

Timeline

Event	Due Date	<input checked="" type="checkbox"/>
Welcome Packet Form and 3 potential ideas for science fair	August 21 st	
Test on Science Fair Packet	August 28 th	
Research Question and Hypothesis	September 4 th	
Bibliography, Research Binder Printed out sources and highlighted.	September 11 th	
Procedures and How will you analyze the data	September 18 th	
<u>Research Plan:</u>	September 25 th	
<u>Required Forms:</u>	October 2 nd	
<u>STEM ART!</u>	Oct 3 rd – 16 th	
Start your Research Journal	October 23 rd	
Start turning your Research Plan into a Paper Discussion Section due	October 30 th	
Submit any questions regarding the Conclusion Section	November 6 th	
Ask about how to write an Abstract Research Journal Check	November 13 th	
Abstract is Due Final questions about completing the Science Fair Project	November 27 th	
Writing Studio Ticket Due	November 4 th	
Class Presentations	December 10 th	
<u>OSS's 9th Annual Science Fair</u> Lynx Campus	January 10 th	
<u>Dr. Nelson Ying Orange County Science Expo (Regionals)</u> Central Florida Fair Grounds	February 20 th – 21 st	
<u>Ying Expo Award Ceremony</u> Lake Highland Prep.	TBA	
<u>64th State Science and Engineering Fair of Florida STEM Competition (States)</u> The Lakeland Center, Lakeland	March 26 th – 28 th	
<u>Dr. Nelson Ying Competition</u> The Orlando Science Center, Orlando	TBA	
<u>ISEF National Science Fair (Nationals)</u> Los Angeles California	May 12 th – 17 th	

Introduction

OSS's science fair is an excellent opportunity for our students to explore their favorite topic in science. It provides an avenue for student research, allow students to be actively engaged in their own learning, and to use their own creativity to solve a pressing problem in an imaginative way. A science fair builds a bridge between home and school - establishing bonds between students, parents, and teachers and inspires students to become life long learners.

Ethics

Each student is required to conduct themselves to the highest ethical standards. The student will not:

- plagiarize
- falsify their research or the outcome of their experiment
- use vertebrate animals (including humans), animal tissues, or micro-organisms, including mold, fungus, and bacteria in their research without special approval.
- steal another's work or idea

To do any of the above, the student will be disqualified from the science fair. Further actions against the student will be at the discretion of OSS's administration.

The 1-2-3's of the Science Fair

The following steps are required to complete a project:

1. Choose your topic
2. Get your parent's and teacher's approval
3. Research your topic, use a Research Binder
4. Develop your Research Plan
5. Fill out and turn in the required paperwork
- 6. Get your teacher's approval before experimentation**
7. Experiment, use a Research Journal
8. Repeat your experiment as many times as possible
9. Analyze your results
10. Draw a conclusion
11. Prepare a Research Paper: extend your Research Plan.
12. Write your abstract
13. Create your display for class and present your project in class
14. Refine your project as needed
15. Present your project at the school fair
16. Present your project at the county and state fair if you qualify
17. Revel in your scientific accomplishments

Choosing Your Topic

The best way to help your student select a topic is to ask “What if” questions and “I wonder” statements.

- What is the level of lead toxins in downtown lakes?
- Is mental practice as effective as physical practice?
- When given a box of crayons, which color will a kindergarten student choose first?
- I wonder why it rains so much in some places.

If you want to win, here are some questions to consider.

- What categories are not as popular?
- What are the **most** modern technology and their potential flaws to them?
- Can I find a suitable contact/lab to help me?

Think back to the days when you thought you could hatch a chick from the egg in your mom’s refrigerator. A great science fair topic starts with a lot of imagination and ends with a lot of hard but fun work! You cannot steal a previously solved/done project, not even from science buddies.

Materials for the Science Fair

This is per person, regardless if they are in a group.

1. Flash drive: All forms and documents need to be electronically saved.
2. Composition Notebook: This is for the research journal/logbook. No ripped pages!
3. 3 Ring Binder: This is for the research binder. They will need printed pages here.
4. Tri-fold or poster board: They need a presentation board of some kind. No physical experiments are allowed at the fair. This board is per group. Note some groups might split up, it is advised to continue with their own experiment if that occurs.
5. Science Fair Project Materials: Students will need to buy materials for their own individual/group project.

