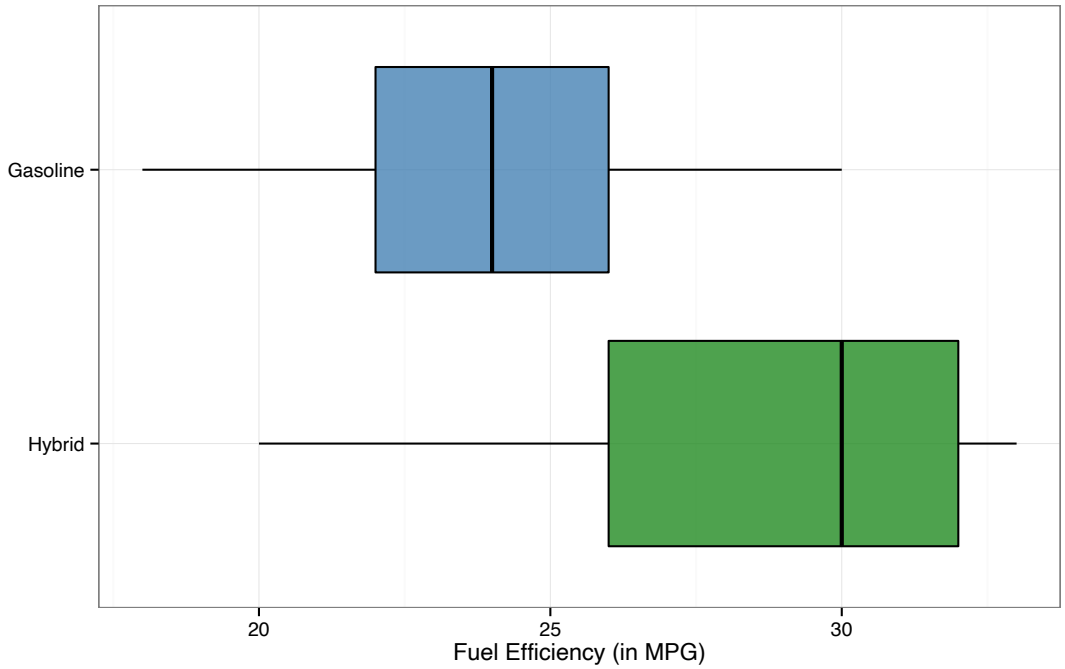
Name:_____ Date:_____

Comparing Fuel Efficiency with Boxplots

Background:

Data were collected on 50 cars – some were hybrids and others were regular gasoline vehicles. The fuel efficiency, in miles per gallon (MPG), is displayed in the boxplots below for each type of vehicle.



Question:

Based on the boxplots, which type of car has better fuel efficiency? Use your knowledge of shape, center, and spread to justify your response.

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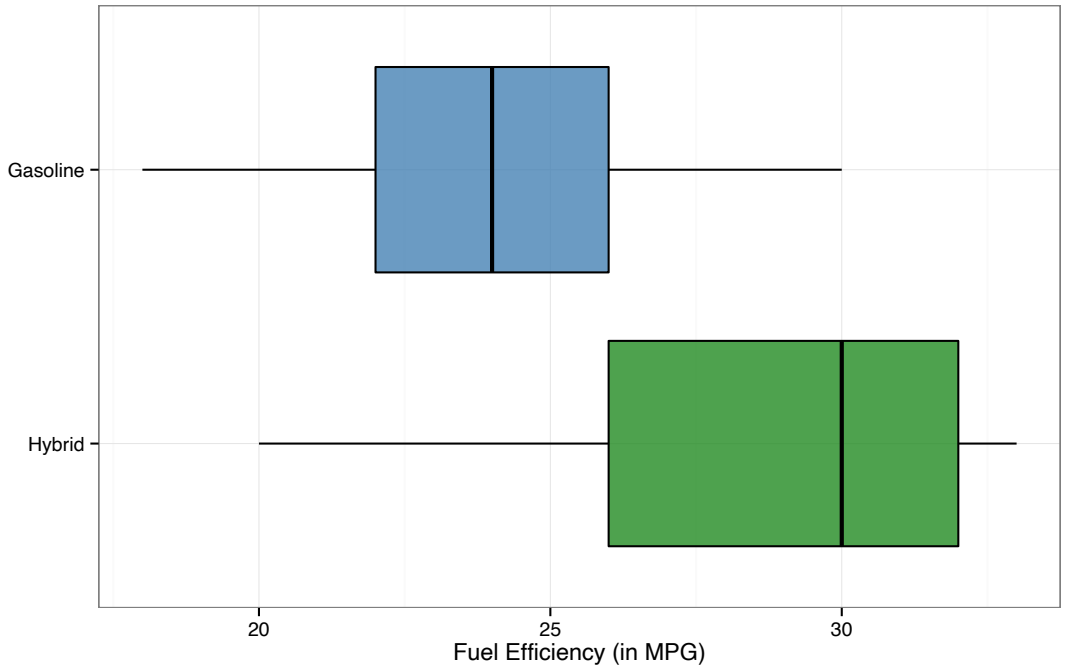

Question:

Based on the boxplots, which type of car has better fuel efficiency? Use your knowledge of shape, center, and spread to justify your response.

Possible Solutions:

The shape of the Gasoline distribution is symmetric while that of the Hybrid distribution is left-skewed. The center, in this case median, of the Gasoline distribution appears to be 24 MPG while that of the Hybrid distribution is 30 MPG. In terms of spread, 50% of the Gasoline data appears to be between 22 MPG and 26 MPG with an overall range of 18 to 30 MPG, while for Hybrid vehicles 50% of the data appears to be between 26 MPG and 32 MPG with an overall range of 20 to 33 MPG.

Using this information, one could argue that Hybrid vehicles have better fuel efficiency. 30 MPG is the median of the Hybrid vehicles while also being the max MPG of the Gasoline vehicles. So, 50% of our sample of Hybrid vehicles are getting better fuel efficiency than all of the Gasoline vehicles in our sample. When comparing spread, the middle 50% of Gasoline vehicle MPG, 22 to 26 MPG, is below that of Hybrid vehicle MPG, 26 to 32 MPG. In addition, if we look at the overall range, Hybrid vehicles have a higher minimum, 20, and maximum, 33, than that of Gasoline vehicles, 18 and 30, respectively.