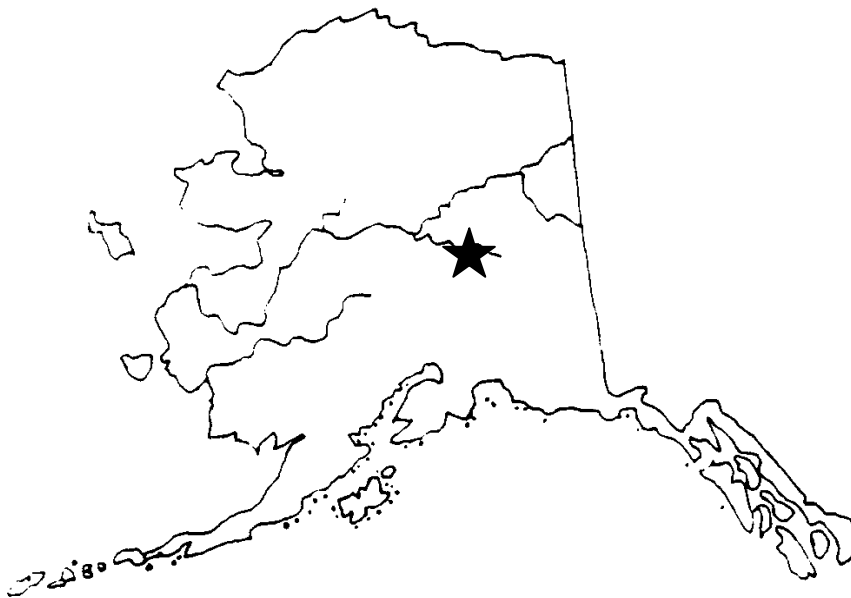


# **STUDENT RESOURCES AND GUIDELINES**

FOR THE

**ALASKA REGIONAL  
JUNIOR SCIENCE & HUMANITIES SYMPOSIUM  
(JSHS Alaska Regional)**



**31<sup>ST</sup> ALASKA STATEWIDE HIGH SCHOOL  
SCIENCE SYMPOSIUM (ASHSSS)  
2016**

**2016**  
**Important Dates and Deadlines**  
**31<sup>st</sup> Alaska Statewide High School Science Symposium**  
**(ASHSSS/NJSHS)**

<b>BEFORE Experimentation:</b>	Complete the <i>ASHSSS Project Approval Form</i> (and additional forms, as required) with <u>proper signatures</u> . (Submit with registration materials.) VISIT OUR WEBSITE AT: <a href="http://www.uaf.edu/cnsm/ashsss/">http://www.uaf.edu/cnsm/ashsss/</a>
<b>February 5:</b> (Material receipt Date)	Submit all materials required for registration to the ASHSSS Director. Fill out REGISTRATION Form COMPLETELY! Submit any other forms, <i>Student Grants</i> , and <i>Chem.190P Registration</i> . <b>Keep copies of all documents submitted.</b> <b>E-mail your FORMAL Abstract to <a href="mailto:abultito@alaska.edu">abultito@alaska.edu</a>!</b>
<b>February 19:</b>	Student notification regarding participation selection in the ASHSSS at UAF and feedback on research paper.
<b>March 4:</b> <b>5:30-7:00 p.m.</b> <b>Friday</b>	<b>Students planning to use a computer during their presentation:</b> <b>Test equipment and software compatibility</b> at UAF's Reichardt Building in the room designated for your PowerPoint delivery session (Check in at room 207).
<b>March 5:</b> <b>Saturday</b>	<b>ASHSSS Preliminaries at UAF's Reichardt Bldg. (white)</b> located at mid to upper campus. <b>8:00 am:</b> Registration (2 <sup>nd</sup> floor mezzanine) begins. <b>9:00 am:</b> Plenary Session (Room 201A & B). <b>Required!</b> <b>9:30 am-6:00 pm:</b> 6 Concurrent <b>Student Presentation Sessions</b> . <b>6-8 pm: Awards Banquet (TBA).</b> Participating Students may bring one guest at no added cost. All other guests of a student will pay \$25 to attend the banquet.
<b>March 6:</b> <b>Sunday</b>	<b>ASHSSS Finals at UAF's Reichardt Bldg. (white), Room 201A&amp;B.</b> 9:00 am-12:10 pm and 1:00-4:00 pm. Presentations by 12 finalists will determine the overall award winners.
<b>April xx-May x</b>	<b>National JSHS travel</b> for the top 5 overall winners & Chaperone. The 54 <sup>th</sup> National JSHS in Dayton, Ohio

# Acknowledgments

The ASHSSS Director and Associate Director graciously acknowledges the following agencies, organizations, companies, institutions, groups and many individuals for their support of the **Alaska Statewide High School Science Symposium (ASHSSS)**, *a College of Natural Science and Mathematics STEM Program* at the University of Alaska Fairbanks. Below are the valuable contributors who have provided mentors, paper readers, judges, in-kind, scholarship, and cash contributions.

## Contributors

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American Fisheries Society  
American Physiological Society  
Mining & Geological Engineering  
Sigma Xi Research Society  
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Alaska Department of Natural Resources  
Alaska Department of Fish and Game  
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United States Fish & Wildlife Service  
United States Geological Survey

### University of Alaska Fairbanks:

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Vice Chancellor for University Advancement

And over 150 valued volunteers annually!

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## **Advisor Resources**

An Advisor Resources booklet is available upon request from the ASHSSS Director. This booklet includes sample timelines, grading criteria, and forms used by some teachers who make an ASHSSS project part of their class requirements. It also includes an example of a student winner's formal abstract, scientific paper, and PowerPoint presentation slides. Also included are one school district's policies regarding research involving student subjects. Copies of the program and a packet of student abstracts for last year's symposium are also available.

## **Program Objectives**

The ASHSSS is a regional event, with winners going on to participate in the National Junior Science and Humanities Symposium (JSHS). The JSHS is administered by the Academy of Applied Science and is jointly sponsored by the U.S. Departments of the Army, Navy, and Air Force. These organizations also provide funding to regional symposia, including the ASHSSS.

The ASHSSS program objectives are those of our parent national organization, the JSHS. The objectives of the JSHS program are:

- To promote research and experimentation in the sciences, mathematics, and engineering at the high school level
- To recognize the significance of research in human affairs and the importance of humane and ethical principles in the application of research results
- To search out talented youth and their teachers, recognize their accomplishments at symposia, and encourage their continued interest and participation in the sciences, engineering, and mathematics
- To expand the horizons of research-oriented students by exposing them to opportunities in academic, industrial, and governmental communities
- To increase the number of future adults capable of conducting research and development

## **For more information about the ASHSSS and the JSHS**

### **ASHSSS (Regional)**

Select the ASHSSS website at  
<http://www.uaf.edu/cnsm/ashsss/>

For questions about the ASHSSS, contact:

Dr. Abel Bult-Ito, ASHSSS Director  
CNSM, Dept. of Biology and Wildlife  
260 Arctic Health Research Building or  
309 Constitution Hall  
P.O. Box 756100  
University of Alaska Fairbanks  
Fairbanks, AK 99775-6100

Office Phone: 907-474-2461 or 7158  
Cell Phone: 907-978-2169  
Fax: 907-474-2465  
E-mail: [abultito@alaska.edu](mailto:abultito@alaska.edu)

### **JSHS (National)**

Select the JSHS website at  
[www.jshs.org](http://www.jshs.org)

For questions about the JSHS, contact:

National JSHS Program  
Academy of Applied Science  
24 Warren Street  
Concord, NH 03301  
Phone: 603-228-4520  
Fax: 603-228-4730  
E-mail: [cousens@jshs.org](mailto:cousens@jshs.org)

## **Awards**

**All students** who participate in the ASHSSS attain a sense of achievement and self-confidence resulting from interaction with students from other schools and regions and with professional researchers and educators. Participants also receive public recognition and certificates honoring their achievement and interest in research pursuits.

### ***Session Winners***

On the first day of the ASHSSS event (Saturday), participants are organized into seven sessions with approximately equal numbers of students in each session. Projects from similar categories are placed in the same session.

The **1<sup>st</sup>-4<sup>th</sup> place winners in each session** are awarded plaques and cash prizes:

1 <sup>st</sup> place:	\$250	<b>Finalist for second round of judging (Sunday)</b>
2 <sup>nd</sup> place:	\$200	<b>Finalist for second round of judging (Sunday)</b>
3 <sup>rd</sup> place:	\$150	
4 <sup>th</sup> place:	\$100	
5 <sup>th</sup> place:	\$50	

Additional special awards related to specific areas of research (For example, Microbiology or Chemistry) are often given as well. These awards are sponsored and presented by other organizations and businesses.

