North Davis Preparatory Academy

2010

NDPA Science Fair Information Packet

December 4, 2009

Dear Parents and Students,

We are excited to announce this year's science fair, to be held February 18, 2010.

All 5th, 6th, and 9th graders are required to participate. All other students are encouraged to participate. Science fairs emphasize the learning of science through experimentation, observation, identifying problems, proposing solutions and interpreting data.

Enclosed is a science fair packet to aid you in completing your project. The packet contains:

- Important Dates
- Project Guidelines and Rules (please make sure your project follows the rules)
- Judging Criteria
- Registration Form

We look forward to your participation. Please contact me with any concerns or questions.

Sincerely,

Larisa Page, Science Fair Committee
risieroo@yahoo.com

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NDPA Science Fair at a Quick Glance

Who May Participate

All students are encouraged to participate. K-3 projects will be for demonstration only. 4-9 grade projects will be judged.

- 5th, 6th, and 9th grade participation is **mandatory**. Each student must complete a project.
- For all other grades (K, 1, 2, 3, 4, 7, 8), participation is optional, but encouraged. Students may enter individual projects or team projects (up to 2 students per team).
- The top 6th -9th grade science fair participants may be given the opportunity to participate at the WSU Junior Science Fair, March 16th-19th.

Important Dates

- **Registration Forms Due** — Mon, January 11, 2010. (Turn into your Science teacher or the folder in the foyer of your school)
- **NDPA Science Fair** — Thursday, February 18th, 2010 (set up Feb 17th - see below)
- **WSU Junior Science Fair** www.ritcheysciencefair.org — Mon, Mar 22,2010 (For selected 6th -8th grade)or Wed, Mar 24,2010(9th grade)
  WSU Registration needs to be in by March 12,2010

Display Size

Maximum height of the exhibit is 95 cm (38 in),not including the table. Displays may not be more than 76 cm (30 in) deep, front to back; and 122 cm (48 in) wide, side to side. There are no exceptions.

Metrics

Remember to use metric units with all measurements.

Electricity

Note whether your display requires electricity.

Judging

Grades 4-9 projects will be judged. Please refer to judging criteria for further information.

Display Set Up	Wednesday, February 17th, 4:00 - 7:00 pm
Judging	Thursday, February 18th, 9:00–12:00 pm(subject to change)
Classes Visit Displays	Thursday, February 18th, 1:00 – 3:00 pm
Public Open House	Thursday, February 18th, 6:00 – 7:00 pm
Awards Ceremony	Thursday, February 18th, Ceremony starts right at 7:00 pm
Display Take-down	Immediately after the awards ceremony, February 18th

Web Sites For More Info

http://school.discovery.com/sciencefaircentral
www.ritcheysciencefair.org
http://faculty.washington.edu/chudler/fair.html
http://davis.k12.ut.us/district/curric/science/links.html

Parental Involvement

By sharing science experiences, parents demonstrate that learning is important and enjoyable. The key is that parents not do too much. Parents can offer advice, help gather materials, assist in constructing the display, and proof-read grammar. The research and overall project, however, should reflect the student's efforts.

Scientific Method (7 Steps)

All Science Fair projects should demonstrate the 7 steps of the Scientific Method

1. **Problem:** State what you want to find out.
2. **Hypothesis:** Predict what will happen.
3. **Material:** List what you need for the work.
4. **Procedure:** Plan what you will do.
5. **Data:** Gather information.
6. **Results:** Show what happened.
7. **Conclusion:** Tell what you learned.

Project Categories

A category must be specified on the registration form in order for it to be valid.

- **Botany:** Study of plant life.
- **Microbiology:** Biology of microorganisms.
- **Zoology:** Study of animals.
- **Chemistry:** Study of the composition of matter and laws governing it.
- **Earth/Space Sciences:** Study of the universe.
- **Engineering:** Technology projects that directly apply scientific principles to practical uses.
- **Environmental:** Study of pollution sources and their control.
- **Medical:** Study of disease and health of humans and animals.
- **Social/Behavioral:** Study of human & animal behavior and relationships.

Project Restrictions:

NDPA Science Fair projects may not use the following materials.

- Rodents (Research on small rodents can't be carried out in a student's home because housing conditions there do not meet Animal Welfare Act standards)
- Animals and humans can't be subjected to pain, weight loss, invasive procedures, or other risks.
- Illegal drugs
- Weapons

Display Restrictions:

The following materials can be used in a science fair project, but they **cannot** be brought to the science fair and displayed. Use photos or drawings of the project instead.

