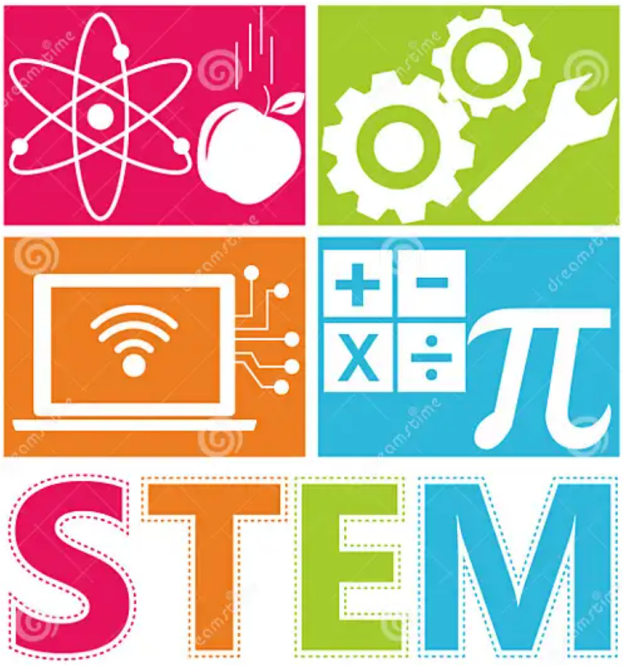
4th Grade
Science Fair Project



Name / Section

Archimedean Academy
2023-2024
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Science Fair Scholar Checklist

Working Plan	Timeline Due Date	Parent's Signature & Date	Teacher's Signature & Date
1. Share information, and packet with scholars, and parents. **Set up Orange Folder.**	Monday 10/2/23		
2. **Select 3 topics from the list provided**. • List them in your preference order. • Read through the question checklist, and circle "yes", or "no". • Sign, and ask your parent to sign, too. **(pg. 4)**	Friday 10/6/23		
3. Complete topic research. • Cite 3 or more resources. • **Write the Problem Statement (Testable Question**). • **Form a Hypothesis**. **(pg. 5, 6)**	Friday 10/13/23		
4. **Design an Experiment**: • Identify Variables. • List and collect Materials. • Write Procedures. • Create a Data Collection Table **(pg. 7, 8, 9)**	Friday 10/20/23		
5. **Perform Experiment**: • Collect Data • Take Pictures • Create a Graph. **(pg. 9)**	Friday 11/3/23		
6. Analyze Data: • Write Results • Compare Results to Hypothesis. • Write Conclusion • Write Application **(pg. 10, 11, 12)**	Friday 11/17/23		

7. **Write the Abstract, and Bibliography (pg. 14, 15)**	Monday 11/27/23		
8. **Create the PowerPoint and record the Video Presentation**	Monday 12/04/23		
9. **Turn in Science Fair Project** (Orange Folder & PowerPoint & Video)	Monday 12/04/23		

Science Fair Project Proposal Form

Topic – Option 1:

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Topic – Option 2:

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Topic – Option 3:

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Question Checklist:

Are the topics interesting enough to read about and work on for the next few weeks?	Yes / No
Can you find at least 3 sources of written information on the subject?	Yes / No
Can you design a "fair test" to answer your question (problem statement)? In other words, can you change only one variable test (independent/ manipulated) at a time, and control other factors that might influence your experiment, so that they do not interfere?	Yes / No
Can you measure the outcome/ dependent/ responding variable, which are the changes in response to the independent/ manipulative variable, using a number that represents a quantity such as count, length, width, weight, time, etc.?	Yes / No
Did you read the Science Fair Rules and Guidelines? Is your experiment safe to perform?	Yes / No
Will you be able to obtain all the materials and equipment you need for your Science Fair Project quickly, and at a very low cost?	Yes / No
Do you have enough time to do your experiment, and repeat it at least 2 more times, before the school Science Fair?	Yes / No

I have discussed the project problem statements and the checklist with my parent(s), and I am willing to commit to following through on this project.