### ***Overall Winners***

From the fourteen finalists who compete in the second round of judging (On Sunday), the **overall winners** are selected and earn the following awards (To be eligible for the JSHS scholarship awards, a student must be a U.S. citizen or permanent resident of the U.S.):

<b>Top 4 finalists</b>	A <b>1-year (2 semester) tuition scholarship to UAF (\$4,200).</b>
<b>Top 5 finalists</b>	<b>An expenses-paid trip to attend the national science symposium (JSHS).</b> (The 6 <sup>th</sup> , 7 <sup>th</sup> , and 8 <sup>th</sup> place finalists are alternates for JSHS)
<b>1<sup>st</sup> place finalist</b>	A <b>\$2,000 JSHS undergraduate tuition scholarship</b> (to a school of their choice) AND an opportunity to present her/his research during the competitive sessions at the National JSHS.
<b>2<sup>nd</sup> place finalist</b>	A <b>\$1,500 JSHS undergraduate tuition scholarship</b> (to a school of their choice) AND an opportunity to present her/his research during the competitive sessions at the National JSHS.
<b>3<sup>rd</sup> place finalist</b>	A <b>\$1,000 JSHS undergraduate tuition scholarship</b> (to a school of their choice) AND an opportunity to present her/his research as a poster at the National JSHS. (The 3 <sup>rd</sup> place finalist is also an alternate speaker)

### ***Additional awards that can be earned at the national JSHS***

The 1<sup>st</sup> and 2<sup>nd</sup> place finalists from the ASHSSS compete for additional scholarship awards at the National JSHS. Students compete in sessions organized by subject area. For each session, the following awards are given:

<b>1<sup>st</sup> place</b>	A <b>\$12,000 JSHS undergraduate tuition scholarship, an expenses-paid trip to the London International Youth Science Forum, and a \$500 award to the student's school, honoring the sponsoring teacher</b>
<b>2<sup>nd</sup> place</b>	A <b>\$8,000 JSHS undergraduate tuition scholarship.</b> (This student is also the alternate for the trip to London)
<b>3<sup>rd</sup> place</b>	A <b>\$4,000 JSHS undergraduate tuition scholarship.</b>

## **General Information and Guidelines**

The realm of student research can be exciting and rewarding, but only after concerted effort. Teachers and mentors can be invaluable resources in helping students become successful. Their role often includes generating ideas, coordinating logistics, advising, providing equipment, writing grants, and helping students to focus on tasks and to stay on schedule.

Students need to conduct a bona fide research project using the scientific method (Some projects may be better suited to an alternate approach that does not adhere strictly to the scientific method). This excludes a strictly “library” research project even though library work is an essential part of any research endeavor. Students should attempt to work with a mentor, who is someone with similar interests, but with greater experience and understanding in the area of the student’s interest.

### ***Multi-year Projects***

If a student has continued a research project that was previously presented at the ASHSSS, their paper and presentation must focus on the current year’s work. Data and results from previous related research may be included, but the year(s) during which data were collected must be clearly indicated. Continuing research must document a significant expansion of the experiment.

### ***Team Projects***

In keeping with National JSHS policy, the ASHSSS maintains an emphasis on individual evaluation and presentation. When students are part of a larger group project, each student may present their own part of the project or one student can present the entire project. If individual students present their part of the project, their presentation should focus on their individual contributions and should properly acknowledge the contributions of other students and their mentors/teachers.

For those team projects that cannot be divided into individual research projects, a team leader should be selected to present the results of the group project. The team leader must clearly delineate their individual contribution to the team project, but can present the entire project. In this case, all ASHSSS guidelines that apply to individual projects will apply to group projects. In the event the presenter of the winning ASHSSS project is unable to present at the National JSHS, this opportunity will be passed on to the next ranking project, **not** to another member of the original winning group. This recommendation is made since the judges’ evaluations and scores pertain only to individual presenters.

### ***Student Grants***

To assist students in conducting research project experiments, student research and travel grants **may** be available through the ASHSSS Director’s office at the University of Alaska Fairbanks, contingent upon availability of funding (See *Grant Submission Request Form*).

## **Steps to Complete**

Outlined below are important steps you should complete as you carry out your research project. Additional helpful information can be found at the JSHS website ([www.jshs.org](http://www.jshs.org); Guidelines).

1. Select a **project idea**.
2. Seek additional assistance from a **mentor**.
3. Carry out a **literature review** to gather background information. This will help you develop a more specific project idea, formulate a hypothesis, and design the experiment itself. The information also help you write the introduction to your paper.
4. Write a **problem statement**.
5. Formulate a **hypothesis**.
6. Design your experimental **method**.
7. Have your project **approved by your teacher or mentor**. **Complete the *Project Approval Form* and all additional forms required for your project**, with proper signatures, **BEFORE** beginning any experimentation (See *Project Approval for ASHSSS*).
8. **Conduct the experiment**: make observations, collect, and organize data.
9. Analyze the **results**.
10. Formulate your **conclusion(s)**, based on the results obtained. Is your hypothesis supported or rejected?
11. **Write a scientific paper** that conforms to ASHSSS guidelines (See *How to Write Your Scientific Paper* and *Scientific Paper Evaluation Form*).
12. **Write an abstract** that conforms to ASHSSS guidelines. (See *How to Write an Abstract*.) Include the abstract as part of your scientific paper **and** prepare a formal abstract. (See *Formal Abstract Guidelines* and *Formal Abstract Example*.)
13. **Submit all materials required for registration** to the ASHSSS Director (See *How to Register for the ASHSSS*). Materials must be received by the deadline noted on the inside front cover. Keep a copy of all documents and forms that you submit.
14. Student speakers for the ASHSSS are selected based upon evaluation of their written paper (See *Scientific Paper Evaluation Form* for details). Students selected to present their projects at the ASHSSS should:
  - a) **Develop an oral presentation** of their project (See *Presentation Guidelines*, *Suggestions for Your Presentation*, and *ASHSSS Judges Score Sheet* for details). Students may also choose to revise their abstract and/or scientific paper (Revised versions of abstracts and/or papers may be submitted at the ASHSSS meeting).



- b) **Test equipment and software compatibility** at UAF the Friday evening before the ASHSSS meeting.
  - c) **Present their project** at the ASHSSS meeting and **attend the presentations of fellow participants**.
  - d) Attend the **awards banquet** Saturday evening (location and time to be announced). All student participants are invited and each participant may bring one guest at no cost. Additional guests may pay to attend the banquet (cost to be announced). Reservations and payment for additional guests should be sent to the ASHSSS Director, if possible by the Monday before the ASHSSS meeting. Payment may also be made on the day of the ASHSSS meeting, at registration or at the awards banquet (Payment in advance is preferred, as it allows adjustments to be made, if necessary, to accommodate an increased number of banquet attendees).
15. Students who earn 1<sup>st</sup> and 2<sup>nd</sup> place in their session on Saturday are advanced as finalists to a finals round of judging on Sunday, to determine the overall winners. Finalists will receive their Judges Score Sheets at the awards banquet Saturday evening. Finalists may choose to revise their presentation for Sunday, and may submit a revised abstract and/or paper on Sunday.

### **Project Approval for ASHSSS**

**Before beginning any experimentation**, your project idea and experimental method **must** be approved by your teacher or mentor and, in some cases, by a Scientific Review Committee (SRC) or Institutional Review Board (IRB). See the *ASHSSS Project Approval Form* for a description of the types of projects that require SRC or IRB approval, and for a list of required SRC/IRB committee members. **For documentation of SRC/IRB approval, you may use the appropriate ASHSSS form (*SRC Approval Form* or *IRB Approval Form*) or any alternate form that includes the necessary information** (Such as ISEF forms, or forms used by a mentor's institution, agency, or business).

