

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Scenario**

Consider a car that is initially moving on a straight roadway. The road may be an uphill road, a downhill road, or a flat road. The driver of the car may be pressing the gas pedal, the brake pedal, or neither pedal. The only energy transformations that can take place are chemical energy becoming mechanical energy (when the gas pedal is pressed) and mechanical energy becoming thermal energy (when the brake pedal is pressed). (Chemical energy levels may be thought about as the level of the gas gauge.)

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**Data Analysis**

For each situation, fill in the sentence explaining how each system's mechanical energy is changing, create an energy bar chart representing the energy transformation, and use the blank space to explain how you formulated your answers.

**PART A:** The car is traveling downhill while the driver presses the gas pedal.

The mechanical energy of only the car is \_\_\_\_\_

\_\_\_\_\_ while the mechanical energy of the car-Earth system is \_\_\_\_\_.

Complete the bar charts to show the energy of the car-gas-Earth system as the car travels from the top of the hill to the bottom of the hill while pressing the gas.

Explain how you formulated your answers.

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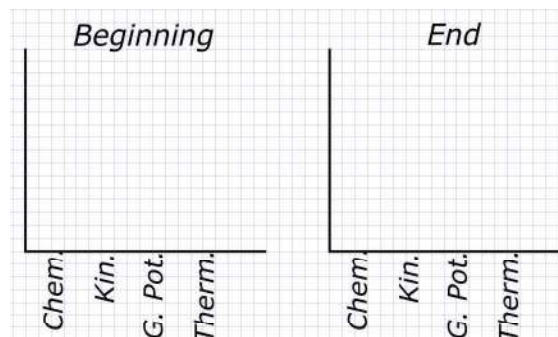
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**PART B:** The car is traveling uphill while the driver presses neither pedal.

The mechanical energy of only the car is \_\_\_\_\_

\_\_\_\_\_ while the mechanical energy of only the car-Earth system is \_\_\_\_\_.

Complete the bar charts to show the energy of the car-gas-Earth system as the car travels from the bottom of the hill to the top of the hill.

Explain how you formulated your answers.

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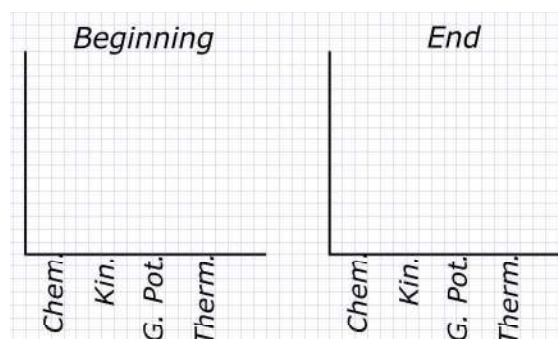
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## 4.K Energy in Systems

**PART C:** The mechanical energy of only the car is constant and the mechanical energy of only the car-Earth system is decreasing. The car is traveling on a road that is \_\_\_\_\_ and the driver is pressing on

\_\_\_\_\_.

Complete the bar charts to show the energy of the car-gas-earth system for this scenario.

Explain how you formulated your answers.

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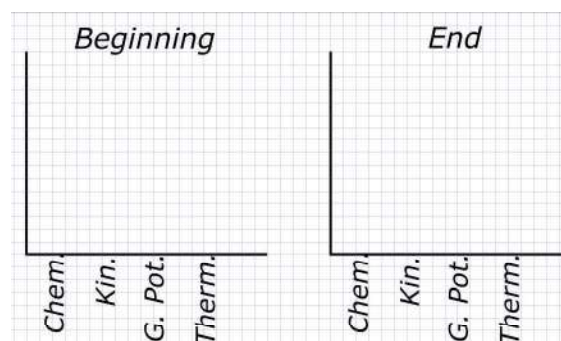
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**PART D:** The mechanical energy of only the car is decreasing and the mechanical energy of only the car-Earth system is increasing. The car is traveling on a road that is \_\_\_\_\_ and the driver is pressing on

\_\_\_\_\_.

Complete the bar charts to show the energy of the car-gas-earth system for this scenario.

Explain how you formulated your answers.

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