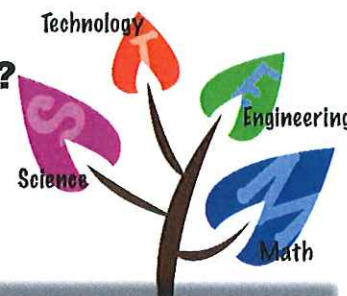


# Do you enjoy Science Technology Engineering & Math?



## The Patcong Creek Foundation Presents Somers Point School's 5th annual **SCIENCE FAIR STEM EXPO!!**

Students in grades 4 – 8 are invited to participate in a **SCIENCE FAIR STEM EXPO**. The Expo will allow students to study a science or engineering topic. Students will develop a question they wish to answer and present their findings at the SCIENCE FAIR STEM Expo.

Students can enter as individuals or group with up to 3 members.

- Attached you will find resources to help you develop a topic and research question.
- There will be after school assistance to help you develop your project if needed.

### Important Dates...

#### September 26th

Kick-off assemblies Distribution of approval forms

#### October 5th

Approval forms due. Submit at:

[https://docs.google.com/forms/d/e/1FAIpQLScphz0LrCz6j0rRuA5RRdTFxZynLKHqWQVOYt\\_gPwA6Jk11Mg/viewform?c=0&w=1](https://docs.google.com/forms/d/e/1FAIpQLScphz0LrCz6j0rRuA5RRdTFxZynLKHqWQVOYt_gPwA6Jk11Mg/viewform?c=0&w=1)

This form is also available on [sptsd.org](https://sptsd.org)

#### January 18th

Lab report / Research paper due

#### Feb 12th

SCIENCE FAIR STEM Expo – Projects presented

## YOU CAN CHOOSE TO BE INVOLVED IN...

### The Research Division

In this division, students will choose a topic and develop a research question to answer. Through research, from at least five sources, students will answer the question in a written paper. Students will be judged on the written components, tri-fold board display, and a 2 minute oral presentation.

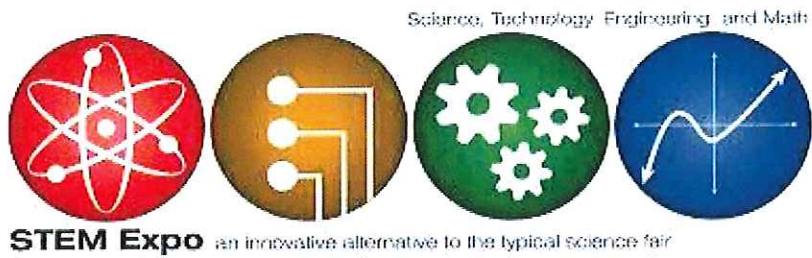
### The Investigative Division

In this division, students will choose a topic and develop a research question and hypothesis. Students will then design and conduct an experiment following the scientific method to test their hypothesis. Students will be judged on the written components, tri-fold board display, and a 2 minute oral presentation.

### STUDENTS MUST:

1. Obtain approval **BEFORE** beginning any project.
2. Have adult supervision when using equipment, sharp objects or chemicals (including household chemicals).
3. Observe proper safety protocol at all times.





September 2018

Dear Parents/Guardians,

We are excited to announce Somers Point School's fifth annual SCIENCE FAIR STEM Expo to take place at the Jordan Road School on February 12<sup>th</sup>, 2018. STEM is the integration of Science, Technology, Engineering, and Mathematics. The **science fair** is a **fair** where students present their **science** project results in the form of a report, display board, and models that students **have** created. It is so important to motivate students with **science**. Students in grades fourth through eighth are invited to participate in the SCIENCE FAIR STEM Expo. This Expo draws upon student's interests and the skills that have been taught and emphasized in your child's education. Students may choose to enter in either the research or investigative division.

Your help may be needed throughout your child's project. Please go over the information that was provided and discuss it with your child. We hope that, with your enthusiastic encouragement, your student will participate in the SCIENCE FAIR STEM Expo. This will be an exciting experience for your child!

Sincerely,

Kimberly Tucker

Supervisor of Curriculum



## **SCIENCE FAIR STEM EXPO Idea Websites**

[www.sciencebuddies.org](http://www.sciencebuddies.org)

[www.sciencefairadventure.com](http://www.sciencefairadventure.com)

Similar to Science Buddies. Provides a searchable list of science fair projects with detailed help for each project. Provides time estimate for duration of set up and how long for results.