Requirements

The following five materials are required: Research Plan (Later gets extended to a Research Paper), Research Binder, Research Journal, Forms, and Presentation Board. **This is per person**, regardless if they are in a group.

Research Plan

The research plan for ALL projects should include the following:

- I) What is the RATIONALE for your project?
 - a) Include a brief synopsis of the background that supports your research problem and explain why this research is important scientifically and if applicable, explain any societal impact of your research.
- II) State your:
 - a) HYPOTHESIS(ES): Your educated guess.
 - b) RESEARCH QUESTION(S): How is this based on the rationale described above?

- c) ENGINEERING GOAL(S): What do you hope to build?
 - d) EXPECTED OUTCOMES: What do you hope to accomplish by doing this investigation? Not the actual data!
- III) Describe in detail your RESEARCH METHODS AND expected CONCLUSIONS.
- a) 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.
 - b) Risk and Safety: Identify any potential risks and safety precautions needed.
 - c) Data Analysis: Describe the procedures you will use to analyze the data/results that answer research questions or hypotheses.
- IV) Bibliography: List at least five (5) 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.
- a) The MSDS needs to be used as a resource if you use chemicals. And the **Ying-Expo Science Fair rules needs to be another resource!**

Research Binder

In addition to any reference books, students are required to keep a printed copy of any Internet research, magazine articles, and any other gathered material. **Highlight** any really important information. They need to keep it in a **3-ring binder** type of notebook.

High Schoolers will be required to obtain scientific peer reviewed articles, those that contain abstracts. High schoolers will also be required to contact scientist in regards to their question and field of study. These email transcripts should be printed and placed in their research binder.

Research Journal: This logbook is the most important part of the project!!!!

A logbook contains all written work done by the student. It must be in the composition notebook and written in blue or black ink – **no pencils or colored pens**. Any errors must be crossed out – **no white outs and no removed pages!**

Be sure to include any visits to the library, a museum, or any other site you visited to gather information. This must also contain a phone log if you made phone calls.

Most importantly, this notebook must contain your project's scientific method.

Please date each entry and number each page as used.

This logbook will be on display with your backboard so that the judges can view your progress. This logbook will be turned in from time-to-time to monitor the student's progress towards benchmarks.

Scientific Method

(Or please use the Engineering Process as a proper replacement or any other Scientific Investigation tool)

Problem/Purpose

What is your goal?

What idea are you trying to test?

What is the scientific question you are trying to answer?

Is it a question you don't know the answer to, but can experiment to find out?

Hypothesis

Tell how you think your project can demonstrate your purpose.

Make a prediction regarding the outcome of your experiment.

Is it measurable????

Can be in the form of If...independent variable, then...dependent variable, because statement

Procedure

Give a detailed explanation of how the experiment will be performed to test your hypothesis.

Be clear about the variables (elements of the experiment that change to test your hypothesis) versus your controls (elements of the experiment that do not change).

Be very specific about how you will measure results to prove or disprove your hypothesis. You should include a regular timetable for measuring results or observing the projects.

Your procedure should be like a recipe – Another person should be able to perform your experiment your procedure. Test this with a friend or parent to be sure you have not forgotten anything.

Order of the trials is also important. Think about consecutive trials vs. simultaneous.

Materials

List all materials and equipment that were used

Quantity, Concentration, Length, Brand and other metrics are important to note.

Your list of materials should include all of the ingredients of the procedure recipe.

Observation/Data/Results

Keep a detailed journal of observations, data and/or results. Quantitative and Qualitative remarks are needed. They can be data measurements and written notes about what you are sensing about your experiment

Photograph your project results or phases of the project if appropriate to help your analysis and possibly to demonstrate your experiment on your exhibit board. **No face pictures!**

Analysis

Explain your observations, data and/or results. This is a summary of what your data has shown you.

List the main points of what you've learned.

Why did the results occur? What did your experiment prove?

Do you accept or reject your hypothesis? Did your experiment prove or disprove your hypothesis? This should be explained thoroughly.

