

Name _____

Electric Cars Estimation Word Problems Answer Key

1. The electric car has an estimated range of 240 miles ($4 \text{ miles/kWh} \times 60 \text{ kWh}$) with a 60-kWh battery.
2. It takes approximately 4 hours ($30 \text{ miles/hour} \times 60 \text{ minutes/hour} \times 0.6 \text{ charging time}$) to charge the electric car from 20% to 80%.
3. The cost to fully charge the electric car is approximately \$9 ($75 \text{ kWh} \times \$0.12/\text{kWh}$).
4. The total energy capacity of the fleet is approximately 500 kWh ($10 \text{ cars} \times 50 \text{ kWh/car}$).
5. The electric car saves approximately 766 kilograms of CO₂ emissions ($10,000 \text{ miles} / 30 \text{ miles per gallon} \times 2.3 \text{ kilograms of CO}_2 \text{ per gallon}$) compared to the gasoline car.
6. The city needs approximately 100 charging stations ($1,000 \text{ electric cars} / 10 \text{ cars per charging station}$) for 1,000 electric cars.
7. The energy lost as waste heat is approximately 40 kWh ($100 \text{ kWh} \times (1 - 0.80)$) for a 100-kWh battery used to travel 200 miles.
8. The Level 1 charger requires approximately 25 hours ($100 \text{ miles} / 4 \text{ miles per hour}$) to gain 100 miles of range, while the Level 3 charger requires 1 hour ($150 \text{ miles} / 150 \text{ miles per 30 minutes}$) to gain 100 miles of range.
9. The remaining capacity of the battery is approximately 90% ($100\% - 5 \text{ years} \times 2\% \text{ per year}$) of the original capacity, which is 45 kWh ($90\% \times 50 \text{ kWh}$).
10. The city needs approximately 100 charging stations ($500 \text{ electric cars} / 100 \text{ cars per 20 charging stations}$) for 500 electric cars.