### **Project Approval for the Alaska Science and Engineering Fair**

**IF** you plan to enter your project in the **Alaska Science and Engineering Fair (ASEF)**, you will need to complete a set of **International Science and Engineering Fair (ISEF)** forms, some of which **must** be completed **before** experimentation begins. **The ASHSSS forms are NOT adequate for participation in ASEF or ISEF.**

**ISEF guidelines and forms can be obtained by contacting:**

Society for Science & the Public  
1719 N Street, NW  
Washington, DC 20036

Phone: 202-785-2255

Fax: 202-785-1243

Website: [www.societyforscience.org](http://www.societyforscience.org)

**Forms and information about the ASEF can be obtained by contacting:**

Alaska Science and Engineering Fair  
C/O Texas Gail Raymond, ASD Science Program  
5530 E Northern Lights Blvd.  
Anchorage, AK 99504-3135

Website: [www.alaskasciencefair.org](http://www.alaskasciencefair.org)

## **Guidelines for the Use of Non-Human Vertebrates**

**Projects involving non-human vertebrates require SRC approval.** In keeping with National JSHS guidelines, the ASHSSS has adopted the following rules regarding research involving non-human vertebrates.

- Only animals that are lawfully acquired shall be used in experimentation and their retention and use shall be in strict compliance with state and local laws and regulations.
- Animals used in experimentation must receive every consideration for their bodily comfort. They must be kindly treated, properly fed, and their surroundings kept in a sanitary condition.
- No intrusive techniques may be used, including surgery, injections, or taking of blood.

When animals are used by students for their education or the advancement of science, such work shall be under the direct supervision of an experienced teacher or an investigator at a research institution with an approved active Institutional Animal Care and Use (IACUC) protocol for the use of vertebrate animals for this research.

## **Guidelines for the Use of Human Subjects**

**Projects involving human subjects require IRB approval.** In keeping with National JSHS guidelines, the ASHSSS has adopted the following rules regarding research involving human subjects.

- No information that could be used to identify a subject (such as subject names or photographs which reveal a subject's identity) may be included in the student's abstract, scientific paper, or project presentation.
- No project may use drugs, food, or beverages in order to measure their effect on a person.
- Projects that involve exercise and its effect on pulse, respiration rate, blood pressure, and so on are approved if a valid normal physical examination is on file with the school (or other sponsoring institution) and provided the exercise is not carried to the extreme.
- If your research involves administration of questionnaires or surveys, a proper consent from subjects must be obtained. If the questionnaires or surveys are administered in a public school, they must meet the requirements of Alaska state law (see next page) and must be approved by your school district (see below).
- No cultures involving human cultures of any type, such as mouth, throat, skin, or otherwise, will be allowed.
- Tissue cultures purchased from reputable biological supply houses or research facilities are suitable.
- The only human blood that may be used is that which is either purchased or obtained from a blood bank, hospital, or laboratory. No blood may be drawn by any person or from any person specifically for a science project. This rule does not preclude a student making use of data collected from blood tests not made exclusively for a science project. Blood may not be drawn exclusively for a science project.
- **If the subjects are students, school/school district approval is required** (in addition to IRB approval), even if the research only involves questionnaires or surveys.
  - **Fairbanks North Star Borough School District (FNSBSD) students:** IRB approval is required **before** requesting approval from the district. School district guidelines and an application to conduct research can be obtained from:  
Fairbanks North Star Borough School District  
Program Planning & Education Department  
520 Fifth Ave.

Fairbanks, AK 99701 Phone: 907-452-2000

- **Students from other schools/districts:** Check your school/district policies and use the appropriate documents to indicate school/district approval for your project.
- See below for Alaska state law regarding **questionnaires and surveys administered in public schools.**
- If the human subjects are University of Alaska students or other human subjects from other educational or research institutions, students need to work with their mentor at the university or other institution to obtain appropriate university or institutional IRB approval.

## Alaska State Law Regarding Questionnaires and Surveys

### Sec. 14.03.110. Questionnaires and surveys administered in public schools.

- a. A school district, principal or other person in charge of a public school, or teacher in a public school may not administer or permit to be administered in a school a questionnaire or survey, whether anonymous or not, that inquires into personal or private family affairs of the student not a matter of public record or subject to public observation unless written permission is obtained from the student's parent or legal guardian.
- b. For an anonymous questionnaire or survey, written permission required under (a) of this section may be obtained annually and is valid until the commencement of the subsequent school year or until the parent or legal guardian who gave permission submits a written withdrawal of permission to the school principal. The school shall provide each student's parent or legal guardian at least two weeks' notice before administering a questionnaire or survey described under this subsection.
- c. If a school administers to a student a questionnaire or survey that is not anonymous, the school shall obtain the written permission required under (a) of this section from the student's parent or legal guardian at least two weeks before the questionnaire or survey is administered.
- d. The school shall give a student's parent or guardian an opportunity to review the questionnaire or survey described under (b) or (c) of this section and shall give the parent or guardian written notice regarding
  1. How the questionnaire or survey will be administered to the student;
  2. How the results of the survey or questionnaire will be used; and
  3. Who will have access to the questionnaire or survey.
- e. A student may refuse to participate in a questionnaire or survey administered in a public school. A student's parent or legal guardian may refuse to allow the student to participate in a specified questionnaire or survey.
- f. In this section, "questionnaire or survey" means a list of questions to, or information collected from, a class or group of students.

## ASHSSS Project Approval Form

**For all projects, this form must be completed before experimentation begins.**

Submit this form to ASHSSS with your registration materials (in February).

Student: \_\_\_\_\_ Grade: \_\_\_\_\_

School, City, State: \_\_\_\_\_

Teacher/Mentor: \_\_\_\_\_ Phone/e-mail: \_\_\_\_\_

Project Title: \_\_\_\_\_

Location(s) where research will be conducted: \_\_\_\_\_

### **Check all items that apply to your research:**

**Attach additional approval forms** as indicated for the items you check.

**Human Subjects.** Research conforms to ASHSSS *Guidelines for the Use of Human Subjects*, to federal and state law, and to school district policies and has been approved by an Institutional Review Board (IRB). The IRB must include a science teacher, school administrator, and one of the following: medical doctor, registered nurse, psychologist, or psychiatrist. If the project concerns behavioral research, the IRB must include a psychologist or psychiatrist. The student's teacher or mentor may **not** be a member of the IRB.

**Some or all subjects are students.**  
**Attach to this form documentation of IRB and school/district approval.**

**NO subjects are students.**  
**Attach to this form documentation of IRB approval.**

**Non-Human Vertebrate Animals.** Research conforms to ASHSSS *Guidelines for the Use of Non-Human Vertebrates*, and to federal and state guidelines, and has been approved by a Scientific Review Committee (SRC). The SRC must include a science teacher, a biomedical scientist (Ph. D., medical doctor, or veterinarian), and at least one other member. One member of the SRC must be familiar with guidelines regarding proper animal care and use. The student's teacher or mentor may **not** be a member of the SRC.  
**Attach to this form documentation of SRC approval.**

**Potentially Hazardous Materials.** Research conforms to federal and state guidelines and has been approved by a Scientific Review Committee (SRC). The SRC must include a science teacher, a biomedical scientist (Ph. D., medical doctor, or veterinarian), and at least one other member. One member of the SRC must be familiar with guidelines regarding proper use of the hazardous materials used in the project. The student's teacher or mentor may **not** be a member of the SRC. Hazardous materials may include recombinant DNA, microbes, pathogens, controlled substances (tobacco, alcohol, prescription drugs), human/animal cells/tissues, hazardous chemicals, or hazardous devices.  
**Attach to this form documentation of SRC approval.**  
**List below the potentially hazardous materials to be used in this project:**

**None of the above.** No SRC/IRB approval is required.

- **I certify that I have reviewed and approved the research plan prior to the start of experimentation.**
- **All necessary IRB/SRC and school district approval has been completed (as indicated above) and documentation is attached.**
- I have determined that the student will be properly trained and supervised during the research.

\_\_\_\_\_  
(Teacher or Mentor Signature)

\_\_\_\_\_  
(Date)

## **ASHSSS Institutional Review Board (IRB) Approval Form**

For projects involving **human subjects** (Any appropriate alternate form may be used in place of this form).

