

ACTIVITY 2: Classification & Levels of HEVs

Activity Objective: Create and fill a table that shows the classifications and levels of HEV (Hybrid Electric Vehicles) to include mild, medium hybrid, full hybrid, and series, parallel, series-parallel (combination), and plug in Hybrids (PHEV) and create a power point presentation on your table.

Definition: A mild hybrid will incorporate idle stop and regenerative braking but is not capable of using the electric motor to propel the vehicle on its own without help from the internal combustion engine. A mild hybrid system has the advantage of costing less, but saves less fuel compared to a full hybrid vehicle and usually uses a 42-volt electrical motor and battery package (36-volt batteries, 42-volt charging). An example of this type of hybrid is the General Motors Silverado pickup truck plus the Saturn VUE and Chevrolet Malibu. The fuel savings for a mild type of hybrid design is about 8% to 15%.

A medium hybrid uses 144- to 158-volt batteries that provide for engine stop/start, regenerative braking, and power assist. Like a mild hybrid, a typical medium hybrid is not capable of propelling the vehicle from a stop using battery power alone. Examples of a medium hybrid vehicle include the Honda Insight, Civic, and Accord. The fuel economy savings are about 20% to 25% for medium hybrid systems.

A full hybrid, also called a strong hybrid, uses idle stop regenerative braking and is able to propel the vehicle using the electric motor(s) alone. Each vehicle manufacturer has made its decision on which hybrid type to implement based on its assessment of the market niche for a particular model. Examples of a full or strong hybrid include the Ford Escape SUV, Toyota Highlander, Lexus RX400h, Lexus GS450h, Toyota Prius, and Toyota Camry. The fuel economy savings are about 30% to 50% for full hybrid systems.

REVIEW VIDEOS:

Hybrid Car Facts: Pros and Cons www.youtube.com/watch?v=IY33vMmCWP0

How a hybrid system works <https://www.youtube.com/watch?v=m2qvGJwTuBo>

PHEV animation <https://www.youtube.com/watch?v=lrQ9h7OKGLE>

Hybrid Cars Explained: 3:43

Difference between Hybrid and Electric: 1:02

Materials: Chapter 8, paper, computer, printer, Internet Access

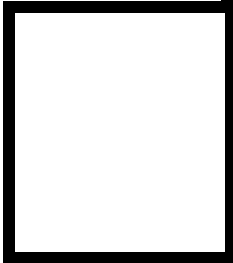
Procedure

1. Work as partners or small teams.
2. Review the above videos.
3. Research and brainstorm the different types HEVs and plug in hybrids like the Chevy VOLT or BOLT.
4. Based on the text in chapter 8 and the Internet search create and fill in a table that shows the classification and levels of HEV types.
5. Create a Power Point presentation on the table you created.



RUBRIC

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