"All-Natural Antibacterial, Disinfectants & Sanitizers made from Natural Components"

"The doctor of the future will give no medicine, but will interest his patients in the care of the human frame, in diet, and in the cause and prevention of disease."

-Thomas Edison, Inventor

8th Grades A & B
“Clean Well, 0 Germs!”

All-Natural Antibacterials, Disinfectants & Sanitizers made from Natural Components

Grade: 8th  A/B

BACKGROUND
"We are all the same planet; there is no place in which to hide." (Kate Jones, Institute of Zoology, London, 2008.)

Paraguay has suffered epidemiological alerts for outbreaks of diseases such as Tuberculosis, Bubonic Plague, Chagas disease and other infectious diseases in the last decade.


As a result of the study, a detailed global map was developed, showing what the “hot spots” of new infectious diseases will be over the next 20 years. The results of this investigation reveal that the next diseases will come from wildlife. The study also gives some clues as to where and how the next outbreak will occur. The relevance and concern of this research is to know that Paraguay is in this first "map of infection" between what is so-called "average levels" of danger. This means that there are great threats to the appearance of new epidemics in our country. And that is why this project is focused primarily on the development of basic and applied research on health problems in our country, such as infectious diseases, in order to develop new strategies or procedures to prevent people from getting infected.

Without doubt, all mechanisms or strategies to avoid or lessen the possibility of acquiring infectious and contagious diseases will be key to preventing the spread of disease and in protecting the health of people.

OBJECTIVES

GENERAL
To elaborate an antibacterial product from natural compounds that can reduce
the number of germs on contact surfaces.

**SPECIFIC**

• To research and collect information on contagious diseases, viral and bacterial
diseases, direct and indirect contact.
• To design a sampling plan with selection of microbiological analysis.
• To perform the collection of microbiological sampling of contact surfaces.
• To develop Analysis and Laboratory indicators of microorganisms and
pathogens.
• To make a Field Visit to Dr. Riera’s laboratory, who will perform the analysis of
each of the microbiological samples?
• To attend to a Specialist´s Talk on contagious diseases, microorganisms, and
pathogens by Dr. Esteban Riera.
• To design tables and graphs with the results of the laboratorial analysis and to
use those results and conclusions to suggest and recommend ways and
procedures to avoid contagious diseases.
• To elaborate a natural antibacterial from natural compounds that can reduce
the number of germs on contact surfaces.

**PROBLEM**

Can a natural antibacterial product be made from natural compounds reduce
the amount of germs on contact surfaces?

**HYPOTHESIS**

A natural antibacterial product made from natural compounds can reduce the
amount of germs on contact surfaces.

**VARIABLES**

**DEPENDENT**

To reduce the amount of germs on contact surfaces.

**INDEPENDENT**

Microbiological sampling of contact surfaces, natural antiseptic compounds.

**INTERVENING**

Microbiological sampling design and sample collection, laboratorial procedures,
methods & procedures for collecting microbiological specimens.
Guidelines and Criteria. 8th Grades A & B

EVALUATION

Total points of the project: 85 points, distributed in two semesters or periods as follows:

FIRST SEMESTER. STAGE 1: 20 P. GATHERING INFORMATION

1st FORMATIVE TUTORIAL: (9 p)

GROUP EVALUATION (5 p)

• Selects the most relevant, current and local information on the assigned topic and presents in the Evidence folder (2p)
• Presents clear and personal work: introduction, rationale, objectives: general and specific, problem definition, hypotheses and variables. (2p)
• Presents the Evidence Folder as required (1P)

INDIVIDUAL ASSESSMENT: (4p)

• Presents the Evidence Folder on time with the structure assigned by the teacher (2p)
• Points to: sources, bibliography and identification of / the topic researched / the group work and meetings/ name of the group/ leader of the group, member of the group (2p)

SUMMATIVE TUTORIAL: (11 p) - EXECUTING

GROUP EVALUATION (8p)

• Presents the report taking into account the structure of the established background (introduction, objectives: general and specific, problem definition, hypotheses and variables. (4p)

• The literature and other sources used (minimum 5 articles and 4 Web sites) are cited in the report. (1p)

• Presents the report on time (1p)

• Presents activities scheduled in the Chronogram sheet. (1p)

• The Evidence Folder is decorated and it contains the structure requested by the teacher (cover pages, dividers, annex) (1p)