Student: \_\_\_\_\_ Grade: \_\_\_\_\_

School, City, State: \_\_\_\_\_

Teacher/Mentor: \_\_\_\_\_ Phone/e-mail: \_\_\_\_\_

Project Title: \_\_\_\_\_

Location(s) where research will be conducted: \_\_\_\_\_

Briefly describe the nature of the research and the type of human subjects involved:

**IRB members:** After reading a description of the student's project or discussing the student's project with him/her, please indicate your approval or disapproval of the project in the appropriate space below. Projects must conform to the *ASHSSS Guidelines for the Use Human Subjects*, to federal and state guidelines, and (if the subjects are students) to school district policies. **Subject and scientist safety is of primary concern.** Please note any concerns or suggestions in the space provided. **All members of the IRB must approve the project before experimentation may begin. The student's teacher or mentor may not be a member of the IRB.**

Science Teacher: \_\_\_\_\_

Position/School: \_\_\_\_\_

approve  do not approve

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Concerns/suggestions:

School Administrator: \_\_\_\_\_

Position/School: \_\_\_\_\_

approve  do not approve

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Concerns/suggestions:

Medical doctor, registered nurse, psychologist, or psychiatrist: \_\_\_\_\_

(If the project concerns behavioral research, this IRB member must be a psychologist or psychiatrist)

Position/Institution: \_\_\_\_\_

approve  do not approve

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Concerns/suggestions:

**REMINDER: If the subjects are K-12 students, school/district approval is also required.**

## ASHSSS Scientific Review Committee (SRC) Approval Form

For projects involving **non-human vertebrates** or **potentially hazardous materials**. (Any appropriate alternate form may be used in place of this form)

Student: \_\_\_\_\_ Grade: \_\_\_\_\_

School, City, State: \_\_\_\_\_

Teacher/Mentor: \_\_\_\_\_ Phone/e-mail: \_\_\_\_\_

Project Title: \_\_\_\_\_

Location(s) where research will be conducted: \_\_\_\_\_

Organism(s) or hazardous material(s) involved:

**SRC members:** After reading a description of the student's project or discussing the student's project with him/her, please indicate your approval or disapproval of the project in the appropriate space below. Projects that involve non-human vertebrates must conform to the ASHSSS *Guidelines for the Use of Non-Human Vertebrates*, and to federal and state guidelines. **Subject and scientist safety is of primary concern.** Please note any concerns or suggestions in the space provided. **All members of the SRC must approve the project before experimentation may begin. The student's teacher or mentor may not be a member of the SRC.**

Science Teacher: \_\_\_\_\_

Position/School: \_\_\_\_\_

approve  do not approve

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Concerns/suggestions:

Biomedical Scientist (Ph. D., medical doctor, or veterinarian): \_\_\_\_\_

Position/Institution: \_\_\_\_\_

approve  do not approve

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Concerns/suggestions:

Other Member: \_\_\_\_\_

Position/Institution: \_\_\_\_\_

approve  do not approve

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Concerns/suggestions:

**If animals are being used**, which member of the SRC is familiar with proper animal care and use?

**If potentially hazardous materials are being used**, which member of the SRC is familiar with guidelines regarding proper use of the potentially hazardous materials?

## **How to Write Your Scientific Paper**

Scientists frequently communicate the results of their work in research reports. They tell others **what** study they performed, **why** they did it, **what** they discovered, and **what** it means.

Regardless of the specific discipline involved, **all research reports follow a general format: Title Page, Abstract, Introduction, Methods and Materials, Results, Discussion, Conclusion, Acknowledgments, and Literature Cited** (and *Appendices*, if necessary). The separate sections are described below. Additional helpful information about writing a scientific paper can be found at the JSHS website ([www.jshs.org](http://www.jshs.org)) under Guidelines.

In general, scientific papers are written in the passive voice (“The results support the interpretation that ...”), instead of the first person, active voice (“We interpret the results to indicate that ...”). Please use the passive voice in your scientific paper.

Your paper should follow this format, be neatly typed, carefully edited, and printed with a letter quality printer. Your paper should double-spaced (except for the *Abstract* and *Literature Cited* sections, as well as the captions of figures and tables). Use 1-inch margins and a 12-point font (Times, Times New Roman, or Arial). Your paper should **not exceed 15 pages**, not including appendices. **Each section of the paper should be clearly labeled with a section heading.** The section headings should be bold and left-justified (except for the *Abstract* heading, which should be centered). Refer to the *Scientific Paper Evaluation Form* for details about how your paper will be evaluated in determining whether or not you will be invited to present your research at the ASHSSS meeting.

### ***Title Page (one page)***

The title page should include the Research Paper Title, Author, School, City, State, and Date. Make the title of your study **concise, descriptive, and informative**. Your title should indicate the nature of your research. “Studies on slug slime” is not as descriptive as “Chemical constituents of slug slime.”

### ***Abstract (up to 200 words)***

Your abstract is best written AFTER completing a draft of your scientific paper (See *How to Write an Abstract* for more details).

### ***Introduction (up to 500 words)***

What problem did you investigate? Why did you choose this subject, and why is it important? What hypotheses did you test? Based upon your reading, what results did you anticipate, and why? The introduction should address these and similar questions. To tackle the last question, some literature (library) research will be necessary. If you include information from other sources to explain what is currently known about the topic and why you are anticipating certain results, **be sure to cite those references in the body of your paper** (See the *Literature Cited* section of these instructions for details). Assume that the reader is scientifically literate, but may not be familiar with the specifics of your study.

Be careful not to fall into the trap of believing that all research must have world-shaking consequences to the human race. That certainly is not true. You may be simply investigating a small facet of the life history of some creature. If so, don't bother fabricating a story simply to “justify” your work.

### ***Methods and Materials (up to 1,000 words, up to 2 figures)***

**How** did you conduct your study? **What equipment** did you use? **What procedures** did you follow?

Relate your procedures in **sufficient detail** so that someone else (or you!) could repeat the experiment. Species of organisms studied **may** be important (depending upon the type of study); the level of precision of your instruments is certainly important to mention here. Since your procedures have been completed, **report them using past tense**. This section should be written in narrative, paragraph format, **not** as a list of numbered steps, and should not include any results. Materials should not be listed separately, but should be included in the description of the methods. Use figures, if appropriate, to help the reader picture the equipment. Include criteria for selection and an “informed consent” statement if human subjects were used. If using a standard method, you may cite the literature reference and give only the details specific to your experiment. If your work is based on a questionnaire or survey, include the blank questionnaire/survey as part of the *Methods and Materials* section (or place it in an appendix and refer to it in the *Methods and Materials* section).

### ***Results (up to 500 words, up to 4 figures)***

**What did you find?** Present the results of your research in a logical order. Use tables and figures (such as graphs) to visually aid your reader to see and understand your results readily. Tables and figures need to be numbered and titled separately. This will enable you to refer to them in text quite easily (“Data in Table 3 suggest that plants are...”). Each table or figure also needs a descriptive caption to aid the reader in deciphering what is supposed to be seen in that particular table or figure. Even though you may present your results in a table or figure, be certain to **explain in the body of your paper** the important features of each. If a trend is indicated in a figure, point out that trend to your reader. A statistical evaluation of your results is very important and should be done whenever possible. **DO NOT INTERPRET your results in this section.** That comes next!

### ***Discussion (up to 1,000 words)***

In this section, you should interpret your results. What do your results mean? Are data consistent with your initial hypothesis? Do data support or reject your hypothesis? Do you need to revise the hypothesis? How do your results compare with the results of other scientists performing similar experiments? What conclusions can be drawn from the results of your experiment? If there are ambiguities in your results, what further experiments need to be performed? What are possible directions for future research? What are the theoretical implications or practical applications of your work?

### ***Conclusion (up to 200 words)***

What do you conclude, based upon your work and reading on this topic? Wrap up your paper with a brief summary of your conclusions.

### ***Acknowledgements (up to 200 words)***

You should acknowledge the assistance of those who helped with your study: mentors, financial supporters, teachers, scientists, proofreaders, typists, etc. You should keep this section brief, but be sure to identify major contributions. Some examples of acknowledgements include: “I thank Backwoods Paper Company for needed supplies, research space, and advice...” or “I thank the following for advice and guidance: Mr. James Sprague (my teacher), Ms. Joy Adams, Mr. Todd Reed, and Ms. Rita Iretowsha (fellow students)...”



### ***Literature Cited***

When you refer to the work of another scientist in your paper, **you must indicate the source** of that information. That way, someone reading your paper will realize that the information comes from another project. Also, the reader may wish to examine other experiments, such as the one you cited. Failure to cite the work of another scientist (that you used in writing your paper) results in a serious offense (plagiarism) that is akin to stealing and is severely frowned upon. Therefore, all information that is not from your experiment and is not “common knowledge” **must** be acknowledged by a citation.

