



65th Georgia Science and Engineering Fair

March 21-23, 2013



65th Georgia Science & Engineering Fair Exhibitor Application: Page 1 of 2

March 21 - 23, 2013

FOUR LETTER REGIONAL FAIR CODE _____

DIVISION (JR / SR) _____

Registration is **\$39 per student**. Electricity, if requested, is **\$100 per exhibit**.
Make check payable to: University of Georgia **and** in the "Memo" line write "GSEF".

PROJECT TITLE *Maximum of 65 characters (including spaces) for title - no exceptions!

PROJECT TYPE ☐ Individual ☐ Team

INDIVIDUAL/TEAM LEADER **US CITIZEN:** ☐ Yes ☐ No **GRADE:** _____ **AGE:** _____ **GENDER:** ☐ Male ☐ Female

Name: _____

Mailing Address: _____

City/State/Zip: _____ County: _____

Home Phone: _____ E-mail: _____

TEAM MEMBER 2 **US CITIZEN:** ☐ Yes ☐ No **GRADE:** _____ **AGE:** _____ **GENDER:** ☐ Male ☐ Female

Name: _____

Mailing Address: _____

City/State/Zip: _____ County: _____

Home Phone: _____ E-mail: _____

TEAM MEMBER 3 **US CITIZEN:** ☐ Yes ☐ No **GRADE:** _____ **AGE:** _____ **GENDER:** ☐ Male ☐ Female

Name: _____

Mailing Address: _____

City/State/Zip: _____ County: _____

Home Phone: _____ E-mail: _____

SCHOOL TEACHER INFORMATION *Do not list your mentor here!

School Teacher: _____

School Name: _____

Mailing Address: _____

School System: _____ County: _____

School Phone: _____

Teacher School E-mail: _____

Teacher Summer E-Mail: _____





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65th Georgia Science & Engineering Fair Exhibitor Application: Page 2 of 2

Check the category of your project below. *Category information is available on the GSEF website.

- | | | | |
|---|---|--|---|
| <input type="checkbox"/> Animal Sciences | <input type="checkbox"/> Computer Science | <input type="checkbox"/> Engineering: Materials & Bioengineering | <input type="checkbox"/> Medicine & Health Sciences |
| <input type="checkbox"/> Behavioral & Social Science | <input type="checkbox"/> Earth & Planetary Science | <input type="checkbox"/> Environmental Management | <input type="checkbox"/> Microbiology |
| <input type="checkbox"/> Biochemistry | <input type="checkbox"/> Energy & Transportation | <input type="checkbox"/> Environmental Science | <input type="checkbox"/> Physics & Astronomy |
| <input type="checkbox"/> Cellular & Molecular Biology | <input type="checkbox"/> Engineering: Electrical & Mechanical | <input type="checkbox"/> Mathematical Sciences | <input type="checkbox"/> Plant Sciences |
| <input type="checkbox"/> Chemistry | | | |

Indicate if either of the following applies to your project:

- ☐ Yes ☐ No **ELECTRICITY REQUESTED** - If yes, please submit the *Electricity Request* form and \$100 with your application.
- ☐ Yes ☐ No **PROJECT CONTINUATION** - Is this project a continuation of your previous year's work? If yes, please submit the *Continuation Project* form (Form 7) with your application.

Indicate whether your research involves any of the following. If so, please include the additional required forms with your application.

- | | | |
|---|----------------------------------|--|
| <input type="checkbox"/> Human Subjects | <input type="checkbox"/> rDNA | <input type="checkbox"/> Microorganisms |
| <input type="checkbox"/> Vertebrate Animals | <input type="checkbox"/> Tissues | <input type="checkbox"/> Potentially Hazardous Biological Agents |

Read the following statement and sign your acceptance. Applications without all necessary signatures will NOT be accepted.

*I (We) plan to enter the project described here in the 65th Georgia Science & Engineering Fair to be held **March 21 - 23, 2013**. I (We) am/are familiar with and will abide by all rules. My (Our) parents, teacher, and I (we) agree to abide by the decisions made by the GSEF Judges and Staff, and we agree not to contest or complain about these decisions. We realize that subjectivity will always be a minor part of competitions. I (We) understand that unsportsmanlike conduct may result in disqualification. I (We) agree to be present during judging and the Awards Ceremony and to keep my (our) exhibit on display for the duration of the fair. I (We) will NOT try to remove my (our) exhibit before the scheduled time (AFTER the Awards Ceremony on March 23, 2013).*

- | | |
|------------------------------------|--------------------------|
| 1. _____
Individual/Team Leader | _____
Parent/Guardian |
| 2. _____
Team Member 2 | _____
Parent/Guardian |
| 3. _____
Team Member 3 | _____
Parent/Guardian |

TO BE COMPLETED BY REGIONAL FAIR DIRECTOR

I certify that the judges for my Regional Science Fair have selected this project for:
This student has already won a trip to the 2013 ISEF directly from my ISEF Affiliated Regional Fair

- | | |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> 1st Place | <input type="checkbox"/> 2nd Place |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |

RSEF Director / Co-Director Name

RSEF Director / Co-Director Signature



OFFICIAL ABSTRACT and CERTIFICATION

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

- | | |
|---------------------------------|--------------------------|
| Animal Sciences | <input type="checkbox"/> |
| Behavioral and Social Science | <input type="checkbox"/> |
| Biochemistry | <input type="checkbox"/> |
| Cellular & Molecular Biology | <input type="checkbox"/> |
| Chemistry | <input type="checkbox"/> |
| Computer Science | <input type="checkbox"/> |
| Earth Science | <input type="checkbox"/> |
| Eng: Electrical & Mechanical | <input type="checkbox"/> |
| Eng: Materials & Bioengineering | <input type="checkbox"/> |
| Energy & Transportation | <input type="checkbox"/> |
| Environmental Management | <input type="checkbox"/> |
| Environmental Sciences | <input type="checkbox"/> |
| Mathematical Sciences | <input type="checkbox"/> |
| Medicine and Health | <input type="checkbox"/> |
| Microbiology | <input type="checkbox"/> |
| Plant Sciences | <input type="checkbox"/> |
| Physics and Astronomy | <input type="checkbox"/> |

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

- | | |
|---|---|
| <input type="checkbox"/> human subjects | <input type="checkbox"/> potentially hazardous biological agents |
| <input type="checkbox"/> vertebrate animals | <input type="checkbox"/> microorganisms <input type="checkbox"/> rDNA <input type="checkbox"/> tissue |

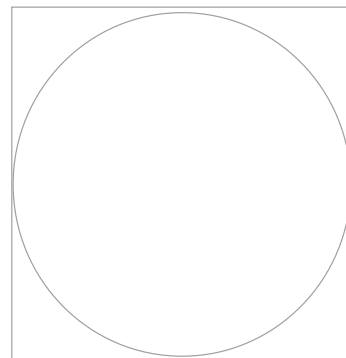
2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only ☐ Yes ☐ No

3. I/we worked or used equipment in a regulated research institution or industrial setting: ☐ Yes ☐ No

4. This project is a continuation of previous research. ☐ Yes ☐ No

5. My display board includes non-published photographs/visual depictions of humans (other than myself): ☐ Yes ☐ No

6. I/we hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work. ☐ Yes ☐ No



Checklist for Adult Sponsor (1)

This completed form is required for ALL projects.

To be completed by the Adult Sponsor in collaboration with the student researcher(s):

Student's Name(s): _____

Project Title: _____

- 1) ☐ I have reviewed the Intel ISEF Rules and Guidelines.
- 2) ☐ I have reviewed the student's completed Student Checklist (1A) and Research Plan.
- 3) ☐ I have worked with the student and we have discussed the possible risks involved in the project.
- 4) ☐ The project involves one or more of the following and requires prior approval by an SRC, IRB, IACUC or IBC:

<input type="checkbox"/> Humans	<input type="checkbox"/> Potentially Hazardous Biological Agents
<input type="checkbox"/> Vertebrate Animals	<input type="checkbox"/> Microorganisms <input type="checkbox"/> rDNA <input type="checkbox"/> Tissues
- 5) ☐ Items to be completed for **ALL PROJECTS**

<input type="checkbox"/> Adult Sponsor Checklist (1)	<input type="checkbox"/> Research Plan
<input type="checkbox"/> Student Checklist (1A)	<input type="checkbox"/> Approval Form (1B)
<input type="checkbox"/> Regulated Research Institutional/Industrial Setting Form (1C) (when applicable after completed experiment)	
<input type="checkbox"/> Continuation Form (7) (when applicable)	
- 6) **Additional forms required if the project includes the use of one or more of the following** (check all that apply):
☐ **Humans** (Requires prior approval by an Institutional Review Board (IRB); see full text of the rules.)

<input type="checkbox"/> Human Participants Form (4) or appropriate Institutional IRB documentation
<input type="checkbox"/> Sample of Informed Consent Form (when applicable and/or required by the IRB)
<input type="checkbox"/> Qualified Scientist Form (2) (when applicable and/or required by the IRB)

☐ **Vertebrate Animals** (Requires prior approval, see full text of the rules.)