Conclusion

Answer your problem/purpose statement

What does it all add up to? What is the value of your project?

What further study do you recommend give the results of your experiment? What would be the next question to ask? If you repeated this project, what would you change?

Abstract

After finishing your research and experiment, you are required to write a maximum 250 word, one-page abstract. The abstract should include: purpose of experiment, procedures used, data, and conclusions. It is written in paragraph form. The abstract should not include: acknowledgements, or work or procedures done by the mentor. The abstract is required to be on the Florida State Science Fair form. Forms can be found at this website: www.yingexpo.com. You will need to print out a minimum of 3 copies. **Abstracts will be on the bottom left of the project board.**

Research Paper

This final report will be placed on the display table with your Logbook, Notebook, and any other material you wish to include. This report will be typed, 12 font, 1” margins on all sides, and doubled spaced. The report is an extension from the Research Plan. This report will include:

- I. Title Page**
- II. Table of Contents**
- III. Abstract**
 - (i) Under 250 words.
- IV. Discussion**
 - (i) **Purpose**
 1. Your observations, your rational, your inspiration.
 - (ii) **Question**
 - (iii) **Hypothesis**
 - (iv) **Background information**
 - (v) **Procedure and Materials**
 1. **Risks and Safety**
- V. Conclusion**
 - (i) **Expected Results**
 - (ii) **Results**
 1. The raw data.
 - (iii) **Data Analysis**

(iv) Referencing your original question and hypothesis.

(v) **Errors and Outliers addressed**

VI. Data

(i) **Copies of graphs, pictures, charts, etc.**

VII. Acknowledgements (credit to those who helped you – parents, mentors, business, individuals, etc)

VIII. References

(i) **Bibliography** (All sources – MLA style)

Note the underline parts are requirements for the previously made Research Plan.

Required Forms

All projects must be approved before you start. **All projects require the following paper work, some will require additional forms.** Original forms only, no scans. Students need to save all forms and electronic copies on a flash drive.

1. Checklist for Adult Sponsor/Safety Assessment Form (1)
2. Research Plan (1A) – This form requires you to attach a typed research plan, which must include your purpose, hypothesis, step-by-step detailed experimental procedures, and bibliographies. **START DATE Form 1A IS 10/23/18! Stop date is 01/05/19**
3. Approval Form (1B)

All forms must be typed or filled out using blue ink. NO pencil!

Mr. Stampas is the adult sponsor. Stampas@orlandoscience.org, (407) 253-7304

Form 1B is signed by the student and the parent. Besides the start date of experimentation on form 1A (10/23/18), **all other forms prior to experimentation will be dated in September, e.g. 09/09/18**

Date order for the forms:

1. Form 1, 1B, numbered forms 2-7 (Dated in September)
2. 1A
3. Log Book Dates (Start 10/23/18)
4. Mortality, Verification, 1C (Dated after 01/05/19)
5. Media, Entry, Abstract

Students doing experiments that involve humans, vertebrate animals, animal tissues, micro-organisms such as bacteria, fungus, and mold, are required to fill out additional forms and get signatures from qualified scientists in their fields of study. These forms are due with the above mentioned forms on the date the Orange County paperwork is due.

13 Science Fair Categories:

<http://www.ssefflorida.com/category-descriptions.html#ANIM>

1. Animal Sciences
2. Behavioral and Social Sciences
3. Biomedical & Health Sciences

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4. Cellular/Molecular Biology & Biochemistry
5. Chemistry
6. Earth & Environmental Sciences
7. Engineering
8. Environmental Engineering
9. Intelligent Machines, Robotics and Systems Software
10. Mathematics & Computational Sciences
11. Microbiology
12. Physics & Astronomy
13. Plant Sciences

Websites

General Science Fair Resources

<http://faculty.washington.edu/chudler/fair.html>

<http://school.discoveryeducation.com/sciencefaircentral/Getting-Started.html>

<http://www.floridassef.net/>

<http://www.all-science-fair-projects.com/>

<http://www.sciencebuddies.org/>

(Not for High Schoolers!)

