

GUIDE

# ARASE 2016-2017

□○△ *Celebrating the 61<sup>st</sup> Fair*



## *Alamo Regional Academy of Science & Engineering*

*An Affiliate of*



**STEM Enrichment Organizations  
Promoting Science, Technology, Engineering and Mathematics**

## **Vision**

Science is for everyone.  
Every child should have the opportunity to practice scientific research.

## **Mission Statement**

To Advance A Public Understanding  
Of Science Research

*And*

An Appreciation of Science Among  
Young People

*And*

To Increase Opportunities for Disadvantage  
Youths and Underrepresented Groups In  
Science and Engineering

## **ARASE Objectives**

Aims to provide students with the opportunity to:

- Engage in a STEM related experimental science fair project.
- Use critical thinking skills
- Conduct literary research
- Design and conduct a STEM related experiment using the scientific method
- Conduct statistical analysis to interpret the data
- Write an organized, well thought-out scientific paper
- Summarize and display the research on a visual board
- Communicate findings to judges from the scientific community

*The Alamo Regional Science & Engineering Fair is an Intel International Science and Engineering Fair (Intel ISEF) affiliate and an affiliate of the Broadcom Masters program, both of which are sponsored by the Society for Science and the Public (SSP), Washington, DC; the Texas Science & Engineering Fair (TSEF) sponsored by UTSA, and the International Sustainable World in Energy, Engineering, & Environment Project Olympiad (I-SWEEEP) sponsored by the Cosmos Foundation. ARASE promotes three events sponsored by the Educational Outreach & Women's Programs at Texas A & M University: Science Olympiad, the Texas Junior Academy of Science (TJAS) and the Texas Junior Science & Humanities Symposium (TJSHS). It encourages students to apply for participation in the Genius Olympia, the Google Science Fair, the Science Talent Search (STS) sponsored by SSP, and the Siemens Science Competition.*

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## Key Terms

## **ARASE Events:**

ARASE sponsors a science fair seminar for teachers, students and parents and two science competitions, the Alamo Junior Academy of Science (AJAS) and the Alamo Regional Science and Engineering Fair (ARSEF) for students (gr. 6-8 and gr. 9-12). Magnet Schools may enter as separate schools if they are separate from the parent school. Home schooled students enter as individual schools or co-ops. Independent entries are accepted under certain conditions. If a student participates in a school fair and does qualify to advance to ARSEF, he/she **cannot** apply to ARSEF. However, a student can apply as an independent entry if he/she did not enter a school fair. Schools do not need to have a fair.

### ***Science Fair Seminar*** [Registration Fees: \$12/Adult; \$10/Student]

The seminar trains teachers, students, and parents on the paperless submission of SRC/IRB Forms. Attendees are informed of the rules and regulations of pre-college experimental research which are designed by the Society for Science and the Public (SSP) for secondary school students. Regional and state fairs affiliates of SSP adhere to these guidelines. Student projects and educational resource exhibits are on display. Free materials and door prizes are available.

### ***Alamo Regional Junior Academy of Science (AJAS)*** [Entry fee is \$15/Student]

Middle schools may enter **15 STUDENTS**. High schools may enter **22 STUDENTS**. Students deliver a 12-minute or less oral presentation on their scientific research before two judges within a category. There are 10 or less presenters/room. Vertical displays, posters, **nor** video tapes are used. PowerPoint presentations are not permitted. Printed material/transparencies may have PPT format to be used on an Elmo projector. It also projects photos. Two copies of a report (20 pp. or less) are given to the judges. Font size is 12 pt. or a minimum of 10 pt. with double spacing or 1.5 minimum line spacing. Reports are stapled on the upper left-hand corner. Binders, folders, data book, photo album, and previous reports of continuing projects or any other materials are not permitted. Photo-taking, video-taping and use of cell phone are **not** permitted. High school students can also apply to the Texas Junior Academy of Science (TJAS) at Texas A&M University. **Team** presentations at AJAS or at TJSA are **NOT** allowed.