<input type="checkbox"/> Vertebrate Animal Form (5A)—for projects conducted in a school/home/field research site (SRC prior approval required.)
<input type="checkbox"/> Vertebrate Animal Form (5B)—for projects conducted at a Regulated Research Institution. (Institutional Animal Care and Use Committee (IACUC) approval required prior experimentation.)
<input type="checkbox"/> Qualified Scientist Form (2) (Required for all vertebrate animal projects at a regulated research site or when applicable)

☐ **Potentially Hazardous Biological Agents** (Requires prior approval by SRC, IACUC or Institutional Biosafety Committee (IBC), see full text of the rules.)

<input type="checkbox"/> Potentially Hazardous Biological Agents Risk Assessment Form (6A)
<input type="checkbox"/> Human and Vertebrate Animal Tissue Form (6B)—to be completed in addition to Form 6A when project involves the use of fresh or frozen tissue, primary cell cultures, blood, blood products and body fluids.
<input type="checkbox"/> Qualified Scientist Form (2) (when applicable)
<input type="checkbox"/> Risk Assessment Form (3) required for projects involving protists, archae and similar microorganisms, for projects using manure for composting, fuel production or other non-culturing experiments, for projects using color change coliform water test kits and for projects involving decomposing vertebrate organisms

☐ **Hazardous Chemicals, Activities and Devices** (No prior approval required, see full text of the rules.)

<input type="checkbox"/> Risk Assessment Form (3)
<input type="checkbox"/> Qualified Scientist Form (2) (required for projects involving DEA-controlled substances or when applicable)

Adult Sponsor's Printed Name

Signature

Date of Review

Phone

Email

Student Checklist (1A)

This form is required for ALL projects.

- 1) a. Student/Team Leader: _____ Grade: _____
Email: _____ Phone: _____
b. Team Member: _____ c. Team Member: _____
- 2) Title of Project: _____

- 3) School: _____ School Phone: _____
School Address: _____

- 4) Adult Sponsor: _____ Phone/Email: _____
- 5) Is this a continuation from a previous year? ☐ Yes ☐ No
If Yes:
a) Attach the previous year's ☐ **Abstract and** ☐ **Research Plan**
b) Explain how this project is new and different from previous years on ☐ **Continuation Form (7)**
- 6) **This year's** laboratory experiment/data collection: (must be stated (mm/dd/yy))
Start Date: _____ (mm/dd/yy) End Date: _____ (mm/dd/yy)
- 7) Where will you conduct your experimentation? (check all that apply)
☐ Research Institution ☐ School ☐ Field ☐ Home ☐ Other: _____
- 8) List name and address of all non-school work site(s):
Name: _____
Address: _____

Phone: _____
- 9) **Complete a Research Plan following the Research Plan instructions and attach to this form.**
- 10) **An abstract is required for all projects after experimentation.**

Research Plan

A. Problem

When using green food coloring as the substance for paper chromatography which solvent will have the highest Rf value: rubbing alcohol (isopropyl), turpentine, nail polish remover (acetone), water, rubbing alcohol (ethyl), vegetable oil, or vinegar?

B. Hypothesis

If seven different solvents are used in a chromatography experiment using green food coloring, then water will best display the different colors of dye because it has a high surface tension which allows it to hold up substances heavier and denser than itself.

C. Procedure

1. Gather all materials.
2. Use pencil to lightly label which solvent will be used on each paper strip.
3. Draw light line 2cm from edge of each strip of paper.
4. Squirt green food coloring onto a plate; dip toothpick into it & spot on chromatography strip (in center of origin line)
5. Take seven wide mouth jars and label each one. Then pour 158ml of each solvent into the right jar.
6. Tape chromatography strip to a pencil and lay pencil across the jar so that the chromatography paper strip barely touches the solvent.
7. Let the solvent rise up the strip for 10 minutes
8. When the 10 minutes are up take the strip out of the solvent and draw a line where the solvent ends
9. Allow the strip to dry then measure the Rf value
10. Repeat 5 times for each solvent
11. Using all data collected, calculate an average Rf value for each solvent

Data Analysis

To analyze the data we took the strips and measured the Rf value which is the distance traveled by the substance over the distance traveled by the solvent. Then we calculated an average Rf value for each of the solvents.

D. Bibliography

<http://www.chemguide.co.uk/analysis/chromatography/paper.html>
<http://www.marzkreations.com/chemistry/chromatography/Dyes/RFValues.html>
<http://buzzle.com/article/paperchromatography.html>
<http://faculty.clinton.suny.edu/faculty/michail.gregory/files/boi100/boilaboratory/photosynthesis/photosynthesis.html>
<http://www.chemicaland21.com/industrialchem/solalc/ACETONE.html>

Approval Form (1B)

A completed form is required for each student, including all team members.