[www.all-science-fair-projects.com](http://www.all-science-fair-projects.com)

Similar to Science Buddies. Provides a searchable list of science fair projects with detailed help for each project. Rates difficulty of projects by school level (elementary, middle, high school).

[www.sciencebob.com/sciencefair/ideas.php](http://www.sciencebob.com/sciencefair/ideas.php)

Site has a list of ideas, but does not have supporting information on how to conduct the study. The site does have a research link with information on many different science topics.

[www.sciencemadesimple.com](http://www.sciencemadesimple.com)

This site does not have specific science fair ideas but does have a lot of information on how to do a science fair project.

<https://patcongcreekfoundation.org/index.html>

Check here for resources about local ecology!



## SAMPLE DISPLAY

<b>TESTABLE QUESTION</b>	<b>TITLE</b>	<b>DATA/RESULTS</b> <ul style="list-style-type: none"><li>• GRAPHS</li><li>• DATA TABLES</li><li>• PICTURES</li></ul>
<b>ABSTRACT</b>	<b>MATERIALS USED</b>	
	<b>PROCEDURE</b>	<b>DATA ANALYSIS</b>
		<b>CONCLUSION</b>
<b>HYPOTHESIS</b>		

\*All above items **must be included** on your display board. However, they **DO NOT** have to be organized in that order. This is a project *be creative!!!!*

\*\*Awards will be given for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>, place projects for each grade level. Only projects approved and submitted on time will be judged and eligible for awards.

## Science Fair Project Abstract

An **abstract** is an abbreviated version of your science fair project final report. For most science fairs it is limited to a maximum of 250 words (check the rules for your competition). The science fair project abstract appears at the beginning of the report as well as on your display board.

Almost all scientists and engineers agree that an abstract should have the following five pieces:

- **Introduction.** This is where you describe the purpose for doing your science fair project or invention. Why should anyone care about the work you did? You have to tell them why. Did you explain something that should cause people to change the way they go about their daily business? If you made an invention or developed a new procedure how is it better, faster, or cheaper than what is already out there? **Motivate** the reader to finish the abstract and read the entire paper or display board.
- **Problem Statement.** Identify the problem you solved or the hypothesis you investigated.
- **Procedures.** What was your approach for investigating the problem? Don't go into detail about materials unless they were critical to your success. Do describe the most important variables if you have room.
- **Results.** What answer did you obtain? Be specific and use numbers to describe your results. Do not use vague terms like "most" or "some."
- **Conclusions.** State what your science fair project or invention contributes to the area you worked in. Did you meet your objectives? For an engineering project state whether you met your design criteria.

### Things to Avoid

- Avoid jargon or any technical terms that most readers won't understand.
- Avoid abbreviations or acronyms that are not commonly understood unless you describe what they mean.
- Abstracts do not have a bibliography or citations.
- Abstracts do not contain tables or graphs.
- For most science fairs, the abstract must focus on the previous 12 months' research (or less), and give only minimal reference to any earlier work.
- If you are working with a scientist or mentor, your abstract should only include procedures done by you, and you should not put acknowledgements to anyone in your abstract.

### Why Is an Abstract Important?

Your science fair project abstract lets people quickly determine if they want to read the entire report. Consequently, at least ten times as many people will read your abstract as any other part of your work. It's like an advertisement for what you've done. If you want judges and the public to be excited about your science fair project, then write an exciting, engaging abstract!

Since an abstract is so short, each section is usually only one or two sentences long. Consequently, every word is important to conveying your message. If a word is boring or vague, refer to a thesaurus and find a better one! If a word is not adding something important, cut it! But, even with the abstract's brief length, don't be afraid to reinforce a key point by stating it in more than one way or referring to it in more than one section.

### How to Meet the Word Limit

Most authors agree that it is harder to write a short description of something than a long one. Here's a tip: for your first draft, don't be overly concerned about the length. Just make sure you include all the key information. Then take your draft and start crossing out words, phrases, and sentences that are less important than others. Look for places where you can combine sentences in ways that shorten the total length. Put it aside for a while, then come back and re-read your draft. With a fresh eye, you'll probably find new places to cut. Before you know it you will have a tightly written abstract.

