Lab Research LR

If working with a group (2-3 students), each group should submit:
one group Research Report, one group presentation via YouTube, and one group poster.

Each member of the group needs to submit their own unique Connections and Collaborations document and Annotated Bibliography. Students must justify why a team was needed and document the roles and responsibilities fulfilled by each team member, to be included in the Connections and Collaborations statement.

Category Requirements – 30%

20 pts.

Research Report (8-12 pages)

Title: Briefly describe the main focus of the work. Often, a title highlights the relationship between the independent and dependent variables investigated.

Table of Contents: Make this the second page of the report

Summary/Abstract: This is a one-paragraph overview of the project. Include a statement of purpose, the hypothesis being tested, a brief description of the procedures and results, and the main conclusions.

Introduction: This section states the purpose of the experiment and provides background information on why you decided to undertake the project. It should also state the hypothesis and explain how you arrived at it.

Procedure: Explain what you did and describe the materials you used in the experiment.

Results: Include measurements and observations you made in the form of graphs, tables, charts, and photographs. Perform appropriate statistical analyses.

Discussion: Summarize in roughly one page what you discovered from your experimental results, citing specific quantitative results to support your argument. Restate the hypothesis, and indicate whether the results support or reject it. Include suggestions for further study.

Bibliography/Acknowledgements: List all books, papers, journal articles, and communications used in your experiment. Follow the general guidelines for annotation of the bibliography, references, and mentorship description. Credit assistance received from mentors, parents, teachers, and other sources.

If you decide to use Human or Animal subjects or potentially hazardous biological or chemical materials, make sure you check the rules at:

http://www.societyforscience.org/isef/rulesandguidelines

Scroll down to Subject Areas. We comply with the Intel Science and Engineering Fairs with

10 pts.

Video Presentation (5-8 minutes)
Create a video presentation that provides an overview of your research (it could, but does not have to incorporate PowerPoint slides). Be sure to cover essential concepts and trends in the data – use graphs/charts where possible. If you use slides, use bullet points and do not overload with text.

Science Content– 30%

30 pts.

Science Content Understanding
The Research Report (see "Category Requirements", above) should demonstrate a mastery of relevant scientific ideas by accurately explaining difficult concepts. It should show a clear, organized pattern of thinking and provide logical and analytical reasoning. The content of your work should reflect critical thinking about the topic.

Student will be judged based on their own work, creativity, and understanding of the science behind the project.

Connections and Collaborations; General Written Requirements – 10%	
5 pts.	**Connections and Collaborations** Include 1-2 typed pages describing the connections you have made with other people as well as the resources you have used the most. More weight is given in judging to those students who put more effort into locating and using available resources. A good use of resources may include working with an advisor or mentor, making arrangements to tour a company, interviewing an adult in your field, in addition to reading an important paper or uncovering an invaluable website. What did you learn? How did this resource help you? An interview with an adult in the field carries far more weight than a Google search. You do *not* have to request a mentor through NWABR to excel in this area. If a qualified adult (i.e. your Expo Mentor, someone you interviewed or a tour guide at site visit) significantly helped you with your project, please include: a) The person's name, title and contact information. b) Dates you emailed, talked on the phone or met. c) Your thoughtful reflections on the experience of working with that person **If you are working in a team,** this is the place to describe the different roles and responsibilities of each team member and the rationale behind why each person took their role.
5 pts.	**Paper Format and Annotated Bibliography** Papers should be typed/word processed with one-inch margins. Use an easily readable font such as Times Roman or Arial, 10-12 point, double-spaced. If included, illustrations must be neat and applicable, with a title and a source. Number your pages and label section headings. Consistently follow the rules of Standard English for usage, spelling, capitalization, and punctuation. If you are using Windows *Vista* or *7*, please use the 'save as' function to save your paper as a "Word 97-2003 Document." Annotated bibliography should be in standard MLA or APA format. Use a minimum of 5 sources. The bibliography should include all books, papers, journal articles, and communications used in your research. For at least 5 sources, provide one reason why you believe the source is credible and describe how it was used in your project.

Creativity -- 10%

10 pts. **Creativity**
Show your ability to creatively approach or solve a problem, or present evidence of your understanding in ways that are novel or unique. Your project should reflect your special insights and abilities.

Poster/Interview at Expo Event – 20%	
10 pts.	**Poster** Posters should convey important information about your project in a visually appealing manner. Displays and models must be freestanding and have the following maximum dimensions: 4 feet width, 2.5 feet depth, and 3 feet height (from table). Use the major section headings of your report to organize your poster. Display your paper in front of the poster. Use graphs and charts to illustrate trends in your data.
10 pts.	**Interview/Presentation** *Judges will be looking at your effectiveness in communicating your project to them, and your understanding of your topic.* Your judge will want an overview of your project - practice giving a short (2-3-minute) 'walk-

through' of your project that explains it in straightforward terms. You will receive written feedback from your judge regarding the strengths of your project, and how you could make it even better in the future.