### ***Alamo Regional Science and Engineering Fair (ARSEF)*** [Entry fee is \$35/student. \$10 fee/projects requiring electricity]

Students compete with a vertical display for awards, scholarships, and for the opportunity to advance to higher levels of competition such as state, national or international fairs. Middle schools may enter **20 PROJECTS** and High schools **25 PROJECTS**. Projects may be individual and team projects (optional).

**Teams:** Schools may enter **no more** than 3 Team Projects (one Team/Fair): High school teams can have **no more than 2 members**. Middle school teams **can have up to 3 members**.

Fair I: Physical Sciences: *Chemistry, Earth & Space, Engineering, Math & Computers, Physics*

Fair II: Health Sciences: *Biochemistry, Medicine & Health, Microbiology*

Fair III: Biological Sciences: *Behavior & Social Sciences, Botany, Environmental, Zoology*

Teams **cannot** be converted to Individual Projects or vice-versa during a current year once experimentation starts. Membership cannot be changed during a given research year.

### AJAS and ARSEF Disciplines:

ARASE has three Sub-Academies for the Alamo Junior Academy of Science (AJAS) and three Sub-Fairs for the Alamo Regional Science & Engineering Fair (ARSEF):

Academy I & Fair I: **Physical Sciences**

Chemistry, Computer Science & Math, Earth & Space, Engineering, Physics

Academy II & Fair II: **Health Sciences**

Biochemistry, Medicine & Health, Microbiology

Academy III & Fair III: **Life Sciences**

Behavioral & Social Sciences, Botany, Environmental Sciences, Zoology

The chart below is a cross-reference of ARASE categories with those of the TSEF and the Intel ISEF.

**Note:** The “Fair” column indicates which Sub-Fair a category is assigned to in the regional fair. Also the column for TSEF and Intel ISEF indicates which categories correspond to the ARASE categories.

ARASE SUB-FAIRS	CATEGORIES	TSEF and INTEL ISEF CATEGORIES
I	Chemistry	Chemistry
I	Computer Science & Math	Systems Software, Computational Biology & Bioinformatics, Mathematical Sciences (Separate Categories)
I	Earth & Space	Earth & Environmental Sciences
I	Engineering	Environmental Engineering, Engineering Mechanics, Material Science, Embedded Systems, Robotics and Intelligent Machines (Separate Categories)
I	Physics	Energy: Chemical, Energy: Physical, Physics & Astronomy (Separate Categories)
II	Biochemistry	Biochemistry
II	Medicine & Health	Biomedical & Health Sciences
II	Microbiology	Cellular & Molecular Biology, Microbiology (Separate Categories)
III	Behavioral & Social Sci.	Behavioral & Social Sciences
III	Botany	Plant Sciences
III	Environmental Sciences	Earth & Environmental Sciences
III	Zoology	Animal Sciences

**NOTE: Team Projects are placed in a Sub-Fair and not in a category at the ARSEF.**

### Continuation Projects

Students enter the most recent year’s research work to be judged. Display boards reflect current year’s work **only**. A Project title can have a previous year study such: “Second Year Study” or “Year II”. The project must document **new** and **different** research (e.g. testing a new variable or new line of investigation). Repetitions of prior experimentation or increasing sample size are unacceptable continuation projects. Students must submit Continuation Project Form (7) with previous year’s abstract and research plan. A third year project must submit only the first year’s abstract.

## **ARASE & INTEL ISEF CATEGORY DESCRIPTIONS**

### Behavioral & Social Sciences

Human and animal behavior, social and community relationships—psychology, sociology, anthropology, archaeology, learning, perception, reading problems, public opinion surveys

### Biochemistry

Chemistry of life processes: molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones etc.

### Botany

Study of plant life: agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, algae, etc.

### Chemistry

Study of nature and composition of matter: physical chemistry, organic chemistry, inorganic chemistry, materials, fuels, plastics, pesticides, soil chemistry, metallurgy etc.

### Computer Science

Study and development of computer hardware, software engineering, internet networking and communications, graphics, simulations/virtual reality or computational science

### Earth & Space

Geology, mineralogy, astronomy, geography, meteorology, seismology, oceanography, climatology, astronomy, planetary sciences, etc.

