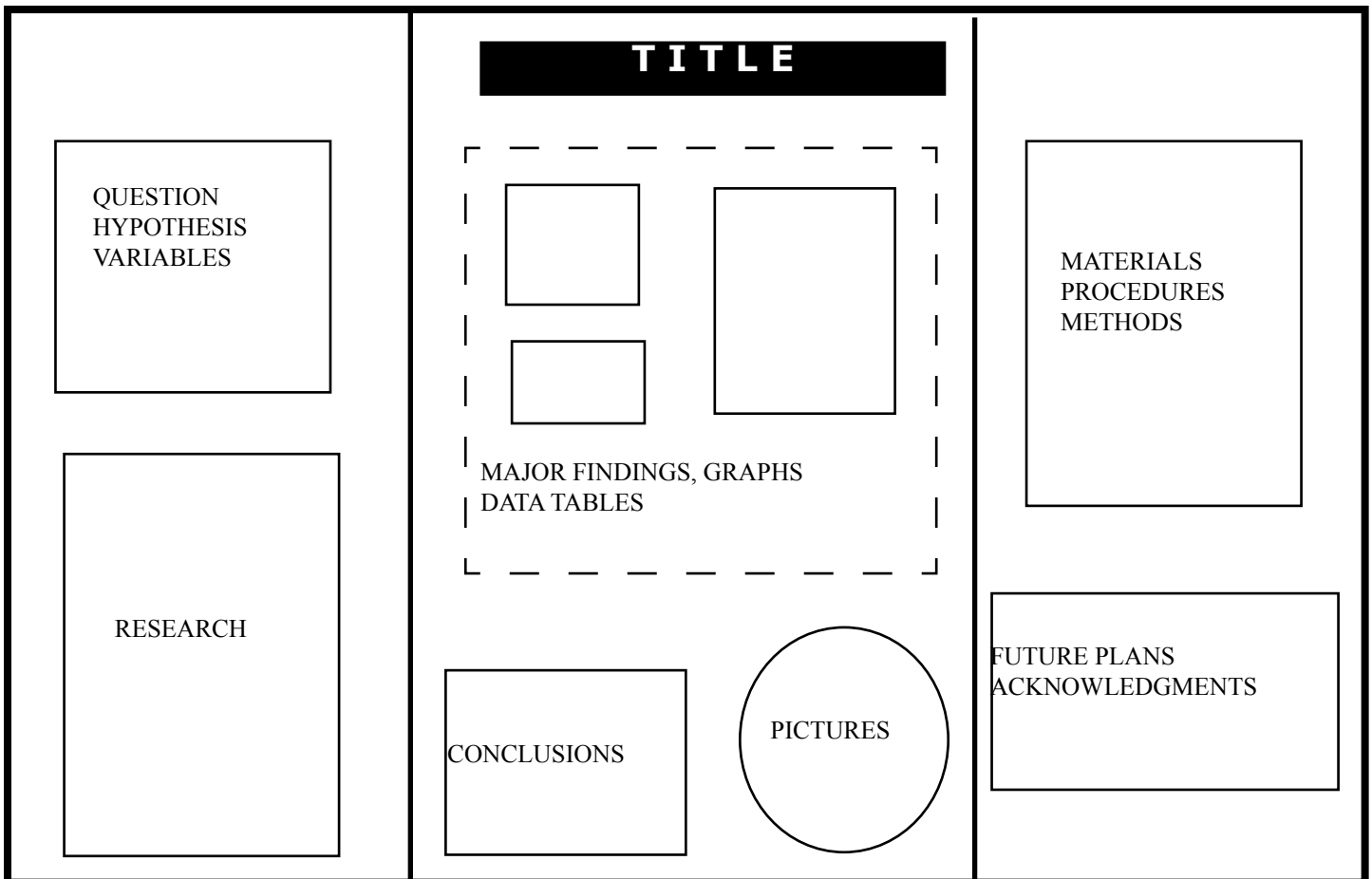
**Project Logbook:** Your logbook should contain accurate and detailed notes about your science research project. Entries should be made on a regular basis (daily). Entries can include design plans, data collection, notes, observations, journaling, drawings, questions, ideas, thoughts, etc.

**Project Paper:** Your project paper should include the following:

- a. **Title Page:** Center the project title and put your name, school, and date of the UNMC Health/Science Meet at the bottom of the page.
- b. **Introduction:** One or two paragraphs explaining why you chose to do your science research project and what you hope to learn. If conducting an experiment, also include your question, hypothesis and variable.
- c. **The Plan:** Describe in detail the methodology used to collect your data, gather your information, or make your observations. Include enough information so that others can repeat your project. You might want to include detailed photographs or drawings.
- d. **Discussion:** Thoroughly discuss exactly what you did in your project. Explain the results to your experiment and/or what you have learned. Include tables and/or graphs of your summarized experimental data.
- e. **Conclusion:** Summarize your learning by doing the following: State the purpose of the project; identify major findings, including what you learned, whether you accept or reject your hypothesis, the answer to your question; and make recommendations for future research.
- f. **Acknowledgements:** Give thanks to everyone who helped make your science research project a success.
- g. **Bibliography:** List any documentation that is not your own (i.e., books, journals, Web sites, interviews, videotapes, etc.)

