STEM 101
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Name: _____
Period: _____

WRITING TEMPLATE: TECHNICAL ANALYSIS REPORT

TITLE: COMPARATIVE ANALYSIS OF SENSOR TECHNOLOGIES IN AUTONOMOUS VEHICLES

STUDENT NAME: _____
DATE: _____

I. Introduction

- State the purpose of your report.
- Introduce the sensors you will compare (at least three).
- Briefly explain why sensor technology is essential for robotic or self-driving cars.

Example Starter:
This technical analysis compares several sensor technologies used in autonomous vehicles, including _____, _____, and _____. These sensors are critical for helping robotic systems detect obstacles, measure distance, and navigate safely.

II. Sensor Overview and Functions

Sensor Type	How It Works
Infrared Sensor	
Ultrasonic Sensor	
LiDAR	
Camera / Vision System	
Radar	
GPS / Gyroscope	

Add rows or remove as needed.

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III. Comparative Analysis

Use this section to compare your selected sensors in detail.

Guiding Prompts:

- Which sensors have the greatest range or accuracy?
- Which are most cost-effective or environmentally adaptable?
- How do these sensors work together in a robotic car?

Example Starter:
LiDAR and camera systems both provide visual data, but LiDAR offers more precise 3D mapping, while cameras deliver detailed color recognition. In contrast, ultrasonic sensors are best for short-range detection during parking or low-speed navigation.

IV. Evaluation of Strengths and Limitations

Sensor Type	Advantages	Limitations
LiDAR		
Ultrasonic		
Camera		

V. Conclusion and Recommendation

Summarize your findings and make a final recommendation.

Guiding Prompts:

- Which sensor or combination of sensors provides the best overall performance?
- Why is using multiple sensors beneficial for safety and precision?

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Example Starter:
Based on this analysis, the most effective configuration for autonomous vehicles combines _____ and _____ sensors. This combination ensures accuracy in distance detection and strong environmental awareness under varying conditions.

VI. TECHNICAL VOCABULARY USED

List at least three technical terms from your research and define them in your own words.

Term	Definition (in your own words)