ENVIRONMENTAL INNOVATION PROJECT
Kindergarten – 5th GRADE

Student Information Packet
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PUTTING IT ALL TOGETHER

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You are surrounded by science. Everything uses some form of science to make it work. Even the chair you sit on was made by a person using tools to build it based on knowledge of science and technology. How did they know what shape to make the saw and how sharp the teeth needed to be to cut wood? How did they know to make one saw for wood and a different one for metal? Why does the wood-cutting saw have larger teeth than the metal-cutting saw?

Science is asking questions and finding answers. A science project, simply put, is the process of asking a question about something you are interested in, for which you don’t already know the answer, and then hypothesizing (best-guessing) what the answer might be, researching for information on that topic, experimentating, inventing, surveying, etc., analyzing your results, and coming to a conclusion!

The purpose of a science fair is to provide a focus for you, the student, to apply skills and concepts you have learned in science as well as in math, reading, writing, and technology. It gives you a place to use these skills creatively in your own way.

What your accomplishment will mean for you:
★ Developing self-reliance
★ Gaining self-confidence
★ Acquiring organizational skills
★ Knowing what the scientific method is and how it can help you.
★ Having your work viewed and recognized by your school and community

Everything you need to know about doing a great science project is inside this packet. You’ll be discussing the contents in class. Approximately every two weeks between now and your school science fair, your teacher will give you a Student Timeline for Science Fair Project sheet to check your science project’s progress. The timeline sheet is designed to keep you on target, and keep your teacher and parents informed so that they can help you if needed.

You must keep this packet, timeline sheets, letters home to parents, and all other information in a separate folder. Your science fair folder should be kept at home unless your teacher asks you to bring it to school.

You will find the science fair to be an exciting and rewarding experience. Let’s make this year’s fair the best ever!
Helpful Hints for Students

Start EARLY; don’t wait until the last two weeks before it is due.

Plan it out. It will be much more fun if you spread the time out over several days per week or several weekends, and you won’t have to race to get it done! It might look like this:

Week 1 – Decide on your PROBLEM – what you want to solve.
Week 2 – Collect and read information about your topic.
Week 3 – Work the steps of your project.
Week 4 – Think about the results and make your charts or graphs.
Week 5 – Write your report.
Week 6 – Make your display.

Check with your parent or teacher if you want to use a web site for research. Not all web sites give correct information.

Students in 4th and 5th grades should be doing almost all of this by themselves.

Students in 2nd and 3rd grades should be able to do many parts.

Students in Kindergarten and 1st grade will need help for most of the project.

This is to be a fun process. “Success” is a completed project where you had fun and learned a lot.

Enjoy the fun!
For Kindergarten through 5th Grade

Caring for our Earth and its many natural resources is a responsibility we all share. We have all seen, heard, and read about issues that threaten the environmental health of our neighborhood, city, and greater geographic area. All environmental innovations begin at a grassroots level with people who take action when they see an opportunity to improve environmental conditions. This project challenges students to identify environmental problems and take steps to solve the problem with innovations, new products, community events, and/or awareness campaigns.

I. ENVIRONMENTAL PROBLEM
State the problem – one sentence in the form of a question. Choose a topic in which you are interested in learning more about.

II. PRELIMINARY RESEARCH
Research, read, watch science videos, contact resource people who may help. Incorporate prior knowledge. Find out if anyone else has looked at this environmental problem.

III. INNOVATIVE IDEA
Explain your innovative idea. The innovation can be a new product, a new or revised process, a campaign to help people learn about the issue and offer a solution, or a community event to share your new solution.

IV. ACTION PLAN
Plan a timeline for carrying out your innovation, showing all the steps you need to take and what materials and people you will need to be successful.

V. OBSTACLES
Describe the difficulties of your plan and how you got past them. Also mention who is needed to carry out the innovation and how people in the community would be affected by it.

VI. REFLECTION
The reflection describes the challenges and rewards of the project. This is also the place to persuade others how important it is to take care of this environmental problem.
**ELEMENTARY ENVIRONMENTAL INNOVATION**

**WRITTEN REPORT CONTENT**

Kindergarten through 5th Grade

- **TITLE PAGE**
  See Written Report Format on next page.

- **PURPOSE**
  In three sentences or less, tell why you chose the environmental issue you did.

- **ACKNOWLEDGEMENTS**
  In one or more sentences, say “Thank You” to those who have helped you with your project. You should include those who gave you guidance, materials and the use of facilities or equipment.

- **TABLE OF CONTENTS**
  List each of the following sections and the page numbers for each. Type the page number at the bottom of each page after you have finished the final copy of your report.

- **ENVIRONMENTAL PROBLEM**
  State the problem in the form of a question. Your page numbering begins here.

- **PRELIMINARY RESEARCH**
  This part of your report has information what scientists or engineers have tried to address your environmental issue.

- **INNOVATIVE IDEA**
  This is where you describe your new idea to help the environment. It can be a new product, a process, a community event, a way to show others what the problem is, or something else!

- **ACTION PLAN**
  This includes a timeline for your innovation, including the steps you need to take, things you will need, and people whose help you will need.

- **OBSTACLES**
  Describe any difficulties you could or did run into, telling how to get past those difficulties. Also mention who is needed to carry out the innovation and how people in the community would be affected by it.

- **REFLECTION**
  Now that you have finished your project, use this section to share with others your thoughts about this experience. What was rewarding? How might this help you in the future? How else could you help others to understand this issue?

- **SOURCES / BIBLIOGRAPHY**
  List all websites, books, articles, pamphlets and other communications or sources that you used for researching your topic and writing your paper. You must have at least two sources, and only one may be an encyclopedia. Interviews with experts in your field of study are encouraged.

**BOXED** topics are part of the rubric criteria for judging. The other parts are used only for grading the written report by the teacher.
ENVIRONMENTAL INNOVATION
WRITTEN REPORT FORMAT

Each line with a box (☐) in front of it begins a new page in the report.

☐ Title page

Title in middle of page

In lower right-hand corner:
Last Name, First Name
Grade ___
Period ___
Teacher Name
School Name
Date (include year)

☐ Purpose

Acknowledgements

☐ Table of Contents (with page numbers)

☐ Environmental Problem (page numbering starts here)

☐ Preliminary Research

☐ Innovative Idea

☐ Action Plan

☐ Obstacles

☐ Reflection

☐ Sources / Bibliography

1. The ORIGINAL report goes inside the report pocket on the display board.
2. A COPY should be kept at home or on the computer.
Entries in a bibliography are alphabetized by the last name of the author or the first word of the title. An entry for which the author is unknown, such as a newspaper article or an unsigned review, is alphabetized by the first word of the title, excluding the articles A, An, and The.

### Books

|---------------------|---------------------------------------------------------------------|

### Magazines

|---------------------|-----------------------------------------------------------------------------------------------|

### Newspapers

### Reference Works

<table>
<thead>
<tr>
<th>Type</th>
<th>Entry</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dictionary Entry</td>
<td>“Advertisement.” Webster’s Third International Dictionary. (Because the number of the edition appears in the title, the date is not necessary.)</td>
<td></td>
</tr>
</tbody>
</table>

### Nonprint Sources

#### Video


### Computer Materials

#### Computer Software


#### Web Sites


### Interview

Persons name (last name first), position or work title, place of interview, date of interview.
ENVIRONMENTAL INNOVATION
DISPLAY INFORMATION

BACKBOARD MATERIALS
The backboard must be sturdy and stand by itself on a table. Foam core-board and cardboard are the best materials. If you need to cut through the sides of your core-board to make “wings”, do not cut all the way through.

COLORS
If you need to paint your backboard, enamel paint works best. Do not use water-based paint. Contact paper may also be used. Use a minimum of three contrasting colors on your board.

LETTERING
Your title and subtitles may be computer-generated or cut from construction paper. Do not freehand the letters. The title letters should be 3-4 inches high. The subtitle letters should be 1-2 inches high. The subtitles, which are mandatory on the display board, are: Environmental Problem, Innovative Idea, Action Plan, Obstacles, Reflection, and Report. All items on the display must be glued to the board. Do not use pins, tacks, staples, or tape.

DRAWINGS, PHOTOS AND GRAPHS
Drawings and photos are most useful on the display. Drawings should be drawn in pencil first and then retraced. Drawings should be in color and outlined in thin black felt tip pen. Graphs and charts must be used in the results section. They may be computer-generated. All graphs and charts must have explanatory titles. Graph axes must be labeled.

If you have a camera, you should photograph your environmental innovation. A photo of you with your project is encouraged. All photos must be titled.

DISPLAY DIMENSIONS
1. When backboard (display portion) is flat, it should be 48 inches wide.
2. Side panels (“wings”) should be 12 to 18 inches.*
3. Height should be no more than 48 inches.

REPORT POCKET
There must be a “pocket” on the display to hold your report.

When you have decided what you are going to put on the backboard (display), lay the unglued display on the floor and look at it carefully. Have family and friends look at it and ask their opinions. Then, you should glue everything into place. Examples of displays will be shown and discussed in class.
DISPLAY SIZE & SET-UP
FOR SCHOOL SITE AND LBUSD SCIENCE FAIRS

Minimum sizes are suggested, not required.

18" max
12" min
48" max
36" min

Title

Action Plan

DRAWINGS
PHOTOS
GRAPHS
CHARTS

Environmental
Problem

Innovative
Idea

Obstacles

Reflection

Report
Pocket

You may decide where to place these elements on your board. This example is to give you an idea of what a display board for a project might look like.
ENVIRONMENTAL PROBLEM

INNOVATIVE IDEA

ACTION PLAN
OBSTACLES

REFLECTION

REPORT
DISPLAY ITEMS

Part of your display should include something that represents the project and should be placed in front of or on the display board. Depending on the type of project you do, the display items may or may not be the focus of the display.

If you cannot decide what to use to represent your project, brainstorm with family, friends, and classmates. Keep in mind that the items you choose will set the tone for your display and must be approved.

No part of your display may pose a safety hazard. Do not include harmful chemicals, bacterial cultures, sharp objects, or any source of heat or flames. No live or preserved animals are allowed at the LBUSD district-level science fair, at the Los Angeles County Fair, or at the California State Fair.

Some examples of display items are listed below:

- **Equipment or materials** you have built or used as part of your project or experiment (i.e., an incubator, variously shaped kites, a solar oven, a microscope with slides, etc.)

- **Models**

- **Artistic representations** of your topic (i.e., a large paper maché nose for an odor project, toothpick bridges for a physics project, or a collage of leaves for a plant project)

- **Samples or specimens**

- **Simulated items** such as photos, video, and audio taken while working on your project or during your experiment. (Keep in mind that use of extension cords requires special permission.)

There are endless possibilities. Be creative! Put on your thinking cap!
<table>
<thead>
<tr>
<th>Environmental Problem</th>
<th>Preliminary Research</th>
<th>Innovative Idea (Double Points x2)</th>
<th>Action Plan with Timeline (Double Points x2)</th>
<th>Obstacles (Double Points x2)</th>
<th>Reflection</th>
<th>Visual Quality of Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>States the environmental problem as a question that is vague, or as a statement, or addresses an issue to which the student already knows the answer. Shows limited or no connection to societal benefit.</td>
<td>Cites fewer than three sources. Or, the description of the research is incomplete, or has little connection to the problem, or is not written in the student’s own words. Or, fails to mention other attempts to address this problem.</td>
<td>Attempts to explain the innovative idea. Visuals and notes may be incomplete or fail to show a new or original approach. It may be unclear how the idea could possibly minimize impact or counter the threat of the environmental problem.</td>
<td>Timeline of the action plan may be incomplete or neglects to reference supports for success, such as resources, materials, people, etc. Action step labels or explanations are vague or missing.</td>
<td>Student provides little description of difficulties in making their innovation practical, efficient, or sustainable. Or, fails to mention realistic ways that people needed to carry out the action plan would be impacted.</td>
<td>Student is unclear about challenges and rewards of the project. Or, makes vague applications to personal strengths or neglects possible use of the idea in other settings. Or, neglects or argues with little evidence about why the problem should be addressed.</td>
<td>Project has limited eye appeal or is not easily readable at approximately two feet distance. The project has limited organization, or contains confusing visuals, or contains major language or spelling errors.</td>
</tr>
<tr>
<td>States environmental problem as a question, which represents a genuine learning opportunity for the student. Generally addresses a benefit to society.</td>
<td>Cites three or more sources from one or more types of resources (e.g., text, encyclopedia, businesses, magazines, catalogs, internet, or interviews). The student generally connects the research to their problem in their own words. Mentions some other solutions attempted by others.</td>
<td>Explains the innovative idea. Visuals and notes show that the idea attempts to solve the problem with a new or original approach. The student mentions a possible way their idea might minimize impact or counter the threat of the environmental problem.</td>
<td>Timeline shows the order of the action plan and refers to supports for success, such as resources, materials, people, etc. All action steps are labeled and explained.</td>
<td>Student describes difficulties they can see in making their innovation practical, efficient, or sustainable. Mentions some ways that people needed to carry out the action plan would be impacted.</td>
<td>Student lists challenges and rewards of the project, making applications to personal strengths and possible use of the idea in other settings. Uses some evidence to explain why the problem should be addressed.</td>
<td>Project is appealing and readable at approximately 2 feet distance. It is organized and clear, uses understandable visuals and/or models, and contains few language and spelling errors.</td>
</tr>
<tr>
<td>States the environmental issue or problem as a question, provides evidence that it comes from the student’s personal interests or experiences, and represents a genuine learning opportunity for the student. The project has a specific beneficial application to some aspect of society.</td>
<td>Cites three or more sources of information about an environmental problem, in the correct format, using at least three types of information resources. Clearly explains the connection to their identified problem and what others have done to address this problem.</td>
<td>Clearly explains the innovative idea in detail. Visuals and notes show how the idea attempts to solve the problem with a new or original approach. The student identifies a specific way their idea will minimize impact or counter the threat of the environmental problem.</td>
<td>Timeline clearly shows each step of the action plan and thoroughly addresses necessary supports for success such as resources, materials, people, etc. All action steps are labeled and explained.</td>
<td>Student thoroughly describes difficulties they can see in making their innovation related to practicality, efficiency, and/or sustainability. Explains the impact on people needed to carry out the action plan.</td>
<td>Student clearly describes challenges and rewards of the project, making numerous applications to personal strengths and possible use of the innovation in other settings. Takes a well-reasoned stand to persuade others that a problem exists and should be addressed.</td>
<td>Project is appealing and neat, and is readable at approximately 2 feet distance. It is well organized and clear, makes striking use of inventive or amusing visuals and/or models, and uses language and spelling flawlessly.</td>
</tr>
</tbody>
</table>

(Projects will receive between 10 and 50 points when all rubric criteria have been addressed.)
| **Environmental Problem** | States the environmental issue or problem as a question, provides evidence that it comes from the student's personal interests or experiences and represents a genuine learning opportunity for the student. The project has a specific beneficial application to some aspect of society. | Describe an environmental issue in your neighborhood, in a community or geographical area. |
| **Preliminary Research** | Cites three or more sources of information about an environmental problem, in the correct format, using at least three types of information resources. Clearly explains the connection to their identified problem and what others have done to address this problem. | Research how others tried to solve the problem. |
| **Innovative Idea** (double points) | x2 | Clearly explains the innovative idea in detail. Visuals and notes show that the idea attempts to solve the problem with a new or original approach. The student identifies a specific way their idea will minimize impact or counter the threat of the environmental problem. Define and explain your type of innovation whether it is a new product, process, promotional project, community event, etc. Show how it solves the problem. |
| **Action Plan with Timeline** (double points) | x2 | Timeline clearly shows each step of the action plan and thoroughly addresses necessary supports for success such as resources, materials, people, etc. All action steps are labeled and explained. Make a timeline of the steps you need to take to solve the problem with your innovative idea. Point out who or what is needed in each step. |
| **Obstacles** (double points) | x2 | Student thoroughly describes difficulties they can see in making their innovation related to practicality, efficiency, and/or sustainability. Explains the impact on people needed to carry out the action plan. Describe difficulties you ran into and how you got past them. Or possible difficulties and how you would get past them. |
| **Reflection** | Student clearly describes challenges and rewards of the project, making numerous applications to personal strengths and possible use of the innovation in other settings. Takes a well-reasoned stand to persuade others that a problem exists and should be addressed. Describe what was hard and what was fun. How might you use what you learned in the future? How can you help others understand your environmental concern? |
| **Visual Quality of Display** | Project is appealing and neat, and is readable at approximately 2 feet distance. It is well organized and clear, makes striking use of inventive or amusing visuals and/or models, and uses language and spelling flawlessly. Make your project fun to look at with pictures and colors. Use large, clear lettering. Check grammar and spelling. |