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Transportation Fuels Debate Worksheet

Gasoline		Fact	Pro	Con
1	Gasoline is a petroleum-based fossil fuel made of hydrogen and carbon.			
2	The chemical formula for gasoline is C8H15-18.			
3	Petroleum is a nonrenewable source of energy.			
4	About forty-two percent of crude oil is refined into gasoline in the U.S.			
5	The octane rating for gasoline is 84 to 93.			
6	Gasoline has a high energy content of 116,000 Btu/gallon.			
7	More than 99 percent of the vehicles in the U.S. use petroleum-based fuels.			
8	The U.S. has a vast infrastructure of refineries, pipelines, and filling stations to distribute gasoline efficiently and conveniently.			
9	The U.S. imports about one-half of the crude oil it uses from other countries.			
10	There are about 159,000 gasoline fueling stations in the U.S.			
11	There are about 246 million cars in the U.S. that use gasoline.			
12	The average gasoline-powered vehicle travels 12,000 miles per year.			
13	Vehicles that use petroleum-based fuels emit air pollutants.			
14	In the last 50 years, gasoline-powered vehicle emissions have decreased an average of 95 percent.			
15	In many metropolitan areas, vehicles contribute about half of the air pollution.			
16	Almost half of the people in the U.S. live in areas that do not meet air quality standards.			

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	Hybrid Electric	Fact	Pro	Con
1	Hybrid vehicles have two power sources—an energy conversion unit (such as an internal combustion engine) and an energy storage device (such as a battery).			
2	The typical hybrid on the market today has a gasoline-powered engine and an electric motor with a battery.			
3	Hybrid electric vehicles (HEVs) can have either a series or parallel design.			
4	In a parallel design, the engine and motor are connected directly to the vehicle's wheels. The primary engine is used for highway driving; the electric motor provides added power during periods of high demand.			
5	In a series design, the primary engine is connected to a generator that produces electricity. The electricity charges the batteries and drives a motor that powers the wheels.			
6	HEVs can function as purely electric vehicles for short trips, using the internal combustion engine only when longer range or more power is required.			
7	HEVs can get 1.5 times the fuel economy of comparable conventional vehicles.			
8	HEVs have generators powered by the internal combustion engines to recharge the batteries when they are low.			
9	HEVs have regenerative braking systems that capture excess energy when the brakes are engaged. This recovered energy is also used to recharge the batteries.			
10	HEVs reduce air pollutants by one-third to one half over gasoline-powered vehicles.			
11	HEVs have a higher purchase price than comparable gasoline-powered vehicles.			
12	Tax incentives and superior fuel economy produce savings over the life of the vehicles to make them competitive with gasoline-powered vehicles.			
13	Today, there are over 30 hybrid models available to consumers, from many of the major auto manufacturers. Hybrid vehicles range from 2-seats, 4 and 5 seat sedans, SUVs, and even light duty trucks.			
14	HEVs on the market today average 40-60 mpg and can travel 500-700 miles on one tank of gasoline.			
15	Plug-in hybrid vehicles used in an urban setting may allow people to make their daily commute using electricity.			

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	Hybrid Electric	Fact	Pro	Con
1	Hybrid vehicles have two power sources—an energy conversion unit (such as an internal combustion engine) and an energy storage device (such as a battery).			
16	Hybrids use established gasoline fueling stations.			

	Electricity	Fact	Pro	Con
1	Electricity can be produced by many sources of energy.			
2	Electric vehicles must have batteries that can be discharged and recharged repeatedly.			
3	Most batteries cannot store large amounts of electricity, so electric vehicles must carry several batteries.			
4	In some electric vehicles, the batteries constitute half the weight of the vehicle.			
5	The batteries in electric vehicles must be replaced every three–six years.			
6	A typical electric vehicle can travel 50-130 miles between charges.			
7	Weather conditions, terrain, and accessory use can reduce the range of an electric vehicle.			
8	Electric vehicles are best suited for neighborhood vehicle use, for consumers going short distances at 35 mph or less.			
9	Extensive research is ongoing to develop longer-lived batteries that will also extend the range of electric vehicles.			
10	Electric vehicles produce no tailpipe emissions.			
11	Some power plants—such as coal-fired plants—that generate electricity produce air pollution and emit carbon dioxide.			
12	It is easier to control the emissions from power plants than from vehicles.			
13	Electric vehicles are low maintenance; they require no tune-ups, oil changes, water pumps, radiators, injectors, or tailpipes.			

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	Electricity	Fact	Pro	Con
1	Electricity can be produced by many sources of energy.			
14	Electric vehicles can be recharged at home at night when electricity rates and demand are low.			
15	Today, there are 9,980 electric charging units at publc electric refueling stations.			
16	Consumers who drive electric vehicles often receive tax incentives.			