What Makes for a Good Science Fair Project Abstract?	For a Good Science Fair Project Abstract, You Should Answer "Yes" to Every Question
Does your science fair project abstract include: <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Problem Statement</li> <li>• Procedures</li> <li>• Results</li> <li>• Conclusions</li> </ul>	Yes / No
Did you review the list of "Things to Avoid" in a science fair project abstract?	Yes / No
Did you write the abstract so that the reader is motivated to learn more about your science fair project?	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/Project Summary.
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"/> Vertebrate Animals	Potentially Hazardous Biological Agents <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"/> Student Checklist (1A) <input type="checkbox"/> Regulated Research Institutional/Industrial Setting Form (1C) (when applicable; after completed experiment) <input type="checkbox"/> Continuation/Research Progression Form (7) (when applicable)	<input type="checkbox"/> Research Plan/Project Summary <input type="checkbox"/> Approval Form (1B)
--	---

**Additional forms required if the project includes the use of one or more of the following (check all that apply):**

- ☐ **Humans**, including student designed inventions/prototypes. (Requires prior approval by an Institutional Review Board (IRB); see full text of the rules.)
  - ☐ Human Participants Form (4) or appropriate Institutional IRB documentation
  - ☐ Sample of Informed Consent Form (when applicable and/or required by the IRB)
  - ☐ Qualified Scientist Form (2) (when applicable and/or required by the IRB)
- ☐ **Vertebrate Animals** (Requires prior approval, see full text of the rules.)
  - ☐ Vertebrate Animal Form (5A) - for projects conducted in a school/home/field research site (SRC prior approval required.)
  - ☐ Vertebrate Animal Form (5B) - for projects conducted at a Regulated Research Institution. (Institutional Animal Care and Use Committee (IACUC) approval required prior experimentation.)
  - ☐ 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.)
  - ☐ Potentially Hazardous Biological Agents Risk Assessment Form (6A)
  - ☐ 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.
  - ☐ Qualified Scientist Form (2) (when applicable)
  - ☐ The following are exempt from prior review but require a Risk Assessment Form 3: projects involving protists, archae and similar microorganisms, for projects using manure for composting, fuel production or other non-culturing experiments, projects using color change coliform water test kits, microbial fuel cells, and projects involving decomposing vertebrate organisms.
- ☐ **Hazardous Chemicals, Activities and Devices** (No SRC prior approval required, see full text of the rules.)
  - ☐ Risk Assessment Form (3) (have up with potentially hazardous biological agents.)
  - ☐ 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. Does this project need SRC/IRB/IACUC or other pre-approval? ☐ Yes ☐ No Tentative start date: \_\_\_\_\_
6. Is this a continuation/progression from a previous year? ☐ Yes ☐ No  
 If Yes:  
 a. Attach the previous year's ☐ Abstract **and** ☐ Research Plan/Project Summary  
 b. Explain how this project is new and different from previous years on ☐ Continuation/Research Progression Form (7)
7. This year's laboratory experiment/data collection:  
 \_\_\_\_\_  
 Actual Start Date: (mm/dd/yy) \_\_\_\_\_ End Date: (mm/dd/yy) \_\_\_\_\_
8. Where will you conduct your experimentation? (check all that apply)  
☐ Research Institution ☐ School ☐ Field ☐ Home ☐ Other: \_\_\_\_\_
9. List name and address of all non-home and non-school work site(s):  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 Phone/ email \_\_\_\_\_
10. Complete a Research Plan/Project Summary following the Research Plan/Project Summary instructions and attach to this form.
11. An abstract is required for all projects after experimentation.



