Student Checklist (1A)

This form is required for ALL projects.

1. a. Student/Team Leader: Nathaniel Kim Grade: 10

   Email: n8kim1@yahoo.com Phone: 310 863 9701

   b. Team Member: _____ c. Team Member: _____

2. Title of Project:

   Predicting El Niño Indicators using Recursion, Data Trees and Evolutionary Algorithms

3. School: Palos Verdes Peninsula High School School Phone: 310 377 4888

   School Address: 27118 Silver Spur Road

   Rolling Hills Estates, CA 90274

4. Adult Sponsor: Peter Starodub Phone/Email: starodub@pvpusd.net

5. Does this project need pre-approval? ☐ Yes ☑ No Tentative start date: 01/01/16

6. Is this a continuation/progression from a previous year? ☐ Yes ☑ No

   If Yes:

   a. Attach the previous year's ☐ Abstract **and** ☐ Research Plan

   b. Explain how this project is new and different from previous years on ☐ Continuation/Research Progression Form (7)

7. This year's laboratory experiment/data collection:

   01/01/16 — Actual Start Date: (mm/dd/yy)

   02/25/16 — End Date: (mm/dd/yy)

8. Where will you conduct your experimentation? (check all that apply)

   ☐ Research Institution ☐ School ☐ Field ☑ Home ☐ Other: _____

9. List name and address of all non-school work site(s):

   Name: Home

   Address: 18 Country Lane

   Rolling Hills Estates, CA 90274

   Phone: 310 541 4326

10. **Complete a Research Plan/Project Summary following the Research Plan instructions and attach to this form.**

11. **An abstract is required for all projects after experimentation.**

Research Plan and Post Project Summary Instructions

A complete Research Plan and Post Project Summary is required for ALL projects and must accompany Student Checklist (1A).

1. The Research Plan is a succinct detailing of the rationale, research question(s), methodology, and risk assessment of your research project and should be completed before experimentation. For all projects requiring preapproval, this document must be reviewed and approved by the appropriate approval committee (e.g. IRB, IACUC, SRC) before experimentation. ALL changes made to the original plan should be added to the final document as part of the Post Project Summary. For projects not requiring preapproval, this document may be completed either pre- or post-experimentation.
2. All projects should complete a Post Project Summary after experimentation.

The Research Plan and Post Project Summary should include the following::

a. What is the **RATIONALE** for your project? Include a brief synopsis of the background that supports your research problem and explain why this research is important scientifically and if applicable, explain any societal impact of your research.
b. State your **HYPOTHESIS(ES), RESEARCH QUESTION(S), ENGINEERING GOAL(S), EXPECTED OUTCOMES**. How is this based on the rationale described above?
c. Describe the following in detail:
   - **Procedures:** Detail all procedures and experimental design including methods for data collection. Describe only your project. Do not include work done by mentor or others.
   - **Risk and Safety:** Identify any potential risks and safety precautions needed.
   - **Data Analysis:** Describe the procedures you will use to analyze the data/results that answer research questions or hypotheses.
   - **Discussion of Results and Conclusions:** Discuss the data/results and the conclusions that can be drawn.

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

Items 1–4 below are subject-specific guidelines for additional items to be included in your research plan/project summary as applicable.

1. **Human participants research:**
   - **Participants.** Describe who will participate in your study (age range, gender, racial/ethnic composition). Identify any vulnerable populations (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
   - Recruitment. Where will you find your participants? How will they be invited to participate?
   - Methods. What will participants be asked to do? Will you use any surveys, questionnaires or tests? What is the frequency and length of time involved for each subject?
   - Risk Assessment
     - ◊ Risks. What are the risks or potential discomforts (physical, psychological, time involved, social, legal, etc.) to participants? How will you minimize the risks?
     - ◊ Benefits. List any benefits to society or each participant.
   - **Protection of Privacy.** Will any identifiable information (e.g., names, telephone numbers, birth dates, email addresses) be collected? Will data be confidential or anonymous? If anonymous, describe how the data will be collected anonymously. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will the data be stored? Who will have access to the data? What will you do with the data at the end of the study?
   - **Informed Consent Process.** Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.

2. **Vertebrate animal research:**
   - Briefly discuss potential **ALTERNATIVES** to vertebrate animal use and present a detailed justification for use of vertebrate animals
   - Explain potential impact or contribution this research may have
   - Detail all procedures to be used
     - ◊ Include methods used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation
     - ◊ Detailed chemical concentrations and drug dosages
   - Detail animal numbers, species, strain, sex, age, source, etc.
     - ◊ Include justification of the numbers planned for the research
   - Describe housing and oversight of daily care
   - Discuss disposition of the animals at the termination of the study

3. **Potentially hazardous biological agents research:**
   - Describe Biosafety Level Assessment process and resultant BSL determination
   - Give source of agent, source of specific cell line, etc.
   - Detail safety precautions
   - Discuss methods of disposal

4. **Hazardous chemicals, activities & devices:**
   - Describe Risk Assessment process and results
   - Detail chemical concentrations and drug dosages
   - Describe safety precautions and procedures to minimize risk
   - Discuss methods of disposal