

### ACTIVITY 3: HEV Fuel Economy

**Activity Objective:** Create a chart showing the fuel economy efficiencies of HEVs vs. PHEVs

**Definition:** A plug-in hybrid electric vehicle (PHEV) is a vehicle that is designed to be plugged into an electrical outlet at night to charge the batteries. By charging the batteries in the vehicle, it can operate using electric power alone (stealth mode) for a longer time, thereby reducing the use of the internal combustion engine (ICE). The less the ICE is operating, the less fuel is consumed and the lower the emissions. Some PHEVs offer the driver an option to use the ICE first then switch to EV mode (electric only) later in the trip. This option is commonly used where the driver is first traveling on the highway and uses the ICE to propel and the vehicle saving the energy in the battery to be used when arriving in the city.

A hybrid electric vehicle (HEV) vehicle is one that uses two different methods to propel the vehicle. A hybrid electric vehicle uses both an internal combustion engine and an electric motor to propel the vehicle. In 1901, Ferdinand Porsche developed the Lohner-Porsche Mixte Hybrid, the first gasoline-electric hybrid automobile in the world. It was originally an electric-powered vehicle and then a gasoline engine was added to recharge the battery. One of the first hybrid electric car was produced by the Owen Magnetic Motor Car Corporation, manufactured in New York City and then in Wilkes-Barre, PA, from 1915 until 1922. It failed because the fuel economy was about the same as a conventional gasoline powered vehicle yet cost more. Another vehicle that used both a gasoline engine and an electric motor to power the vehicle was built by Woods Motor Company of Chicago, Illinois, and was called the “Woods Dual Power” (1915–1918).

#### REVIEW VIDEOS:

LO: What is range anxiety: Range anxiety and how to get over it Rating:

<https://www.youtube.com/watch?v=cYyEwE1Mvqs>

**Materials:** Chapter 7, paper, computer, printer, Internet Access, graphing software like MS Excel or Visio

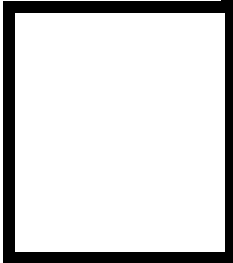
#### Procedure:

1. Research the fuel economy of HEV and PHEV types.
2. Create a graph showing HEV vs. PHEV fuel economy.
3. Determine which of these vehicles offers the greatest advantage for sustainability.



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4 World-Class Learner	3 Proficient Learner	2 Developing Learner	1 Emergent Learner
Learner at this level has gone beyond mastery of knowledge, skills, & attitudes described in project. World-class learner consistently exhibits high-quality performance.	Learner at this level has had opportunities to apply knowledge, skills, & attitudes of component of project. Proficient learner has mastered essential attributes, thus proving mastery.	Learner at this level has been exposed to & had opportunity to apply knowledge, skills, & attitudes of project. Developing learner may have only a few essential attributes to master before mastery.	Learner at this level may or may not have been exposed to knowledge, skills, & attitudes required by academic standards of the project.



- 1= Emergent Learner
- 2 = Developing Learner
- 3 = Proficient Learner
- 4 = World-Class Learner