### Engineering

Technology; projects that directly apply scientific principles to manufacturing and practical uses: civil, mechanical, aeronautical, chemical, electrical, sound, automotive, marine, transportation environmental engineering, etc.

### Environmental

Study of pollution (air, water, and land) sources and their control; ecology

### Mathematics

Development of formal logical systems or various numerical and algebraic computations: calculus, geometry, abstract, algebra, number theory, statistics, complex analysis, probability

### Medicine & Health

Study of diseases and health of humans and animals: dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, dermatology, allergies, speech and hearing, etc.

### Microbiology

Biology of microorganisms such as bacteriology, virology, protozoology, fungi, bacterial genetics, yeast, etc. Specimens can be collected at home as long as they are immediately transported to a lab with the appropriate level of bio-safety containment. Bacteria samples cannot be cultured at home!

### Physics

Theories, principles, and laws governing energy: solid state, optics, acoustics, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, thermodynamics, semiconductors, magnetism, etc.

### Zoology

Study of animals: animal genetics, herpetology, physiology, ornithology, animal ecology, ichthyology, animal ecology, paleontology, cellular physiology, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, entomology, animal husbandry

## **RULES AND GUIDELINES FOR PRE-COLLEGE RESEARCH**

ARASE affiliates with the Society for Science and the Public (SSP) in Washington D.C. It adheres to the rules and guidelines established by SSP. Please refer to SSP's *Intel International Science and Engineering Fair (Intel ISEF) Rules and Guidelines* at SSP's website: [www.societyforscience.org](http://www.societyforscience.org). Click on *Student Science* at the top of the Menu. Go to "Intel ISEF" on the left-hand side Menu. Scroll down to Rules, Forms, and Resources. Review the applicable rules and the applicable forms before submitting the required forms for specific studies. Once the rules and forms are reviewed and the student is familiar with required forms, use the **Scienceteer** paperless system to submit SRC/IRB forms to ARASE.

The **Scienceteer System** website is [www.scienceteer.com](http://www.scienceteer.com). A School Account needs to be set-up first by a contact person before students can set-up their account to submit the applicable forms to the regional fair. The contact person will use the role of "**Fair Director**" to set-up a School Account. Both the Fair Director and the student need to create **their own** User Name and a Password unique to the science fair. Once the accounts are set-up, go back and login and complete the required information.

### **SRC/IRB REQUIRED FORMS (To be submitted via Scienceteer)**

To enter the Alamo Regional Science & Engineering Fair and the Texas Science & Engineering Fair, students need to submit *Scientific Review Committee (SRC)* forms. In addition, they need to submit special SRC forms if the study deals with Human Participants, Vertebrate Animals, and Potentially Hazardous Biological Agents (PHBA). PHBA studies include studies on bacteria, mold, human or animal tissue, cell cultures, etc. All the above studies require special forms that must be filled out, signed and dated **PRIOR TO EXPERIMENTATION**.

Keep in mind that bacteria samples **CANNOT BE CULTURE** at home. Samples can be collect at home or from the environment, but **NOT CULTURE AT HOME**. The samples must be contained in a safe container and need to be taken immediately to a Biosafety Level 1 (BSL-1) lab or a BSL-2 lab. Mold studies being conducted at home have to be **TERMINATED** on the **FIRST SIGN** of mold growth.

Please refer to SSP's "*Intel International Science and Engineering Fair (Intel ISEF) Rules and Guidelines*" at SSP's website ([www.societyforscience.org](http://www.societyforscience.org)) for guidance on experimental studies. Click on the "*Student Science*" link and go to "*Intel ISEF*" then click on the "*Rules, Forms, and Resources*". Review the applicable rules for the selected study in reference to the following studies: Human Participants, Vertebrate Animals, Potentially Hazardous Biological Agents (PHBA) and Hazardous Chemical, Devices, or Activities. Also review the section on "Display and Safety Regulations" (D & S) for displaying a project at regional, state, and Intel ISEF fairs.

