

# Highlands Science Fair

January 4, 2010

Dear Students, Parents and Guardians:

Since September all students have been actively involved in many science experiments, observations and projects. Now is your child's opportunity to choose a project of his or her own. Projects can be in any area of Life, Physical or Earth/Space Science. Lists of possible science projects are available in the office, science room, in each classroom and at the Highlands Website at <http://www.mdusd.k12.ca.us/highlands/>. This packet is also available on the website. The fair is not competitive and is open to all students (K-5) at Highlands. Each child participant will receive a certificate of participation. In addition, two projects from grades 3, 4 and 5 (for a total of six projects) will be chosen to represent Highlands in the Mount Diablo Unified School District 21st annual science fair.

Important dates:

- **Friday, February 19, 2010: Highlands Science Fair, all projects** due in Multi-Use room before school begins, science fair will be from 6:30-8:00 p.m. that evening. Awards presented at 7:00 p.m.
- **Friday, March 12, 2010:** Project set up for MDUSD science fair from 3:30-5:30 p.m.
- **Saturday, March 13, 2010:** MDUSD 21<sup>st</sup> annual science fair 8:00 to 4:00 p.m. (lunch provided)

See the list of Safety Rules on the other side of this paper. Students in grades 3-5 **must use the scientific process** on their project if they wish to participate in the MDUSD science fair. In addition, this year the district is asking for projects to have a connection to a real life, workplace situation. Other than these restrictions, your child may follow his or her own interest and may work with another child or group (no more than four in a group, and the group must be approved by student's teacher). Classroom entries will also be accepted. Make sure your child and his or her team members work well together. If your child received a 1, 2, or 3 in a science unit, they may raise their grade by doing a project in one of these areas. Prior approval is needed by each student's teacher if the project is to be used to raise a grade. Please turn in your science project title to your teacher for approval.

When displaying the project please insure that it is **free standing**. This is necessary due to the lack of space. You **must** have your name, grade, room number and project clearly written and displayed on the project board. Highlands' students will have the opportunity to visit the fair with their teacher during the school day. Parents may also visit the Science Fair during school hours or from 6:30-8:00 p.m. Thank you for your cooperation and support.

Sincerely,

*Ms. Stevenson*

P.S. If you have questions that cannot be answered by your teacher, please email Ms. Stevenson at [stevensonam@mdusd.k12.ca.us](mailto:stevensonam@mdusd.k12.ca.us)

## Safety Rules

1. All projects must be approved by the teacher or science fair coordinator before beginning.
2. No live vertebrate animals may be exhibited at the fair (models or photographs should be used instead).
3. Projects may not involve experiments on any living creatures that result in their death, altered state or mutilation (i.e. pesticide effectiveness).
4. No human body parts may be displayed. Exceptions are teeth, hair and nails.
5. Students should avoid doing experiments involving bacteria cultures.
6. No controlled substances will be exhibited.
7. No dangerous or combustible chemicals may be displayed at the fair. Rockets or engines must not contain fuel. All chemical displays must have the contents clearly marked on the container and be presented in a safe manner.
8. No open flames are permitted.
9. If eye protection is necessary, student experimenters must wear safety goggles and follow standard safety practices. Parent supervision may be required for some projects.
10. Parent Help: Some students are fortunate because their parents have time to help them, but parents who do the thinking or display for them do not help the student in the end. Younger students may need more supervision and guidance to complete their projects. Parents are encouraged to help their children in these ways:
  - a. Projects should be done individually by the student
  - b. Read and discuss packet
  - c. Select projects that are appropriate for your child's age
  - d. Plan and manage project work times and cleanup
  - e. Take children to the library or bookstore
  - f. Purchase needed supplies
  - g. Listen to your child's explanation of the project
  - h. Supervise and monitor safety of your child
11. All projects using household electricity must conform to standard wiring practices and safety.
12. Expensive or fragile items may not be displayed. Valuable items essential to the project should be simulated or photographed.
13. Collections (i.e. minerals, shells, feathers, etc.) can be protected with a covering of plastic wrap.
14. Items to be displayed in front of display board must be adequately secured (i.e. batteries, wire, switch and motor secured to a piece of plywood and placed in front of board).
15. Carefully pack all materials when transporting to and from the fair.

