

UNIT: AUTONOMOUS VEHICLE

ACT-BASED WRITING: WRITING A RESEARCH SUMMARY

Here are **ACT-aligned writing activities** for the Robotic Car Kit that help students develop real-world communication skills by explaining speed and distance calculations, interpreting sensor data, and evaluating motion patterns. Through writing tasks that involve organizing technical information, supporting claims with evidence, and analyzing robotic performance, students build the clarity, argument development, and analytical writing skills emphasized on the ACT Writing section.

OBJECTIVE:

Students will summarize research on robotic car technology.

MATERIALS NEEDED:

- Research articles

STUDENT DIRECTIONS:**Goal:**

Students will read, synthesize, and summarize research articles about autonomous vehicle technology, building analytical writing skills aligned with ACT standards.

Step 1: Select and Annotate Research Articles

1. Students will be given **1–2 articles** related to robotic car technology. These should be at an appropriate reading level and contain clear findings, data, or expert conclusions.
2. As they read, students should:
 - **Highlight or annotate** key ideas, supporting evidence, and conclusions.
 - Use margins or sticky notes to **paraphrase complex sections**.
 - Identify **technical vocabulary** that supports understanding (e.g., “sensor fusion,” “navigation algorithm”).

Step 2: Organize the Main Points

1. Students use a **research summary organizer or outline** to structure their notes under these headings:
 - **Topic / Title of Article**
 - **Main Idea / Research Purpose**

- **Key Findings**
 - **Evidence or Data Cited**
 - **Conclusions / Implications**
2. Encourage students to **summarize in their own words** and avoid copying full sentences.

Step 3: Draft the Research Summary

1. Using the organizer, students write a **summary paragraph or 1-page report** that includes:
 - **An effective introductory sentence** (see ACT question for a model)
 - 2–3 sentences outlining the **research purpose and findings**
 - 1–2 sentences on **implications or applications** (e.g., “This research suggests that autonomous vehicles could reduce accidents caused by human error.”)
 - Clear transitions and logical flow
2. Reinforce the following:
 - **Avoid personal opinions or vague language**
 - Keep the tone **objective and formal**
 - Cite the source by title or author if possible

Step 4: Peer Review and Revisions

1. In pairs, students exchange summaries and use a **peer checklist** to assess:
 - Does the summary capture the core message of the article?
 - Are details accurate and paraphrased effectively?
 - Is the summary clear, concise, and well-organized?
 - Are there grammar or clarity issues?
2. Students then revise their drafts based on feedback.

Optional Step 5: Connect Summary to Hands-On Work

1. As an extension, ask students to **relate the research summary** to the robotic car they’ve built or programmed in class:
 - “How does this research apply to the sensors in our robotic cars?”
 - “What are some ways our project demonstrates the technology described in the article?”
2. This strengthens transfer from reading to real-world STEM practice.

ACT-STYLE QUESTION:

- Which of the following is the most effective way to introduce a research summary on autonomous vehicles?
 - A. "Autonomous vehicles are cool and exciting, and many people are talking about them nowadays."
 - B. "Autonomous vehicles use advanced sensors and AI technology, leading researchers to study their impact on transportation safety and efficiency."
 - C. "Some cars can drive themselves now, and this is a big change from how things used to be."
 - D. "The future of transportation will be completely different because of all the new technology being developed."

⚡ Why These Activities and Questions Matter

By engaging in writing-based tasks connected to the Robotic Car Kit, students:

- ✓ Explain real-world systems involving speed, distance, and sensor-based movement through clear, structured writing.
- ✓ Develop arguments about robotic efficiency using data collected from experiments and trials.
- ✓ Strengthen writing skills by organizing evidence, analyzing outcomes, and evaluating multiple perspectives related to robotics and engineering design.

These writing-focused tasks mirror the ACT Writing emphasis on logical organization, clarity of ideas, and evidence-based argumentation—preparing students to succeed on the ACT and communicate effectively in STEM careers.