**NOTE:** Projects entering a Society for Science and the Public (SSP) Affiliated Fair must meet the approval of the local (school) and regional fair's SRC/IRB. Required SRC/IRB forms must be completed with appropriate signature and dates before a student is allowed to start a project and to set-up at the regional science fair. Again, remember that certain projects require prior SRC/IRB special approval **BEFORE** experimentation. Refer to the description of the SRC/IRB on the next page.

## **SCIENTIFIC REVIEW COMMITTEE (SRC) INFORMATION**

A school's local SRC reviews the forms and the Research Plan for **all** projects to ensure that students follow all applicable rules. A school's SRC/IRB Membership is to be entered in the school's Scienteer System account at [www.scienteer.com](http://www.scienteer.com). ARASE website, [www.arase.org](http://www.arase.org), also has the link to the Scienteer.

The SRC consists of professionals knowledgeable about regulations concerning experimentation in restricted areas. It reviews and approves following forms: **Form (1) Checklist for Adult Sponsor**, **Form (1A) Student Checklist**, the **Research Plan Attachment**, and **Form (1B) Approval Form** and the **Official Abstract/Certification** in addition to **all other** required forms for students entering the fair. SRC **PRIOR** approval by an SRC/IRB chair is needed for projects involving Human Participants, Non-Human Vertebrates, Potentially Hazardous Biological Agents (PHBA) that include rDNA, human or animal tissue cultures, controlled substances or pathogens, etc. Depending on the study, a Qualified Scientist, Designated Supervisor, or Veterinarian signature might be needed.

Projects involving Hazardous Chemicals, Devices or Activities need the Risk Assessment Form (3). Please refer to the **SRC/IRB Required Forms Chart** in the next few pages for additional guidance on which forms are needed for submission to ARASE.

### ***Special Notes on SRC***

A school (local) SRC must have a minimum of three persons. Additional members are recommended to avoid conflict of interest. If a school cannot establish an SRC, it should contact the Regional Fair Director(s) for assistance in reviewing the above projects **PRIOR** to experimentation. The SRC must include:

- Biomedical Scientist (PhD., M.D., D.V.M., D.D.S, Pharm.D, or D.O.)
- Science Educator (familiar w/animal care helps—not the student's teacher)
- One other member
- **NOTE:** The Adult Sponsor, Qualified Scientist, Designated Supervisor who oversees the student's project, including a parent or a relative of the student **CANNOT** serve on the SRC reviewing that project.

An SRC examines projects for the following:

- Evidence of literature search and proper supervision
- Evidence of proper supervision
- Use of accepted research techniques
- Completed forms, Signatures, and Dates
- Evidence of search for alternatives to animal use
- Humane treatment of animals
- Compliance with state/ federal rules and laws governing Human & Animal Research
- Compliance with state/federal rules and laws regarding rDNA, Pathogenic Agents, Controlled Substances, Hazardous Substances & Devices
- Appropriate documents & substantial expansion for Continuation project



## **INSTITUTIONAL REVIEW BOARD (IRB) INFORMATION**

A school's IRB should consist of a minimum of three members to evaluate the potential physical or psychological risk of research involving human participants, including projects with surveys, questionnaires and tests **PRIOR** to experimentation. A member of the SRC can serve on the IRB if the requirements are met. Additional members are recommended to avoid conflict of interest. The IRB should include a:

- Science Educator (not the student's teacher)
- School Administrator (preferably Principal, Vice-Principal, or Dean)
- Medical or health professional who is knowledgeable about and capable of evaluating the physical and/or the psychological risk in the study (Psychologist, Psychiatrist, M.D., P.A., R.N. or Licensed Social Worker, etc.)

If a school cannot establish an IRB, the teacher/school should contact the Regional Fair Director(s) for assistance in evaluating human research projects **PRIOR** to experimentation.

IRBs also exist at federally registered institutions, including prisons. An institutional IRB must initially review and approve the research conducted or sponsored by that institution. For research not performed at these facilities, the sponsoring research organization (school, regional fair, etc.) must appoint an IRB to review and approve research involving human participants.

A regional SRC/IRB may override a school IRB. The state SRC/IRB can override a regional decision.