1) To Be Completed by Student and Parent

a) Student Acknowledgment:

- I understand the risks and possible dangers to me of the proposed research plan.
- I have read the Intel ISEF Rules and Guidelines and will adhere to all International Rules when conducting this research.
- I have read and will abide by the following Ethics statement

Scientific fraud and misconduct are not condoned at any level of research or competition. Such practices include plagiarism, forgery, use or presentation of other researcher's work as one's own, and fabrication of data. Fraudulent projects will fail to qualify for competition in affiliated fairs and the Intel ISEF.

Student's Printed Name

Signature

Date Acknowledged (mm/dd/yy)
(Must be prior to experimentation.)

b) Parent/Guardian Approval: I have read and understand the risks and possible dangers involved in the **Research Plan**. I consent to my child participating in this research.

Parent/Guardian's Printed Name

Signature

Date Acknowledged (mm/dd/yy)
(Must be prior to experimentation.)

2) To be completed by the local or affiliated Fair SRC

(Required for projects requiring prior SRC/IRB APPROVAL. Sign 2a or 2b as appropriate.)

a) Required for projects that need prior SRC/IRB approval BEFORE experimentation (humans, vertebrates or potentially hazardous biological agents)

The SRC/IRB has carefully studied this project's **Research Plan** and all the required forms are included. My signature indicates approval of the **Research Plan** before the student begins experimentation.

SRC/IRB Chair's Printed Name

Signature

Date of Approval (mm/dd/yy)
(Must be prior to experimentation.)

OR

b) Required for research conducted at all Regulated Research Institutions with no prior fair SRC/IRB approval.

This project was conducted at a regulated research institution (**not home or high school, etc.**), was reviewed and approved by the proper institutional board before experimentation and complies with the Intel ISEF Rules. **Attach (1C) and required institutional approvals (e.g. IACUC, IRB)**

SRC Chair's Printed Name

Signature

Date of Approval (mm/dd/yy)

3) Final Intel ISEF Affiliated Fair SRC Approval

(Required for ALL Projects)

SRC Approval After Experimentation and Before Competition at Regional/State/National Fair

I certify that this project adheres to the approved **Research Plan** and complies with all Intel ISEF Rules.

Regional SRC Chair's Printed Name

Signature

Date of Approval

State/National SRC Chair's Printed Name
(where applicable)

Signature

Date of Approval

Approval Form (1B)

A completed form is required for each student, including all team members.

1) To Be Completed by Student and Parent

a) Student Acknowledgment:

- I understand the risks and possible dangers to me of the proposed research plan.
- I have read the Intel ISEF Rules and Guidelines and will adhere to all International Rules when conducting this research.
- I have read and will abide by the following Ethics statement

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Student's Printed Name

Signature

Date Acknowledged (mm/dd/yy)
(Must be prior to experimentation.)

b) Parent/Guardian Approval: I have read and understand the risks and possible dangers involved in the **Research Plan**. I consent to my child participating in this research.

Parent/Guardian's Printed Name

Signature

Date Acknowledged (mm/dd/yy)
(Must be prior to experimentation.)

2) To be completed by the local or affiliated Fair SRC

(Required for projects requiring prior SRC/IRB APPROVAL. Sign 2a or 2b as appropriate.)

a) Required for projects that need prior SRC/IRB approval BEFORE experimentation
(humans, vertebrates or potentially hazardous biological agents)

The SRC/IRB has carefully studied this project's **Research Plan** and all the required forms are included. My signature indicates approval of the **Research Plan** before the student begins experimentation.

SRC/IRB Chair's Printed Name

Signature

Date of Approval (mm/dd/yy)
(Must be prior to experimentation.)

OR

b) Required for research conducted at all Regulated Research Institutions with no prior fair SRC/IRB approval.

This project was conducted at a regulated research institution (**not home or high school, etc.**), was reviewed and approved by the proper institutional board before experimentation and complies with the Intel ISEF Rules. **Attach (1C) and required institutional approvals (e.g. IACUC, IRB)**

SRC Chair's Printed Name

Signature

Date of Approval (mm/dd/yy)

3) Final Intel ISEF Affiliated Fair SRC Approval

(Required for ALL Projects)

SRC Approval After Experimentation and Before Competition at Regional/State/National Fair

I certify that this project adheres to the approved **Research Plan** and complies with all Intel ISEF Rules.

Regional SRC Chair's Printed Name

Signature

Date of Approval

State/National SRC Chair's Printed Name
(where applicable)

Signature

Date of Approval