

Intel ISEF OFFICIAL ABSTRACT and CERTIFICATION



What propeller length will achieve the greatest rotations per minute?

Neil Armstrong

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The purpose of the project is to find out, what effect propeller length has on rotations per minute (RPM). If one increases the propeller length, then the propeller will achieve the greatest rotations per minute. I made my project by creating a wind tunnel with wood on the top and bottom and Plexiglass on the sides. Three holes are places inside the tunnel to hold the axle. On the axle at the front is a propeller with different sizes depending on the test. On the back of the axle, is a stick of wood to hold a magnet on one side, and a load of pennies on the other to counter the magnet's weight. On the last pole is the reader that is connected to the speedometer. The speedometer is to tell how fast the propeller is spinning. A wall of straws is placed at the front of the wind tunnel to straighten the wind flow. Outside the tunnel is the leaf blower to move the propeller. Running the test for one minute the spedometer found the average speed for each test. The one inch blade did not move. Two inch blade moved at a constant speed with decent results. The three inch blade moved fast compared to the other tests. I can conclude that my hypostasis is correct because the speed did increase when I added an inch for each blade.

Category  
Pick one only--  
mark an "X" in  
box at right

- Animal Sciences
- Behavioral and Social Science
- Biochemistry
- Cellular & Molecular Biology
- Chemistry
- Computer Science
- Earth Science
- Eng. Electrical & Mechanical
- Eng. Materials & Bioengineering
- Energy & Transportation
- Environmental Management
- Environmental Sciences
- Mathematical Sciences
- Medicine and Health
- Microbiology
- Physics and Astronomy
- Plant Sciences

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):  human subjects  vertebrate animals  
Potentially hazardous biological agents:  microorganisms  rDNA  tissue
2. Student independently performed all procedures as outlined in this abstract.  Yes  No
3. Student worked or used equipment in a site other than school, field or home.  Yes  No
4. This project is a continuation of previous research.  Yes  No
5. My display board includes non-published photographs/visual depictions of humans (other than myself):  Yes  No

***I/We hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year s research. I/We also attest that the above properly reflects my/our own work.***

\_\_\_\_\_  
Finalist or Team Leader Signature

\_\_\_\_\_  
Date

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*This embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Intel ISEF Scientific Review Committee.*

## ABSTRACT & CERTIFICATION INSTRUCTIONS

*This abstract form and the instructions below are intended for Intel ISEF finalists. Entrants of regional and state fairs may also be directed to use this form. Please follow all local, regional or state instructions. As an Intel ISEF finalist, you will receive further information and will be required to complete this abstract in an on-line abstract system immediately after winning at your regional or state fair.*

### WRITING REQUIREMENTS

Abstracts should be **single-spaced using 12-point type** from a black ribbon or laser cartridge. Abstracts may not exceed 250 words and must be typed within the predefined area (5.5 tall by 6 wide). Type title (Title Case required); your first name, middle initial and last name; and your school's name, city and state within the first .75 inches of space within the box. Two lines may be used for the title. *Teams must include all team member names.*

Example: Effects of Marine Engine Exhaust Water on Algae  
Mary E. Jones  
Hometown High School, Hometown, Pennsylvania

**BE SURE TO ANSWER THE 4 QUESTIONS BY MARKING THE APPROPRIATE BOXES AND CERTIFY BY SIGNING**

### TIPS ON WRITING

The three most common reasons that a student is asked to rewrite the abstract are 1) including acknowledgements (this includes naming the research institution and/or mentor with which you were working) 2) describing research not completed by the student finalist and 3) describing research done in previous years. Please limit yourself to describing research **you** have done in the current year.

### THE ABSTRACT ON YOUR DISPLAY BOARD

Because your Abstract & Certification will not be considered an official one until it is stamped/embossed at the Intel ISEF, you must NOT mount a copy of any abstract on your vertical display board before arriving at the Intel ISEF. If you plan to have an Abstract & Certification on your vertical display board (recommended), you should leave a space (8.5 by 11 inches) for it to be mounted after you have arrived at the ISEF and your Official Abstract & Certification has been returned with the embossed approval.

