

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

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 The Relationship Between a Crater's Diameter and the Projectile's Energy
Is this a continuation of a previous project? Yes No

2. STUDENT'S NAME (Last, First, Middle) Kumar, Ashwin

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 11837 Westview Parkway, San Diego, 92126

4. Phone 858-635-6793 email aksportsmaniac@gmail.com

5. School Marshall Middle School Grade 8

6. Teacher Mrs. Gillum

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

- Live Vertebrate Animals (GSDSEF-2, 2015)
- Humans as subjects, helpers, or interviewees (GSDSEF-3, 2015)
- Hazardous Substances (anything that could cause injury) (GSDSEF-4, 2015)
 - Chemicals
 - Infectious Agents
 - Bacteria, Fungi and/or Molds
 - Mutagenic Agents
 - Carcinogenic Agents
 - Teratogenic Agents
- Human or Other Vertebrate Tissue (GSDSEF-5, 2015)

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, 2015)
- Certification of Compliance of Research Involving Humans (GSDSEF-3, 2015)
- Certification of Hazards Control (GSDSEF-4, 2015)
- Certification of Vertebrate Tissue Source & Safety (GSDSEF-5, 2015)

9. Location where experimental procedures will take place: The experiment will take place at the home address of 11837 Westview Parkway.

10. People, companies, etc. providing equipment, materials, workspace: _____

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

This project is to test the relationship of impact craters' diameters to the energy of their projectiles. To simulate the mass and height variables of a projectile striking the Earth, a tennis ball will be dropped with a different mass, changed by cutting out the tennis ball and filling it up with sand. The height can easily be changed by simply making a peg board and double prong contraption. It will be formed by attaching two double prong hooks to a peg board and squeezing a PVC pipe through them. Two zip ties will keep the PVC pipe straight and prevent angle. After a ball is dropped, the diameter of the crater is to be measured. Each height and each weight will be dropped 25 times each, and by calculating an average of all of them, graphs can be plotted, and equations can be formed. The equation can be applied to real life scenarios. With an average speed, along with dimensions of a projectile, the resulting crater can be estimated and applied to many cities. The opposite can be derived, and with a diameter and an average velocity, the dimensions of the crater can be calculated. By testing for mass and crater diameter, many conclusions can be made.

Just before the screening fair, attach a 200-250 word ABSTRACT of your project 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.



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.



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*.



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