UNIT: AUTONOMOUS VEHICLE

ACT-BASED ENGLISH: UNDERSTANDING SENSOR TECHNOLOGY IN ROBOTICS

Here are ACT-aligned language and editing activities for the Robotic Car Kit that help students strengthen real-world communication skills by clearly explaining measurements, analyzing speed and distance calculations, adjusting ratios and proportions, and interpreting data related to sensor readings, motion paths, and acceleration tracking.

OBJECTIVE:

Students will read and interpret technical texts on robotic sensors.

MATERIALS NEEDED:

- Articles on sensor technology
- Reading guides

STUDENT DIRECTIONS:

Goal:
To improve technical reading and writing skills by analyzing sensor technology in autonomous vehicles. Students will identify key vocabulary, understand sensor functions, and summarize how these technologies support robotic navigation systems.

Reading Guides:

Step 1: Read a Technical Article on Sensor Systems

Read the provided article or excerpt about sensors commonly used in robotic or autonomous vehicles. These might include:
- **Infrared Sensors**
- **Ultrasonic Sensors**
- **LiDAR**
- **Cameras**
- **Gyroscopes**
- **GPS Modules**

As you read:
- **Underline** technical terms and definitions.
- **Highlight** key functions and real-world examples.
- **Annotate** where each sensor is located on the robotic car and how it helps with decision-making (e.g., obstacle detection, turning, braking, or parking).
- **Mark** any unfamiliar vocabulary and use context clues or a glossary to define them.

Tip: Use active reading strategies—write questions in the margins like "What does this sensor detect?" or "Why is this sensor important?"

Step 2: Identify Key Sensor Terms and Their Functions

After reading, create a vocabulary chart that lists **at least 5 technical terms** from the article. Structure your list as a T-chart or table:

Sensor Term	What It Does
Infrared Sensor	Detects nearby objects using reflected light; helps avoid obstacles.
Gyroscope	Measures orientation and balance to keep the robotic car stable.

- Use **your own words** to explain the function of each sensor.
- Include any visual notes or sketches if it helps you remember the concept.

 Optional Extension: Group sensors by function—e.g., "Obstacle Detection," "Navigation," "Positioning."

Step 3: Write a Summary of Sensor Use in Robotic Cars

In a clear paragraph (3–5 sentences), explain **how and why sensors are essential** for robotic navigation. Your summary should:
- Identify the role of sensors in **preventing collisions, guiding movement, and adjusting behavior.**
- Describe how **multiple sensors work together** (e.g., an infrared sensor detects a wall, while a gyroscope stabilizes the car as it turns).
- Use at least **two key vocabulary terms** from your list in your explanation.

Keep your writing precise and technical, as if you are preparing documentation for a robotic engineer or designer.

ACT-STYLE QUESTION:

- What is the primary function of an infrared sensor in a robotic car?

  A. To measure temperature
  B. To detect obstacles
  C. To increase speed
  D. To control sound

⚡ Why These Activities and Questions Matter

By engaging in structured activities connected to the Robotic Car Kit, students:

✅ Practice communicating technical ideas clearly, such as describing how speed, distance, and time interact in real-world systems.
✅ Strengthen their use of precise language when explaining data from robotic sensors and movement analysis.
✅ Develop editing and revision skills by interpreting graphs, refining procedural explanations, and evaluating informational clarity.

These hands-on, robotics-based tasks support the ACT English focus on effective communication, logical structure, and clarity of expression—helping students succeed on the ACT and in future STEM writing and technical documentation.