INDIVIDUAL EVALUATION (3P)

• Answers the teacher’s questions about main concepts and group work. (1p)
• Participates and gets involved in the process (group work, group meetings, assigned role, etc.) (1p)

SECOND PERIOD. STAGE 2: 25 P. PERFORMANCE (Experimental)
1st. FORMATIVE TUTORIAL: (5p)

• Communicates in both, oral and written reports the results of the experiments performed. (2p)
  • Follows the correct structure of the experimental work guided by the teacher (2p)
• Attends and brings all the materials requested for the lab experiment (1p)

SUMMATIVE TUTORIAL (20P)

EVALUATION GROUP (14 p)

• Follows the correct structure of the experimental work guided by the teacher (2p)
• Attends and Participates actively during the lab entrances (2p)
• Develops a study design (model, questionnaire, sample) (2p)
• The results are expressed clearly using graphs, charts, tables, photos, statistics (2p)
• The conclusions of the experimental work are expressed clearly and in accordance with the objectives of the research (2p)
• Designs the flyers or brochures (Diptych or Triptych draft). (2p)
• Uses the standard lab format to present the lab written report (2p)

INDIVIDUAL ASSESSMENT: (6p)

• Applies the rules of respect, tolerance and timeliness as the result of a critical and participatory attitude. (2p)
• Cooperates actively in the implementation of the work (2p)
• Attends lab entrances provided with all of the materials needed to perform the field work and/or experimental work. (2p)

FINAL PRESENTATION. STAGE 3: 40p – DRAWING CONCLUSIONS & COMMUNICATING RESULTS

1ST. FORMATIVE TUTORIAL : WRITING RESULTS (15p)

GROUP EVALUATION (10p)

• Cover pages, acknowledgments, index (3p)
• Body of work (correct order and sequence) (1p)
• Results: a) Surveys (1p) b) Cost Study, graphics and other (1p) c) Methodology (1p)
• Conclusion (1p)
• Annex (1p)
• Bibliography & References (1p)

INDIVIDUAL EVALUATION (5p)

• Applies the rules of respect, tolerance and timeliness as the result of a critical and participatory attitude. (2p)
• Cooperates actively in the implementation of the work (1p)
• Answers the questions formulated by the teacher about any part of the work or research or experiments performed (2p)

SUMMATIVE TUTORIAL (10p)
GROUP EVALUATION (7p)

- Presents the written report in a ringed booklet. (2p)
- Presents a PowerPoint in a pen drive as a complement to the oral presentation (2p)
- Presents the Evidence Folder with the work developed during the three periods with the teacher’s corrections (1p)
- Hands in the identification cards following the standard format and clips on the back (1p)
- Hands in the final flyers or brochures (3 or 5 samples) (1p)

INDIVIDUAL EVALUATION: (3p)

- Writes his/her personal conclusions (1p)
- Applies the rules of respect, tolerance and timeliness as the result of a critical and participatory attitude. (1p)
- Cooperates actively in the implementation of the work (1p)

ORAL DEFENSE (15p)

GROUP EVALUATION (5p)

- Presents the written report in a ringed booklet. (1p)
- Uses the PowerPoint as a visual support or complement to express the main ideas (1p)
- Presents the Evidence Folder with the work developed during the three periods (1p)
- Hands in the identification cards following the standard format and clips on the back (1p)
- Hands in the final flyers or brochures (1p)

INDIVIDUAL EVALUATION: (11p)

- Does not read from the PowerPoint or papers in his/her hands (1p)
- Uses the technical vocabulary appropriately (1p)
- Demonstrates ability to interpret the theme (1p)
- Explains clearly and with good diction the ideas, graphs, tables and diagrams (1p)
- Answers questions with confidence and without rambling (1p)
- Expresses conclusions consistent with the proposed objectives (1p)
- Takes and appropriate posture & behavior as well a positive attitude to express proper conduct and formality during the oral defense (1p)
- Comes with the correct uniform and name tags. (2p)
- Uses appropriate and effective visual support materials. (1p)

IMPORTANT OBSERVATIONS:

Procedural assessments are made through the tutorial system according to the schedule established by the institution.