<http://www.sciencefair-projects.org/>

<http://www.super-science-fair-projects.com/>

<http://www.education.com/science-fair/>

MLA Generator

<http://www.easybib.com/>

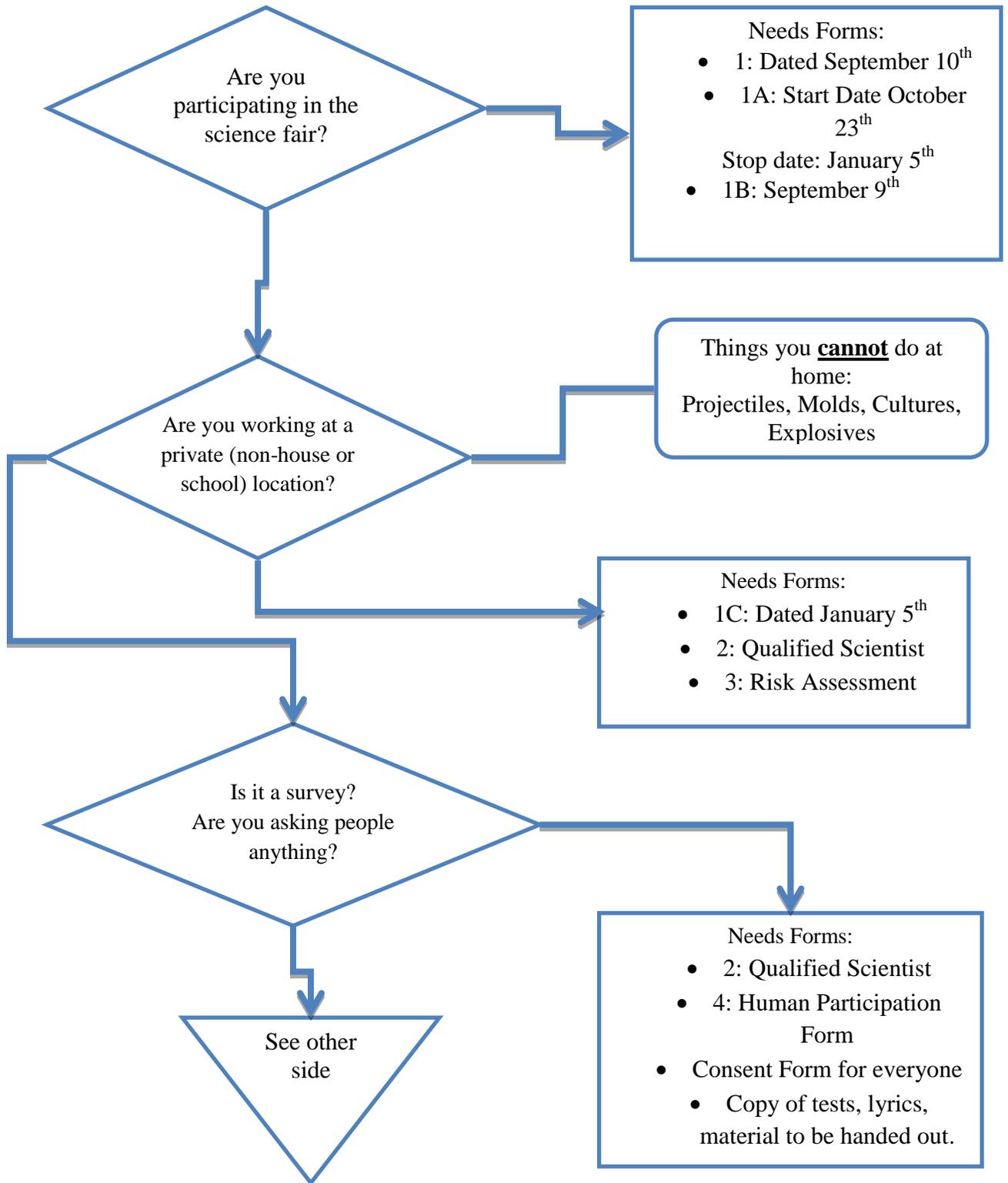
Orange County's Science Fair Site/all forms