- Living Organisms, including plants.
- Taxidermy specimens or parts.
- Preserved vertebrate or invertebrate animals.
- Human or animal food.
- Human/animal parts or body fluids.
- Plant materials (living, dead, or preserved) in their raw, unprocessed, or non-manufactured state.
- Laboratory/household chemicals including water.
- Hazardous substances or devices.
- Dry ice or other sublimating solids.
- Sharp items (for example, syringes, needles, pipettes, knives).
- Flames or highly flammable materials.
- Batteries with open-top cells.
- Awards, medals, business cards, flags, acknowledgements, etc.
- Photographs or other visual presentations depicting vertebrate animals in surgical techniques, dissections, necropsies, or other lab procedures.
- Active Internet or e-mail connections as part of displaying or operating the project.

Registration:

- **All participants must register by January 11, 2010.**

Overview of a Science Fair Project….

(http://community.weber.edu/sciencefair/workshop.htm)

Where to Begin….

A Science fair project is the presentation of an experiment or a research effort. It's an investigation that tries to answer a question or solve a problem.

Example: Can paper be used to separate the dyes in food colorings?
Which paper separates the dyes the best?
Which solvent works the best?
Does it work with Kool-Aid dyes?

The First Step: Select a Topic
The best project is one that you're interested in. Focus on hobbies, sports, or things that would be fun. Science deals with plants, animals, medicine, physics, chemicals but also with TV, music, basketball, aerobics and every other part of life. Remember, a science project should answer a question, not just show what you know about something.

The best project is one where you can gather data.

Gather Background Information
Get information on your topic from books, magazines, the Internet, people and companies. Remember to keep notes about where you get information.

Organize and Theorize
Organize everything you have learned about your topic. Decide on a problem and form a hypothesis (prediction) by focusing on a particular idea.

Make a Timetable
Choose a topic that can be done in the amount of time you have. Allow plenty of time to experiment and collect data.

Plan Your Experiment
Once you have your idea, decide how you will perform the experiment and design a specific procedure you will use. Remember to have a variable or something that you can change. This is an important part of the scientific method.

Conduct the Experiment
While doing your work, keep detailed notes of every experiment, measurement, and observation. Don't change more than one variable at a time. Use a control in which none of the variables are changed. This validates your experiment. Include sufficient numbers of test subjects so that you can get accurate results. Use METRIC units of measurement.

Examine Your Results
Once you have completed the experiment, examine your findings. Did the experiment give you the expected results? Did you use the exact same steps each time you preformed the experiment? Were there any errors in your observations? Understanding errors is an important part of a successful project. Statistically analyze your data if possible.

Draw Conclusions
Was your hypothesis correct? You should be able to state if your hypothesis was correct or not. A hypothesis does not have to be correct in order for the experiment to be valid. Results are often exhibited in the form of charts and graphs.

Choosing Your Project

Most scientific studies attempt to answer questions the scientists have. Most questions come from observations the scientists make about the world around them. You can make observations that will lead to questions that will be the basis for good science fair projects.

Many questions that result from observations will have one of the following patterns. Mentally fill in the blanks and you will have nine questions that could be investigated.

1. What is the effect of_____on_____?

Examples:	detergent	seed germination
	temperature	activity of insects
	heat	vitamin C

2. How does the_____affect_____ ?

Examples:	humidity	fungi growth
	color of material	heat absorption
	air pressure	people's behavior

3. Which_____ (verb)_____ ?

Examples:	foods	do	meal worms prefer
	paper towels	are	most absorbent
	vegetables	contain	the most water

Narrow down your list of questions to those that might result in projects.

Investigation: Can the question be answered by an investigation?
Interests: Is this a project I'll enjoy doing?
Difficulty: Is the level of the investigation reasonable?
Safety: Is it safe? Is it harmless?
Time: Is there enough time to complete the investigation?
Expense: Can it be done with little cost?
Materials & Equipment: Can I get the materials and equipment I'll need?

Experimentation Project

Planning Lab-Type Investigations

Think about what might happen or change in the experiment. This is the data you will gather. Things that can change are called **variables.**

Example 1: What is the effect of different sources of water on plant growth?
The plan is to vary the source of the water (experimental variable) and see what happens to plant growth (measured variable). Think about what conditions you should not allow to change (controlled variable), so that they do not interfere with the experiment. Controls might be temperature, light and amount of water.

Three types of variables

- **Experimental**: What do you change?
- **Measured**: What do you measure?
- **Controlled**: What do you keep from changing?

Example 2: How does the type of exercise affect pulse rate?

Experimental Variable: Kind of exercise
Measured Variable: Pulse beat/minute
Controlled Variable(s): Amount of exercise, amount of rest between exercise sessions, age of exerciser, time of day, where pulse in taken.

Judging Information

Because some of our 6th – 9th graders may have the opportunity to advance to the Weber State University Junior Science Fair, we will use the same judging criteria at NDPA.

www.ritcheysciencefair.org

Scientific Thought (20 points)

- Is the problem or question stated clearly?
- Is the hypothesis stated clearly?
- Are variables recognized and defined?
- Are controls implemented?
- Were retests conducted/was sample size sufficient?
- Are conclusions or summary remarks justified by the data?
- Are conclusions drawn and clearly stated?
- Does this project have application in the real world?

Originality (10 points)

- How original is the question or problem investigated?
- How creative is the approach or experimental work?

Display Value (10 points)

- Does the display show what has been done?
- Is the display neat and orderly?
- Are tables, graphs, or charts clear and properly labeled?
- Was a logbook or notebook used to record data and observations?

Interview (10 points)

- Is the presentation clear and orderly?
- Does the student demonstrate knowledge of the subject area?
- Can the student answer questions effectively and accurately?

Tips on Being Judged

Science fair judges are often teachers, scientists, or people from science related industries in the area. They are interested in hearing about your project and are not there to frighten or try to stump you. They simply want to hear about what you investigated, how you did the work and how well you understand what you found. Your presentation is just as important as any other part of your project.

A normal judging interview goes something like this:

1. Introduce yourself.
2. Give the title of your project.
3. Explain the purpose of the project.
4. Tell the judge how you became interested in the topic.
5. Explain the procedure that you used in the project.
6. Show and explain your results and conclusions.
7. Tell the judges what you might do to expand the project in the future.
8. Explain any applications that your project might have.
9. Ask the judges if they have any questions and thank them for listening.

Time Considerations

Most judges can only spend a short period of time at each project, so you should make good use of that time. Impress the judges with how smoothly you can talk about your project. Limit your presentation to those portions of the experiment which are vital to your project.

Appearance

You should dress up to be judged. This is an important event at which you should look clean and professional. Wear your best NDPA uniform. Stand up straight and don't chew gum or be eating or drinking. Smile.

Get the Judges Involved in Your Project

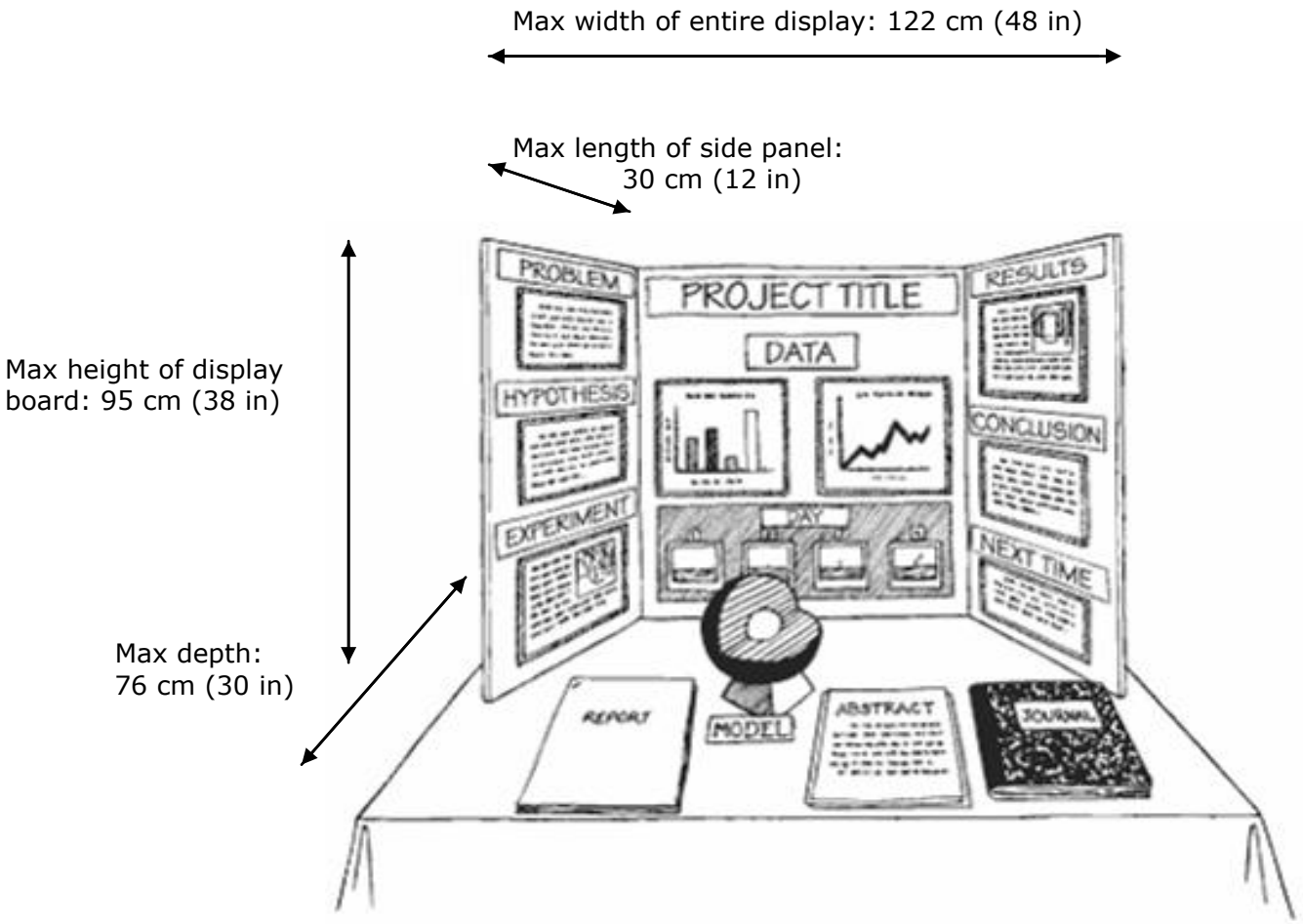
Let the judges hold your notebook, research paper, or apparatus. Point out charts, graphs and photos on your display. Speak loudly enough to be heard by all of your judges. Remember to pay attention to what your judges are saying and always be polite. Maintain good eye contact with the judges.

Between Judges

Stay at your project because you never know when a judge will be coming. Practice any part of your presentation that has given you trouble with past judges until it is smooth. Do not leave your project until it is announced you are free to leave. You will have a minimum of two judges. Bring a book to read or homework to do, so that you will have something quiet to do while waiting for the judges.

Display Example

(http://school.discovery.com)



When preparing your display and presentation, use the following checklist:

- ☐ Your display is the right size. Maximum height of the exhibit is 95 cm (38 in). Displays may not be more than 76 cm (30 in) deep, front to back; and 122 cm (48 in) wide, side to side. There are no exceptions.
- ☐ **All display items fit in the confines of the display board** (not extended past or items under the table.
- ☐ The project display board can stand by itself.
- ☐ Your name and teacher's name are written on the **BACK** of the project display board, and on any written materials included in your display, so that they can be returned to you if they get misplaced.
- ☐ You've brought extra tape, scissors, etc., to make any repairs if your display falls.
- ☐ You've included an abstract (one-page summary of your project) with bibliography.
- ☐ You've included your research report with bibliography.
- ☐ You've included your logbook of daily work (if applicable).
- ☐ You're ready to give your oral presentation (3 to 5 minutes) and answer any questions the judges ask.
- ☐ You've brought a book or homework to do while waiting for the judges.

NDPA Science Fair Registration Form

Student Name:_____ **Grade**:_____

Teacher:_____

If Team Project, Second Team Member's

Name:_____ **Grade**_____

Teacher_____

Project Title:_____

Project Category (circle one):

Botany Microbiology Zoology Earth/Space Sciences

Engineering Environmental Medical Social/Behavioral Chemistry

Brief Project Description and Research Plan (Outline procedures you intend to follow. Give enough detail that the Science Fair Committee can assess safety concerns):

_____

_____

_____

_____

Electrical Outlet Needed: YES NO

Student Signature: _____

If Team, Second Student Signature:_____

Parents, Please read and agree to the following:

1. I am aware of the exhibit size requirements.
2. I am aware of the school's restrictions on exhibits.

Parent Signature: _____

Student's Science Teacher Review: _____

Science Fair Committee/Safety Review:_____

The NDPA Science Fair committee, the cooperating teachers, sponsors, and North Davis Preparatory Academy administration assume no responsibility for loss of damage to any exhibit or part thereof.