

Independent Research Project (IRP) Agreement

I. Schedule

What is Due?	When?	To Whom?
IRP Agreement (This)	Friday, 8/12/2016	Your science teacher
Topic Proposal	Tuesday, 8/23/2016	Submit Google Form
Research Plan	Tuesday, 9/20/2016	Turnitin.com
ISEF Forms	Tuesday, 9/20/2016	Your IRP sponsor
Display Board	Tuesday, 11/29/2016	Your IRP sponsor
Final Paper	Tuesday, 1/3/2017	Turnitin.com
BFHS Science Fair*	Tuesday, 1/10/2017	
GNOSEF Science Fair*	Monday-Thursday, 2/13-16/2017	

**If your topic is selected to advance*

II. Getting Your Topic Approved (Due on or before 8/23/2016)

A) **This is new:** You will submit your topic proposal on Google Forms:

<https://docs.google.com/forms/d/e/1FAIpQLSfshiUyYsUn6iCvSxKA7FPBoYd2CyqrpHxEkIjm1hLO8kkkgg/viewform>

1. You may NOT receive approval from an individual science teacher.
 2. Your proposal will be reviewed by a committee of science faculty members. After review, your proposal may be:
 - i. Accepted
 - ii. Conditionally accepted
 - iii. Rejected
- B) In your proposal, you may rank up to 3 science faculty members whom you would like to serve as your sponsor. Though you are not guaranteed to be paired with any of your choices, an effort will be made to honor your preferences.
- C) If, in the opinion of the approval committee, your proposal fails to make a “good faith effort” to complete all parts of the application, your proposal will be automatically rejected.
- D) Within three weeks of submitting your proposal, you will receive a reply via email indicating whether your proposal has been accepted or declined, as detailed above.
 1. If accepted, you will also be informed of your sponsor, and it is YOUR responsibility to contact that teacher in a timely fashion.
 2. Once assigned, you may not, under any circumstances, change your topic or sponsor.

III. Writing Your Research Plan (Due 9/20/2016)

- A) Rationale (5 pts)
1. Provide a real-world application or reason why your research should be conducted
 2. As a guide, consider these questions:
 - i. Why would anyone want to know the results of your research?
 - ii. Why would anyone fund this research?
 - iii. What benefits might society reap from your research?
- B) Hypothesis, Research Goals, Engineering Goals, and/or Expected Outcomes (10 pts)
1. Include a null hypothesis (H_0)
 2. Include an applied hypothesis (H_a)
- C) Procedure (35 pts)
1. Method--Specific and complete enough to be repeated; special topics addressed, if applicable.
- D) Risks and Safety (10 pts)
1. Describe the risks involved in every step of the procedure
 2. Explicitly state which safety precautions must be taken for EACH risk listed.
- E) Data Analysis (30 pts)
1. Indicate which type of statistical test you will employ to analyze your data. You must use one or more of these tests:
 - i. ANOVA
 - ii. t-test
 - iii. Chi squared
 2. Justify why the test(s) you indicated are the best means for evaluating your data. Specifically discuss the TYPE of data you collected in answering this question.
- F) Bibliography (10 pts)
1. You must include at LEAST five (5) major references
 2. At least two (2) of your references must be peer-reviewed scholarly journal articles
 3. No journal articles can be more than 10 years old
 4. All references must be cited correctly in MLA format.
- G) Overall Writing
1. Must be written in past tense, and in passive voice
 2. Must not contain any spelling or grammatical errors

IV. ISEF Forms (Due 9/20/2016)

- A) All students must submit forms 1, 1A, & 1B
- B) Special topics forms are also due, for students with approved special topics categories

V. Statistical Analysis of Results

- A) Your results must be analyzed quantitatively by an appropriate statistical test, such as:
- i. t-test
 - ii. ANOVA
 - iii. Chi squared
 - iv. Another test, if necessary, as directed by your sponsor.
- B) Dr. Spahn will conduct optional after-school sessions during the first semester for students wishing to learn more about statistical analysis.
- C) Be aware: Failure to quantitatively analyze your data will result in a substantial grade reduction, per the rubric described above.

VI. Making Your Display Board (Due Tuesday, 11/29/2016)

- A) Size Requirements (2 pts). At most, your display board may be:
1. 76 cm (36 in) deep
 2. 122 cm (48 in) wide
 3. 274 cm (108 in) tall
- B) Formatting/Quality (6 pts)
1. Computer printed
 2. Properly-sized titles
 3. Project title uses scientific names, when applicable
 4. Project title includes independent and dependent variables
 5. Project is neat
 6. Project contains no spelling errors.
- C) Purpose (2 pts)
1. Written in narrative form
 2. Is sufficiently detailed, but concise
- D) Hypothesis (2 pts)
- E) Research Plan (4 pts)
- F) Results & Discussion (24 pts)
1. Include all relevant data tables, figures, and graphs
 2. All data must be computer printed (use Excel, LoggerPro, or similar)
 3. Discussion should be written in narrative form
- H) Photographs included (10 pts)
1. Photographs must provide visual proof that YOU actually conducted the experiment.
 2. If selected to advance to the BFHS Science Fair, you must obscure faces of all humans in your photographs, such that they are unrecognizable to a judge