The evaluation of the product is verified by:

a) Field trips and/or experimental work with written reports.
b) A written presentation of the work done by the group using the standard formats in the Evidence Folder and in a Final Ringed Booklet.
c) Presentation of the best science fair projects nationally and internationally if the institution proposes to do so.
d) A Final Oral Defense will take place through an examination table, conformed for the purpose, with internal and external professionals who will listen and evaluate each group.

**Cronogram – Science Annual Project 2015**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Deadlines</th>
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<tbody>
<tr>
<td>The teacher hands in the project topic to the groups with guidelines and normative.</td>
<td>Week 23 - 27 March.</td>
</tr>
<tr>
<td>Each group presents raw information about the topic as well as the evidence folder (structure &amp; decoration)</td>
<td>Week 13 - 17 April</td>
</tr>
<tr>
<td>1st Formative tutorial. The teacher returns Evidence Folder with first correction and guidelines for the first summative tutorial.</td>
<td>Week 4 - 8 May</td>
</tr>
<tr>
<td>1st Summative tutorial. Each group hands in the Evidence Folder (introduction, objectives: general and specific, problem definition, subtopic, hypotheses and variables, bibliography.</td>
<td>Week 18 - 22 May</td>
</tr>
<tr>
<td>Talk with a Specialist: Dr. Esteban Riera</td>
<td>May 19th</td>
</tr>
<tr>
<td>2nd Formative Tutorial: Lab Reports, Methodology, type of investigation. Collecting Samples &amp; Sending samples for Laboratorial Analysis. Visit to Dr. Riera’s Lab</td>
<td>Week 2 - 6 June</td>
</tr>
<tr>
<td>2nd Summative Tutorial: Implementation (product development, experimentation, final product elaboration)</td>
<td>Week 23 - 27 June</td>
</tr>
<tr>
<td>The teacher returns the Evidence Folder with corrections. Receiving and Analyzing Laboratorial Results.</td>
<td>Week 6-10 July</td>
</tr>
<tr>
<td>3rd Formative Tutorial: Final structure (Acknowledgements, Index, Introduction, Analysis of Results, General conclusion, individual conclusion)</td>
<td>week 3 to 7 August</td>
</tr>
<tr>
<td>3rd Summative Tutorial (ringed booklet, and evidence folder, Powerpoint, ID cards, flyers and brochures)</td>
<td>Week 07 - 11 September</td>
</tr>
<tr>
<td><strong>Final Oral Defense</strong></td>
<td><strong>Week 16 – 18 September</strong></td>
</tr>
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**REMARKS:** The dates above will be governed by the schedule of activities submitted by the Evaluation Department and might suffer changes that will be announced with anticipation.

**STEPS FOR DEVELOPING A SCIENTIFIC PROJECT:**
• DESIGNING A RESEARCH IDEA: The ideas are the first approach to the reality that will be investigated, sources may be: individual experiences, written materials, discoveries, personal conversations, observations of facts, beliefs, newspapers, etc.

• SUMMARY: It has to be written at the end of the research and after drawing conclusions. It is a synthesis of the project in no more than 150 words including key words and results, with the following requirements: Log of the institution (upper left), name of the Institution Area, Course, Project Name, Tutor, Project Summary (as title), authors (such as footer).

• INTRODUCTION: explains what is going to be researched, the background of problem, and the subject of the project, establishing the chapters to be developed in the investigation.

• OUTLINE OF THE PROBLEM OF RESEARCH: It is a formal explanation of the idea and structure of the research and the justification of the topic. Including the following steps

a) THE DEFINITION OF THE PROBLEM: Set by a question that covers briefly and concisely the problem of research.

b) OBJECTIVES: Establish a general idea of the intended research.

• GENERAL: Expresses the intent of the investigation or search.

• SPECIFIC: expresses the intermediate steps to reach the expected results:

c) BACKGROUND OR JUSTIFICATION: Indicates the reason for the investigation. It must describe the objective of the project following these steps: Relevance of the topic to research, feasibility & analysis of available resources.

• MAKING A HYPOTHESIS: A tentative explanation of a particular event or phenomenon. It is stated in a true propositional form and tries to explain the actual relationships between variables.

