Energy Facts and Figures

Assignment in addition to the basic Lifestyle Project
During the first week of the Lifestyle Project, find two tasks that you normally do. For each task, determine the energy requirements, water use or garbage output, if applicable. Do these tasks require large inputs of energy or create a lot of waste? Or are you surprised by how little energy a given task requires? You may need to do a bit of background research to determine the energy needs of various appliances or tasks. Ask your lab instructor if you need help. Turn in these figures, and your response to the figures in your first week's Lifestyle Project journal.

Hot shower
The shower uses up to 5 gallons of water per minute. It takes 440 Btu to heat one gallon of water, or 2200 Btu per minute. Thus, a 10 minute shower uses 50 gallons of water and 22,000 Btu of energy. A 20-minute shower uses a whopping 44,000 Btu!

How about a bath? It takes about 35 gallons to fill the bathtub. This would require 15,400 Btu, and is equivalent to a 7 minute shower. So if you want a long, hot soak, taking a bath uses less water and energy than a long shower.

Stereo
An average stereo uses 80 watts. To find out how much energy your stereo requires, look on the labels on the back. You should find a number followed by a "W." For instance 150W would mean 150 watts. Some appliances give the energy requirement in amps (for example 1.5 A). To convert amps to watts, multiply by 120 (1.5 amps x 120 volts = 180 watts). Let's say you listened to your 80 watt stereo for 2 hours. This would be 160 watt-hours. If you divide watt-hours by 1000, you get kilowatt hours, and 3412 Btu is equivalent to one kilowatt hour.

80 watts x 2 hours = 160 watt-hours
160 watt-hours/1000 = 0.16 kilowatt-hours
0.16 kilowatt-hours x 3412 Btu/kilowatt-hour = 546 Btu

So you can see that a ten minute shower uses much more energy than 2 hours of stereo playing.

Laundry
It takes 40 gallons of water to do one load of laundry. One thing you can do to minimize water use is to run only large, full loads of laundry. You can reduce your energy use by choosing cooler water. Remember that it takes 440 Btu to heat one gallon of water. If you wash and rinse your laundry with hot water, this would require 17,600 Btu. If you use warm water, you could cut this number in half, or 8,800 Btu. If you use cold water, no energy is required to heat the water. The "bright colors" cycle on campus washing machines is the cold cycle.

Cars
Each gallon of gasoline is equivalent to 125,000 Btu. How much energy does it take to drive from Skidmore to Stratton Mt. Vermont for a day of skiing? This depends on the fuel efficiency of your car.

In Table I, you will see a sampling of EPA fuel economy estimates for the 2003 model year. The some of the information was gathered on the web by going to the manufacturer's web page. Interestingly, some manufacturer's web pages do not include EPA gas mileages. In some cases specific models, do not put the EPA gas mileages on their web pages. Guess why! The best resource is the EPA web page: http://www.fueleconomy.gov

So if it's 62 miles from here to Stratton and you're driving a Chevy Blazer, let's say you'll get 20 miles/gallon (the average between city and highway miles). The 124 mile round trip will use 6.2 gallons of gasoline and 775,800 Btu. The same trip in a Honda Civic will use 3.1 gallons of gasoline and 387,500 Btu. The gluttonous Chevy Suburban will need 7.75 gallons and nearly 1,000,000 Btu to make the journey.

Over the life of a car, the fuel economy makes a very large difference in the amount of gasoline used. Let's compare a Jeep Grand Cherokee with a Volvo station wagon over the life of the car. These cars are comparable in term of passenger and cargo space. Assume that both cars will last for 100,000 miles (which raises another issue over the longevity of some cars over others). The Volvo will require 4,081 gallons of gasoline. To drive the same 100,000 miles the Jeep will consume 6,250 gallons -- considerably more! You could save 2,169 gallons by buying a Volvo instead of a Jeep Cherokee. And you'd also be safer in the Volvo. Plus, they have heated seats.

Further information about fuel economy can be found at: http:www.fueleconomy.gov. From there you can find fuel economy figures for cars from 1985 to the present. There is also useful information how to maximize your fuel efficiency. Table I, below, contains generalized data from the EPA and is for cars and transmissions that we thought were the most likely for students (and some others for comparison). The size of the car is determined by the EPA based on interior passenger volume. You will find some surprises in the list.