The preferred method of **citing a reference in text** in most scientific papers is the author-date system. The citation (author last name and year of publication) should be placed naturally into the flow of the sentence. If the name of the author appears as part of the text, cite only the year of the publication. For example, “Campbell (1975) saw gulls driving incubating females from their nests.” Otherwise, place both the name and year in parentheses, as in “Gulls have been observed to drive incubating females from their nests (Campbell 1975).” If there are two authors, cite them both, as in “(Dwernychuk and Boag 1972).” When there are more than two authors, cite only the name of the first author and indicate the rest by using “et al.” (meaning “and all others”), as in “(Divoky et al. 1974).” When a reference has no individual author or the author is unknown, use the name of the agency or group, which published the document, or the name of the lead editor. If there is no author, agency, or editor, use all or part of the title (enough of the title that the reference can be easily identified).

The most common method of listing articles cited in your paper is to place them in a “*Literature Cited*” section at the end of the paper. **All literature cited in the body of your paper must be listed in your *Literature Cited* section, and all references in the list must be cited in the text.** Sources not actually cited should not be included in the *Literature Cited* section (This is different from a bibliography, in which you list everything you read, whether or not you actually cited it in your paper).

**References should be listed in alphabetical order, according to the first author’s last name.**

All types of references should be lumped together before you alphabetize; **do not** make separate lists for books, articles, etc. References should be single spaced and left justified, with additional lines indented five spaces (1/2 inch). Double-space **between** references. Works by the same person should be arranged chronologically by the date of publication. Be sure to include enough information that each source can be identified and located.

An annotated example of a *Literature Cited* section can be found on the next page and shows examples of what individual citations look like from different types of sources, which should be helpful (The comments on the left indicate the type of the source of each entry, but should **not** be included in the *Literature Cited* section of your paper. The information **inside** the box is what your *Literature Cited* section should look like).

### ***Literature Cited***

Journal article, more than one author	Kohara, Y., K. Akiyama, and K. Isono. 1987. The physical map of the whole <i>E. coli</i> chromosome: application of a new strategy for rapid analysis and sorting of a large genomic library. <i>Cell</i> 50:495-508.
Book, one author	Day, R.A. 1994. <i>How to write and publish a scientific paper</i> . 4 <sup>th</sup> ed. Phoenix: Oryx Press.
Pamphlet, organization as author	American Society for Microbiology. 1994. Slide and poster requirements. Pamphlet. Washington, DC: ASM.
Interview	Barber, J.D. 8 May 1995. Interview by author. Carbondale, IL.
Telephone conversation	Barber, J.D. 15 May 1995. Personal communication.
Encyclopedia, editor/no author	Lorimer, L.T., ed. 1993. Magnet and magnetism. In <i>Encyclopedia Americana</i> . Vol. 15. New York: Americana Corp.
Internet	Martin, Linda. 08 Nov 1997. General Information. <a href="http://www.science.siu.edu/ijshs/info.html">http://www.science.siu.edu/ijshs/info.html</a> , Accessed 20 Nov 1997.
Newspaper, discontinuous pages	McDonald, K.A. 15 Dec 1995. Researchers ponder a stormy forecast. <i>The Chronicle of Higher Education</i> . A12, A16.
Newspaper, no author	Study finds free care used more. May 1989. <i>APA Monitor</i> . 14.

### ***Appendices***

*The use of appendices is strongly discouraged.* However, if you decide to include them, *appendices* contain supplemental information such as lists of terms, definitions, or questionnaires that are useful but not essential to the body of the research paper. If you have a large table of raw data, but most of it is not essential to the discussion in your paper, you could include the complete table as an appendix. A smaller table with a subset of data (or a summary of the data) could then be included in the body of your paper. If you have more than one set of materials to include, give each a number: Appendix 1, Appendix 2, etc.

## ASHSSS Scientific Paper Evaluation Form

**Student Name:** \_\_\_\_\_

**School:** \_\_\_\_\_

QUALITY OF PAPER (Check the appropriate box for each section.)	Acceptable/ Needs Minor Revisions	Needs Extensive Revisions	Missing
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### CONTENT

<b>Title Page</b> Includes title, author, school, city, state, date.			
<b>Abstract</b> Concise summarizes the <b>entire</b> study.			
<b>Introduction</b> Clearly states the purpose, hypothesis, evidence of outside reading, and anticipated results.			
<b>Materials &amp; Methods</b> Effectively communicates methods used.			
<b>Results</b> Well organized, includes tables and/or graphs as well as descriptions.			
<b>Discussion</b> Conclusions are <b>based on the results</b> . Indicates support/rejection of the hypothesis. Discusses future directions for research.			
<b>Conclusion</b> Summarizes interpretations and conclusions.			
<b>Acknowledgments</b> Acknowledges the assistance of others.			
<b>Literature Cited</b> References are cited in the text of the paper. Lists all references using an appropriate format.			
<b>Appendices (optional)</b> Large tables should be included in the appendices.			

### EXPERIMENTAL DESIGN

<b>Methods</b> Methods are appropriately designed to test the hypothesis.			
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### OVERALL QUALITY OF WRITING

<b>Organization</b>			
<b>Grammar</b>			
<b>Spelling</b>			
<b>Neatness</b>			

### RECOMMENDATION

RECOMMENDATION	COMMENTS
<b>How can this project be improved for oral presentation?</b> Please provide constructive comments as to how the paper and the presentation of the paper's findings can be improved	

Feel free to make **additional constructive comments** on the student's paper, attach a separate page of comments, or use the reverse side of this form. **Papers, evaluation forms, and comments will be returned to the student.** The student will have an opportunity to submit a revised paper the day of the symposium. **If** you would like to invite the student to contact you to discuss your suggestions, feel free to include your name and contact information with your comments (Otherwise, your comments are anonymous).

## **How to Write an Abstract**

The abstract is the reader's first encounter with your paper, and is the chief means by which scientists decide which research reports to read in their entirety. The abstract should provide a brief summary of the findings of the paper, and should be a stand-alone document that can be understood without reading the paper.

The body of the abstract should be included as a section of your scientific paper. You will also submit a separate formal abstract as part of your ASHSSS registration materials (See *Formal Abstract Guidelines* and *Formal Abstract Example*). The formal abstract and the abstract you include with your paper will have different formats for the heading, but the body of the abstract will be the same for both versions.

### ***Format***

The abstract included with your paper should be on the page immediately after the title page. The section heading should be centered, with one line of space between the section heading and the body of the abstract. The abstract must be **single-spaced** and should contain **no more than 200 words**.

### ***The Body of the Abstract***

The abstract is a very brief overview of your **ENTIRE** study. It tells the reader **WHAT** you did, **WHY** you did it, **HOW** you did it, **WHAT** you found, and **WHAT** it means. The abstract should briefly state the purpose of the research (introduction), how the problem was studied (methods), the principal findings (results), and what the findings mean (discussion and conclusion). Being descriptive but concise is important; say only what is essential, using no more words than necessary to convey meaning.

The *Abstract Worksheet Example* and *Abstract Worksheet* on the next two pages may be helpful as you prepare the first draft of your abstract.

There is no standard arrangement for the parts of an abstract. The sequence of the parts in your abstract may be completely different from that in your scientific paper (and different from the sequence shown in the example). Choose a sequence that best allows you to convey the needed information in the fewest words possible.

## **Abstract Worksheet Example**

The *Abstract Worksheet* on the next page may be used to help you prepare the first draft of your abstract (Some projects may not lend themselves to this format, so don't feel that you need to use the worksheet). The sequence of sentences in the *Abstract Worksheet* is ordered in a logical fashion, beginning with an **introduction** and proceeding to your **hypothesis**, **methods**, **results**, **discussion**, and **conclusion**.

Think of the most important items that crystallize each part of your project. Leave out unimportant details. As a first draft (using the *Abstract Worksheet*), write one or two sentences that *summarize* each section. For your final draft, make sure the abstract "flows" logically. Give it to a friend to read. Ask them to tell you what they think you actually did and what you found. **Revise** as necessary.

Below you will find an example of a completed abstract worksheet.

### ***Introduction***

The food habits of larval butterflies of two related species from a zone of overlap near Oil City, PA were examined.

### ***Hypothesis***

The theory of competitive exclusion predicts that food habits of closely related species should not overlap significantly where species occur together.

### ***Methods***

Transects in five different habitats were used to determine food and habitat preferences in wild populations. Two species of captive caterpillars were offered various food in the laboratory. Weight changes of foods and caterpillars were determined daily.

### ***Results***

Food habits in overlapping habitats were significantly different between the two species (ANOVA  $p < 0.001$ ). Food habits in non-overlapping habitats were not significantly different (ANOVA  $p < 0.52$ ). No differences in food preferences (ANOVA  $p < 0.76$ ) or growth rates (ANOVA  $p < 0.88$ ) on different foods in laboratory maintained populations were found.