The following are samples of the types of additional questions a judge might ask you: Why were you interested in this topic? What did you learn from doing your project? What was the most enjoyable/difficult aspect of doing this project? What else would you like to learn about this topic?

100 points total

What you need to do on or April 23, 2017

❑**Register** for the Student Bio Expo. Student registration will be open between April 3rd until the deadline Sunday midnight April 23, 2017.

❑**Submit** an electronic copy of your project to NWABR (and your teacher) using the **BOX cloud storage**. Further registration and submission information will be posted at: https://www.nwabr.org/events-programs/student-events/student-bio-expo

What you need to bring to the Expo

Bring a *hard copy* of your written work. Include the following:

- ❑ **Cover Sheet**
- ❑ **Research Report**
- ❑ **Bibliography + description of Effort in use of Resources**
- ❑ **A copy of your video presentation**
- ❑ **Any electrical or AV equipment you may need**
- ❑ **Poster**

YouTube Uploading Instructions

For the Lab Research (LR) category, the judges will view your work on YouTube. You can upload your video at www.youtube.com <http://www.youtube.com/> using the following instructions:

1. The maximum video time on YouTube is 10 min. 59 seconds. If your video exceeds this time, you will need to create a part 1, part 2 and part 3 as needed and upload your video in 2 or 3 sections.

2. Once on the main Youtube page, click "Sign In" on the upper right hand corner. Use the following log-in information:
   Username: bioexpo2017@gmail.com
   Password: studentbioexpo2017 (Alternatively, use your own Gmail account to upload your video but make sure to label your video as described below.)

3. Once signed in:
   a. Click on the "upload" link at the top right.
   b. On the next screen, click the "upload video" link and select your video from your saved files.
   c. In the title section: Type the title of your project.
   d. In the description section type: "A lab research project for the 2017 Student Bio Expo by (your name)." Next type a brief description of your project topic.
   e. In the tag section type: "Student Bio Expo 2017, 'lab research', 'your topic' (eg. Autism, Down Syndrome, Thyroid Disorders etc.)
   f. Select an appropriate category from the drop-down menu.
   g. Under Broadcasting and Sharing Options, change the "comments" section to "Don't allow comments." Leave the other options as they are by default.
   h. When you are done uploading your videos, click "save changes".

4. Log out of YouTube and you are done!

Lab Research Tips

This project category gives you an opportunity to design and conduct an experiment that demonstrates or tests a concept or principle related to biotechnology or biomedicine. Like any scientific research, the main goal is to formulate a testable hypothesis, design an experiment that tests the hypothesis, generate and analyze the appropriate data, and present the results clearly and creatively.

Although this is a challenging category, we encourage you to consider a research project. There is no better way to see what science is really like! Many participants in this category have gone on to longer internships after the Expo.

Research at School

If you cannot gain access to a lab, you can still work on a research project. For example, we have had past participants conduct projects at their school and have their mentors visit them there. Many microbiology projects are well suited to being conducted outside of a research lab. Several schools that have biotechnology programs are well-equipped to conduct research experiments given some materials from an industry mentor (plasmids, media, etc.). Be sure that any materials transferred between a company and a school meet school safety guidelines.

Projects Still in Process

We recognize that students have differing lengths of time to work on projects. Some students will not be able to complete data collection on their project by the time of submitting papers for prejudging. If you do not finish collecting data, you should outline the work done to date and discuss what you would advocate for next steps. If you have sufficient data, you can try to make some preliminary statements about possible trends. You may submit an updated paper at the Expo itself, but judges may not have time to read it carefully.

Other Science Fairs

Students with winning projects/honorable mentions will be encouraged to submit their projects to the Washington State Science and Engineering Fair (WSSEF), the local 'feeder' for the National Intel Fair.

Intel Science Talent Search: http://www.sciserv.org/sts/

Intel International Science and Engineering Fair: http://www.societyforscience.org/isef/

Washington State Science and Engineering Fair: http://www.wssef.org/

Many Expo students have gone to national level competitions afterwards. Before you begin your project, make sure that you are compliant with the entry requirements for the WSSEF so that you can use your project for both!

Student Bio Expo

Student Name:

Student School:

Project Title:

Lab Research LR

Judging Criteria (Judging criteria are explained in the *Student Requirements*)	Superior	Excellent	Good	Developing	Limited
Lab Research Category Req. (30%)					
Research Report (20 pts)					
Video Presentation (10 pts)					
Science Content (30%)					
Science Content Understanding (30 pts)					
Connections/Written Req. (20%)					
Connections and Collaborations (5pts)					
Paper Format; Annotated Bibliography (5 pts)					
Creativity (10%)					
Creativity (10 pts)					
Poster/Interview at Expo Event (20%)					
Poster (10 pts)					
Interview/Presentation (10 pts)					

Comments

(Please continue on back, if needed)

What I found particularly impressive about your project:

Pre-Judging:

Final Judging:

What you could do in the future to make it better:

Overall Rating (circle one)

Superior **Excellent** **Good** **Developing** **Limited**