## Research Plan/Project Summary Instructions

**A complete Research Plan/Project Summary is required for ALL projects and must accompany Student Checklist (1A).**

1. All projects must have a Research Plan/Project Summary
  - a. Written prior to experimentation following the instructions below to detail the rationale, research question(s), methodology, and risk assessment of the proposed research.
  - b. If changes are made during the research, such changes can be added to the original research plan as an addendum, recognizing that some changes may require returning to the IRB or SRC for appropriate review and approvals. If no additional approvals are required, this addendum serves as a project summary to explain research that was conducted.
  - c. If no changes are made from the original research plan, no project summary is required.
2. Some studies, such as an engineering design or mathematics projects, will be less detailed in the initial project plan and will change through the course of research. If such changes occur, a project summary that explains what was done is required and can be appended to the original research plan.
3. The Research Plan/Project Summary should include the following:
  - a. **RATIONALE:** Include a brief synopsis of the background that supports your research problem and explain why this research is important and if applicable, explain any societal impact of your research.
  - b. **RESEARCH QUESTION(S), HYPOTHESIS(ES), ENGINEERING GOAL(S), EXPECTED OUTCOMES:** How is this based on the rationale described above?
  - c. Describe the following in detail:
    - **Procedures:** Detail all procedures and experimental design including methods for data collection. Describe only your project. Do not include work done by mentor or others.
    - **Risk and Safety:** Identify any potential risks and safety precautions needed.
    - **Data Analysis:** Describe the procedures you will use to analyze the data/results.
  - d. **BIBLIOGRAPHY:** List major references (e.g. science journal articles, books, internet sites) from your literature review. If you plan to use vertebrate animals, one of these references must be an animal care reference.

Items 1–4 below are subject-specific guidelines for additional items to be included in your research plan/project summary as applicable.

1. **Human participants research:**
  - a. **Participants:** Describe age range, gender, racial/ethnic composition of participants. Identify vulnerable populations (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
  - b. **Recruitment:** Where will you find your participants? How will they be invited to participate?
  - c. **Methods:** What will participants be asked to do? Will you use any surveys, questionnaires or tests? What is the frequency and length of time involved for each subject?
  - d. **Risk Assessment:** What are the risks or potential discomforts (physical, psychological, time involved, social, legal, etc.) to participants? How will you minimize risks? List any benefits to society or participants.
  - e. **Protection of Privacy:** Will identifiable information (e.g., names, telephone numbers, birth dates, email addresses) be collected? Will data be confidential/anonymous? If anonymous, describe how the data will be collected. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will data be stored? Who will have access to the data? What will you do with the data after the study?
  - f. **Informed Consent Process:** Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.
2. **Vertebrate animal research:**
  - a. Discuss potential ALTERNATIVES to vertebrate animal use and present justification for use of vertebrates.
  - b. Explain potential impact or contribution of this research.
  - c. Detail all procedures to be used, including methods used to minimize potential discomfort, distress, pain and injury to the animals and detailed chemical concentrations and drug dosages.
  - d. Detail animal numbers, species, strain, sex, age, source, etc., include justification of the numbers planned.
  - e. Describe housing and oversight of daily care
  - f. Discuss disposition of the animals at the termination of the study.
3. **Potentially hazardous biological agents research:**
  - a. Give source of the organism and describe BSL assessment process and BSL determination.
  - b. Detail safety precautions and discuss methods of disposal.
4. **Hazardous chemicals, activities & devices:**
  - Describe Risk Assessment process, supervision, safety precautions and methods of disposal.

## 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 but are not limited to 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.)
<p><b>b. Parent/Guardian Approval:</b> I have read and understand the risks and possible dangers involved in the <b>Research Plan/Project Summary</b>. I consent to my child participating in this research.</p>		
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/Project Summary** and all the required forms are included. My signature indicates approval of the **Research Plan/Project Summary** 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 any 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/Project Summary** 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



## Regulated Research Institutional/Industrial Setting Form (1C)

This form must be completed AFTER experimentation by the adult supervising the student research conducted in a regulated research institution, industrial setting or any work site other than home, school or field.

Student's Name(s) \_\_\_\_\_

Title of Project \_\_\_\_\_

### To be completed by the Supervising Adult in the Setting (NOT the Student(s)) after experimentation:

(Responses must remain on the form as it is required to be displayed at student's project booth.)