### ***Special Notes on IRB***

- If a project is behavioral, a psychologist, or individual with human behavioral training must serve on the IRB.
- Human Participant (including student researcher) studies require **Human Participant Form (4)** regardless if there is minimal risk, anonymous data collected, and is waived by the school IRB. Some will require an **Informed Consent/Assent document**. If informed consent/assent is waived, IRB needs to attach a note stating why waiver is being granted. The Research Plan should state that a waiver is being obtained for the Informed Consent/Assent and why.
- The Adult Sponsor, Parents, Qualified Scientist, **NOR** the Designated Supervisor who oversee a specific project is permitted to serve on the IRB reviewing that project. These adults may not sign the SRC/IRB 2(a) or 2(b) section of a student's **Approval Form (1B)** or any of the forms that require the signature of the SRC/IRB local chair. If the project is a team, then **EACH** member needs **Form (1B)** since they each need their parent's signature.
- The Human Participant Form (4) is to be submitted to the local and regional SRC/IRB with a **SAMPLE** of an Informed Consent/Assent Form and all applicable forms for final approval. Informed Consent/Assent Forms from each human participant in the study must be available at the fair, but not displayed and kept in a secured place.
- Please refer to the SRC/IRB Required Forms Chart on the next page for additional guidance on which forms are needed for submission to ARASE.

# SRC / IRB

## 2016-2017 Required Forms Chart

			PAGE
<b>ALL PROJECTS REQUIRE THESE FORMS</b>		Official Abstract (download from website)	*
	(1)	Checklist for Adult Sponsor	29
	(1A)	Student Checklist – Individual / Team	30
	RP	Research Plan	31
	(1B)	Approval Form	32

\*NOTE: Abstract form is listed after Form (7) on the SSP Website

In Addition to <b>PROJECTS INVOLVING...</b>	Required	If Applicable	FORM	DESCRIPTION	FORM PAGE
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The complete 2017 Intel ISEF Rules & Guidelines Booklet can be printed ([www.societyforscience.org](http://www.societyforscience.org))

<b>1</b>	<b>Human Participants</b> <i>Rules PP. 8-11</i>	?	(1C)	Regulated Research Institution Form	33	
		?	(2)	Qualified Scientist Form	34	
		?	(3)	Risk Assessment Form	35	
		✓	-	(4)	Human Participant Form	36
		?	-		Informed Consent	37
<b>2</b>	<b>Vertebrate Animals Non-Regulated Site</b> <i>Rules PP. 12-13</i>	?	(2)	Qualified Scientist Form	34	
		?	(3)	Risk Assessment Form	35	
		✓	-	(5A))	Vertebrate Animal Form	38
<b>3</b>	<b>Vertebrate Animals Reg. Research Site</b> <i>Rules PP. 13-14</i>	✓	(1C)	Regulated Research Institution/Industrial Setting	33	
		✓	(2)	Qualified Scientist Form	34	
		?	(3)	Risk Assessment Form	35	
		✓	-	(5B)	Vertebrate Animal Form	39
<b>4</b>	<b>Potentially Hazardous Biological Agents (PHBA) Risk Assessment</b> <i>Rules PP. 15-18</i>	?	(1C)	Regulated Research Institution/Industrial Setting	33	
		?	(2)	Qualified Scientist Form	34	
		?	(3)	Risk Assessment Form	35	
		✓	-	(6A)	Potentially Hazardous Biological Agents Risk Form	40
		✓	-	(6B)	Human & Vertebrate Animal Tissue Form	41
<b>5</b>	<b>Hazardous Chemicals Activities, or Devices</b> <i>Rules PP. 19-21</i>	?	(1C)	Regulated Research Institution/Industrial Setting	33	
		?	(2)	Qualified Scientist Form	34	
		✓	-	(3)	Risk Assessment Form	35
<b>6</b>	<b>Continuation Projects</b> <i>Rules P. 4</i>	✓	-	(7)	Continuation Project Form	42
		✓	-	-	Prior Year's Official Abstract	-
		✓	-	RP	Prior Year's Research Plan	-
		✓	-	-	Other Previous Abstracts Only	-

KEY: ✓ Required ? If Applicable

SSP Website: [www.societyforscience.org](http://www.societyforscience.org) Refer to the "*Intel ISEF International Rules & Guidelines*" **PRIOR** to filling out forms on-line with the **Scienteer System** at ([www.scienteer.com](http://www.scienteer.com)).

