

GREATER SAN DIEGO SCIENCE & ENGINEERING FAIR (GSDSEF)
PROJECT PROPOSAL/SIGNATURE* FORM (GSDSEF-1, 2014)

This form must be completed and signed prior to starting project work. It must be placed in the student's notebook with an ABSTRACT OF THE PROJECT for the GSDSEF Screening Fair. (Use the "Tab" key to move from line to line)

1. Project Title Efficiency Differences and Time Differences Between Tank Treads and Wheels
Is this a continuation of a previous project? Yes No

2. STUDENT'S NAME (Last, First, Middle) Hern, Nicholas, Adam

2a. Partner's Name (for Senior Division 2 person projects only) _____
EACH SENIOR DIVISION PARTNER MUST SUBMIT A SEPARATE PROJECT PROPOSAL FORM.

3. Address, City, Zip 11362 Village Ridge Road San Diego California

4. Phone 619-507-2921 email kloe@san.rr.com

5. School Scripps Ranch High School Grade 9

6. Teacher Mrs. Gillum

7. This project involves (check all that apply):

- Live Vertebrate Animals (GSDSEF-2, 2014)
- Humans as subjects, helpers, or interviewees (GSDSEF-3, 2014)
- Hazardous Substances (anything that could cause injury) (GSDSEF-4, 2014)
 - Chemicals
 - Infectious Agents
 - Bacteria, Fungi and/or Molds
 - Mutagenic Agents
 - Carcinogenic Agents
 - Teratogenic Agents
- Human or Other Vertebrate Tissue (GSDSEF-5, 2014)

8. WHERE REQUIRED (see #7 above), the following supplemental forms must be completed and included with the project proposal form (CHECK ALL THAT APPLY):

- Certification of Humane Treatment of Live Vertebrate Animals (GSDSEF-2, 2014)
- Certification of Compliance of Research Involving Humans (GSDSEF-3, 2014)
- Certification of Hazards Control (GSDSEF-4, 2014)
- Certification of Vertebrate Tissue Source & Safety (GSDSEF-5, 2014)

9. Location where experimental procedures will take place: Scripps Ranch San Diego CA

10. People, companies, etc. providing equipment, materials, workspace: Lego, Home Depot, Fluke

11. Proposed Project Category: Engineering - Electrical & Mechanical-
(See [Category Descriptions](#) on GSDSEF website)

12. Describe, in 200 – 250 words, the planned project/experiment and the procedures to be used:

This science fair project is about determining the most efficient propulsion system between two styles of treads and two types of wheels through energy consumed and time of completion. The project will show which configuration is best in different terrains. The terrains used will include grass, sand, asphalt, concrete, and rugged terrain (dirt and rocks). There will be two robot configurations utilized in order to minimize issues that arise from varying weight or design of any one robot. Each robot will be exposed to 100 tests, twenty-five (25) on each pair of treads and twenty-five (25) on each pair of wheels. Terrain will be tested five times for each robot configuration for the purpose of consistency. The energy level will be monitored with a fluke meter by recording the milliamps (mA) the robot is using every second of movement and adding up all readings for a single run to find total energy consumed during the run. In addition to energy, the test is also measuring the speed the robot can cover on a certain terrain. Therefore, the results lead to calculating the speed and energy to obtain the most optimal configuration. This information can then help us make faster and more efficient robots to handle a variety of situations.

Just before the screening fair, on a separate sheet of paper, write a 200-250 word ABSTRACT of your project and attach it to this form.

***Continue to next page for required Signatures**

GREATER SAN DIEGO SCIENCE & ENGINEERING FAIR
(GSDSEF) **PROJECT PROPOSAL/SIGNATURE FORM (GSDSEF-1, 2015)**
REQUIRED SIGNATURES:

Student:

I have read the *Rules and Regulations* of the GREATER SAN DIEGO SCIENCE AND ENGINEERING FAIR and certify that my project complies with them. I understand that failure to meet the terms of these rules and regulations will result in the disqualification of my project.

SENIOR DIVISION: GSDSEF forms meet the requirements of California law; therefore, all Senior Division students agree that, should they be selected to compete at the 2015 Intel International Science and Engineering Fair (Intel ISEF), when they sign all required Intel ISEF forms they will predate them to agree with the date on this form.

Nicholas Horn 9/1/14
Student Signature/Date

Parent/Guardian:

I am aware of all potential safety hazards connected with this project, approve the precautions being taken to ensure my student's safety and will, when appropriate, provide guidance and/or supervision. I understand that failure to comply with *Rules and Regulations* of the GREATER SAN DIEGO SCIENCE AND ENGINEERING FAIR will result in the disqualification of the project.

Arny K. Heru 9/1/14
Parent Signature/Date

Teacher:

I approved this project prior to the student beginning work on it and verified that it complies with the *Rules And Regulations* of the GREATER SAN DIEGO SCIENCE AND ENGINEERING FAIR. Any concerns about the project's design, appropriateness, safety, or legality were submitted to the GSDSEF Scientific Review Committee (SRC) for approval prior to allowing the student to proceed. I understand that failure to comply with the Fair's *Rules And Regulations* will result in the disqualification of the project. I will provide all needed supervision (other than that specified on other included forms) and will ensure that this proposal and all required supplemental forms are included in the student's notebook at the screening fair. I will have the student, if invited to apply for entrance to the GSDSEF, submit all SRC requested certification forms with their 2015 Application for Entrance.

Egobello 9-1-14
Teacher Signature/Date

Additional Advisor (if required)

When certification forms (GSDSEF 2, 3, 4 or 5, 2015) are signed by someone in addition to the science teacher, a signature here ensures that the procedures described on these forms will be followed.

Additional Advisor Signature/Date