### 3. Display Board

Your project's display board should attract and inform and make the most use of space with clear and concise information. Your display board is a powerful way to share what you have learned with others.



*No organisms, alive or dead, (vertebrates and invertebrate animals, bacteria, fungus, protists, etc.) can be displayed except plants. Plants may be displayed with appropriate containers to avoid breakage or spilling.*

Dimensions of Display boards:

Height: **About 36-48 inches high is best.**

(The maximum height allowed is 72 inches or 183 cm but this size is not recommended.)

Wide or side to side: 48 inches (122 cm)

Deep or front to back: 30 inches (76 cm)

### 4. Presentation

Prepare a 3-5 minute oral presentation to share with your judges. The judges are interested in you and your project and they are looking forward to what you have to say. Begin by introducing yourself, and then tell the judge about your project.

**Timeline:**  
**UNMC Regional Health/Science Meets**

<b>Time</b>	<b>Event</b>
10 to 8 weeks before Meet	Select a science research project topic. Begin making entries in your logbook. Research your topic.
8 to 7 weeks before Meet	Design your science research project plan. Present your plan to your teacher for approval. Continue making logbook entries.
7 to 5 weeks before Meet	Conduct your science research project. Make observations, collect and record data, and continue making logbook entries.
5 weeks before Meet	Teachers submit all required paper work for the Regional Meet at least one month before Regional Meet: <ul style="list-style-type: none"> <li>• Student Registration Form</li> <li>• Student Media Release Form</li> <li>• Abstract of Project</li> <li>• Community/Teacher Contact Form</li> </ul>
4 to 3 weeks before Meet	Continue work on science research project. Begin writing project paper (title page, introduction, and the plan.) Continue making logbook entries.
3 to 2 weeks before Meet	Examine the results of your science research project. Continue working on project paper (discussion, hypothesis and any conclusions drawn, acknowledgements, and the bibliography.) Continue making logbook entries.
2 weeks before Meet	Finalize work on project paper. Begin working on display board. Prepare notes for your presentation to judges.
1 week before Meet	Proofread and edit project paper and display board. Practice (practice and practice) your oral presentation.
The Meet	Congratulations on completing your science research project. Good Luck!

## Resources

<b>Science Fair Materials</b>	
Superior Distributing 2501 Maple Street Louisville, KY 40211 1-800-365-6661 <a href="http://www.superiordisplayboards.com">http://www.superiordisplayboards.com</a>	<ul style="list-style-type: none"> <li>• display boards</li> <li>• certificates</li> <li>• awards</li> <li>• books</li> </ul>
Website also has Science Fair Project Resource Links	
<b>Science Supplies and Live Specimens</b>	
Carolina Biological Supply PO Box 60232 Charlotte, NC 28260-0232 1-800-334-5551 Customer Service 1-800-227-1150 Product Information <a href="http://www.carolina.com">http://www.carolina.com</a>	<ul style="list-style-type: none"> <li>• wealth of science supplies</li> <li>• live specimen guarantee</li> <li>• Product information of live specimens provided by experts.</li> </ul>
<i>On the web site, Sign-up for E-Tips Newsletter, access resources including the <u>Carolina Tips</u> newsletter and <u>Caring Guides for Plants and Animals</u>, and check-out the incredible teacher resource section.</i>	
<b>Science Fair Web sites</b>	
<input type="checkbox"/> <b>Education Planet</b> Guideline on how to get a project started and on how to run a science fair. Also includes ideas for projects and links to other science fair sites. <a href="http://www.educationplanet.com/sciencefair.html">http://www.educationplanet.com/sciencefair.html</a>	
<input type="checkbox"/> <b>Nebraska Junior Academy of Sciences</b> Handbook for guiding students doing inquiry-based research. <u>Section 1: Facilitating Junior High/Middle School Students</u> and <u>Section 3: Useful information for Adult Sponsors and Students Participating in NJAS Science Fairs</u> . Handbook can be downloaded from NAS/NJAS web site at: <a href="http://www.neacadsci.org/njas/index.htm">http://www.neacadsci.org/njas/index.htm</a>	
<input type="checkbox"/> <b>Science Fairs Homepage</b> A project of the Eastern Newfoundland Science Fairs Council. This page lists project ideas in three age groups: elementary, intermediate, and senior high. <a href="http://www.cdli.ca/sciencefairs/">http://www.cdli.ca/sciencefairs/</a>	