1. Click on **Student Science** at top of the Home Page.
2. Click on **Intel ISEF**
3. Scroll down to **Rules, Forms, and Resources**.
4. **Review the SSP Guidelines**. Be familiar with the required **RULES** for specific studies
- \* 5. The complete 2017 Intel ISEF Rules & Guidelines Booklet can be printed.

## **DISPLAY AND SAFETY (D&S)**

All projects undergo a Display and Safety (D&S) Inspection to insure projects meet safety requirements and have been approved by the local and regional SRC/IRB. Projects need to be cleared by the SRC **BEFORE** setting-up for the D&S Inspection. The D&S Committee is the final authority on display and safety issues for projects approved by the SRC to compete in the ARASE regional fair, the Texas Science and Engineering Fair (TSEF), and in the Intel ISEF.

The ARASE regional fair D&S Committee may occasionally require students to make revisions in their display to conform to D & S regulations. Refer to the Intel ISEF Display and Safety Regulations of the *International Rules and Guidelines*, at [www.societyforscience.org](http://www.societyforscience.org) to determine what is allowed and **NOT** allowed on the display board or table. Go to the “*Student Science*” link and click on “*Intel ISEF*”. Go to “*Rules, Forms, and Resources*”. Click on “*Rules*” and on this page scroll down to “*Display and Safety Regulations*.”

### **Maximum Size of Project for Table or Floor Displays:**

- Depth (front to back): 30 inches or 76 centimeters
- Width (side to side): 48 inches or 122 centimeters
- Height (floor to top): 108 inches or 274 centimeters

Regional fair will provide tables that will not exceed 36 inches (91 centimeters) in height.

### **Display Board Items:**

Vertical displays should have at least the following items (information) displayed on the board:

- Official Abstract/Certification with the SRC Approval Stamp  
(Vertically displayed on the table or on the upper left panel of board)
- Rational and Introduction
- Question
- Purpose (Objective, Goal, Aim)
- Hypothesis
- Materials (Chemicals, Supplies, or Instruments)
- Methods (Procedure, Experimental Design)
- Results, Data Analysis, Observations
- Discussion of Results
- Conclusion
- Practical Application
- New Questions
- Future Expansion
- Applicable Forms: e.g. Forms (1C) and/or Form (7) vertically displayed

**Note:** The bibliography and acknowledgements **DO NOT** go on the display board. The bibliography goes in the science fair report. A general acknowledgement can be included in the report **WITHOUT** mentioning names of individuals, institutions, organizations.

## **FREQUENTLY ASKED QUESTIONS**

### ***1) What is the reason for SRC/IRB Forms?***

Students participating in an Intel ISEF Affiliated Fair are to adhere to **ALL** requirements set forth by the Society for Science and the Public (SSP) to encourage safe methods of investigation, especially in working with human participants, vertebrate animals, potentially hazardous biological agents (PHBA), and potentially hazardous chemicals, devices, and activities.

Review the ***Intel International Rules and Guidelines***, including forms from the SSP's website: [www.societyforscience.org](http://www.societyforscience.org). The ***Intel International Rules and Guideline*** guides the teacher and student on the forms needed based on type of study. Click on "***Student Science***" on the top Menu, and then click on "***Intel ISEF***" on the next page. Go to "***Rules, Forms, and Resources***". Review the rules, forms, and resources.

### ***2) Which forms are to be used?***

The new paperless **Scienteer System** at [www.scienteer.com](http://www.scienteer.com) will guide the students by means of a questionnaire as to which forms will be needed. As the student answers the questionnaire for the applicable study (Human Participants, etc.), the applicable forms will be automatically filled out.

Teachers need to set-up a **School Account** before the student can start the **Student Account**. Once the student completes the questionnaire and has the necessary signatures and approvals, the forms will then be submitted to the regional fair from the Student Account on the Scienteer System. The teacher advances the students for regional SRC to review the forms.

### ***3) Can SRC Forms be filled on-line?***

Yes. All forms filled out by the student will be done on the **Scienteer System** at [www.scienteer.com](http://www.scienteer.com). Teachers need to set-up a **School Account** before the student can start a **Student Account**. Forms are submitted to the regional fair from the Student Account on the Scienteer System.

### ***4) Can we print our forms for our own purpose?***

Yes. Keep printed copies to have available if needed at the regional, state, or Intel ISEF. Forms can be saved on a memory stick. Remember, forms will be submitted to the regional fair by means of the paperless system, Scienteer through the Student Account at the [www.scienteer.com](http://www.scienteer.com)

Teachers be sure to have a file of the student's forms.

### ***5) How many members to a team project?***

ARASE allows only two members per team.

### ***6) Does each team member submit a set of SRC Forms?***

Only one set per team with the **exception** of Form (1B) is submitted. Each member needs Form (1B) since it requires a parent's signature.

**7) How many teams can a school send?**

A school can send three team projects, one per Fair I., Fair II., and Fair III. Refer to the section on *AJAS & ARSEF Disciplines* of this *Fall Guide*.

**8) Do team members have to be from the same school or grade?**

No. However, they need to be from the same entry division (Junior or Senior Division).

**9) When are SRC/IRB Forms Due to ARASE?**

SRC/IRB Forms for projects that need **prior** approval **before** experimentation are due on or before December 6 of a given year. Forms for projects that **do not** need prior SRC approval **before** experimentation are due January 19 of a given year.

**10) Can be bacteria projects be cultured at home?**

**NO!!!** Experimentation with potentially hazardous biological agents (PHBA), even with BSL-1 organisms, is prohibited in a home environment. Specimens are allowed to be collected at home or from the environment, but must be culture in a BSL-1 (school or research institution) or BSL-2 lab (research institution, etc.). The following can be worked with at home:

- Studies involving Bakers yeast and Brewers yeast except when involved in DNA studies
- Studies involving most protists and similar microorganisms
- Research using manure for composting or other non-culturing experiments and field productions

**Note:** All petri dishes **must be sealed** and labeled. They **cannot** be opened for observation if the study involves collecting samples of unknown bacteria from the environment.

**11) Can mold projects be conducted at home?**

Yes. However, the experiment **needs to be terminated** on the **first sign of mold growth**. The experiment **cannot** continue for more observations. Project **will be disqualified** at the fair if there is indication that the experiment continued.

**12) What is a Human Participant study?**

It is one in which an investigator is conducting a study to obtain (1) data or samples through intervention or interaction with individuals or (2) identifiable private information. Refer to *Intel ISEF Rules and Guidelines* for more details.

**13) When is a project involving humans not a Human Participant study?**

When the testing of the design of a student's product (invention, program, concept, etc.) is done **ONLY** by the student researcher and it does not pose a health or safety hazard and no other participants are involved, then it is not a Human Participant study. The data should refer to the product and personal data is not collected. Refer to *Intel ISEF Rules and Guidelines* for more details.

**14) What are SRC Clinics?**

SRC Clinics for teachers, students, and parents are held to help with forms or to answer questions. Location and times of the clinics are announced via e-mail to the schools on the contact list.

**15) Can students enter more than one project in AJAS and in the regional fair?**

Only one project can be submitted for each competition. It can be one project for AJAS and a different one for ARSEF or the same project for both competitions.

**16) Do students have to enter both the Alamo Junior Academy of Science and the Alamo Regional Science & Engineering Fair?**

No. Students can enter one or the other or both. By entering the Alamo Junior Academy of Science (AJAS), students will have a good practice before the regional fair. Also, the suggestions from the judges at AJAS will be beneficial in preparing for the regional fair.

**17) Can regional fair rules be stricter than those of the Intel ISEF?**

Yes. School, district, regional and state fairs can have stricter rules than those of Intel ISEF.

**18) What is a Research Plan and when is it written?**

It is a written plan stating the rationale of the study. Why is the study important? The plan also states the purpose (objective) or question of the study followed by a hypothesis that refers to the purpose or question of the study. The research plan is written in the **future tense** since it states **what will be done** in the procedure or the method. It is written **before** experimentation.

