SPARK Research Proposal

Abstract (3-6 sentences)

An abstract is a short summary of your entire project. It should briefly explain what you are studying, what you observed or learned (including information you found online), and why your question is interesting or important.

A strong abstract:

- Introduces the topic of your project
- Clearly states your research question
- Mentions key ideas or information you learned from online sources
- Explains the goal or importance of the project

Your abstract should be written in full sentences and be easy to understand. Do not include long details or step-by-step instructions.

This project explores why soap bubbles pop faster in warm air than in cold air. I first observed that bubbles lasted longer when I played with them outside on a cooler day. To understand why this happens, I searched online and learned that soap bubbles are made of a thin layer of water and soap, and that heat causes water to evaporate more quickly. Using this information, this proposal explains how temperature may affect bubble lifespan and how this idea could apply to other real-world situations.

Research Question (1 sentence)

The research question is the main question your project is trying to answer. It should be clear, specific, and testable. Your question should focus on one main factor and explain what you are studying and what you are measuring or observing.

A strong research question:

- Is written as one complete sentence
- Can be answered using observations, data, or an experiment
- Is not too broad or too vague

Example sentence starters:

- How does ___ affect ___?
- What happens to ___ when ___?

How does air temperature affect how long soap bubbles last before popping?

Background (4-7 sentences)

The background section explains what you already know about your topic and what you learned from observing or researching it online. This is where you show that you tried to understand your topic before designing your project.

A strong background:

- Describes what you observed in real life or learned in class
- Explains key ideas you learned from websites, videos, or books
- Uses your own words to summarize information
- Helps explain background information to your Research Question

DO NOT copy and paste information from the internet. Focus on the most important ideas that helped you understand your topic.

I became interested in this topic after noticing that bubbles popped very quickly on a warm day but lasted longer on a cold day. I searched online to learn more about bubbles and found that they are made of a thin film of water and soap. I also learned from science websites and videos that higher temperatures cause water to evaporate faster. Since bubbles rely on a thin layer of water, this information suggests that temperature could play an important role in how long bubbles last.

Hypothesis (1-3 sentences)

A hypothesis is your prediction about what you think will happen in your project. It should be based on what you observed and what you learned from online research.

A strong hypothesis:

- Clearly states what you think will happen
- Explains why you think it will happen
- Apply information you learned in the background section to make an educated guess

Sentence starter you can use:

- If ___, then ___, because ___.

If the air temperature is higher, then soap bubbles will pop faster because heat increases the rate of evaporation, which causes the water in the bubble's thin film to disappear more quickly.

Proposed Method (3-6 Sentences)

The proposed method explains how you would test your idea. It should describe what you plan to change, what you plan to keep the same, and how you will measure or observe results. Your method should be fair, safe, and realistic.

A strong proposed method:

- Explains the steps of the experiment in order
- Shows how online research helped you design a fair test
- Identifies variables you will change and control
- Describes how results will be measured or observed

Write in full sentences and focus on your plan, not the final results.

To test this idea, I would blow soap bubbles using the same bubble solution in two different environments: one warm room and one cooler room. Before planning this experiment, I looked online to learn how scientists keep experiments fair. Based on what I learned, I would keep the type of bubble solution, the method of blowing bubbles, and air movement the same. I would only change the air temperature. I would then use a timer to measure how long each bubble lasts before popping.

Data Collection & Analysis (2-5 Sentences)

This section explains how you would record your results and how you would make sense of them. It should show that you understand how data helps answer your research question.

A strong data collection and analysis section:

- Describes what data you will collect (numbers, measurements, or observations)
- Explains how the data will be organized, such as in a table or chart
    - Describe columns/rows, axis titles (if applicable)
- Shows how online learning helped you understand fair testing or data reliability
- Explains how you would compare or analyze results

Use clear sentences and focus on how the data helps answer your question.

I would record how long each bubble lasts in seconds and write the results in a table. I learned online that scientists often repeat experiments to make results more reliable, so I would test multiple bubbles in each environment. I would then calculate the average bubble time for warm and cool air and compare the results to see how temperature affects bubble lifespan.

Challenges or Limitations (Optional)

This section asks you to think about problems you might face if you were to carry out your project. Scientists do this to plan better experiments.

A strong response:

- Identifies at least one possible issue or limitation
- Explains briefly why it could be a problem
- Shows that you are thinking ahead

Examples of issues: Difficulty controlling variables / Limited tools or materials / Measurement errors
You do not need to solve the problem. Just explain what it might be.

One challenge in this project could be controlling air movement, since even small breezes could cause bubbles to pop faster. Another limitation is that bubbles do not always form the same size, which could affect how long they last and make results less accurate.

Potential Applications (Optional)

This section explains how what you learned could be useful in real life or connected to other ideas. It is optional and meant to show extra thinking and curiosity.

A strong potential applications section:

- Connects your topic to everyday life, technology, or science
- Explains how the idea could be used or explored further

Is realistic and based on what you learned. You may use words like could, might, or may. This section does not need to be long.

By researching bubbles online, I learned that thin liquid films are used in many areas of science and engineering. Understanding how temperature affects bubbles could help explain how heat affects things like soap films, paints, or other liquids that dry over time. This research could be useful for improving bubble machines or for learning more about evaporation in everyday materials.

References (MLA Format)

Zubrowski, Bernie. “Bubbles.” *Science World*, 2016, https://www.scienceworld.ca/resource/bubbles/. Accessed 12 January 2026.