The student(s) conducted research at my work site:

1. Did you or your proxy (e.g. graduate student, postdoc, employee) mentor or provide substantial guidance to the student researcher? ☐ Yes ☐ No
  - a. If no, describe your and/or your institution's role with the student researcher and his/her project (e.g. supervised use of equipment on site without ongoing mentorship and sign below.
  - b. If yes, complete questions 2–5.
2. Is the student's research project a subset of your ongoing research or work? ☐ Yes ☐ No

Use questions 3, 4 and 5 to detail how the student's project was similar and/or different from ongoing research or work at your site.
3. Describe the independence and creativity with which the student:
  - a. developed the hypotheses or engineering goals for her/her research project
  - b. designed the methodology for his/her research project
  - c. analyzed and interpreted data
4. Detail the student's role in conducting the research (e.g. data collection, specific procedures performed). Differentiate what the student observed and what the student actually did.
5. Did the student(s) work on the project as part of a group? ☐ Yes ☐ No

If yes, how many individuals were in the group and who were they (e.g. high school students, graduate students, faculty, professional researchers)?

I attest that the student has conducted the work as indicated above and that any required review and approval by institutional regulatory board (IRB/IACUC/IBC) has been obtained. Copies are attached if applicable.

I further acknowledge that the student will be presenting this work publicly in competition and I have communicated with the student research regarding any requirements for my review and/or restrictions of what is publicized.

Supervising Adult's Printed Name \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Institution \_\_\_\_\_

Date Signed (must be after experimentation) \_\_\_\_\_

Address \_\_\_\_\_

Email/Phone \_\_\_\_\_



## Human Participants Form (4)

Required for all research involving human participants not at a Regulated Research Institution. If at a Regulated Research Institution, use institutional approval forms for documentation of prior review and approval.  
(IRB approval required before experimentation.)

Student's Name(s)

Title of Project

Adult Sponsor

Phone/Email

**Must be completed by Student Researcher(s) in collaboration with the Adult Sponsor/Designated Supervisor/Qualified Scientist:**

1. ☐ I have submitted my Research Plan/Project Summary which addresses ALL areas indicated in the Human Participants Section of the Research Plan/Project Summary Instructions.
2. ☐ I have attached any surveys or questionnaires I will be using in my project or other documents provided to human participants.  
☐ Any published instrument(s) used was /were legally obtained.
3. ☐ I have attached an informed consent that I would use if required by the IRB.
4. ☐ Yes ☐ No Are you working with a Qualified Scientist? If yes, attach the Qualified Scientist Form 2.

## BELOW - IRB USE ONLY

**Must be completed by Institutional Review Board (IRB) after review of the research plan. All questions must be answered for the approval to be valid. (If not approved, return paperwork to the student with instructions for modifications.)**

- ☐ Approved with Full Committee Review (3 signatures required) and the following conditions: (All 6 must be answered)
1. Risk Level (check one): ☐ Minimal Risk ☐ More than Minimal Risk
  2. Qualified Scientist (QS) Required: ☐ Yes ☐ No
  3. Designated Supervisor (DS) Required: ☐ Yes ☐ No
  4. Written Minor Assent required for minor participants:  
☐ Yes ☐ No ☐ Not applicable (No minors in this study)
  5. Written Parental Permission required for minor participants:  
☐ Yes ☐ No ☐ Not applicable (No minors in this study)
  6. Written Informed Consent required for participants 18 years or older:  
☐ Yes ☐ No ☐ Not applicable (No participants 18 yrs or older in this study)
- ☐ Approved with Expedited Review (1 signature required). Study involves either of the following:
- ☐ Human participants will only provide feedback on project design/student-designed invention or prototype, etc., no personal data will be collected and there are no health or safety hazards.
- ☐ Student is the only subject of the research and no more than minimal risk is involved.

**IRB SIGNATURES (All 3 signatures required unless expedited review checked above)** None of these individuals may be the adult sponsor, designated supervisor, qualified scientist or related to (e.g., mother, father of) the student (conflict of interest).

**I attest that I have reviewed the student's project, that the checkboxes above have been completed to indicate the IRB determination and that I agree with the decisions above.**

**Medical or Mental Health Professional (a psychologist, medical doctor, licensed social worker, licensed clinical professional counselor, physician's assistant, doctor of pharmacy, or registered nurse) with expertise related to this project.**

Printed Name	Degree/Professional License
Signature	Date of Approval (Must be prior to experimentation.)
Educator	
Printed Name	Degree
Signature	Date of Approval (Must be prior to experimentation.)
School Administrator	
Printed Name	Degree/Professional License
Signature	Date of Approval (Must be prior to experimentation.)