### ***Discussion\****

These species are able to coexist because they are not competing for the same, and limiting, food resources in the same area.

### ***Conclusion\****

These results support the theory of competitive exclusion because the two species did not use the same food resources from similar habitats.

\*Sometimes these two sections are combined in one section.

## **Abstract Worksheet**

Use one or two concise sentences to summarize the most important aspects of your project for each section listed below (Some projects may not lend themselves to this format, so don't feel that you need to use this worksheet).

**Introduction** (What is this project about? Why is this project interesting or important?)

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**Hypothesis** (What did you think you would find? Why?)

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**Methods** (Briefly explain your procedure.)

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**Results** (What did you find when you performed your experiment? Include relevant statistics.)

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**Discussion** (Are your results consistent with your initial hypothesis? Why or why not?)

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**Conclusion** (What is your interpretation of what the results mean? Why should anyone become excited about or interested in your findings?)

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## **Formal Abstract Guidelines**

The Formal Abstract (separate from your scientific paper) is submitted for publication in the ASHSSS program booklet and may be used for other ASHSSS-related purposes.

Your abstract will be **PUBLISHED AS SUBMITTED (check it thoroughly!)** and will be accepted **ONLY** if it conforms to the guidelines described below. **Do NOT submit your Formal Abstract via FAX or photocopy from the original. Submit an original!**

The Formal Abstract must be an original, printed on 8.5" x 11" white paper with a letter quality printer using standard 12-point font (Times or Times New Roman) and black type. The abstract must be single-spaced and left justified, with 1-inch margins, and must not exceed 200 words. Include one line of space between the heading and the body of the abstract.

The Formal Abstract should include the following information as a heading (See also the *Formal Abstract Example*).

Title (The same as the title of your scientific paper)

Your name

The name of your high school, high school city, and state

The name of your teacher, sponsor, or mentor and his/her organization. Precede the person's name with a subheading (i.e., teacher, sponsor, or mentor)

When you register, in addition to submitting a printed version of your Formal Abstract, you will also submit an electronic version (See *How to Register for the ASHSSS* for details about submitting your formal abstract electronically). The ASHSSS Director reserves the right to make minor editorial changes to your abstract to ensure that all abstracts look similar.

## **Formal Abstract Example**

Below you will find an example of a completed *Formal Abstract*.

A Test of the Competitive Exclusion Theory in Two Related Species of Butterflies

Sarah Dioski

Oil City High School, Oil City, PA

Teacher: Mrs. Georgiana Spallanzi, Oil City High School

Mentor: Dr. Joseph Pascale, Oil City University

The food habits of larval butterflies of two related species, *Papilio splendens* and *Papilio blanchii* in a zone of overlap near Oil City, PA, were examined. The theory of competitive exclusion predicts that food habits of closely related species should not overlap significantly where the differing species occur together. Transects in five different habitats were used to determine food and habitat preferences in wild populations. Captive caterpillars were offered various foods in the laboratory. Weight changes of foods and caterpillars were examined daily. Food habits in overlapping habitats were significantly different between the two species (ANOVA  $p < 0.001$ ). Food habits in non-overlapping habitats were not significantly different (ANOVA  $p < 0.52$ ). No differences in food preferences (ANOVA  $p < 0.76$ ) or growth rates (ANOVA  $p < 0.88$ ) from different foods used in laboratory maintained populations were found. These species are able to coexist because they are not competing for the same and limited food resources in the same area. These results support the theory of competitive exclusion because the two species did not use the same food resources when they occupied the same habitats.

## **Presentation Guidelines**

Students who are selected to participate in the actual ASHSSS meeting will present the results of their research orally, in a manner similar to that in which a scientist would present the results of his or her work at a conference. The audience will include a panel of scientists who will serve as judges, as well as fellow student participants and members of the general public. Awards are determined primarily on the basis of the oral presentation, although judges may also refer to the written scientific papers.

**Guidelines for the oral presentations are as follows** (See the *Judges Score Sheet* for details about how your presentation will be evaluated):

- The **content and format** of the oral presentation should be similar to that of your scientific paper, with a few exceptions. The abstract will be read by the judges and should **not** be a part of your presentation. Unlike in your paper, the results and discussion sections may be combined in your presentation. The acknowledgements may come at the beginning or end of your presentation.
- **Time:** A maximum of 15 minutes is allowed for the presentation, followed by a question-and-answer period of a maximum of 5 minutes.
- **Revised versions** of your Formal Abstract (5 copies) and/or scientific paper (1 copy) may be submitted to your head judge **at the beginning of your session** (This is optional, but **highly recommended**). Be sure to **include a date on the new version** so judges know which version to keep and which to discard for evaluation!
- **Presentation Media:** You **must** use a computer to prepare your presentation. PowerPoint is now the standard in the scientific field and you **must** use this software program. Computer-generated graphics, video, and audio may be used **only** for those aspects of the presentation that cannot be adequately presented by slides. Video clips may be embedded within the PowerPoint presentation, but **must not exceed a total of two (2) minutes**. Video material presented must be an **integral** part of the research and **should not** be a substitute for presentation of data. Video clips **must not** be used for presentation of common procedures, illustrating equipment, or showing laboratory facilities. Video clips should illustrate work that was done and **should not** be used for stimulation or aesthetic value. **No** written handouts are permitted (except for copies of the revised abstract and your scientific paper as described above). A research apparatus may be used if it is integral to the presentation and only if the apparatus is small enough to be hand-held.
- **For your PowerPoint presentation:**
  - A computer and projector will be provided (If you wish, you may bring your own computer to use).
  - You **must** bring your presentation on a jump drive or CD.
  - Be sure to test equipment and software compatibility at UAF the evening before the ASHSSS meeting. **Check each of your slides to make sure all images (Graphs, photos, etc.) will be shown properly.**
  - No audio or background music is permitted, other than sounds that are an integral part of the research. If video clips are used, they must meet the guidelines described above for videos. The student speaker must do the narration in person (It may not be recorded or produced mechanically).



## **Suggestions for Your Presentation**

In planning your presentation, keep the following ideas in mind:

- **You are the expert.** Nobody in the audience knows as much about your project as you do. Therefore, explain your research in enough detail so all will understand what you did, how you did it, and what you learned. Remember that your audience is not as familiar with the subject as you are.
- It's all right to be excited about your research, and it's OK to share your excitement with your audience. In fact, that makes your presentation more enjoyable. **Just make sure your excitement is genuine.**
- Pretend that you are going to be in the audience. What would you find interesting about your presentation? What would be confusing? Whenever possible, **avoid jargon or unnecessary terminology.** If it is essential to use specialized terms, remember to explain them briefly.
- **Graphs, tables, diagrams, and statistical representations are very important in explaining your results.** When displaying a graph, take time to orient the audience to the graph. For example, remember to state the variables on both axes of the graph. Explain the meaning of each graph, diagram, or table.
- **Include diagrams or photographs of key aspects of your methods.**
- **Each slide should be simple and uncluttered.** Use short phrases to emphasize key points. Visuals should make a few simple statements and supplement what you are saying while the visual is on the screen. Make sure the visual is legible from a distance, and that the entire visual will be visible. Do not overuse color or background graphics because they will distract your audience. Use colors with high contrast (such as black letters on a white or yellow background).
- **Deliver your presentation at a comfortable pace.** Give your audience enough time to understand what you are trying to convey. Display each slide only when you are ready for your audience to see it, and give the audience time to read it even though you will "speak them through" it.
- **Avoid using too many graphics during your presentation,** which would require you to quickly flash from one visual to the next. An average of one slide for every one-two minutes of presentation time is considered a good balance.
- **Make sure your presentation is logical and easy to follow.**
- It really helps to **practice your presentation** before a non-specialized audience (and to listen to their advice!), in addition to seeking advice from teachers and mentors. Practice will also help you perfect the presentation and timing. Plan to speak for 12-14 minutes, to allow additional time to finish within the allotted 15 minutes.
- Before answering a question, **repeat or paraphrase the question** so everyone in the audience can hear it.
- **Dress professionally,** but be comfortable (Jeans and t-shirts are not appropriate).