# Steps to Prepare a Science Fair Project

## 1. Select a Topic/ Decide on a question or problem you want to solve

See the projects lists if you are having a hard time finding a project. Remember a Science Fair Project is a test you do to find an answer to a question, not just showing what you know about something. For example you might ask “What would happen if.....” Or “How many ways can we....?” What exactly do you want to know?

## 2. Gather Background Information/Research

Gather information about your topic from books, magazines, the Internet, people and companies. Keep notes about where you got your information. This is when you look for information about the question. You will talk with people who might know something about how to answer your question. You will read books, go to the library and look up information. You may also find information on the computer. Some people call this the background information.

## 3. Use the Scientific Method to prepare your experiment

- State the **Purpose** of your experiment - What are you trying to find out?.
- Make a prediction about the answer to the question. In science this is called the **hypothesis**. You are making a “guess” about what you think the answer to your question will be.
- Decide how to answer the question. This means you have to design a test to help you answer your question. In science, we call this the **experiment**.

Note: The hardest part of the project is deciding what your variables are. Variables are the things that can be changed or that can be controlled in an experiment. You will change one variable in you experiment and perform the test or experiment. For example, you are trying to find out the effect of salt water on the growth of plants. Both groups are treated in exactly the same way (the same type of seeds, same soil, same amount of light, same temperature etc.) The only thing that is different between the two groups is that you water one with tap water and the other with salt water. The water is the variable.

- Write out the **PROCEDURE** you will follow, step by step, to answer your question.
- Make a complete list of **equipment and materials** and gather them together.

## 4. Run Controlled Experiment and Record Data using the Scientific Method

- Do your experiment and collect the data. Remember to measure and record data accurately. Use and report measurement units carefully. All of your measurements should be in metrics. Repeat the experiment to double check data. Keep notes in one place. Write down everything you can think of, you might need it later.
- Make your conclusions. Does your data agree or disagree with your hypothesis. Hypotheses are never right or wrong, they are just supported or unsupported. What do your data presentations mean? Are they useful and how are they useful? What did you learn? What do you need to investigate further?

## 5. Graphs and Charts

- Study the results of your experiment.
- Compare various data. What happened? Answer that question, then decide how to put the results in graphs, tables and charts.
- Label all of these correctly with the measurement units you used. Be able to write sentences to explain your data and what they mean.

**6. Construct an Exhibit or Display:** (size of display should not exceed 30" X 30")

- Make your display **free standing** (should not require support other than the table surface), eye catching, creative yet straight forward and well organized
- Show that you used the Scientific Method. Categories such as: question, hypothesis, procedure, materials, results and conclusions should be arranged in a logical sequence on the display board.
- Charts, graphs and tables should be clearly labeled, with units of measurement clearly indicated: all photos and illustrations should have captions
- Sketch out the layout before cutting and gluing items on the board.
- Proofread every line of text including captions and labels before cutting out and gluing them on the board.
- It has to be neat, but it does NOT have to be typed.
- **Remember to include a brief statement of how your project connects to real life.**

**7. Practice Presentation to Judges/Teachers**

Practice explaining your project to someone (parent, friend, grandparent, etc.) This will help you be calm on Science Fair Day. The judges are very nice and will be interested in what you did and what you learned.

**8. Come to the Fair and have fun! See you there.** (Remember to be prepared to explain your project to teachers and judges.)


## Sample Display

**Problem/ Purpose**  
State the problem you meant to solve.

**Project Title**  
by  
Your Name

**Results**  
What did you learn from your work?  
Explain your data.

**Hypothesis**  
State your hypothesis.

**Data & Graphics**  
  
Display your data and pictures in this area.  
  
Graphics are very effective for explaining results.

**Conclusions**  
Was your hypothesis right or wrong? Can you make a new one?

**Procedures**  
Explain the experiments you did. What? How? Why?

**Recommendations**  
From what you learned, would you try anything new?

~~ Science Fair Board Layout ~~  
Experimental Project

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Name: \_\_\_\_\_

## Schedule for Science Fair Projects

<u>Week</u>	<u>Date</u>	<u>Check when Completed</u>	
1	1/4-1/8	_____	1. Choose a topic that you are interested in doing (one that is not too hard nor too easy)
1	1/4-1/8	_____	2. Pick up a science board during science lab or after school.
1	1/9	_____	3. Begin work on your project. (may start when you have teacher approval)
2-4	1/11-1/22	_____	a. Organize everything you plan to do. Start a journal to keep all your notes and research along the way.
2-4	1/11-1/22	_____	b. Change your topic if necessary.
2-4	1/11-1/22	_____	c. If you are doing an experiment, make a guess (hypothesis) about what you think will happen.
2-4	1/11-1/22	_____	d. Gather your materials. Complete initial research.
2-4	1/11-1/22	_____	e. Perform your experiment.
4-5	1/25-2/5	_____	f. Record your observations in your journal.
4-5	1/25-2/5	_____	g. What did you learn or find out by doing this experiment?
4-5	1/25-2/5	_____	h. See if your original hypothesis was correct.
5-6	2/1-2/12	_____	4. Begin work on your free standing display. Present the information you collected in easy-to-read graphs or tables. If you did an experiment, reserve special areas of you display for your Problem, Hypothesis, Procedure, Results and Conclusion. If you plan to use photographs, allow enough time to have them developed.
5-6	2/1-2/12	_____	5. Type or neatly write explanations or background information and mount them to your display. Proofread your work.
5-6	2/1-2/12	_____	6. Finish constructing your display, including graphs, charts and visual aids.
5-6	2/8-2/18	_____	7. Prepare a 2-3 minute oral presentation for your class and/or the judges.
6	2/19	_____	8. Bring your project to school. Due Friday, February 19!!

**Science Project Worksheet (for projects using the scientific method)**

**Name:** \_\_\_\_\_ **Attach this sheet to the back of your display**

**Project Title:** \_\_\_\_\_

**Question:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Hypothesis: (Prediction of what you think may happen)** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Equipment I need: (List all necessary materials for your experiment)** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Procedure: (Number and list all steps)** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Results: (What happened in the experiment?)** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Conclusion: (What did you find out by doing this experiment?)** \_\_\_\_\_

\_\_\_\_\_

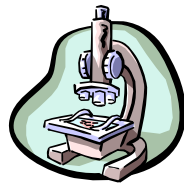
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\_\_\_\_\_

\_\_\_\_\_





## Areas of Study by Grade Level

- Kindergarten: **Physical Science:** Properties of materials can be observed measure and predicted.  
**Life Science:** Different types of plants and animals inhabit the earth.  
**Earth Science:** The earth is composed of land, air and water
- First: **Physical Science:** Materials come in different forms (states) including solids, liquids, and gases.  
**Life Science:** Plants and animals meet their needs in different ways.  
**Earth Science:** Weather can be observed, measured and described.
- Second: **Physical Science:** The motion of objects can be observed and measured.  
**Life Science:** Plants and animals have predictable life cycles.  
**Earth Science:** Earth is made of materials that have distinct properties and provide resources for human activities.
- Third: **Physical Science:** Energy and matter have multiple forms and can be changed from one form to another.  
**Life Science:** Adaptations in physical structure or behavior may improve an organism's chance for survival.  
**Earth Science:** Objects in the sky move in regular and predictable patterns.
- Fourth: **Physical Science:** Electricity and magnetism are related effects that have many useful applications in everyday life.  
**Life Science:** All organisms need energy and matter to live and grow.  
**Earth Science:** The properties of rocks and minerals reflect the processes that formed them.
- Fifth: **Physical Science:** Elements and their combinations account for all the varied types of matter in the world.  
**Life Science:** Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials.  
**Earth Science:** Water on Earth moves between the oceans and land through the processes of evaporation and condensation.

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Name: \_\_\_\_\_

My project will be in the following area: Physical      Life      Earth

Project title: \_\_\_\_\_

I will work:    by myself    In a group (no more than 4 people)    \_\_\_\_\_

Yes, I want to raise my grade    \_\_\_\_\_

Parent Signature: \_\_\_\_\_

Teacher Approval: \_\_\_\_\_

Include the following in your project: \_\_\_\_\_

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