If you do not plan to mount a copy of your official Abstract & Certification on your vertical display board, you should bring with you a means by which to display the official Abstract & Certification in a vertical position somewhere at your project. The only abstract allowed anywhere at the Intel ISEF is the official Abstract & Certification. **The term "abstract" may NOT be used** as a title or reference for any information **on your vertical display board** or in readily visible materials at the project **except as a part of displaying the Official Abstract & Certification.**

# Information on Required Abstract & Certification for ALL Projects at the Intel ISEF

*\* This form may not be relevant for your regional or state fair; please refer to instructions from your affiliated fair.\**

In ADDITION to the basic form requirements for ALL Projects and any other requirements due to specific areas of research, an Abstract & Certification is required at the conclusion of research. Details on this requirement follow.

## Completing the Abstract

After finishing research and experimentation, you are required to write a (maximum) 250 word, one-page abstract. This should be written on the Official Abstract and Certification Form as provided by Science Service. The abstract **should include the following:**

- a) *purpose of the experiment*
- b) *procedure*
- c) *data*
- d) *conclusions*

It may also include any possible research applications. Only minimal reference to previous work may be included. An abstract **must not include the following:**

- a) *acknowledgments (including naming the research institution and/or mentor with which you were working), or self-promotions and external endorsements*
- b) *work or procedures done by the mentor*

## Completing the Certification

At the bottom of the Abstract & Certification form there are five questions. Please read each carefully, answer appropriately, and sign in the signature box to certify your answers. The Intel ISEF Scientific Research Committee will review and approve the abstract and answers to the questions.

Revisions or questions will be resolved via an SRC appointment on site at the Intel ISEF. Please bring a copy of your Abstract & Certification to the fair. Only after final Intel ISEF SRC approval has been obtained via a stamped/embossed copy of this Abstract & Certification may a Finalist make copies to hand out to the judges and the public.

**Intel ISEF Sample Abstract & Certification**

|   |  |
|---|--|
| <p>Title _____</p> <p>Finalist's Name _____</p> <p>School Name, City and State, Country _____</p> <hr/> <p style="text-align: center;">Start Typing the Body of Your Abstract Here Beginning at the Left Margin</p> | <p>Category</p> <p>Pick one only-- mark an "X" in box at right</p> <ul style="list-style-type: none"> <li>Animal Sciences <input type="checkbox"/></li> <li>Behavioral and Social Science <input type="checkbox"/></li> <li>Biochemistry <input type="checkbox"/></li> <li>Cellular &amp; Molecular Biology <input type="checkbox"/></li> <li>Chemistry <input type="checkbox"/></li> <li>Computer Science <input type="checkbox"/></li> <li>Earth Science <input type="checkbox"/></li> <li>Eng. Materials &amp; Bioengineering <input type="checkbox"/></li> <li>Eng.: Electrical &amp; Mechanical <input type="checkbox"/></li> <li>Energy &amp; Transportation <input type="checkbox"/></li> <li>Environmental Sciences <input type="checkbox"/></li> <li>Environmental Management <input type="checkbox"/></li> <li>Mathematical Sciences <input type="checkbox"/></li> <li>Medicine and Health <input type="checkbox"/></li> <li>Microbiology <input type="checkbox"/></li> <li>Physics &amp; Astronomy <input type="checkbox"/></li> <li>Plant Sciences <input type="checkbox"/></li> </ul> |
|---|--|

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):
 

|   |   |
|---|---|
| <input type="checkbox"/> human subjects     | <input type="checkbox"/> potentially hazardous biological agents                                      |
| <input type="checkbox"/> vertebrate animals | <input type="checkbox"/> microorganisms <input type="checkbox"/> rDNA <input type="checkbox"/> tissue |
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Sample Intel ISEF Official Abstract & Certification

**NOTE: Your abstract must be on the Intel International Science and Engineering Fair Abstract & Certification form and embossed/stamped by the Intel ISEF Scientific Review Committee before it is displayed or handed out. No pasted or taped text will be permitted. No other format or version of your approved Abstract & Certification will be allowed for any purpose at the Intel ISEF.**