Student Signature **Date**

I have discussed the project idea and the checklist with my child, and I believe he/ she can follow through with this project.

Parent Name & Signature **Date**

Science Fair Project Planning Form

Topic _____

Do Research to collect background information.

Directions: Write a brief summary of the background information. What are you going to investigate? What is the nature of this topic?

Bibliography for Resources

Directions: List all the resources you used for your background research; books, internet articles and websites, etc. You may NOT list any search engine as a resource (for example google.com). Please list the **URL** for each website you used in your research.

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Problem Statement (Testable Question): Form of a question, like "Does changing _____(**IV**) affect the _____(**DV**)?"

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Form a Hypothesis: An educated guess of what you think will happen. An "**If (IV), then (DV), because (rationale/reason)**"-statement.

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Experimental Design:

- **Variables:**
  - **Independent/ Manipulated Variable (IV):** What do I choose to change?

  - **Dependent/ Responding Variable (DV):** What do I measure?

  - **Control /Constant Variables (CV):** What do I keep the same in the experiment?

- **Materials:**
  Directions: Make a list of all the materials you will use, along the amounts of each material in metric units. **Use metric measurement tools only.**

- **Procedures:** Use a **step-by-step numbered list**. Each step should begin with an action verb, such as “take”, “pour”, “mix”, “add”, “place”, etc.

Data: Create a data table to collect and record data observed and measured during the experiment. **Remember to include all 3 trials and the average**.

Table Title_____

(Independent Variable = What you are testing/changing))	Trial 1	Trial 2	Trial 3	Average

Now you are ready to conduct the Experiment. Remember to take pictures and to repeat the experiment at least 3 times.

Graph: Make a graph to display the data collected and recorded on data table. (**Remember: DRy MIx**)

Results: Record collected data from the experiment in a **narrative summary form.**

Conclusion: Must be written as a paragraph(s), not in bullets or numbered.

Answer the following questions, *in paragraph format*, to complete the Conclusion:

1. **What was investigated?** (State the purpose of the experiment by describing the problem statement.)
2. **Was your hypothesis supported by the data?** (Write a statement as to whether the data supports or does not support the hypothesis including a restatement of the hypothesis.)
3. **What were the major findings?** (Describe the data collected that provides the evidence as to why the hypothesis was supported or not supported.)
4. **What possible explanations can you offer for your findings?** (Think about everything that may have affected your results.)

Application/ Extension: **Must be written as a paragraph(s), not in bullets or numbered.**

Answer the following questions, *in paragraph format*, to complete the Application:

1. **How can the investigation be improved?**
2. **What are some possible applications of the experiment?** (Describe how the findings from this investigation can be used in day-to-day life.)
3. **What questions has your experiment lead you to ask that could be tested in a new investigation.**

Abstract: Summary of your Science Fair Project

Write three or more paragraphs. Include what was being investigated and the hypothesis. Write about (summarize) the procedures followed in the investigation. Include information on the data and conclusions reached. Last write about your project's applications.

Bibliography:

Edit and add your bibliography from the pg. 6. Cite as follows:

- For a book, or magazine: “Jones, Jenny R. “Science Experiments to Try” Science Time, New York: Sterling Pub. Co., May 2004. Vol. 3:12-15
- For a Website: Helmenstine, Anne, About Chemistry Website, “http://chemistry.about.com, Oct. 4, 2005.
- For a conversation: Smith, John, Telephone Conversation, Oct. 15, 2021

