Republic of the Philippines
DEPARTMENT OF EDUCATION
Region III
DIVISION OF CITY SCHOOLS
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July 8, 2014

Division Memorandum
No. 100, S. 2014

To: **Public Secondary School Principals /OICs**
Principal, First City Providential College (FCPC)

DIVISION EVALUATION OF SCIENCE INVESTIGATORY PROJECTS (SIP)

1. This is to announce that the submission of the final copies of Science Investigatory projects (SIP) for Clusters 1 and 2, to the Division Office will be on or before **July 31, 2014.**

2. Three (3) copies of the project write-ups in Life Science (Team and Individual) and Physical Science (Team and Individual) must first be evaluated by the School Screening Committee (SSC) prior to submission to the Division Office.

3. Science Investigatory Projects (SIPs) that passed the School Screening Committee will be evaluated by the Division Screening Committee on **August 8, 2014, 8:00 A.M. at the Division Library Hub.**

4. **Format of the Research Paper should conform with the rules and guidelines contained in Enclosure No. 4 to DepEd Memorandum No. 159, s, 2013.**

5. Immediate and wide dissemination of the contents of this Memorandum is highly enjoined.

ESTELITA G. PINEDA, CESO V
Schools Division Superintendent

(Enclosure No. 4 to DepEd Memorandum No. 159, s. 2013)

Format of Research Paper

Investigatory papers that were reviewed by the national SRCs in the past years were found to have inadequacies in the content particularly in the areas cited below. These rules can be found in the Guidelines (http://www.societyforscience.org/isef/rulesandguidelines) and in the Student Handbook (http://www.societyforscience.org/document.doc?id=12).

I. ***Research Plan:*** (This is compiled separately from the rest of the investigatory paper): All projects should include the following:

A. *Question or Problem being addressed*

B. *Goals/Expected Outcomes/Hypotheses*

C. *Description in detail of method or procedures (The following are important and key items that should be included when formulating ANY AND ALL research plans.)*

- *Procedures: Detail all procedures and experimental design to be used for data collection.*
- *Data Analysis: Describe the procedures you will use to analyze the data/results that answer research questions or hypotheses.*

D. *Bibliography: List at least five (5) major references (e.g. science journal articles, books, internet sites) from your litrature review. If you plan to use vertebrate animals, one of these references must be an animal care reference.*

II. ***Project Data Book:***

- *A project data book is your most treasured piece of work. Accurate and detailed notes make a logical and winning project. Good notes show consistency and thoroughness to the judges and will help you when writing your research paper. Data tables are also helpful. They may be a little 'messy' but be sure the quantitative data recorded is accurate and that units are included in the data tables. Make sure you date each entry.*

III. ***Research Paper:***

A research paper should be prepared and available along with the project data book and any necessary forms or relevant written materials. A research paper helps organize data as well as thoughts. A good paper includes the following sections.

a) ***Title Page and Table of Contents:*** *The title page and table of contents allows the reader to follow the organization of the paper quickly.*

b) ***Introduction:*** *The introduction sets the scene for your report. The introduction includes the purpose, your hypothesis, problem or engineering goals, an explanation of what prompted your research, and what you hoped to achieve.*

c) *Materials and Methods: Describe in detail the methodology you used to collect data, make observations, design apparatus, etc. Your research paper should be detailed enough so that someone would be able to repeat the experiment from the information in your paper. Include detailed photographs or drawings of self-designed equipment. Only include this year's work.*

d) Results: The results include data and analysis. This should include statistics, graphs, pages with your raw collected data, etc.

e) Discussion: This is the essence of your paper. Compare your results with theoretical values, published data, commonly held beliefs, and/or expected results. Include a discussion of possible errors. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What would you do differently if you repeated this project? What other experiments should be conducted?

f) Conclusions: Briefly summarize your results. State your findings in relationships of one variable with the other. Support those statements with empirical data (one average compared to the other average, for example). Be specific, do not generalize. Never introduce anything in the conclusion that has not already been discussed. Also mention practical applications.

g) Acknowledgements: You should always credit those who have assisted you, including individuals, businesses and educational or research institutions. However, acknowledgments listed on a project board are a violation of D & S Display rules and must be removed.

h) References/Bibliography: Your reference list should include any documentation that is not your own (i.e. books, journal articles, websites, etc.). See an appropriate reference in your discipline for format or refer to the Instructions to Authors of the appropriate publication. Three common reference styles are:

1. *APA (American Psychological Association) Style :*
   -http://apastyle.apa.org/
   -http://www.calvin.edu/library/knightcite/index.php
   -http://owl.english.purdue.edu/owl/section/2/10/

   This resource offers examples for the general format of APA research papers, in-text citations, endnotes/footnotes, and the reference page.

2. *MLA (Modern Language Association) Format:*
   -http://www.mla.org/style
   -http://www.calvin.edu/library/knightcite/index.php
   -http://owl.english.purdue.edu/owl/section/2/11/

   This resource offers examples for the general format of MLA research papers, in-text citations, endnotes/footnotes, and the Works Cited page.

3. *The Chicago Manual of Style:*
   - http://www.chicagomanualofstyle.org/home.html
   -http://www.calvin.edu/library/knightcite/index.php

The Chicago Manual of Style presents two basic documentation systems. The more concise author-date system has long been used by those in the physical, natural, and social sciences. In this system, sources are briefly cited in the text, usually in parentheses, by author's last name and date of publication. The short citations are amplified in a list of references, where full bibliographic information is provided.

4. ***Abstract:***

After finishing research and experimentation, an abstract should be written. This needs to be a a maximum of 250 words on one page. It should include the a) purpose of the

experiment, b) procedures used, c) data, and conclusions. It also may include any possible research applications. Only minimal reference to previous work may be included. The abstract must focus on work done in the current year and should not include a) acknowledgments, or b) work or procedures done by the mentor. See below for examples of award winning abstracts. See page 28 of the International Rules for the proper formatting of an Official Intel ISEF Abstract and Certification. Please Note: The official abstract form is only for those participating in ISEF. This form may not be required for other levels of competition.

Sample Abstracts

2002 ISEF First Grand Award, Physics	**2002 ISEF First Grand Award, Microbiology**
A Novel Application of Locally Formulated Cholesteric Liquid Crystals in Dosimetry	**Antibiotic Substance Obtained from the Parotid Gland Secretions of the Toad (*Bufo marinus*)**
By Estrella, Allan N., Macalintal, Jeric V., Manapat, Richard K.S. Adviser: Mr. Jonathan Derez Manila Science High School	By Rara, Prem Vilas Fortran M. Adviser: Dr. Jose M. Oclarit Integrated Development School-MSU-Iligan Institute of Technology
Radiation has many industrial and economic uses. However, it poses a danger on those people working near it. To settle with this, dosimetry was introduced. Many kinds of dosimeters such as silver halides, thermoluminuscent dosimeters, and semi-conductor dosimeters were developed. This study focuses on the potential use of liquid crystals as a dosimeter. Three mixtures of liquid crystals were prepared using nematic E48, cholesteric TM74A and Canola oil synthesized cholesteric liquid crystal with mass ratios (E48: TM74A) of Mixture A (Mixture A), 30:70 (Mixture B) and (E48: Canola) 30:70 (Mixture C). The liquid crystals were then mounted to cells made from polyethylene sheets. Three samples were prepared for each mixture. The samples were then exposed to cobalt-60 for gamma radiation with doses of 2.5 kgy, 5 kgy, 10 kgy, 15 kgy, 20 kgy, 25 kgy and 30 kgy. After each exposure, the samples were observed and color changes were noted. Color changes corresponding to different gamma radiation does were observed in all samples. In all responses, the grand jean texture of the liquid crystals was restrained suggesting that the energy that was absorbed did not induce any chemical change. However, observed color changes indicated 'unwinding' of the pitch of the helical conformation for the TM74A-based formulation (Mixtures A and B) and 'winding' for the Canola-based liquid crystals (Mixture C). The application of liquid crystals in dosimetry was determined due to the color changes.	The study showed an antibiotic substance was obtained from the parotid secretions of a toad (*Bufo marinus*). This was isolated by extraction with methanol and initial purification by thin-layer and gravity column chromatography using aqueous methanol in varying concentrations as solvent. The crude extract was assayed on three test microorganisms (*Escherichia coli, Bacillus subtillis* and *Aspergillus niger*). Commercial antibiotics (Streptomycin and Penicillin) were used as controls to compare the potency of the compound. All test organisms were inhibited by the isolated compound, showing similar potency as that of the control antibiotics. Out of 30 fractions that were obtained from the gravity column chromatography only fractions 27-30 inhibited bacteria but not fungi, although at the initial experimentation, the crude extract, revealed effective inhibition against *Aspergillus niger*, a fungal test microorganism. Further purification of the active fractions using high performance liquid chromatography (HPLC) with aqueous methanol yielded a compound with retention time of 3.74 minutes. The compound was collected and assayed on the same test microorganisms. The active compound inhibited *E. Coli* and *B. Subtillis* at 30 and 40 mm, respectively. Infra Red (IR) spectrometry revealed amine, alkene and alkyl halides as functional groups. These spectrometric data revealed a trace of peptide spectra suggesting that the antibiotic principle is peptide-like molecule Bioassay of this compound demonstrated a comparable degree of antibiotic potency as that of streptomycin and penicillin with maximum inhibition of 45 mm in *B. subtilllis* and 34 mm in *E. coli.*