SMART Team SM

Each team will submit one model and one poster; **each individual** will submit an abstract, Connections and Collaborations, and bibliography

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Category Requirements – 30%	

30 pts.	**Model –**
	Design and build a model: This could be using a 3D printer, robotics or any form the student chooses.
	• Model defines a biological or bioengineering structure
	• Model defines a structure that relates to a specific function
	• Model is visually appealing and invites questions
	• An attached card explains the main function of the model
	• The explanation card highlights the significance of any colors used in the model.
	• Model is well made via manufacturing guidelines-could be "sold" or donated to industry or an academic institution
	  ○ Clean
	  ○ clear color
	  ○ no drips from final epoxy
	  ○ struts present for stability

Science Content and Poster– 30%	
20 pts.	**Science Content paper** Include a 5-8 page paper describing the science behind your model. Your goal is to explain the structure/function and importance of your model.
10 pts.	**Poster** Your poster should tell the story of this model. It should address the following: • What is the "hook" or "big picture" regarding this model? Why do we care about this model? • What function is being modeled? • What are the important features that you want to highlight on your model? Why are these features the important ones you have chosen to highlight on your model? For example, are there secondary structures or significant amino acids that make up an active site or a binding site? Does this bioengineered joint play a significant role in the body? Posters should be 24" x 36" or 36" x 48"

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

5 pts.	**Annotated Bibliography** 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** The most successful projects have been ones that have invited audience interaction or have presented a challenging concept in a new and engaging way. 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.

Interview at Expo Event – 20%	
20 pts.	**Interview** ***Judges will be looking at your effectiveness in communicating your project to them, and your understanding of your topic.*** Are you able to communicate the story well? Do you understand how your model fits into the "larger picture"? If modeling hemoglobin, for example, do the students understand how this protein is important in both the cardiovascular and respiratory systems? If you have created a bioengineered joint, do you understand the role and importance of this joint in the body? 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 find out about this topic?
100 points total	

What you need to do *on or before* April 23, 2017

❑**Register** (one person per team) for the Student Bio Expo. An Expo Student Registration link will be sent out to teachers at the beginning of April. Student registration will be open between April 3rd with a deadline Sunday midnight April 23, 2017.

❑ **By the deadline submit** an electronic copy of your abstract, poster (as PowerPoint Slide), Connections and Collaborations and annotated bibliography to NWABR (and your teacher, if requested) using the **EXPO SMART TEAM 2017 SUBMISSION TEMPLATE**. Instructions will be sent to your teacher as to how to upload these into a cloud- based document system called BOX.

What you need to bring to the Expo

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

- ❑ **Model (one per team)**
- ❑ **Poster (one per team)**
- ❑ **Abstract (each individual)**
- ❑ **Bibliography and Connections and Collaborations (each individual)**
- ❑ **Any electrical or AV equipment you may need**

SMART Team Tips

The SMART Team category at the Student Bio Expo is only open to teams consisting of a teacher who has participated in the Center for BioMolecular Modeling's summer course, Modeling the Molecular World, Part I (or its predecessor, Genes, Schemes and Molecular Machines), students, and a research mentor OR any teacher that is teaching 3D printing techniques for biotechnology or biomedicine.

As a SMART (**S**tudents **M**odeling **A R**esearch **T**opic) Team, students develop teamwork as they design and build a model of a protein using Rapid Prototyping technology. Students work closely with a researcher to understand and model the structure-function relationship for a particular model. SMART teams then create an oral presentation explaining their work to a lay audience and a poster which is presented to a scientific audience. The development of this program was supported by grants from the NIH-NCRR SEPA program (Science Education Partnership Award) and an HHMI Precollege Science Education Award. For more information about this program, visit the CBM web site at www.rpc.msoe.edu/cbm .

Student Bio Expo

Student Name:

Student School:

Project Title:

SMART Team SM

Judging Criteria (Judging criteria are explained in the *Student Requirements*)	Superior	Excellent	Good	Developing	Limited
SMART Team Category Req. (30%)					
Model Design (30 pts)					
Science Content (30%)					
Poster (25 pts)					
Abstract (5 pts)					
Connections/Written Req. (10%)					
Connections and Collaborations (5 pts)					
Annotated Bibliography (5 pts)					
Creativity (10%)					
Creativity (10 pts)					
Poster/Interview at Expo Event (20%)					
Interview (20 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**