ELEMENTARY SCIENCE, MATHEMATICS, ENGINEERING AND INVENTION FAIR

Project #: _____

Judge Number: _____

Directions:
Darken circles completely.
Tally total points.
Total Points: _____

RUBRIC FOR JUDGING INVESTIGATION PROJECTS

1. Abstract & Bibliography To what degree does the abstract and bibliography describe the project and support the research?	0 = No Abstract/No documentation of research 1 = Poorly written and one documentation 2 = Poorly written and two documentations of research 3 = Well-written but does not describe all components of the project 4 = Well-written and completely describes the project	⓪ ① ② ③ ④
2. Problem Statement To what degree is the problem statement new and/or different for a student at this grade level and how well is it written?	0 = No Problem Statement 1 = Incomplete Problem Statement 2 = Poorly written or not in a question form 3 = Complete well-written Problem Statement in question form 4 = Above expectations – detailed, well-written in question form	⓪ ① ② ③ ④
3. Hypothesis To what degree is this a testable prediction?	0 = No hypothesis 1 = Incomplete hypothesis 2 = Complete hypothesis, but not completely testable 3 = Hypothesis is well-written and testable 4 = Hypothesis is above expectations – detailed, well-written, testable	⓪ ① ② ③ ④
4. Procedures - Numbered step by step - Sentences begin with verbs - Quantities to measure are listed in metric units	0 = No overall procedural plan to confirm hypothesis 1 = Partial procedural plan to confirm hypothesis 2 = Sufficient procedural plan to confirm hypothesis 3 = Well-written plan, numbered step by step, sentences beginning with verbs 4 = Well-written as above and detailed including repeatability and specified measurements of materials used in experiment	⓪ ① ② ③ ④
5. How well are all variables recognized? -Test (independent/manipulated) -Outcome (dependent/responding) -Control (if applicable) -Constants	0 = No variables or constants are recognized 1 = Some variables or some constants are recognized 2 = All variables are recognized, but not all constants and controls (if applicable) or vice versa 3 = All variables & constants and controls (if applicable) are recognized 4 = All variables & constants and controls (if applicable) are clearly and appropriately recognized	⓪ ① ② ③ ④
6. Materials and Equipment Were the items: - listed in column form - equipment specifically named - metric units are used	0 = No materials identified or used 1 = Materials not specifically identified and/or used properly 2 = Materials specifically identified but used improperly 3 = Materials specifically identified in column form and used properly 4 = Materials specifically identified in column form & metric units used properly	⓪ ① ② ③ ④
7. Results To what degree have the results been interpreted?	0 = No written narrative interpretation of data 1 = Partial written narrative interpretation of data 2 = Correct written narrative interpretation of data 3 = Comprehensive narrative interpretation of data including averaging 4 = Comprehensive and significant interpretation of data above expectations	⓪ ① ② ③ ④
8. Conclusion To what degree are the conclusions recognized and interpreted? Including: - the purpose of the investigation - hypothesis supported/not supported - the major findings	0 = No problem statement or interpretation of data support for hypothesis identified 1 = Incomplete problem statement or interpretation of data support for hypothesis 2 = Correct/complete conclusion/interpretation of data support for hypothesis 3 = Well-written conclusion/interpretation of data support for hypothesis 4 = Well-written conclusion/interpretation of data support for hypothesis with major findings and possible explanations for them	⓪ ① ② ③ ④
9. Application To what degree are the applications recognized and interpreted? Including: -Improvements to the investigation - Use of the findings - New question(s) to be investigated	0 = No recommendations, applications, or new question recognized 1 = Incomplete or vague recommendations, applications, or new question recognized 2 = Apparent recommendations, applications, or new question recognized 3 = Recommendations, applications, and new question clearly recognized 4 = Significant well-written recommendations, applications, and new question recognized	⓪ ① ② ③ ④
10. Display Attributes: - free standing - correct grammar/ spelling - clear and legible - attractive visual display	0 = Unsatisfactory quality of display - more than three attributes are missing 1 = Poor quality of display - only two or three attributes are missing 2 = Average quality- only one attribute missing with minor errors and of fair quality 3 = Good quality – all attributes present and with few if any minor errors 4= Superior display – all attributes present and of exemplary quality	⓪ ① ② ③ ④
11. Oral Presentation or Interview -How clear, well prepared and organized is the presentation? -How complete is the student's understanding of the experimental work?	0 = Poor presentation; cannot answer questions 1 = Poor presentation; partially answers questions 2 = Fair presentation; adequately answers most questions 3 = Good presentation; precisely answers most questions 4 = Exemplary presentation and knowledge; precisely answers all questions	⓪ ① ② ③ ④