• VARIABLE: An entity or attribute that can vary and whose variation is likely to be measured.

a. DEPENDENT VARIABLE: Is that part of the hypothesis clearly known, and which are unknown elements that produce, modify and influence it. It is what you measure in the experiment and what is affected during the experiment. It responds to the independent variable. It is called dependent because it "depends" on the independent variable. In a scientific experiment, you cannot have a dependent variable without an independent variable.

b. INTERVENING VARIABLE: facilitates a better understanding of the relationship between the independent and dependent variables when the variables appear to not have a definite connection.

c. INDEPENDENT VARIABLE: An independent variable is the variable you have control over, what you can choose and manipulate. It is usually what you think will affect the dependent variable. In some cases, you may not be able to manipulate the independent variable. It may be something that is already there and is fixed, something you would like to evaluate with respect to how it affects something else, the dependent variable like color, kind, time.
d. CONTROL VARIABLE: is something that is constant and unchanged in an experiment. A control variable is any factor that remains unchanged and strongly influences values; it is held constant to test the relative impact of an independent variable. In scientific experimentation, a control variable is the one that must not be changed throughout an experiment because it affects the independent variables and thus affects the outcome of the experiment.

• CHAPTER I. THE THEORETICAL FRAMEWORK: Consists of the literature review, identification, collection, query, retrieval, collection and processing of relevant information, so as to give theoretical support to scientific research.

• CHAPTER II. METHODOLOGICAL DESIGN: is a clear and concise statement of each of the stages of the investigation. The description of how the investigation will be conducted.

CHAPTER III. ANALYSIS OF RESULTS: The process by which the student prepares and presents the research report with charts, diagrams and others, such as Surveys and Study of costs, Marketing Research, etc.

• CONCLUSION: The conclusion is a final comment or idea that summarizes the most important aspects of the topic as well as the results of the experiments or activities that took place during the course of the investigation. The conclusion should be expressed in a paragraph of small size and is designed to meet the following objectives:

- Identify and summarize aspects of the subject that the student was expected to discover through the development of the project and research.
- Encourage the student’s reflection on the importance of the topic research to their daily lives or the environment in which they live.
- Provide a final comment on the results of the activity being performed, in order to provide a feedback to the students or to make suggestions that may improve the process that involves a scientific research.

• ANNEX: in this section additional information is attached ( photos, clippings, diagrams, schedules, tables, etc.) and other materials to enrich the research.

• BIBLIOGRAPHY & REFERENCES: the name or names of the author - year of publishing - editorial - page. Internet pages, the page address.

REQUIREMENTS FOR A SCIENTIFIC REPORT.

Written reports for each tutorial will be monitored and evaluated by the teacher, according to the criteria presented in the corresponding item or term. The final written report must be drawn to computer, using the following guidelines:

- Font size 12.
- Type: Arial.
- Margins: Left: 3.5 cm. Right: 1.5 cm. Top: 2.5 cm. Bottom: 2.5 cm.
- Line Spacing: 1.5 cm.
Evidence Folder Structure:

Cover Page 1.

• Name of the Institution.
• School Logo
• Project Title
• A graph or image related to the subject
• Slogan
• Asuncion, Paraguay
• Year.

Cover Page 2

• Project Topic
• Area: Science and its Technologies.
• School: St. Ignacio of Loyola School
• Tutors of the Project
• Project Period: March to September

• 3 rd. pg. Acknowledgments
• 4 th. Pg. Index
• 5 th. - Introduction
• 6 th. – Background (Justification)
• 7 th. - General and Specific Objectives
• 8 th. - Brief description of the problem, a question
• 9 th. - Hypothesis:
• 10th. - Variables:
• 11th. Chapter I - Theoretical Framework
• 12th. - Chapter II Methodology.
• 13 th. - Chapter III Analysis of Results.
• 14th. - Conclusion.

Obs.: Logo and name of the school in each page (headings)

• 15 th. - Annex.
• 16 th. - Bibliography.

TOPICS TO RESEARCH

1. Contagious Diseases. Types of Viral and Bacterial Diseases. Direct and indirect contact.
4. Microbial contamination on contact surfaces (hands, handrails, doorknobs, kitchen countertops, pots and pans, vegetables and meat chopping trays).
7. Natural antibacterial substances and disinfectants for contact surfaces (to use in kitchens, office, toilet, classroom, car, purse or backpack)

REFERENCES

1. Fuhrman, Joel, M.D. Fasting and Eating for Health—A Medical Doctor’s Program for Conquering Disease. N.Y. St. Martin’s Press, 1995

Lic. Susana Ismael Basualdo