VII. Rubric for Final Paper (Due Tuesday, 1/3/2017)

Criteria (explanation)	Value	Points Earned
I. Abstract (24 pts) <i>Provides reader with an overview of entire paper</i> <i>Note: while abstract appears at the beginning of the paper, it is WRITTEN LAST, as it is a condensation of the entire research paper.</i>		
a. Purpose/problem	4	
b. Hypothesis	4	
c. Summary of method (condensed version)	4	
d. Summary of main results	4	
e. Conclusions	4	
f. Typed on ISEF form	4	

II. Introduction (40 pts)		
<p>a. Purpose</p> <p><i>includes the rationale for conducting the experiment, emphasizing unresolved questions/issues; includes a statement of what is hoped to be learned, and why project was chosen (real world relevance)</i></p>	5	
<p>b. Review of Literature</p> <ul style="list-style-type: none"> · <i>Describes background information about the research problem that is reported in the literature.</i> · <i>Includes information on independent and dependent variables</i> · <i>Includes specific subject of the study and any specialized procedures</i> · <i>Describes related research studies, including analysis of prior research and implications for project</i> · <i>Links purpose to hypothesis</i> · <i>Properly uses in-text citations, using MLA formatting</i> 	30	
<p>c. Hypothesis</p> <ul style="list-style-type: none"> · <i>States if hypothesis is to be accepted or rejected (H_o = null hypothesis; H_a = experimental hypothesis)</i> · <i>states specifically what is tested</i> 	5	
III. Method (50 pts)		
<p><i>NOTE: Although your <u>final IRP paper</u> must be written using past tense and passive voice, this section on the <u>GNOSEF Research Plan</u> was required to be in <u>future tense</u>.</i></p> <ul style="list-style-type: none"> · <i>Reports specifically and as concisely as possible</i> · <i>Includes procedures used to conduct research;</i> · <i>written so that the project could be replicated by anyone</i> · <i>written in past tense an passive voice</i> · <i>indicates materials used as part of the narrative</i> · <i>use SI units, when applicable</i> · <i>includes how data measured</i> · <i>includes how data analyzed statistically, including if hypothesis was rejected or accepted based on statistical analysis</i> 		

IV. Results (30 pts) <i>Includes most notable findings supported by references to tables (lists, charts) and figures (graphs, drawings) found after “discussion”</i>		
a. Tables & figures referenced explicitly in text <ul style="list-style-type: none"> · follow “discussion” section · referenced by number in title · titles of tables and figures appropriately placed (title of tables is placed above table; title of figures placed below figure) · referenced by number in the text · Photographs are considered figures and are also placed after discussion section <p><u>Note:</u> no name on photograph and no face in photograph for paper presented at Science Fair)</p>	12	
b. data analysis, <u>includes BOTH</u> <ul style="list-style-type: none"> · Descriptive statistics, and · Inferential statistics https://statistics.laerd.com/statistical-guides/descriptive-inferential-statistics.php ;	18	
V. Discussion (30 pts) <ul style="list-style-type: none"> · Refers back to and restates the purpose and hypothesis. · States conclusions based on the results (data analysis) and research literature · Gives explanations for discrepancies due to sources of error in data are presented · Reports the limitations of study (such as small sample size or factors out of your control) · Includes suggestions for procedural improvements · Recommendations for further research · States potential application of your project’s findings 		
VI. Tables (10 pts) <p>a. Title(s) correct placed and labeled</p> <p>b. SI units, when applicable</p>		
VII. Figures (graphs) (10 pts)		
a. Title(s) - Correctly placed and labeled	2	
b. Variables on correct axes/labeled correctly	6	
c. Choice of graph used considered	2	

VIII. References (6 pts)		
a. Required number of sources (5, inclusive of 2 scientific journals, not older than 10 years from present)		
b. Correctly formatted (MLA) <i>Be sure you list all references alphabetically, by author, on your bibliography page.</i>		
c. Reference to each citation found in paper		
IX. Overall Writing <i>Points will be deducted for each writing mistake, including those involving spelling, grammar, and usage. You must also write the paper in past tense and in passive voice, except during the Review of Literature. For more details, see file:///C:/Users/lhartman/Downloads/Lit_review_hum-ss.pdf</i>		
TOTAL	200	

VIII. Submitting Your Paper

- A) ALL projects must submit a final paper, regardless of whether they advance to the BFHS fair
- B) Ask your IRP sponsor for your class ID and password for Turnitin.com
- C) Go to Turnitin.com
- D) Create a new account
 1. **If you already have an account**, select the “Enroll in a class” tab. This will allow you to add the new class using the Class ID and Password from your sponsor
- E) Upload your paper.

Please sign and return by Friday, 12 August 2016

I have read and understood the new policies and procedures explained in this document, concerning the Independent Research Project, effective August 2016. I further understand that many of these policies are different than in previous years.

Student name (print) _____ Date _____

Student signature _____ Date _____

I have read and understood the new policies and procedures explained in this document, concerning the Independent Research Project, effective August 2016. I am aware that my child must complete an IRP prior to the completion of their 11th-grade year at Benjamin Franklin High School as a graduation requirement. I further understand that many of the policies described herein deviate from IRP policies in previous years at BFHS, and I am aware of those changes, as outlined above.

Parent name (print) _____ Date _____

Parent signature _____ Date _____