# Name: Block

# 8th Grade Science Exhibition Project Rubric: Options 1 - Experiment

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| **Project Components** | **Guidelines to follow in order to meet expectations:** | **Evaluation** |
| **Project Process** | * Project Intention Statement on time * Project proposal submitted on time * Project Proposal includes detailed work plan with both my dates and at least 2 internal deadlines you set for yourself. * Project Proposal includes a clearly stated first draft of your research question * Initial data submitted on time. * Amount of Data at this point at least a first pass on experiment in terms of setting up an initial run of the experiment and gathering at least one complete trial worth of data. * Rough draft submitted on time * Completeness/Quality of first draft * 2nd Draft completed on time | \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Research Question, Science Background, Hypothesis** | **Research Question and Science Background**   * Research question is stated in a scientifically meaningful way in relationship to the experiment. * Identifies and discusses the key science concepts that are involved in the experiment, providing a summary of what is already known about the subject based on the background research that you did. Includes careful definition and use of key terms and vocabulary. * At least 3 sources are used. * Quality and range of background sources   **Hypothesis (If revelevant to experiment)**   * Hypothesis is clearly presented (or not, if not relevant) * Clearly explains the reasoning behind any hypothesis in relationship to previous scientific knowledge and prior experience. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Experimental Design & Procedure** | **Materials**   * Bulleted list of all materials with quantities   **Variables and Experimental Design Discussion**   * Describes the overall structure of the experiment in terms of what is being measured, why you chose to measure those things, and how your experimental setup was designed in order to make it “scientifically valid”. Specifically identifies controlled variables, any manipulated (independent) variables, and any responding (dependent) variables. * Describes what you learned from the initial data gathering in terms how it affected your procedure or data gathering. * Quality of experimental design   **Procedure**   * Provides detailed instructions that would allow someone else to accurately repeat the experiment. * Calls for multiple trials (typically at least 5 trials) * Includes illustrations with captions (drawings or photos) to clarify instructions. | \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Present Results** | **Data**   * Written summary of data is presented, including relevant written observations and/or illustrations with captions (drawings, photos).   **Tables and Graphs**   * Data is clearly organized in a table with rows and columns clearly labeled. Units are identified. * Data is correctly represented graphically; include clear labels and properly scaled axis. * Graph presents a meaningful illustration of the data. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Analyze Results and Discuss** | * Identify specific trends and/or patterns in the data and observations. * Identify any individual result in your data set that do not agree with your overall observations. * Describe what you learn from your results and how you arrived at that conclusion. * Discuss specific measurements you made in terms of the difficulty of getting an accurate value (what sources of experimental error where there? How big was the uncertainty in the measurements?) * Identifies remaining questions or inconsistencies in your results. * Discuss the results in relationship the background science * Discuss the results in relationship to your hypothesis (if you had one). | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Poster and Display** | * Includes physical samples of experimental apparatus as appropriate. * Each section has a clear heading and information is organized on the poster in a way that reflects how the information connects together. * Uses color, text, and illustrations to create an eye-catching display. * Includes acknowledgements of everyone who supported your experimental efforts * Includes sources cited in correct MLA format | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |

Overall Assessment

Project Process:

Research Question, Science Background, Hypothesis:

Experimental Design and Procedure:

Results:

Discussion:

Poster:

# Name: Block

# 8th Grade Science Exhibition Project Rubric: Option 2 – Further Circuit Exploration

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| **Project Components** | **Guidelines to follow in order to meet expectations:** | **Evaluation** |
| **Project Process** | * Project Intention Statement on time * Project proposal submitted on time * Project Proposal includes detailed work plan with both my dates and at least 2 internal deadlines you set for yourself. * Project proposal includes clearly stated goal/research question. * Initial data submitted on time. * Data at this point shows that you have done at least a first pass on experiment in terms of setting up an initial run of the experiment and gathering at least one trial worth of data. Also, have at least one page of notes on background research at this check in. * Rough draft submitted on time * Completeness/Quality of first draft * 2nd Draft completed on time | \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Circuit Exploration, Science Background, Hypothesis or Goal** | **Circuit Exploration and Science Background**   * Goal or research question of your circuit exploration is stated in a scientifically meaningful way. * Identifies and discusses the key circuit concepts and circuit components that are involved, including a detailed summary of what is already known. Includes careful definition and use of key terms and vocabulary. * At least 3 sources are used. * Quality and range of background sources   **Hypothesis**   * If appropriate to your investigation, clearly state a Hypothesis (or leave out, if not relevant to your investigation). * Clearly explains the reasoning behind any hypothesis in relationship to scientific knowledge and prior experience. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Investigation Description & Procedure** | **Materials**   * Bulleted list of all materials with quantities   **Circuit Investigation**   * Describes the overall structure of the exploration, including describing your goals, describing the specific circuit behavior your are investigating, what you will being measuring, why you chose to measure those things. Depending on the investigation, identify any controlled variables, any manipulated (independent) variables, and any responding (dependent) variable. * Describes what you learned from the initial data gathering how it affected the way in which you set up the investigation. * Quality and sophistication of circuit investigation.   **Procedure**   * Provides detailed instructions that would allow someone else to accurately repeat the investigation. * Calls for multiple trials (typically at least 5 trials) for any measured values. * Includes schematic diagrams of the circuit.   **Circuit Data**   * You include measurements of current and voltage for the circuit as a whole and for any important sections of the circuit as they connect to your investigation. | \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Present Results** | **Data**   * Written summary of data is presented, including relevant written observations and/or illustrations with captions (drawings, photos).   **Tables and Graphs**   * Data is clearly organized in a table with rows and columns clearly labeled. Units are identified. * Data is correctly represented graphically; include clear labels and properly scaled axis. * Graph presents a meaningful illustration of the data. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Analyze Results or Outcomes and Discuss** | * Identify specific trends and/or patterns in the data and observations of your circuit. * Identify any individual result in your data set that do not agree with your overall observations. * Describe what you learn from your results and how you arrived at that conclusion. * Discuss specific measurements you made in terms of the difficulty of getting an accurate value (what sources of experimental error where there? How big was the uncertainty in the measurements?) * Identifies remaining questions or inconsistencies in your results. * Discuss the results in relationship the background science * Discuss the results in relationship to your hypothesis (if you had one) or primary goal of your investigation. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Poster and Display** | * Includes your circuit set up in working order to demonstrate at least one aspect of your investigation. * Each section on poster has a clear heading and information is organized on the poster in a way that reflects how the information connects together. * Uses color, text, and illustrations to create an eye-catching display. * Includes acknowledgements of everyone who supported your experimental efforts * Includes sources cited in correct MLA format | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |

Overall Assessment

Project Process:

Technical Drawing or Schematic:

Description of Exhibit:

Science Involved:

Poster:

Name: Block

# 8th Grade Science Exhibition Project Rubric: Option 3 – Designing a Solution

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| **Project Components** | **Guidelines to follow in order to meet expectations:** | **Evaluation** |
| **Project Process** | * Project Intention Statement on time * Project proposal submitted on time * Project Proposal includes detailed work plan with both my dates and at least 2 internal deadlines you set for yourself. * Project proposal identifies situation you plan to work with * Initial Problem Exploration within your journal submitted on time * Initial Problem exploration includes at least 3 sources and at least 1-2 pages of detailed notes, with initial descriptions of user needs and constraints. * Initial Rough draft submitted on time * 2nd Draft completed on time | \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Identifying the Problem** | * Specific explanation is provided as to why this situation was the one you chose to work on. * To as much an extent as possible, “observe” the people involved with the situation as they interact with the situation. In other words, you *need to form and present a detailed picture of what it is like “being in that person’s shoes” in the situation*. For situations involving people you cannot observe and talk to, you will need to do research to develop this picture thoroughly. * Clearly identifies the key constraints for the situation that is being considered. This includes identifying what is NOT part of the problem to be worked on, as well as describing any built-in limitations (constraints) the situation creates, whether on available materials or resources, or anything else. * Includes a clear statement of the most important issue in the situation that your solution will attempt to address. You can include a list of additional issues you hope to address, but need to identify the top one. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Imagining Solutions** | * After sharing your description of the situation and the people involved in it to a group of at least 4 other people, lead that group in an open-ended brainstorm of ideas that might help in some way or another, without analyzing each idea as to how it might work. Have fun with this; get playful and let your imaginations soar, don’t worrying about constraints at this point. **Everything** gets written down, no ideas are bad ideas yet. A detailed description of this event should be on your poster, and you should include the people in your brainstorm in the acknowledgement section. You should also have evidence of the list of ideas generated (eg photograph of whiteboard or a list in your journal). * Spend a few days letting stuff spin around in the back of your mind. Then select the first 10 things you want to try from the list of ideas in your brainstorm or ideas you have had since then while thinking about the problem. Have this list of the first 10 ideas in your journal and on your poster. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Selecting a solution** | * Run through scenarios, either in actual practice or in your mind if you can’t actually try something, using each of the 10 different ideas (or combinations of them). Specifically, look at how each idea would interact with the people in the situation. Think about how each idea would work in relationship to the constraints of your situation. Think about how it would address the key issue or other issues. For each scenario, divide a piece of paper into two halves; jot down details of what seems like it would work on one half, and what seems like it wouldn’t work on the other half. Show evidence in your journal of this work. Let clearly bad ideas fail quickly. Spend more time thinking about the ideas that head off in a good direction. * Based on the results of doing the scenarios described above, select the most promising 2 or 3 ideas. If nothing is promising, go back to your original list and select a few more possibilities to run through a scenario. Present the list of the top 2-3 in your journal and on the poster. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Describing your solution** | * Clearly describe how your solution will connect back to the details of the people’s interaction with the situation. * Clearly describe how your solution fits within the constraints you identified * Clearly identify and describe any remaining issues that your solution does not successfully address. * Provide a detailed plan for what you would do next to test your solution, assuming you had the time and resources to test it in practice. * GOING BEYOND: Describe and evaluate solutions that other people are trying in similar situations to the one you worked on. This research should not occur until you are well into developing your own solution. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Poster** | * Has clear headings for each aspect of the process, and organizes the information on the poster in a way that reflects the process. * Includes everything described in the rubric. * Uses color, text, and illustrations to create an eye-catching display. * Includes acknowledgements * Includes sources cited following MLA format | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |

Overall Assessment

Project Process:

Defining the Problem:

Imagining Solutions

Selecting Solutions

Describing your Solution

Poster:

Name: Block

# 8th Grade Science Exhibition Project Rubric: Option 4 – Research on an

# Active Science Research Topic

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| --- | --- | --- |
| **Project Components** | **Guidelines to follow in order to meet expectations:** | **Evaluation** |
| **Project Process** | * Project Intention Statement on time * Project proposal submitted on time * Project Proposal includes detailed work plan with both my dates and at least 2 internal deadlines you set for yourself. * Project proposal includes statement of research area. * Initial research notes submitted on time. * Amount of research at this point includes good overview on your topic, with at least 2-3 pages of notes and at least 3 sources. * Rough draft submitted on time * Completeness/Quality of first draft * 2nd Draft completed on time | \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Research Context** | * Provide a detailed introduction to the broad research area your specific example falls into, explaining why researchers are interested in this topic (why is it relevant), and discussing the different types of research questions they are pursuing in relationship to this area of research. * Based on 3-4 good quality overview level sources | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Specific Research Example** | * A clear connection is made between the broader research context and this particular research question; that is, explain how your specific example connects to the overall research area described in the research context. * Describe the specific research question being pursued by your researcher/research group in their investigation. * Describe the basic research method (not necessarily a step by step procedure, but the main tasks the researchers do). * Describe what type of data they gather * Describe what their results are indicating * Describe what open questions/issues remain * Based on at least 1 technical source (such as a research journal) in which the nitty gritty details of a specific research investigation being done by a specific researcher or group of researchers is presented. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Conclusion** | * Summarizes the broader research context and how the specific research example is connected. * Summarizes the ongoing areas of inquiry in this area. * Provides the reader with suggestions of where they can learn more about this topic. | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |
| **Poster** | * Is more than just a board with the paper attached to it; should include color, text highlights, and illustrations to create an eye-catching display that pinpoint the broad area of research, key research questions, important findings, and open questions. * Includes acknowledgements * Includes sources cited according to MLA format | \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1  \_\_\_ 4 \_\_\_ 3 \_\_\_ 2\_\_\_ 1 |

Overall Assessment

Project Process:

Research Context

Specific Research Example:

Conclusion:

Poster: