Thinking About Continuation Projects & Making Adjustments for Remote Research

For Students:

**Question:** I submitted a project to NYCSEF 2020, which was cancelled because of COVID-19. Can I resubmit it for 2021?

**Answer:** This is a complicated question. The short answer is that you cannot, because the project you enter for the 2021 fair may not be started before 1/1/2020, and all of the projects that were submitted for NYCSEF 2020 started before that date. However, all is not lost if you will not graduate in 2020. In many cases, it will be possible to do a continuation/research progression project. Here a few rules:

1. As in the professional world, research projects may be built on work performed previously. Students will be judged only on experiment/data collection performed over 12 continuous months, from January 2020 to May 2021.
2. A continuation/research progression project must document that the new research is a considerable expansion from prior work.
3. The display board and abstract must reflect the current year’s work only.
4. New forms must be completed for NYCSEF 2021, and must include Form 7 as well as the 2020 abstract and research plan.
5. Examples of acceptable and unacceptable continuation projects follow:

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<thead>
<tr>
<th>ACCEPTABLE CONTINUATIONS</th>
<th>UNACCEPTABLE CONTINUATIONS</th>
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<tbody>
<tr>
<td>Testing a new variable</td>
<td>Using the same research question and methods, but with a larger sample size</td>
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<td>Testing a new line of investigation</td>
<td>Using the same data, but including more charts and/or a more detailed discussion of results</td>
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<td>A longitudinal (multi-year study) in which TIME is a critical variable. Ex: Change in the amount of air, water, or soil pollution after a factory opens/closes; effect of very high rain or drought on soil in a given area</td>
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<td>Using a new methodology. Ex: Previous methods counted the number of cells produced; new methods did a chemical analysis.</td>
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**Are these acceptable continuation projects?** For each project described below, decide whether it is acceptable, and answer all questions.

**A. Microbial Fuel Cell Project (Biochemistry or Microbiology):**

**Note:** Microbial fuel cells (MFCs) create electricity through the use of microorganisms. These microorganisms may be found in mud found in small lakes or other moist areas. It is easy to find directions to build inexpensive fuel cells. There are many interesting research questions that can be asked and explored regarding microbial fuel cells.

Last year, Chris built a microbial fuel cell, producing electricity from anaerobic bacteria found in mud in a small local fresh water lake. With the help of his adult sponsor, he built the apparatus, collected some mud, and measured the amount of electricity that was produced.

For a continuation project, Chris wants to compare the results of last year’s project to the mud from a small fresh water lake that is close to a factory that makes electronics.
1. Is this an acceptable project? Why or why not?
2. Can this project be done at home?
3. What is one weakness or limitation of this project?
4. What are some unanswered questions that you have about microbial fuel cells?

**B. Environmental Sciences Projects:**

1. For last year’s project, Leslie grew lima bean plants in school, and compared the results of plants grown in uncontaminated soil to plants grown in soil contaminated with three different percentages of lead ions. In each of the four test groups, there were three plants, each grown in its own pot of soil.
   As a continuation, Leslie would like to repeat last year’s experiment, increasing the number of plants in each group to twenty. No other changes would be made.
   a. Is this an acceptable continuation? Why or why not?
   b. What are some unanswered questions that you have about the effects of heavy metals on plants?
   c. If Leslie still had an interest in the effects of heavy metals on plants, what are some research questions that could be asked?

2. For last year’s project, Alex measured the amount of lead pollution in soil in various locations in Manhattan. Due to the presence of Covid-19, many factories have closed, and there are fewer vehicles on the streets. Alex would like to retest the same areas, and compare the results.
   a. Is this an acceptable project? Why or why not?
   b. What is a major difference between this project and the one above?
   c. What are some additional research questions that could be asked?

**C. Engineering Project:**

In Avery’s previous project, a voice-activated controller for a wheelchair was designed, constructed, and tested. The wheelchair was able to follow directions to start, move in a straight line, make right and left turns, and stop.

For this year’s project, Avery wants to use different materials to construct the controller, so that although no new motions will be added, it will be done as efficiently, but at a cheaper cost.

1. Is this an acceptable continuation? Explain.
2. What are some additional research questions that could be asked?