## ASHSSS Judges Score Sheet

Student Presenter: \_\_\_\_\_ Session #: \_\_\_\_\_

TIME LIMITS: 15 minutes maximum for presentation 5 minutes maximum for questions

Does this student have a formal mentor? Yes \_\_\_ No \_\_\_

Description	Maximum Points Possible	Points Earned
Title	1	
Background Information / Literature Review	4	
Question Pursued and Hypothesis Tested (Scientific quality and originality)	4	
Methods & Materials (Quality and originality of model or experimental design)	5	
Results	4	
Discussion	4	
Future Directions(s)	3	
Conclusions	2	
Acknowledgements	2	
Subject Command (Depth of background knowledge)	5	
Quality of Responses to Questions	5	
Delivery of Presentation (Poise, voice, enthusiasm, timing)	4	
Preparation (Quality of visual aides)	4	
Abstract (Printed)	3	
<b>Total Points Earned</b>	<b>50</b>	

**Disclaimer:** Placement is based on scores **and** discussion between judges. Written papers may also be used in determining placement. Originality and creativity of the project may also be considered. **Judges decisions are final.**

**Judges: Please use the reverse side for additional comments to the student presenter. Comments will be returned to teachers for students or to students directly.** Finalists especially appreciate suggestions for improvements, as they will present their project again tomorrow (Sunday) to a different set of judges.

Suggested questions to evaluate student involvement in the research:

- How did you choose your research topic and what resources helped frame your hypothesis?
- What role did your mentor play in the process of data collection and analysis?
  - No mentor or mentor was advisor only.
  - Provided access to equipment and explained its operation, but collection and analysis was done by the student.
  - Assisted with data collection and analysis working side-by side in all phases.
  - Used archived data, but analysis was student centered.
  - Data collection and analysis was mentor centered (due to project complexity, equipment privileges, or Review Board restrictions, but student observed and/or assisted.
  - Theoretical study: possibly no raw data
- Describe any problems you had to solve in the course of your research.

**Judges Comments (on reverse side):**

**ASHSSS Grant Submission Request Form**

This request may only be submitted after your project has been completed. **Receipts showing actual costs MUST be attached.** Reimbursement awards are contingent upon availability of funding. Research awards will usually not exceed \$50.00, while travel awards will usually not exceed \$250.00.

Student name: \_\_\_\_\_ Student Soc. Sec. #: \_\_\_\_\_

Home address: \_\_\_\_\_

City, state, zip: \_\_\_\_\_

Student E-mail: \_\_\_\_\_

Student Home phone: \_\_\_\_\_ Fax: \_\_\_\_\_

School name & address: \_\_\_\_\_

Date: \_\_\_\_\_

Have you entered an ASHSSS competition before? Yes [ ] No [ ]  
(A "yes" here will in no way offset potential funding)

If yes, were you a 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, or 5<sup>th</sup> place winner? Yes [ ] No [ ]

Project title for which funds are requested:  
\_\_\_\_\_  
\_\_\_\_\_

Teacher/mentor name: \_\_\_\_\_

Teacher/mentor phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Teacher/mentor signature: \_\_\_\_\_ Date: \_\_\_\_\_

Institution/agency/lab represented: \_\_\_\_\_

Brief description of how the money was used: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Amount Requested: \_\_\_\_\_

**Receipts must be attached.**

## **How to Register for the ASHSSS**

To register for the ASHSSS, complete and submit the following items by the appropriate deadline (See *Important Dates and Deadlines*). Keep a copy of **all** forms and papers that you submit.

### ***Items to submit for Registration:***

- *Registration Form.*
- *Project Approval Form* **and** all additional forms required for your project, with proper signatures. **Papers submitted without necessary approval forms (or with necessary signatures missing) may not be accepted.**
  - **Human Subjects (no student subjects):** Attach IRB approval form.
  - **Human Subjects (with student subjects):** Attach IRB **and** school/district approval forms.
  - **Non-human Vertebrate Animals:** Attach SRC approval form.
  - **Potentially Hazardous Materials:** Attach SRC approval form.
- *Formal Abstract.* Your abstract will be **published as submitted.** With your packet of registration materials, include a paper version that is an original, printed with a letter quality printer (See *Formal Abstract Guidelines*). **Abstracts that do not meet the guidelines may not be accepted.**
- **ONE ELECTRONIC** copy of your scientific paper (abstract included).
- **IF** you wish to register for **2 UAF science credits**, submit the following items **with your registration materials** (These items may be submitted separately, but must be received by the Monday before the ASHSSS meeting. If you submit a check with your registration materials and your paper is not accepted for presentation at the ASHSSS meeting, your check will be returned to you).
  - *UAF Secondary School Student Enrollment Form* (**NOTE** that this form should be submitted to the ASHSSS Director by the relevant ASHSSS deadline, **NOT** to the UAF Registrar's office during UAF's regular registration period).
  - Check for \$50.00, payable to "UAF (ASHSSS)."

### ***Send all registration materials listed above to (submission by email strongly preferred):***

Dr. Abel Bult-Ito, ASHSSS Director  
CNSM, Dept. of Biology and Wildlife  
260 Arctic Health Research Building  
University of Alaska Fairbanks  
P.O. Box 756100  
Fairbanks, AK 99775-6100

E-mail: [abultito@alaska.edu](mailto:abultito@alaska.edu)

### ***Information about the awards banquet:***

The awards banquet will be held Saturday evening, on the first day of the ASHSSS meeting (location and time to be announced). All student participants are invited and each participant may bring one guest at no cost. Additional guests may pay to attend the banquet for the cost of the meal. Reservations and payment for additional guests should be made with your teacher before the ASHSSS meeting. Payment may also be made on the day of the ASHSSS meeting, at registration, or at the awards banquet.

**2016 ASHSSS Registration Form (page 1 of 2)**

See *How to Register for the ASHSSS* for a list of items to submit with this form.

Student Name: \_\_\_\_\_  
(as you would like it to appear on name badge, awards, or certificates)

Are you a U.S. citizen or permanent resident of the U.S.? Yes [ ] No [ ]

Social Security #: \_\_\_\_\_ Cell Phone#: \_\_\_\_\_  
(needed for tuition awards)

Home Address: \_\_\_\_\_  
\_\_\_\_\_

Home phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Class grade (Circle ONE): 9 10 11 12 Age: \_\_\_\_\_

Name of School: \_\_\_\_\_ Title I school?  Yes  No  
(Home School or Online School?)

School phone: \_\_\_\_\_ School fax: \_\_\_\_\_

Sponsoring Teacher: \_\_\_\_\_ E-mail: \_\_\_\_\_

Mentor Name & Agency: \_\_\_\_\_

Project Title: \_\_\_\_\_  
\_\_\_\_\_

***Equipment needs:*** \_\_\_\_\_

**Computers with projectors will be provided** (Bring your PowerPoint presentation on a jump drive or CD).

**Will you have embedded videos in your PowerPoint presentation?** Yes [ ] No [ ]  
**If yes, do they total less than 2 minutes in length?** Yes [ ] No [ ]

**Indicate below your 1<sup>st</sup> choice of category (2<sup>nd</sup> & 3<sup>rd</sup> choices are optional)\***

- |                         |                           |                           |
|-------------------------|---------------------------|---------------------------|
| ___ Anthropology        | ___ Computer Science      | ___ Mathematics           |
| ___ Archaeology         | ___ Earth Science         | ___ Microbiology          |
| ___ Atmospheric Science | ___ Ecology               | ___ Molecular Biology     |
| ___ Biochemistry        | ___ Engineering           | ___ Organismal Behavior   |
| ___ Botany              | ___ Environmental Science | ___ Organismal Physiology |
| ___ Cellular Biology    | ___ Human Behavior        | ___ Physics               |
| ___ Chemistry           | ___ Human Physiology      | ___ Zoology               |

\* The final assignment of category may be slightly different from what you indicate. We will always place you in an appropriate category that closely matches your research subject.