Table I - E.P.A. Fuel Economy for Selected 2003 Vehicles

Car, SUV, Truck	Size	MPG City/Hwy	Car, SUV, Truck	Size	MPG City/Hwy
BMW Z4 Roadster	TS	20/28	Nissan Maxima	M	20/26
Chevrolet Corvette	TS	19/28	SAAB 9-5	M	22/31
Ferrari Modena/Spyder	TS	11/16	Saturn L200	M	24/32
Honda Insight*	TS	61/68	Toyota Camry	M	23/32
Mazda MX-5 Miata	TS	23/28	Volkswagen Passat	M	22/31
Nissan 350Z	TS	20/26	Volvo S80	M	20/28
Audi TT Coupe	MC	21/29	BMW 745 I	L	18/26
BMW Mini Cooper*	MC	28/37	Buick LeSabre	L	20/29
Porsche Carrera 2 Coupe	MC	18/26	Buick Park Avenue	L	20/29
Ford Mustang	SC	20/29	Cadillac Deville	L	18/27
Subaru Impreza	SC	20/27	Chevrolet Impala*	L	21/32
Volkswagen New Beetle	SC	24/31	Chrysler LHS/Dodge Intrepid	L	21/29
Audi A4	SC	24/41	Ford Crown Victoria	L	18/26
Bentley Continental L	C	11/16	Ford Taurus	L	20/28
BMW 325 I	C	20/29	Lincoln Town Car	L	17/25
BMW 525 I	C	20/28	Pontiac Bonneville	L	20/29
Chevrolet Cavalier/Pontiac Sunfire	C	24/33	Toyota Avalon	L	21/29
Dodge Neon	C	25/32	Chevrolet S10/GMC Sonora	SPT	22/28
Ford Focus	C	27/33	Chevrolet C1500/GMC Sierra	ST	15/20
Honda Civic	C	29/38	Dodge Dakota Pickup	ST	18/19
Honda Civic Hybrid	C	46/51	Dodge Ram 1500	ST	15/20
Hyundai Elantra	C	25/33	Ford F150	ST	16/20
Mazda Protégé	C	25/30	Ford Ranger Pickup*	ST	24/29
Mercedes C240	C	19/25	Nissan Frontier	ST	22/25
Nissan Sentra	C	28/35	Toyota Tacoma	ST	22/27
Pontiac Grand Am	C	24/33	Ford Econoline E250	CV	14/17
SAAB 9-3	C	23/31	Chevrolet Venture	MV	19/26
Saturn Ion	C	24/32	Chrysler/Dodge Caravan*	MV	18/25
Subaru Legacy/Outback	C	22/28	Ford Windstar	MV	17/23
Toyota Corolla	C	29/38	Honda Odyssey	MV	18/25
Toyota Echo	C	35/43	Mazda MPV	MV	18/25
Toyota Prius*	C	52/45	Toyota Sienna	MV	19/24
Volkswagen Golf Diesel	C	42/49	Volkswagen Eurovan	MV	17/20
Volkswagen Golf	C	24/31	BMW X5	SUV	16/21
Volkwagen Jetta Diesel	C	42/49	Chevrolet Suburban	SUV	13/17
Volkswagen Jetta	C	24/31	Chevrolet Tahoe	SUV	14/18
Volvo S40	C	22/30	Chevrolet Trailblazer	SUV	15/21
Volvo S60	C	20/28	Dodge Durango	SUV	14/18
Acura 3.2 TL	M	19/29	Ford Escape	SUV	18/23
Audi A6	M	20/27	Ford Expedition	SUV	14/18
Buick Century	M	20/29	Ford Explorer	SUV	14/19
Buick Regal	M	19/29	Honda CRV	SUV	22/26
Chrysler Sebring/Dodge Stratus	M	22/30	Jeep Grand Cherokee	SUV	16/21
Honda Accord*	M	24/33	Jeep Liberty	SUV	17/21
Hyundai Sonata	M	22/30	Nissan Pathfinder	SUV	15/19
Jaguar S-Type 3.0 Litre	M	18/26	Saturn Vue	SUV	21/26
Lexus ES 300	M	21/29	Subaru Forester	SUV	21/27
Mercedes-Benz E320	M	19/27	Toyota 4Runner	SUV	15/19
Nissan Altima	M	23/29	Toyota RAV 4	SUV	22/27

* - Best in class TS – Two Seater MC – Minicompact SC – Subcompact C Compact M – Midsize L – Large SPT – Small Pickup Truck 2WD ST – Standard Pickup Truck 2WD CV – Passenger/Cargo Van MV – Minivan SUV – Sport Utility Vehicle 4WD