The research plan includes a section after the method entitled, “**Data Analysis**”. This section states **how the data will be analyzed**. Thus, this section, too, is written in the **future tense**. It also has a section stating the data and conclusion that **can be drawn** from the study (**future tense**).

The research plan also includes a **well-written** bibliography of at least five major resources. Internet resources need to state the author if given, the title of the article, website, and the date the article was posted on the website or retrieved from the website.

A website alone is **NOT** accepted!

Remember, the research plan is written before experimentation. Therefore, it should **not include** results, observations, nor a conclusion other than those that can be drawn!

**18) What is the Start Date of the project?**

The Start Date is when a student starts to collect data for the experiment.

**19) What is the End Date?**

The End Date is when the student is no longer collecting data from the experiment.

**20) What is an abstract and when is it written?**

It is a short summary written in the **PAST TENSE** after the completion of an experiment. It should have a short introduction with a question of the study or purpose, hypothesis, method used, results, and a conclusion based on the results and the hypothesis

## **Key Terms**

**Abstract** *It is a short summary written in the PAST TENSE after the completion of an experiment. It should have a short introduction with a question of the study, purpose, hypothesis, method used, results, and a conclusion based on the results and the hypothesis.*

**Adult Sponsor** *A teacher, parent, university professor, or scientist in whose lab the student is working; must have solid background in science and close contact with student.*

**Assent** *A term used to indicate willingness to participate in research study by individuals who are under the age of 18, but are old enough to understand the objective to the research and the risks involved and the activities that are expected of them as subjects in the research study. Parental permission is required. Assent and parental permission is needed for individuals over the age of 18 who are mentally challenged.*

**BSL –1** *BioSafety Level 1 Projects with biological agents, plants or animals that pose low risk to personnel and the environment (conducted in HS lab).*

**BSL–2** *BioSafety Level 2: Biological agents pose moderate risks to personnel and environment (cannot be conducted in high school).*

**BSL–3 and BSL–4** *Studies are prohibited for high school students since the biological agents usually cause serious disease and can be dangerous.*

**Control Substances** *Refers to alcohol, tobacco, prescribed drugs and chemicals that can be used to make illegal drugs. All studies using these substances must be supervised by a qualified scientist.*

**Display and Safety** *A group of qualified individuals responsible for checking compliance of exhibits with display and safety rules.*

**Designated Supervisor** *An adult properly trained in the specific procedures used in the investigation who will directly supervise the student.*

**IACUC** *An Institutional Animal Care and Use Committee that approves all animal studies at a regulated research institution prior to experimentation.*

**Informed Consent** *An agreement by an individual 18 years or older who is considered an adult and does not need parental permission. The participant agrees to the purpose of the research and understands the risks and benefits involved in the study.*

**IRB** *Institutional Review Board is a committee of specific composition at an affiliated fair, high school, or institution that review research plans and consent forms to evaluate potential physical or psychological risk of research involving human subjects.*

**MSDS** *Material Safety Data Sheets.*

**Non-regulated Research Site** *Include home, school, farm, ranch, in the field, etc. If the study involves behavioral observational or supplemental nutritional studies on animals and the research involves only non-invasive and non-intrusive methods that do not negatively affect an animal's health or well-being.*

**Qualified Scientist** *Individual with an earned doctoral degree in science or medicine or a master's degree with equivalent experience and/or expertise, and who has a working knowledge of the techniques to be used by the student.*

**Rational:** *A brief synopsis of the background that supports the research problem and explains why the research is scientifically important and if applicable explains any societal impact.*

**Regulated Research Institution** *Institutions registered as research centers and universities.*

**Research Plan** *This is a written plan or outline plan written in the FUTURE TENSE before start of an experiment. It should include the question, purpose, materials, and method, and how the data will be analyzed. A bibliography written in the proper format should be included. (No data, results, or conclusion are to be included since this is a plan of what will be done in the study.)*

**SRC** *Scientific Review Committee is a group of qualified individuals responsible for evaluation of student research, certifications, research plans, etc. for safety and proper experimental protocol*