**2016 ASHSSS Registration Form (page 2 of 2)**

For National JSHS reporting requirements, we request that you complete the following confidential information. This information will be submitted in aggregate and your name will not be attached to this information:

- Gender:**      Male  
                   Female  
                   Choose Not To Report

- Race/Ethnicity:**    Alaskan Native or Native American  
                           Native Hawaiian or Other Pacific Islander  
                           Hispanic or Latino  
                           Asian  
                           Black or African American  
                           White / Caucasian  
                           Other: \_\_\_\_\_  
                           Choose Not To Report

- Do You Receive a Free or Reduced-Cost Lunch?**      Yes  
   No  
   Choose Not To Report

- Is English Your First Language?**    Yes  
   No  
   Choose Not To Report

- Did One of Your Parents/ Guardians Graduate from College?**    Yes  
   No  
   Choose Not To Report

- Do You Have a Documented Disability?**    Yes  
   No  
   Choose Not To Report

**2016 TEACHER OF THE YEAR AWARD NOMINATION FORM**  
FOR THE  
**31<sup>ST</sup> ALASKA STATEWIDE HIGH SCHOOL**  
**SCIENCE SYMPOSIUM (ASHSSS)**

Date: \_\_\_\_\_

Name of Teacher: \_\_\_\_\_

School of Teacher: \_\_\_\_\_

Name of Nominator: \_\_\_\_\_

School of Nominator: \_\_\_\_\_

Please briefly describe why you nominate this teacher for the Teacher of the Year Award:

Please submit this nomination form to ASHSSS Director Abel Bult-Ito at [abultito@alaska.edu](mailto:abultito@alaska.edu) no later than 26 February 2016.

The Teacher of the Year Award consists of a plaque, certificate, and a \$100 check, which will be awarded at the Saturday night banquet on 5 March 2016.

**2016 MENTOR OF THE YEAR AWARD NOMINATION FORM**  
FOR THE  
**31<sup>ST</sup> ALASKA STATEWIDE HIGH SCHOOL**  
**SCIENCE SYMPOSIUM (ASHSSS)**

Date: \_\_\_\_\_

Name of Mentor: \_\_\_\_\_

Professional Affiliation of Mentor: \_\_\_\_\_

Name of Nominator: \_\_\_\_\_

School of Nominator: \_\_\_\_\_

Please briefly describe why you nominate this mentor for the Mentor of the Year Award:

Please submit this nomination form to ASHSSS Director Abel Bult-Ito at [abultito@alaska.edu](mailto:abultito@alaska.edu) no later than 26 February 2016.

The Mentor of the Year Award consists of a plaque, certificate, and a \$100 check, which will be awarded at the Saturday night banquet on 5 March 2016.



Barcode label  
Office use only

# HIGH SCHOOL ENROLLMENT FORM



SID label  
office use only

RECEIVED

Office use only

Term \_\_\_\_\_

P \_\_\_\_\_

**To enroll at UAF while still a high school student, you must**

- Complete this form.
- Meet prerequisites of the course or courses in which you want to enroll.
- Get permission from the instructor or the department head.
- Submit the completed form to the Office of Admissions and the Registrar during the regular registration period
- Pay tuition and fees by the last day of fee payment in the

semester you are enrolled. NOTE: Permission to enroll in a course must be obtained each time you register.

- If you want to use university credit to meet high school requirements, contact your high school counselor before you enroll at UAF.
- Students may choose not to release their directory information by completing a "request to withhold or release directory information" form, available at the Office of Admissions and the Registrar.\*

NAME: \_\_\_\_\_  
(Last) (First) (M I)

UA ID (or SSN): \_\_\_\_\_

SEMESTER OF ENROLLMENT: Year 20\_\_\_\_  Fall  Spring  Summer Date of Birth (MM/DD/YYYY): \_\_\_\_\_

**CURRENT MAILING ADDRESS:**

Day Phone: \_\_\_\_\_

Evening Phone: \_\_\_\_\_

Email Address: \_\_\_\_\_

\_\_\_\_\_  
(City) (State) (Zip)

**Residency<sup>1</sup>:** Students seeking Alaskan residency or a waiver of non-resident surcharge must complete an "Application for Resident Tuition" or "Waiver of Non-Resident Surcharge" and provide required documentation to the Office of Admissions before the published first day of instruction (UA Board of Regents Regulation R05.10.05). See reverse side for information.

**DEMOGRAPHIC INFORMATION:** See reverse side for information and codes.

Sex:  Male  Female Ethnicity<sup>2</sup>: \_\_\_\_\_ Vet/Military Status<sup>3</sup>: \_\_\_\_\_

For instructions on withholding directory information, please see FERPA on reverse side<sup>4</sup>.

US Citizen?  Yes  No If no, Nation of birth: \_\_\_\_\_ Nation of citizenship: \_\_\_\_\_

Visa Type: \_\_\_\_\_ Permanent Resident?  Yes  No

**PRIOR EDUCATION INFORMATION:**

Name of high school you are attending: \_\_\_\_\_ Location (city/state): \_\_\_\_\_

Expected graduation date? (MM/DD/YYYY): \_\_\_\_\_

COURSE INFORMATION (Complete all information requested below. Refer to the Class Schedule for course information)							
CRN	Dept.	Course Number	Section	Course Title	# of Credits	"Yes" if Audit	Instructor Signature required (permissions rec'd thru UAF e-mail account from instructor or dept head is acceptable)

I understand I, or my parent, are responsible for all applicable UAF academic regulations, tuition and fees whether or not I successfully complete the course or courses in which I am enrolling<sup>5</sup>. The university will not initiate a drop for non-payment<sup>5</sup>.

Student's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Parent's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**OFFICE OF ADMISSIONS AND THE REGISTRAR ONLY:**

Processed By: \_\_\_\_\_

Date: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

## 1 RESIDENT AND NON-RESIDENT TUITION

First-time non-degree students or students returning to enrollment after more than a two-year absence are considered non-residents until they submit an "Application for Resident Tuition" with this registration form before the first published day of instruction and are approved (for the purposes of residency pursuant to UA Board of Regents Regulation R05.10.05) as a resident of Alaska.

For more specific criteria, please refer to the "UA Application for Resident Tuition Assessment" at [www.uaf.edu/admissions/pdf/res\\_tuition\\_app.pdf](http://www.uaf.edu/admissions/pdf/res_tuition_app.pdf).

## 2 ETHNICITY\*

Code	Description
AA	Alaska Aleut
AE	Alaska Eskimo, other
AH	Alaska Indian, Haida
AI	Alaska Indian, Other
AK	Alaska Indian, Tlingit
AM	Alaska Indian, Tsimshian
AN	Alaska Native, Other
AQ	Alaska Eskimo, Inupiaq
AS	Alaska Native, Southeast
AT	Alaska Indian, Athabaskan
AY	Alaska Eskimo, Yup'ik
BL	Black, Non-Hispanic
HI	Hispanic
IN	American Indian (Not Alaska Native)
OT	Other
PI	Asian, Pacific Islander
WH	White
XX	American Indian or Alaska Native

\* Requested for compliance with Title IV of the Civil Rights Act of 1964

## 3 VETERAN/MILITARY STATUS

Code	Description
Blank	Non-veteran
AA	Active Duty – Army
AC	Active Duty – Coast Guard
AF	Active Duty – Air Force
AN	Active Duty – Navy/Marines
AO	Active Duty – Other
DC	Dependent Child
DS	Dependent Spouse
VR	Veteran – Discharged/Retired (Eligible)
WW	Widow/Widower

## 4 INFORMATION RELEASE/FERPA

The Office of Admissions and the Registrar is responsible for keeping student education records. The full copy of the university's policies regarding access to student records under the Family Educational Rights and Privacy Act of 1974 (FERPA) are available at [www.uaf.edu/reg/ferpa/](http://www.uaf.edu/reg/ferpa/).

### Directory Information

The university may release certain directory information to the public on a routine basis unless a student requests, in writing, that the university not release it. Forms to request that directory information not be released are available in the Office of Admissions and the Registrar.

No directory information will be released until the last day of late registration. Any request to withhold directory information will continue until a student provides permission, in writing, for the university to release such. After that, information will be released when appropriate. The names of students who have requested their directory information be withheld will not appear in the published university chancellor's and dean's lists.

The following is considered directory information:

1. Name
2. E-mail address
3. Home city and state
4. Weight and height of students on athletic teams
5. Dates of attendance at UAF
6. Program/major field(s) of study
7. Degrees and certificates received, including dates
8. Participation in officially recognized university activities
9. Academic and co-curricular honors, awards and scholarships received, including dates

## 5 LATE PAYMENT/REINSTATEMENT FEES

**Cost:** \$100; \$35 per month for late payment plan payments.

**Who pays:** All students who have missed the fee payment deadline and have a balance of \$100 or more. An additional \$100 fee will be added to accounts which are not paid by the withdrawal deadline. **The university will not initiate a drop for non-payment.**

**What's covered:** Processing of late payments  
Contact the Business Office (474-7384).



Office of Admissions and the Registrar, 102 Signers' Hall,  
PO Box 757480, Fairbanks, Alaska 99775  
907-474-7500 (ph) • 907-474-7097 (fax) • [registrar@uaf.edu](mailto:registrar@uaf.edu)