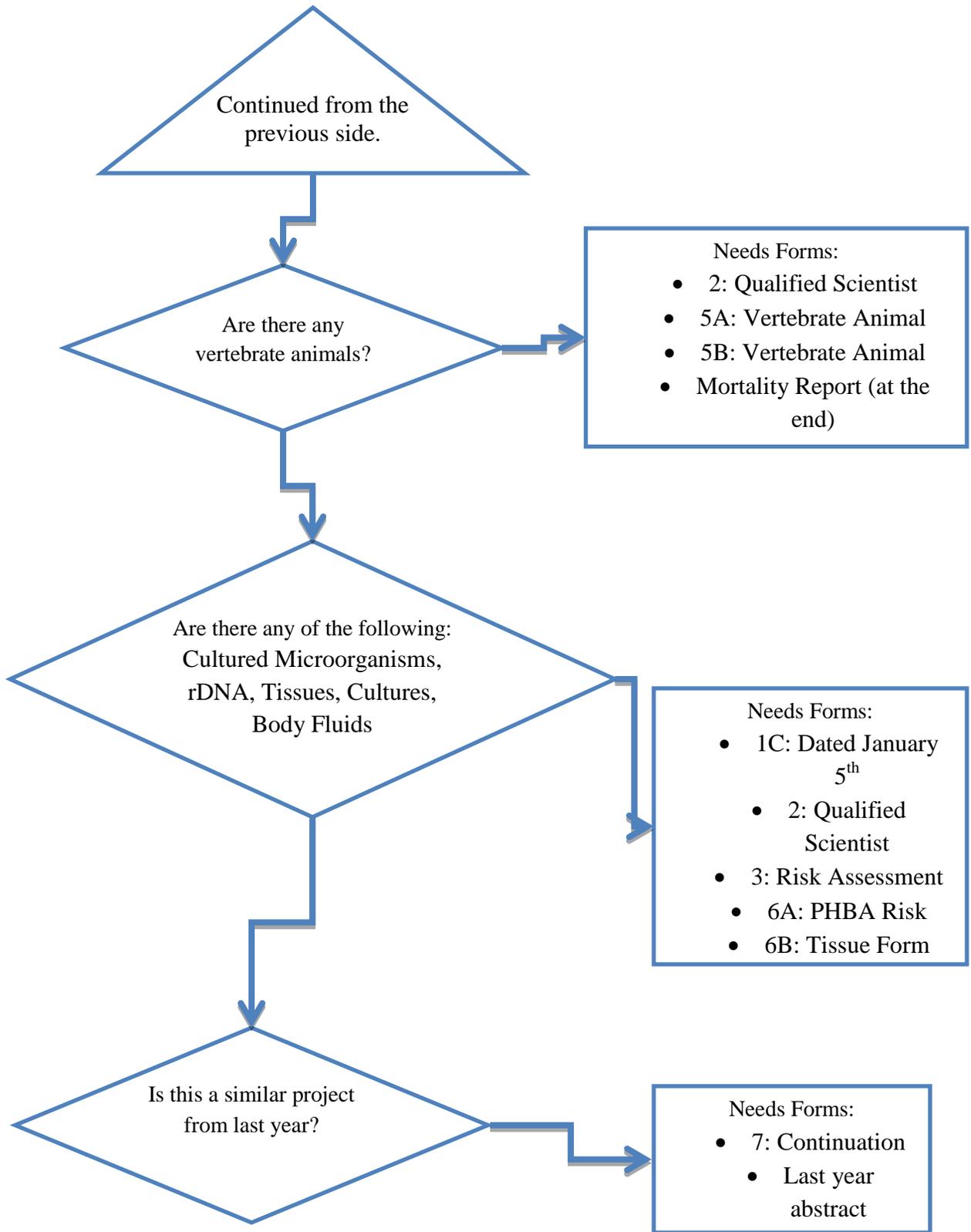
www.yingexpo.com

Intel International Science & Engineering Fair

<http://www.societyforscience.org/isef/>

(This site MUST be included in the bibliography.)





Orlando Science School
Science Fair Agreement Teacher Copy

I, _____, and my child, _____, have read through the Orlando Science School's Science Fair Handbook. We understand what is required and agree with the timeline.

We especially understand the ethics involved in a science fair and agree to abide by them.

Parent's Signature

Date

Student's Signature